



Identifying effective factors in the relationship between a socially responsible board of directors and earnings management

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ABSTRACT

The role of the board of directors as the main decision-maker in relation to corporate social responsibility and corporate earnings management is very important in the era of corporate governance. In this study, the factors affecting the modeling of the board of directors supporting social responsibility and its impact on earnings management with respect to corporate governance have been identified. This research is of a descriptive-correlation type that initially began with a qualitative method. In the qualitative part, data were collected through semi-structured interviews with 19 experts and specialists related to the subject. Also, the time frame of the present study was 1403 and the interviews lasted about 6 months.

The sampling method in this part was non-random, purposeful/snowball. Information related to the influencing factors was extracted from the Kodal site and the Delphi method was used to analyze the data. The results of the study show that various factors such as social responsibility performance, information disclosure, social responsibility strategies, corporate characteristics, and corporate governance structure affect the modeling of the board of directors supporting social responsibility on earnings management. Socially responsible performance in environmental and social dimensions, transparent information disclosure, and social responsibility strategies increase stakeholder trust and reduce non-transparent behaviors such as earnings management. Also, corporate characteristics such as company size and cash flow, along with an appropriate corporate governance structure, enhance financial transparency and greater oversight of board decisions and reduce earnings management behaviors. These factors generally help improve the financial and social sustainability of companies.

Keywords:



1. Introduction

The 2001 financial crisis and the collapse of large companies such as Enron, WorldCom, and Parmalat have brought corporate governance and board responsibility to the forefront of attention. These scandals have involved socially irresponsible behavior and the phenomenon of earnings management. For this reason, researchers in the field of corporate governance and its impact on issues related to social responsibility and earnings management have tried to provide an answer to these challenges using different theoretical perspectives (Chatnevy, 2021). Research in the field of social responsibility has been considered by researchers from various disciplines, including business, management, marketing, finance, corporate governance, and accounting. This research shows that successfully addressing social and environmental concerns has become an important and essential competitive issue for companies to achieve sustainable economic success (Lamond et al., 2010; Gangi and Trotta, 2015; Kim et al., 2017).

In general, researchers have argued that investing in environmental and social strategies may bring internal and external benefits directly related to the ultimate economic goals of the companies (Ballo et al., 2003; Fulmer et al., 2003). For example, investing in socially responsible activities related to employees can help companies develop new resources and capabilities related to the way they work and the company culture (Branco and Rodriguez, 2006). Also, developing an environmental management control system can help reduce waste in the business process and, consequently, help improve the efficiency of the production process and reduce costs and gain competitive advantage (Clarkson et al., 2011).

This study identifies the influential factors of modeling a socially responsible board of directors on earnings management with respect to corporate governance, focusing on the research of Shaukat et al. (2016) and Halfaya and Musa (2017) and aims to conduct further research in this field. The board of directors, as a visible resource for companies, has an important relationship with managing and reducing challenges, autonomy, and uncertainties posed by external factors of the company such as the environment and society (Lee et al., 2022).

In other words, although previous studies (Hillman et al., 2002; Kemp et al., 2015; Issa and Fang, 2019) have examined the impact of the board's willingness to

implement social responsibility on the company's strategy, performance, and disclosure of social responsibility, their results cannot be generalized due to the limited sample size (one country or one year). Therefore, there is a need for further studies in this area with larger samples (Shaukat et al., 2016; Halfaya and Moussa, 2017; Moussa et al., 2019).

Also, the legal origin and philosophical orientation of the company may influence the company's decision to adopt social responsibility and the orientation of corporate governance towards social responsibility issues (Garcia-Tora et al., 2016; Cook et al., 2016). As a result, the impact of the board's willingness to implement social responsibility on the company's strategy, performance and disclosure of social responsibility depends on the circumstances and environment of the company and the country in which it operates.

Previous research has shown that the governance structure at the board level may influence the decisions of company managers, depending on the legal origin, and lead to different outcomes (Shatnoy, 2021). Investigating the relationship between the board's willingness to implement social responsibility and the company's strategy, performance, and social responsibility disclosure remains a challenging topic in the research literature. This is due to the lack of generalizability of the results of past studies in this field. In other words, although previous studies have examined this relationship, due to the limited sample size (usually in one country or one year), the results cannot be generalized to a wider range of companies and countries. Therefore, there is still a need for more research in this field with larger samples.

Previous research has shown that companies with a CSR strategy perform better in CSR performance and disclosure (Clarkson et al., 2011). However, a significant limitation of this literature is that the impact of environmental and social strategies on CSR performance and disclosure has rarely been examined (Banerjee et al., 2003; Clarkson et al., 2011). Therefore, the motivation of this study is to investigate whether CSR strategy affects the effect of a socially responsible board on earnings management. The last motivation of this study is to examine the relationship between the board's willingness to implement CSR and earnings management based on two perspectives of agency and resource dependence. In this regard, integrating these two perspectives can provide a better

understanding of the relationship between the board's willingness to implement CSR and earnings management. Finally, the research question is as follows:

What are the influential factors of modeling a socially responsible board of directors on earnings management with respect to corporate governance?

Theoretical foundations and research background

Resource dependency theory addresses the relationship between board composition, social responsibility strategy, performance, and related disclosure. Recent studies show that boards, by forming externalities and influencing strategic decision-making processes, help formulate and implement social responsibility strategies and improve the company's relationship with stakeholders (Shaukat et al., 2017). These studies also show that directors with a strong orientation towards social responsibility issues are more sensitive to social and environmental challenges and therefore provide effective advice to senior management on social responsibility management (Shaukat et al., 2017; Helfaya and Moussa, 2017; Moussa et al., 2019). Previous studies show that the degree to which a board is inclined to implement social responsibility is positively related to directors who have a positive impact on social responsibility issues, such as independent directors, female directors, and audit committee financial expertise (Zhang, 2012). Also, the financial expertise of the audit committee also plays an effective role in the development and evaluation of social responsibility strategies and related disclosure (Shaukat et al., 2016; Helfaya and Moussa, 2017; Moussa et al., 2019). Given these results, this study examines the impact of a board inclined to implement social responsibility on social responsibility strategy, social responsibility performance, and related disclosure. Therefore, it can be said that the composition of the board and their orientation towards social responsibility issues have a direct impact on the performance and relations of the company with its stakeholders. Theorists of the resource-based perspective believe that effective social responsibility strategies can improve the ability of companies to create sustainable internal and external competitive advantages (McWilliams and Siegel, 2011). For example, by promoting environmentally responsible

practices, an internal competitive advantage can be created for companies (Branco and Rodriguez, 2006).

Also, social responsibility strategies can be the result of developing social responsibility strategies by promoting socially responsible practices, such as fair wages, a safe and clean work environment, and training opportunities. Studies by Banerjee et al. (2003) show that social responsibility disclosure is associated with social responsibility strategy and that companies that disclose a high level of their environmental strategies are likely to have a more sustainable competitive advantage. Also, Kater et al. (2009) stated that companies that adopt an environmental strategy tend to report a relatively high level of environmental disclosure. A recent study by Helfaya and Musa (2017) states that high quality environmental disclosure is a result of having a comprehensive strategy. Therefore, it is argued that companies that have an effective social responsibility strategy have superior social and environmental performance. Hence, social responsibility strategy is expected to have a positive impact on social responsibility performance and social responsibility disclosure. In this study, independent directors, female directors, and audit committee financial expertise are examined as factors that are associated with a board's willingness to engage in socially responsible behavior (Katmon and Farooq, 2017). Evidence suggests that effective oversight functions by the board and relevant subcommittees can mitigate agency problems, including those related to earnings management practices (Kapoor and Gul, 2019). For example, board quality is expected to be strongly related to the degree of independence of its members (Tam et al., 2019). From an agency perspective, independent directors have superior technical expertise and professional reputation concerns (Jiang et al., 2016) and therefore have a greater incentive to monitor management activities (Tam et al., 2019).

Klein (2002) found that independent directors have a significant negative impact on earnings management. Shi et al. (2003) also found that firms with a higher proportion of independent directors are less likely to engage in earnings management than firms with a lower proportion of independent directors. Wafis (2005) found that adding independent directors to the boardroom improves the quality of financial reporting and reduces earnings management. This finding is also supported by recent studies such as Siagian and

Trisnarningsje (2011) and Tam et al. (2019). Each director plays a unique and irreplaceable role in the board's oversight capacity and effectiveness and makes a significant and different contribution to this (Shatnoy, 2021).

Research evidence shows that corporate governance and social responsibility have significant effects on the financial and social performance of companies. Barzegar and Alavi (1402) examined the effect of corporate governance and company strategy on the performance of family-owned companies and showed that overall family ownership has an inverse and significant relationship with the financial performance of companies. Also, Abbasi (1402) showed that corporate social responsibility has a positive effect on board members' compensation, while the quality of corporate governance has a negative and significant effect on this relationship. Kaveh and Salemi (1401) showed that there is a significant inverse relationship between corporate social responsibility and enterprise risk management with real profit management. Also, Pakdelan et al. (1401) stated that there is a negative and significant relationship between disclosure of social responsibility and accrual-based earnings management, and disclosure of social responsibility reduces the complexity of financial reporting and increases transparency. Biglarkhani and Talebnia (2014) showed that there is an inverse and significant relationship between the complexity of financial reporting and social responsibility, and the more social responsibility reporting decreases, the more the complexity of financial reporting increases. Also, the findings of Haji Mohammadloo and Hajiha (2013) show that a selfish, compassionate, and systematic moral climate has a direct and significant effect on accountants' support for ethical standards and social responsibility. On the other hand, accountants' ethical judgments regarding earnings management have a significant and positive relationship with their ethical intentions and behavior. The results of Hajiha and Shakeri's (2019) study show that there is a significant relationship between the criterion of ownership concentration and social responsibility, but no significant relationship was observed between the criterion of percentage of shares held by major shareholders and social responsibility. Brandek et al. (2019) showed that the efficiency of the board of directors has a significant relationship with the company's social responsibility performance. The

results of the study by Vaez et al. (2018) indicate that there is no relationship between ownership concentration and economic and ethical dimensions, as well as no relationship between the independence of board members and legal and economic dimensions of social responsibility. Heidari et al. (2018) stated that the ratio of non-executive directors and the size of the board of directors have a positive effect on the quality of social information disclosure, but the number of board meetings does not affect the quality of social information disclosure. Various studies have shown that the impact of the board of directors on the financial and social performance of companies is a complex issue. Various studies indicate that corporate social responsibility is related to reducing organizational risk management and increasing transparency and ethics in organizations. Also, the moderating role of factors such as managerial self-confidence in the impact of corporate social responsibility on earnings management is important. In a study by Hanjera et al. (2024), it was shown that the size of the board of directors, board meetings, and board independence significantly negatively affect the credit risk of banks. Corporate social responsibility also leads to a reduction in bank credit risk. Miloud (2024) showed that the effect of corporate governance increases with firm size and is reduced by firm leverage. Katit and Khalaf (2024) have shown that corporate social responsibility has a significant effect on dividend distribution in European firms. Ahmed et al. (2024) showed that good corporate governance practices have a negative effect on financial performance, but corporate social responsibility has a positive effect on financial performance. Suryandari and Susandia (2023) showed that board size and independent commissioners can increase a firm's incentive to disclose corporate social responsibility. Ahmed et al. (2023) showed that corporate social responsibility costs are related to real earnings management in contexts where shareholder ownership and founder internal control are dominant. Stefani and Morhadi (2023) showed that ethics affect corporate governance system and corporate social responsibility practices, but there is no evidence that corporate governance system and corporate social responsibility affect financial performance. Ngoc et al. (2022) showed a negative relationship between corporate social responsibility and earnings management, and Li et al. (2022) showed that companies with top managers

with financial expertise have higher social responsibility performance. Shatnoy (2021) shows that companies with boards inclined to implement social responsibility tend to report more conservative earnings. Moussa et al. (2019) showed that the more the board is inclined to implement social responsibility, the better the company's performance around environmental strategy. Katmon et al. (2017) showed that the level of education of the board and the diversity of board tenure affect the quality of a company's social responsibility disclosure. Halfaya and Musa (2017) showed that a corporate social responsibility strategy and a socially responsible board have a positive effect on corporate social responsibility disclosure. Parente and Machado Filho (2016) showed that board members are more likely to view the organization as an institution with a social role, which is reflected in their decision-making processes. Katmon and Al-Farouk (2015) show that the quality of corporate social responsibility disclosure is negatively related to earnings management.

The above research emphasizes that corporate boards play a vital role in the relationship between social responsibility and earnings management. This research shows that corporate social responsibility is associated with reducing organizational risk management and increasing transparency and ethics in organizations. In addition, research indicates that disclosure of social responsibility in corporate financial reports can increase transparency and reduce the complexity of financial reporting. The moderating effect of factors such as managerial self-confidence on the effect of corporate social responsibility on earnings management is also important. Overall, the research conducted on the subject under study shows that decisions and measures of the board of directors in

support of corporate social responsibility and ethics can help improve the financial and social performance of organizations. This material and research can help decision-makers and organizations to choose the best strategies for interacting with financial and social issues and pay attention to the interests of shareholders and society simultaneously. The above studies are exploited from several aspects to examine the relationship between the board of directors, social responsibility, corporate governance and earnings management in more detail. These studies play a very important role in understanding the complex relationships between different dimensions of corporate governance and the financial and social performance of companies. It can be concluded that foreign studies have emphasized the importance of the board of directors in the issue of earnings management and corporate social responsibility, and there is a common model that leads to a general conclusion about the relationship between corporate social responsibility and earnings management. These studies show that this relationship is complex and is moderated by various factors such as ownership structure, management teams, and environmental strategies. In general, corporate social responsibility may lead to a decrease in earnings management, but this effect may be moderated by internal and external factors. Finally, all these studies show that corporate social responsibility plays a role as an important tool in the financial and social decision-making of managers and boards of directors in companies. Based on the research conducted, the modeling factors of the impact of a socially responsible board of directors on earnings management with respect to corporate governance are extracted as follows:

Table 1: Factors Modeling the Impact of a Socially Responsible Board on Earnings Management Considering Corporate Governance

Factors	Sources
Corporate Social Responsibility (CSR) Performance	Parente & Machado Filho (2016), Ngoc et al. (2022), Pakdelan et al. (2022), Hajimohammadlou & Hajiha (2020), Brandek et al. (2019)
Corporate Social Responsibility (CSR) Disclosure	Halfaya & Mousa (2017), Katmon et al. (2017), Pakdelan et al. (2022), Hajiha & Shakri (2019), Heidari et al. (2018)
Corporate Social Responsibility (CSR) Strategy	Halfaya & Mousa (2017), Mousa et al. (2019), Shtenoy (2021)
Board Inclined to Implement Social Responsibility	Parente & Machado Filho (2016), Halfaya & Mousa (2017), Mousa et al. (2019), Shtenoy (2021)
Earnings Management	Katmon & Al Farooq (2015), Shtenoy (2021), Kaveh & Salemi (2022), Pakdelan et al. (2022), Ahmad et al. (2023), Ngoc et al. (2022), Biglarakhani & Talebnia (2021), Hajimohammadlou & Hajiha (2020), Heidari et al. (2018)
Company Activity Indicators (Return on Assets,	Biglarakhani & Talebnia (2021), Halfaya & Mousa (2017)

Factors	Sources
Financial Leverage, Revenue Growth, Profitability)	
Corporate Governance (Board Members, Largest Shareholder, Institutional Shareholder)	Katmon & Al Farooq (2015), Katmon et al. (2017), Ahmad et al. (2023), Hajiha & Shakri (2019), Vaez et al. (2018)
Corporate Characteristics (Operating Cash Flow, Company Size, Market-to-Book Value)	Biglarakhani & Talebnia (2021), Halfaya & Mousa (2017)

Research methodology

This research was conducted using a qualitative method and an exploratory approach. The statistical population of the research is experts and people with opinions in line with the research topic, and ultimately 19 experts participated in this research. The sampling method was a non-random sampling method of a selective type. In order to identify and extract the factors affecting the proposed model, the Delphi method is used. This method is considered one of the qualitative techniques in which, by referring to experts and specialists in the field in question, their opinions and suggestions are collected and analyzed. The Delphi process is carried out in several stages so that, ultimately, a consensus is reached among the experts regarding the key factors. In this stage, the library method and document studies are used to carefully examine the different dimensions of the subject by referring to theoretical foundations and research history and to provide a scientific and documented basis for the Delphi process. The data collection tool in this research includes semi-structured interviews with experts.

The semi-structured interview of the first stage of Delphi had 38 items that experts were asked to respond to. Also, the Likert response scale is five-choice (completely irrelevant = 1 to completely relevant = 5). In the second stage of Delphi, a semi-structured interview was defined, consisting of 52 items, and its response range was the same as in the

first stage. Semi-structured interviews were distributed online and in person. Also, the time frame of the present study was 1403 and the interviews lasted about 6 months.

Research findings

Demographic analysis of the experts shows that most of the experts are in the age range of 30 to 40 years (52.63%), which indicates a mix of relatively young and experienced workers in this field. In terms of education, 57.9% of the experts have a PhD or higher, which indicates a high level of education and scientific expertise. In terms of expertise, 84.21% of the individuals have expertise in accounting, which, given the nature of the research, is highly relevant to the research topic. Most of these experts work as university faculty (68.42%), which means having scientific and educational expertise along with executive experience. Also, in terms of academic rank, 47.36% are at the level of associate professor, and a significant number also work as instructors and assistant professors. In terms of executive responsibility, 68.42% of the experts hold executive management positions, which indicates their active and executive role in professional environments. In terms of work experience, most experts have 20 to 25 years of work experience (42.10%), which indicates their deep and long-term experience in this field (19 are the number of research experts).

Table 1, Demographic information of experts

Abundance percentage	Abundance	Demographic information	
52.63%	10	30 to 40 years	age
15.79%	3	40 to 50 years	
21.05%	4	50 to 60 years	
10.53%	2	60 years and above	
42.10%	^	Master's degree	education
57.9%	11	PhD and above	
84.21%	16	Accounting	Specialization or field of study
10.53%	2	audit	
-	-	Financial management	
5.26%	1	Other disciplines	

Abundance percentage	Abundance	Demographic information	
31.58%	6	Auditing companies and institutions	workplace
68.42%	13	University faculty or lecturer	
26.32%	5	coach	Scientific rank
47.36%	9	assistant professor	
15.79%	3	Associate Professor	
10.53%	2	teacher	
68.42%	13	executive director	Executive responsibility
21.05%	4	middle manager	
10.53%	2	Senior or top executive of legislative bodies	
-	-	other	
15.79%	3	5 to 10 years	work history
21.05%	4	10 to 15 years	
21.05%	4	15 to 20 years	
42.10%	8	20 to 25 years	
-	-	25 years and up	
19		total	

Analysis of Delphi results

The Delphi method was used to analyze the qualitative part (Hashemian Taheri et al, 2022; Asadi et al, 2021); after focusing on theoretical foundations, research backgrounds, and influential indicators (measurement criteria), the opinions of experts were used to measure the dimensions (variables) using the Delphi method. In

general, in order to measure the dimensions (variables) of the research, indicators were introduced, and then appropriate measurement criteria were determined for each variable with the help of experts.

After extracting these items, they were prepared in the form of a structured interview, interviewed with experts, and analyzed using the Delphi method.

Table 2: Identified Dimensions and Component

Dimensions (variables)	Symbol	Description	Component (measurement criterion)	Source
Corporate Social Responsibility Performance	CSR performance	It measures a company's impact on living and non-living natural systems, including air, land and water, as well as entire ecosystems. It shows how a company is using best management practices to avoid environmental risks and capitalize on environmental opportunities.	Environmental performance	Cheng et al. 2014;) Shawkat et al., 2016; Halfaya and Musa, (2017
		Measures a company's capacity to build trust and loyalty with its workforce, customers, and community through the use of best management practices. Covers topics such as employee turnover, incidents, training hours, financial aid, .and health and safety discussions	Social function	
		Customer-related social responsibility refers to companies' marketing efforts to meet the needs of their customers in ethical and fair ways (Anthony .and Hong, 2014)	Customer relationship performance	Ismaili and Aqoubi,) (1400 (Anthony and Hong, 2014)
		Social responsibility related to society refers to the sense of responsibility of institutions in society. Today, it is accepted that companies	Community relations performance	Ismaili Viagubi,) (1400 (ISO Standard, 2006)

Dimensions (variables)	Symbol	Description	Component (measurement criterion)	Source
		interact and relate to communities and institutions in it (ISO Standard, 2006)		
		Employee-related social responsibility describes the company's human resource activities in nurturing employees and meeting their needs .(Anthony and Hong, 2015)	Employee communication performance	(Ismaili Viagoubi, 1400) (Anthony and Hong, 2015)
Corporate Social Responsibility Disclosure	CSR disclosures	The level of environmental disclosure of a company, as reported through multiple sources including annual reports, independent reports, and the company's website	Environmental Disclosure	Qiu et al., 2016;) ;Gatche et al., 2017
		The level of social disclosure of a company, as reported through multiple sources including annual reports, independent reports and the company's website	Social disclosure	Wang et al., 2018
		Disclosure of employee relations in the form of retirement benefits and cash profit sharing	Disclosure of employee relationships	Hajiha and Shakeri, 2019
		Disclosure of product features based on product quality and safety	Disclosure of product features	
Hajiha and Shakeri, 2019	CSR-Oriented board	This index measures corporate social responsibility policies and initiatives at the company level, with a higher social responsibility strategy score indicating more social responsibility-related activity within a company and, consequently, more active social responsibility planning, monitoring, and communication strategy at the board level	Corporate Social Responsibility Committee or Team	Shawkat et al., 2016;) Halfaya and Musa, (2017
			Aligning the corporate social responsibility report with international guidelines	
			Social Responsibility Report Audit	
			Management analysis of financial and non-financial factors	
			Use of foreign investors (eliminated according to the results of the first stage Delphi)	
Board of Directors inclined to implement social responsibility	CSR-oriented board	Board decisions on the extent of social responsibility implementation	Board Independence (AI)	(Shawkat et al., 2016; Halfaya and Musa, 2017) (Sahari and Pourzamani, 1401) (Mobini Dehkordi et al., 1399)
			Board of Directors' Expertise	
			Presence of women on the board of directors (eliminated according to the results of the first stage Delphi)	
			Board of Directors membership history (deletion based on expert opinion)	
			Audit Committee Financial Expertise	
			Strategy Committee (deleted based on expert opinion)	

Dimensions (variables)	Symbol	Description	Component (measurement criterion)	Source
			Risk Management Committee (deleted based on expert opinion)	
Profit management	EM	The role of earnings management in improving performance	Accrual-based earnings management: Modified Jones model, Kaznik model	(Shatnavi, 2021; Ngok et al., 2022; Haji Mohammadloo and Hajiha, 2020; Biglarkhani and Talebnia, 2019)
			Real Profit Management	
Company activity indicators	ROA	Net profit divided by total assets for the current year	Return on assets	Nakhaei and Ahmadpour, 2010; Kaveh and Salmi, 2012; Pakdelan et al., 2012; Hajiha and Shakeri, 2019; Brandek et al., 2019; Vaez et al., 2018; Heydari et al., 2018; Ngok et al., 2022; Li et al., 2022; Shatnavi, 2021; Moussa et al., 2019; Katmon et al., 2017; Halfaya and Moussa 2017)
	ROE	Ratio of net profit to total equity for the current year	Return on equity	
	FL	Ratio of total liabilities to equity value	Financial leverage	
	RG	Current year's income minus previous year's income divided by previous year's income	Revenue growth	
	Loss	The dummy variable is equal to 1 if the firms have operating losses, and 0 otherwise	Profitability	
Corporate Features	MTB	Market price of the stock at the end of the year divided by the book price of the stock at the end of the year	Market to book value	Nakhaei and Ahmadpour, 2010; Kaveh and Salmi, 2012; Pakdelan et al., 2012; Hajiha and Shakeri, 2019; Brandek et al., 2019; Vaez et al., 2018; Heydari et al., 2018; Ngok et al., 2022; Li et al., 2022; Shatnavi, 2021; Moussa et al., 2019; Katmon et al., 2017; Halfaya and Moussa 2017)
	CFO	Operating cash flow divided by total assets of the previous year	Operating cash flow	
	Size	Natural logarithm of total assets at the end of the year	Company size	
Corporate governance	BS	Board of Directors	Board members	Aghaei et al., 2009
	AM	Number of audit committee meetings during the year	Audit Committee Meetings (deleted based on expert opinion)	
	OC	The largest shareholder is measured.	Largest shareholder	
	IO	The total percentage of the company's shares owned by banks, insurance companies, financial institutions, holding companies, organizations, institutions, and government companies.	Institutional ownership	
	CEO - Influence	If the chairman of the board of directors is a member, it is equal to one, otherwise it is zero.	CEO influence (removed based on the results of the first stage)	Aghaei et al., 2009
	Dual-CEO	If the CEO is the chairman of the board, it is equal to one, otherwise it is zero.	CEO duality of duty (eliminated according to the results of the first stage Delphi)	

Consensus scale

In this study, the Kendall coefficient of agreement is used to determine the level of consensus among panel members. The Kendall coefficient of agreement indicates that people who have ranked several categories based on their importance have used essentially the same criteria to judge the importance of

each category and are in agreement with each other in this regard.

Table 3, Interpretation of various values of the Kendall coordination coefficient (Schmidt, 1997, quoted by Sarlak, 2005)

Confidence in the order of factors	interpretation	مقدار w
does not exist	Very weak consensus	•/1
less	Weak consensus	•/3
average	Moderate consensus	•/5
a lot	Strong consensus	•/7
very much	Very strong consensus	•/9

Delphi analysis results

The Delphi method is a qualitative research tool used to gather and analyze expert opinions and reach consensus. This method is particularly effective in cases where complex and multifaceted issues require a detailed and systematic assessment. In this study, the Delphi method was used to examine indicators and criteria related to corporate social responsibility, and the experts' opinions on the suitability of these indicators for measuring the research variables were collected and analyzed. The results of the Delphi analysis are presented in Table 4, which shows in detail which indicators are considered more valid by the experts and which need to be revised or eliminated. In the analysis of Table 4, the results of the Delphi method show that various indicators of corporate social responsibility and its related variables have been evaluated from the experts' perspective. In general, indicators related to corporate social responsibility performance, such as environmental, social, community relations and customer relations performance indicators, with high averages of 4.44 to 4.67 and low standard deviations, indicate significant agreement among experts. In particular, environmental and social performance indicators, which have averages of 4.56 and 4.67, respectively, have enjoyed high credibility in the experts' assessments. These results show that these indicators measure corporate social responsibility performance criteria well. In other sections, indicators related to corporate social responsibility strategy and corporate governance have also been generally approved with high averages of 4.00 to 4.33. These indicators include things like auditing the social responsibility report, management analysis of financial and non-financial factors, and board independence. However, some indicators, such as the presence of women on the board and the dual

role of the CEO, have been associated with lower means such as 3.44 and 3.56, indicating greater disagreement among experts on these indicators. These differences could be due to cultural or structural reasons related to companies and the way social responsibility is implemented. Based on the research results and analysis of Table 4, the indicators that should be removed or revised in the final assessment are those that have a lower mean and a higher standard deviation. These indicators should be considered due to insufficient agreement among experts or insufficient validity for measuring variables. Some of these indicators include:

Women on the Board: This indicator has one of the lowest scores among the indicators, with a mean of 3.44 and a standard deviation of 1.130 and 1.333. This indicates that experts have less agreement on the importance of this indicator and it is probably not a suitable indicator for measuring corporate social responsibility performance.

CEO Influence: This indicator, with a mean of 3.67 and a standard deviation of 0.866, also has a relatively low score, indicating disagreement among experts. Therefore, this indicator may also need to be removed or revised.

CEO duality of duty: This indicator, with a mean of 3.56 and a standard deviation of 1.236, also indicates a significant difference in the experts' assessments and may not be considered an appropriate indicator.

Use of foreign investors: This indicator, with a mean of 3.67 and a standard deviation of 0.707, is another indicator that has a relatively low score and could be prioritized for removal or revision.

These indicators, due to their low means and high standard deviations, indicate that they are either not important enough or there is a lot of disagreement among experts about their impact, so their removal or modification may help improve the model.

Table 4, Delphi method output results

Indicator (measurement criterion)	Average	Standard deviation	Maximum	At least	Average rank
Is the environmental performance index appropriate for the corporate social responsibility performance variable?	4,56	0,726	5	3	25,72
Is the environmental performance index appropriate for the corporate social responsibility performance variable?	4,67	0,707	5	3	27,61
Is the customer relationship performance indicator appropriate for the corporate social responsibility performance variable?	4,44	1,014	5	2	25,67
Is the community engagement performance index appropriate for the corporate social responsibility performance variable?	4,67	0,500	5	4	27,82
Is the employee relations performance indicator appropriate for the corporate social responsibility performance variable?	3,89	0,782	5	3	17,00
Is the environmental disclosure index appropriate for the corporate social responsibility disclosure variable?	4,33	0,707	5	3	23,39
Is the social disclosure index appropriate for the corporate social responsibility disclosure variable?	4,44	0,726	5	3	24,78
Is the employee relations disclosure indicator appropriate for the corporate social responsibility disclosure variable?	4,00	0,866	5	3	17,44
Is the disclosure of product features an appropriate indicator for the corporate social responsibility disclosure variable?	4,11	0,782	5	3	20,28
Is the corporate social responsibility committee or team indicator appropriate for the corporate social responsibility strategy variable?	4,22	0,667	5	3	21,94
Is it appropriate for the corporate social responsibility strategy variable to align the corporate social responsibility report with international guidelines?	4,00	0,707	5	3	18,44
Is the social responsibility report audit indicator appropriate for the corporate social responsibility strategy variable?	4,11	0,782	5	3	21,11
Is the financial and non-financial factors management analysis index appropriate for the corporate social responsibility strategy variable?	4,11	0,928	5	3	20,11
Is it appropriate to use foreign investors for the indicator company's social responsibility strategy variable?	3,67	0,707	5	3	12,56
Is the board independence indicator appropriate for the variable of a board inclined to implement social responsibility?	4,00	1,118	5	2	19,22
Is the board expertise index appropriate for the variable of board willingness to implement social responsibility?	3,89	1,054	5	2	17,82
Is the indicator of female presence on the board of directors appropriate for the variable of a board inclined to implement social responsibility?	3,44	1,332	5	1	13,17
Is the indicator of board membership history appropriate for the variable of board willingness to implement social responsibility?	3,67	1,000	5	2	14,06
Is the audit committee financial expertise indicator appropriate for the variable of board of directors inclined to implement social responsibility?	3,89	0,928	5	3	16,06
Is the strategy committee indicator appropriate for the variable of board of directors inclined to implement social responsibility?	3,78	0,832	5	3	14,67
Is the risk management committee indicator appropriate for the variable of board of directors inclined to implement social responsibility?	3,78	1,092	5	2	15,82
Is the accrual-based earnings management index appropriate for the earnings management variable?	4,44	0,527	5	4	25,22
Is the real earnings management index appropriate for the earnings management variable?	4,33	0,707	5	3	23,78
Is the return on assets index appropriate for the variable of company activity indicators?	4,33	0,500	5	4	24,11
Is the return on equity index appropriate for the variable of company activity indicators?	4,22	0,667	5	3	22,67
Is the financial leverage index appropriate for the company's activity indicator variable?	4,11	0,782	5	3	20,28

Indicator (measurement criterion)	Average	Standard deviation	Maximum	At least	Average rank
Is the revenue growth index appropriate for the company's activity indicators variable?	4/22	0.823	5	3	21/67
Is the profitability index appropriate for the company's activity indicator variable?	4/11	0.782	5	3	20/28
Is the market-to-book value index appropriate for the variable of company activity indicators?	3/89	0.782	5	3	16/72
Is the operating cash flow indicator appropriate for the company's activity indicator variable?	4/22	0.667	5	3	22/28
Is the company size index appropriate for the company activity indicators variable?	4/00	0.707	5	3	17/44
Is the board members index appropriate for the corporate governance variable?	4/11	0.928	5	2	21/94
Is the board member independence indicator appropriate for the corporate governance variable?	4/33	0.500	5	4	24/11
Is the audit committee meetings indicator appropriate for the corporate governance variable?	4/11	0.782	5	3	20/72
Is the largest shareholder index appropriate for the corporate governance variable?	4/11	0.601	5	3	20/44
Is the institutional ownership index appropriate for the corporate governance variable?	4/00	1.000	5	2	20/39
Is the CEO influence index appropriate for the corporate governance variable?	3/67	0.866	5	2	14/17
Is the CEO duality indicator appropriate for the corporate governance variable?	3/56	1.236	5	1	15/89

Table 5, Summary of Cronbach's alpha and Kendall coefficient results

	Delphi analysis
Cronbach's alpha	0.970
Kendall coefficient	0.227

The results of Table 5, which includes the values of Cronbach's alpha and Kendall's coefficient for assessing the reliability and agreement between experts in the Delphi method, provide an interesting analysis. Cronbach's alpha, which is used to measure the reliability and internal consistency of the measurement tools, shows a value of 0.970. This very high value (above 0.9) indicates very good reliability and internal consistency of the tools used in this study. In other words, the questions and criteria used in the Delphi analysis have significant consistency and stability, and the measurement tools are well-functioning. However, the Kendall's coefficient, which indicates the level of agreement between experts, shows a value of 0.227. This number is relatively low and indicates that there is no significant agreement between the experts' opinions. While Cronbach's alpha indicates the internal consistency of the tools, a low Kendall's coefficient indicates significant differences in the experts' views. This result could indicate that the experts did not act homogeneously in their assessment and had differences of opinion regarding some

indicators or criteria. This difference of opinion requires further investigation into the possible causes of the disagreement.

In this section, in order to simplify and streamline the variables of corporate social responsibility performance, corporate social responsibility disclosure, and corporate social responsibility strategy, we will discuss the Delphi results and expert opinions. For this purpose, the sub-indices of these variables are defined based on the criteria that are to be measured and are also reviewed and analyzed based on the experts' opinions. The sub-indices are presented in the table before the expert survey:

The results of the Delphi analysis are presented in Table 7 and show in detail which indicators are more valid from the experts' point of view and which ones need to be revised or deleted.

Table 6, relevant identified sub-indicators

Dimensions (variables)	Symbol	Component (measurement criterion)	Environmental performance
Corporate Social Responsibility Performance	CSR performance	Environmental performance	<ul style="list-style-type: none"> - The amount of materials required in the organization is adjusted based on weight and volume. - Recycled materials enter the production cycle as raw materials. - The organization's total fuel consumption includes renewable and non-renewable resources. - The organization's energy consumption is monitored. - Reduction in energy consumption is measured and improved. - The reduction in energy types is monitored and managed. - Water withdrawal from sources is controlled within the organization. - The impact of water resources on water withdrawal is assessed. - Recycling and reuse of water takes place in the organization's processes. - Direct greenhouse gases produced by the organization are recorded. - The organization's waste is managed based on type and disposal method. - The organization complies with environmental laws and regulations. - Domestic and international environmental standards are implemented and adhered to within the organization. - Natural resource impact management operations are implemented. - Activities are being carried out to establish and develop specialized strategic and environmental oversight committees. - Operations are carried out to optimize the use of natural resources. - Educational and cultural activities are implemented regarding the environment (removed according to the results of the second stage Delphi). - Research and development is carried out to innovate in environmentally friendly product production methods (deleted according to experts). - The level of savings and profitability in the use of natural resources is evaluated.
		Social function	<ul style="list-style-type: none"> - Authorities have been designated in economic, environmental, and social issues. - Responsibilities are assigned at the executive level for economic, environmental, and social issues. - Conflicts of interest are managed within the organization. - The organization's reward policies are set and implemented. - The direct economic value added produced and distributed is disclosed. - Infrastructure investments and support services are carried out. - The organization's significant indirect economic impacts are assessed. - The organization's internal supplier cost ratio is managed.
		Customer relationship performance	<ul style="list-style-type: none"> - Incidents related to non-compliance with health and safety impacts of products and services are assessed and managed.
		Community relations performance	<ul style="list-style-type: none"> - Research and development is carried out to create innovation in environmentally friendly product production methods. - Significant indirect economic impacts of the organization on the assessment community (deleted according to expert opinion).
		Employee communication	<ul style="list-style-type: none"> - Special benefits are offered to full-time employees that are not considered for temporary or part-time employees.

Dimensions (variables)	Symbol	Component (measurement criterion)	Environmental performance
		performance	<ul style="list-style-type: none"> - Maternity leave is granted to female employees. - A formal joint committee for the management of worker health and safety has been formed (removed based on the results of the second phase Delphi). - The average annual training hours are considered for each employee.
Corporate Social Responsibility Disclosure	CSR disclosures	Environmental Disclosure	<ul style="list-style-type: none"> - The company discloses information about its environmental responsibilities and actions in its annual report. - Independent corporate social responsibility (CSR) reports are prepared and published, including the company's environmental data. - The level of transparency in reports on the company's environmental impacts is assessed. - Information about the company's environmental activities and commitment to environmental responsibilities is available on the website.
		Social disclosure	<ul style="list-style-type: none"> - The company discloses information about its social activities in its annual report. - The number and quality of CSR reports that address social issues are reviewed. - The level of transparency in company reports on the company's social actions and impacts is measured. - Information about the company's activities and social impacts is publicly available on the website.
		Disclosure of employee relationships	<ul style="list-style-type: none"> - Information about the company's relationships and interactions with employees is disclosed in the annual report. - The company publishes reports that promote employee relations and support them in the form of CSR reports. - The level of transparency in reports about company policies and practices related to employees is examined. - The company website publicly provides information related to employee relations and policies.
		Disclosure of product features	<ul style="list-style-type: none"> - Information about the features and specifications of the company's products and compliance with product quality and safety requirements is disclosed in the annual report. - The company publishes independent reports on its responsibilities related to the quality and safety of its products. - Transparency of reports on product features and quality and safety standards is reviewed. - Information related to product features and quality standards is publicly available on the company's website.
Corporate Social Responsibility Strategy	CSR-Oriented board	Corporate Social Responsibility Committee or Team	The company has a formal Corporate Social Responsibility (CSR) committee.
		Aligning the corporate social responsibility report with international guidelines	The company uses the Global Reporting Initiative (GRI) guidelines in its social responsibility report (removed based on the results of the second phase of the Delphi).
		Social Responsibility Report Audit	The company conducts independent audits of its corporate social responsibility (CSR) and environmental and social sustainability (ESG) reports.
		Management analysis of financial and non-financial factors	The company has integrated financial and non-financial factors related to social responsibility in the management analysis section of the annual report.
		Using foreign investors	The company reports on its global CSR activities (first stage is omitted according to Delphi).

Table 8, Delphi method output results under indicators

Sub-indices	Average	Standard deviation	Maximum	Minimum	Average rank
The amount of materials required in the organization is adjusted based on weight and volume.	1,563	2,78	5	1	19,33
Recycled materials enter the production cycle as raw materials.	1,236	3,56	5	1	28,89
The organization's total fuel consumption includes renewable and non-renewable resources.	1,481	3,22	5	1	25,11
The organization's energy consumption is monitored.	1,691	3,11	5	1	26,89
The increase in energy consumption is recorded and evaluated.	1,014	3,44	5	2	31,00
Reductions in energy consumption are measured and improved.	1,481	2,78	5	1	21,28
The reduction in energy types is monitored and managed.	1,333	3,56	5	1	32,94
Water withdrawal from sources is controlled within the organization.	1,509	3,56	5	1	33,00
The impact of water resources on water withdrawal is assessed.	1,364	2,89	5	1	24,22
Water is recycled and reused in the organization's processes.	1,333	3,56	5	1	33,44
The organization's direct greenhouse gases are recorded.	1,323	3,33	5	1	30,50
The organization's waste is managed based on type and disposal method.	1,269	3,11	5	1	26,67
The organization complies with environmental laws and regulations.	833.	3,22	4	2	27,33
Domestic and international environmental standards are implemented and adhered to within the organization.	1,014	3,44	5	2	31,56
Natural resource impact management operations are implemented.	1,225	3,00	4	1	23,83
Activities are being carried out to establish and develop specialized strategic and environmental oversight committees.	1,481	3,78	5	1	33,67
Operations are being carried out to optimize the use of natural resources.	1,302	2,78	4	1	20,06
Educational and cultural activities are carried out regarding the environment.	1,014	2,56	4	1	16,89
Research and development is carried out to innovate in environmentally friendly product production methods.	928.	3,89	5	2	35,11
The level of savings and profitability in the use of natural resources is evaluated.	882.	3,56	4	2	32,83
Authorities have been designated in economic, environmental, and social issues.	667.	3,78	4	2	34,44
Responsibilities are assigned at the executive level for economic, environmental, and social issues.	866.	4,00	5	2	39,50
Conflicts of interest are managed within the organization.	1,000	3,67	5	2	35,33
The organization's reward policies are set and implemented.	1,236	3,56	5	1	32,06
Direct economic value added produced and distributed is disclosed.	1,364	3,11	5	1	24,11
Infrastructure investments and support services are carried out.	1,302	3,22	4	1	25,67
The organization's significant indirect economic impacts are assessed.	882.	3,44	4	2	30,39
The proportion of costs incurred by the organization's internal suppliers is managed.	1,269	3,11	4	1	23,39
Incidents related to non-compliance with health and safety impacts of products and services are assessed and managed.	1,167	2,89	4	1	22,39
Research and development is carried out to create innovation in environmentally friendly product production methods.	1,269	3,11	5	1	25,22
The organization's significant indirect economic impacts on society are assessed.	1,500	3,00	4	1	23,89
Special benefits are offered to full-time employees that are not considered for temporary or part-time employees.	1,509	3,44	5	1	30,56
Maternity leave is granted to female employees.	1,014	3,44	5	2	29,61
A formal joint committee for the management of worker health and safety has been formed.	1,424	2,56	4	1	16,83

Sub-indices	Average	Standard deviation	Maximum	Minimum	Average rank
The average annual training hours are considered for each employee.	1/481	2/78	4	1	20/50
The company discloses information about its environmental responsibilities and actions in its annual report.	1/803	3/33	5	1	31/56
Independent corporate social responsibility (CSR) reports are prepared and published, including the company's environmental data.	1/563	2/78	5	1	20/61
The level of transparency in reports on the company's environmental impacts is assessed.	1/302	2/78	5	1	20/00
Information about the company's environmental activities and commitment to environmental responsibilities is available on the website.	1/481	2/78	4	1	20/22
The company discloses information about its social activities in its annual report.	1/130	3/56	5	1	32/06
The number and quality of CSR reports that address social issues are reviewed.	1/453	3/11	5	1	25/44
The level of transparency in company reports on the company's social actions and impacts is measured.	1/333	3/44	5	1	27/00
Information about the company's activities and social impacts is publicly available on the website.	1/414	3/33	5	1	29/89
Information about the features and specifications of the company's products and compliance with product quality and safety requirements is disclosed in the annual report.	1/302	3/22	5	1	27/39
The company publishes independent reports on its responsibilities related to the quality and safety of its products.	1/000	3/00	4	1	21/78
Transparency of reports on product features and quality and safety standards is reviewed.	882	3/44	5	2	25/44
Information related to product features and quality standards is publicly available on the company's website.	1/054	3/11	4	1	23/89
The company has a formal Corporate Social Responsibility (CSR) committee.	1/453	2/89	4	1	21/72
The company uses the Global Reporting Initiative (GRI) guidelines in its social responsibility reporting.	1/236	2/44	4	1	14/28
The company conducts independent audits of its corporate social responsibility (CSR) and environmental and social sustainability (ESG) reports.	1/500	3/00	4	1	23/89
The company has integrated financial and non-financial factors related to social responsibility in the management analysis section of the annual report.	1/453	2/89	4	1	21/44
The company reports on its global activities related to corporate social responsibility (CSR).	1/323	3/00	4	1	22/94

The analysis of Table 8 based on the results of the Delphi method shows that some sub-indices are less important and the agreement among experts on these indicators was lower. In particular, sub-indices with a mean below 20 and a high standard deviation represent those that have the least value in the assessments for measuring corporate social responsibility. These include indicators such as “use of GRI guidelines”, “formation of a formal worker health and safety management committee”, and “implementation of educational and cultural activities regarding the environment”. Although these indicators cover part of the overall assessment of social responsibility, due to

the low level of importance and dispersion of opinion among experts, they are considered suitable options for removal from the final set of criteria. In addition, indicators with relatively high means but significant standard deviations, such as “executive-level responsibilities for economic, environmental and social issues,” “research and development for environmentally friendly innovations,” and “control of water withdrawals,” indicate that although they are highly rated, there is considerable disagreement among experts about their importance. These sub-indicators require further revision to improve the level of agreement on their importance or to be categorized

more effectively. Overall, focusing on indicators with high means and low standard deviations will help create a more stable framework for measuring social responsibility. Indicators with means below about 20 and high standard deviations indicate low importance and less agreement. Therefore, sub-indicators that may be considered for removal include:

- 1) The company uses the Global Reporting Initiative (GRI) guidelines in its social responsibility report - with a mean of 14.28 and a standard deviation of 1.236
- 2) A formal joint committee for the management of workers' health and safety has been formed - with a mean of 16.83 and a standard deviation of 1.424
- 3) 3-Educational and cultural activities regarding the environment are implemented - with a mean of 16.89 and a standard deviation of 1.014

Sub-indices with high averages but high relative standard deviations may also need to be re-examined, as despite receiving high scores, there is little agreement on their importance. Some of these sub-indices include:

- Responsibilities are assigned at the executive level for economic, environmental and social issues - mean 39.50 and standard deviation 0.866
- Research and development is carried out to innovate in environmentally friendly product production methods - mean 35.11 and standard deviation 0.928
- Activities are carried out to establish and develop specialized strategic and environmental monitoring committees - mean 33.67 and standard deviation 1.481
- Water withdrawal from sources is controlled within the organization - mean 33.00 and standard deviation 1.509

Other indicators that have lower average means and standard deviations can be retained, as there is probably more agreement on their importance. As a result, according to the data analysis, the following sub-indicators can be considered for deletion due to their low averages and lower agreement:

- The company uses the Global Reporting Initiative (GRI) guidelines in its social responsibility report.
- A formal joint committee for the management of worker health and safety has been formed.
- Educational and cultural activities regarding the environment are being implemented.

Table 9, Summary of Cronbach's Alpha and Kendall Coefficient Results

	Delphi analysis
Cronbach's alpha	0.987
Kendall coefficient	0.871

The analysis of Table 9, which includes the results of Cronbach's alpha and Kendall's coefficient in the Delphi method, shows that the level of reliability and agreement between the evaluators is very high. The Cronbach's alpha value (0.987) indicates a high level of internal consistency among the sub-indices and shows that the criteria reliably measure corporate social responsibility. Also, the Kendall's coefficient (0.871) indicates a strong convergence between the experts' opinions, which indicates a high level of agreement in ranking the indicators and confirming the validity of the Delphi method for selecting and evaluating the sub-indices. These results ensure that the indicators and criteria used have high accuracy and reliability. Finally, the final variables and components and indicators are as follows:

Table 10, variables, components and final indicators of the research

Dimensions (variables)	Symbol	Component (measurement criterion)	Sub-indicators
Performance Corporate Social Responsibility	CSR performance	Performance Environmental	The amount of materials required in the organization is adjusted based on weight and volume.
			Recycled materials enter the production cycle as raw materials.
			The organization's total fuel consumption includes renewable and non-renewable resources.
			The organization's energy consumption is monitored.
			The increase in energy consumption is recorded and evaluated.
			Reduction in energy consumption is measured and improved.
The reduction in energy types is monitored and managed.			

Dimensions (variables)	Symbol	Component (measurement criterion)	Sub-indicators
			Water withdrawal from sources is controlled within the organization.
			The impact of water resources on water withdrawal is assessed.
			Water is recycled and reused in the organization's processes.
			The organization's direct greenhouse gases are recorded.
			The organization's waste is managed based on the type and method of disposal.
			The organization complies with environmental laws and regulations.
			Domestic and international environmental standards are implemented and adhered to within the organization.
			Natural resource impact management operations are implemented
			Activities are being carried out to establish and develop specialized strategic and environmental monitoring committees.
			Operations are being carried out to optimize the use of natural resources.
		The level of savings and profitability in the use of natural resources is evaluated.	
		Social function	Authorities have been designated in economic, environmental, and social issues.
			Responsibilities are assigned at the executive level for economic, environmental, and social issues.
			Conflicts of interest are managed within the organization.
			The organization's reward policies are set and implemented.
			Direct economic value added produced and distributed is disclosed.
			Infrastructure investments and support services are made.
			The organization's significant indirect economic impacts are assessed.
		Customer relationship performance	Incidents related to non-compliance with health and safety impacts of products and services are assessed and managed.
		Community relations performance	Research and development is carried out to create innovation in environmentally friendly product production methods.
		Employee communication performance	Special benefits are offered to full-time employees that are not considered for temporary or part-time employees.
			Maternity leave is granted to female employees.
			The average annual training hours are considered for each employee.
		Corporate Social Responsibility	CSR disclosures

Dimensions (variables)	Symbol	Component (measurement criterion)	Sub-indicators
Disclosure			Independent corporate social responsibility (CSR) reports are prepared and published, including the company's environmental data.
			The level of transparency in reports on the company's environmental impacts is assessed.
			Information about the company's environmental activities and commitment to environmental responsibilities is available on the website.
		Social disclosure	The company discloses information about its social activities in its annual report.
			The number and quality of CSR reports that address social issues are reviewed.
			The level of transparency in company reports on the company's social actions and impacts is measured.
			Information about the company's activities and social impacts is publicly available on the website.
		Disclosure of employee relationships	Information about the company's relationships and interactions with employees is disclosed in the annual report..
			The company publishes reports that promote employee relations and support them in the form of CSR reports..
			The level of transparency in reports about company policies and practices related to employees is examined.
			The company's website makes information related to employee relations and policies publicly available.
		Disclosure of product features	Information about the features and specifications of the company's products and compliance with product quality and safety requirements is disclosed in the annual report.
			The company publishes independent reports on its responsibilities related to the quality and safety of its products.
			Transparency of reports on product features and quality and safety standards is reviewed.

Dimensions (variables)	Symbol	Component (measurement criterion)	Sub-indicators
			Information related to product features and quality standards is publicly available on the company's website.
Corporate Social Responsibility Strategy	CSR-Oriented board	Corporate Social Responsibility Committee or Team	The company has a formal Corporate Social Responsibility (CSR) committee.
		Social Responsibility Report Audit	The company conducts independent audits of its corporate social responsibility (CSR) and environmental and social sustainability (ESG) reports.
		Management analysis of financial and non-financial factors	The company has integrated financial and non-financial factors related to social responsibility in the management analysis section of the annual report.

- Environmental performance consists of 18 sub-indices, and for each sub-indices, companies are scored based on the disclosure of relevant information. If a company has disclosed information on one of the sub-indices, such as energy consumption, material recycling, or direct greenhouse gas emissions, a score of one is assigned to that sub-indices, and otherwise a score of zero is given. All annual reports and financial statements of the companies were manually reviewed and coded to determine the exact level of disclosure for each sub-indices.
- Social performance consists of 8 sub-indices, and each company is scored based on the disclosure of information related to these items, in the same way. These sub-indices include items such as the definition of responsibilities at the executive level, management of conflicts of interest, and disclosure of direct economic value added. All information is carefully extracted and coded from annual reports and related documents.
- Customer relations performance also has 1 sub-index, which includes the assessment of incidents related to non-compliance with health and safety of products and services. A score of 1 is given to companies that disclose this information, and the information is manually extracted from the reports.
- Community relations performance includes 2 sub-indices, which focus on the disclosure of information related to research and development and the assessment of indirect economic impacts on society. Companies' annual reports are reviewed and scored for these sub-indices.
- Employee relations performance also includes 3 sub-indices, and includes the disclosure of information on special benefits for full-time employees, maternity leave, and average annual training hours. This information is also collected and scored by manually reviewing the reports and carefully coding them.
- Environmental Disclosure consists of 4 sub-indices that are dedicated to the disclosure of environmental information by the company in reports and websites. For each sub-indices, if a company provides relevant information such as disclosure of environmental responsibilities in the annual report or the level of transparency of environmental data, it is given a score of 1, and otherwise it is given a score of 0. The information in question is coded through a manual review of the companies' annual reports and websites.
- Social Disclosure consists of 4 sub-indices that refer to the disclosure of social information by the company in annual reports and websites. If a company publishes data related to its social activities, the level of transparency of CSR reports, and information related to social impacts on its website, a score of 1 is assigned to that sub-indices. This information is collected through a detailed review of the annual reports and websites.

- Employee Relations Disclosure also includes 4 sub-indices and is dedicated to the disclosure of information related to the company's employees. These indicators include things like disclosure of information about interactions with employees and transparency in reports related to employee policies. If this information is disclosed in the annual report or on the company's website, it is given a score of 1. All information has been carefully extracted and coded through a manual review of reports and websites.
- Product Features Disclosure includes 4 sub-indices that focus on providing information related to product quality and safety. If a company provides data about product features and specifications, compliance with quality and safety requirements, and transparency in its reports and website, a score of 1 is assigned to that sub-indices. This information has also been collected and coded through a manual and careful review of annual reports and websites.
- The corporate social responsibility committee or team is assessed by whether the company has a formal CSR committee. If such a committee exists, it is assigned a score of one, otherwise it is assigned a score of zero. Information on the existence of these committees was manually extracted and coded from annual reports and public sources.
- Social responsibility report audit includes an assessment of companies in the field of conducting independent audits of CSR and environmental and social sustainability (ESG) reports. If the company's social responsibility and sustainability reports have been reviewed by an independent auditor, a score of one is assigned to that sub-index, and otherwise a score of zero is assigned. This information is also collected and recorded by carefully reviewing the reports.
- Management analysis of financial and non-financial factors indicates the extent to which the company has disclosed financial and non-financial factors related to social responsibility in an integrated manner in the management analysis of its annual report. If the company provides this information in an integrated manner, it is given a score of one, and otherwise, it is given a score of zero. To ensure the accuracy of the data, this information is manually extracted and coded from annual reports.

Also, by reviewing the opinions of experts and studying past research, board membership history, risk management committee, and strategy committee are removed from the present study as sub-indices related to the variable of board of directors inclined to implement social responsibility. Also, in the sub-indices of the corporate governance variable, audit committee independence and institutional ownership are removed from the present study.

Table 11, final variables and components of the research

Dimensions (variables)	Symbol	Component (measurement criterion)
Board of Directors inclined to implement social responsibility	CSR-oriented board	Board Independence (AI)
		CEO and Board Expertise
Profit management	EM	<p>Modified Jones Model (Dicho et al., 1995)</p> <p>The modified Jones model (Dechow et al., 1995) decomposes accruals into discretionary and non-discretionary parts. Dechow et al. (1995) proposed this method after adjusting for changes in sales and receivables. This model reduces the measurement errors associated with discretionary accruals. Following Kothari et al. (2005), Kiaw et al. (2017), Collins et al. (2017), and Kothari et al. (2016), return on assets and growth in sales are used as additional explanatory variables to control for the effect of firm performance and growth.</p> $AccEM1: TA_{it} = \beta_0 + \beta_1(\Delta Sales_{it} - \Delta REC_{it}) + \beta_2 \Delta PPE_{it} + \varepsilon$ <p>$(\Delta Sales_{it} - \Delta REC_{it})$: Changes in accounts receivable from changes in sales revenue PPE_{it} : Fixed assets Model error is a measure of earnings management based on accruals.</p>

Dimensions (variables)	Symbol	Component (measurement criterion)
		<p align="center">- Earnings Management Model Kaznik(1999)</p> <p>The Kaznik (1999) model is used to calculate earnings management based on accruals, because according to Nazir et al. (2018) and Black et al. (2018), this is the best model for identifying earnings management practices based on accruals, which is as follows: AccEM2: $TA_{it} = \beta_0 + \beta_1 1/ASSET_{t-1} + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 OCF_{it} + \varepsilon$ In this model, the difference between net profit and operating cash flow represents the changes in accounts receivable and receivables for the current year compared to the previous year. By subtracting the changes in accounts receivable from the changes in sales revenue, the new variable obtained is equivalent to the changes in cash sales revenue. $OCF_{it} : \text{Operating cash flow}$ Divide all the variables in the model by the total assets at the beginning of the year to make the data homogeneous. This reduces the potential heterogeneity of variance in the error values. A new variable is added to the model as . The numerator of this fraction will be 1 and the denominator will be the total assets at the beginning of the year. This variable was added to the model as suggested by Kothari et al. (2005) to reduce the heterogeneity of variance in the error values.</p> <p>Real earnings management is calculated as follows (Rowichouduri 2006, Cohen et al., 2008; Cohen and Zarvin, 2010; Dechau et al., 2010): Real profit management through operating cash flow) ReEM1 – CFO(ReEM1: $CFO_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \alpha_2(S_t/A_{t-1}) + \alpha_3(\Delta S_t/A_{t-1}) + \varepsilon_t$ CFO):Operating cash flow(A):Total assets(S):Sale(The aforementioned model error is considered as the actual profit management through operating cash flow (AB_CFO). Real profit management through discretionary spending) ReEM2 – DISEXP(ReEM2: $DISEXP_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \alpha_2(S_t/A_{t-1}) + \alpha_3(\Delta S_t/A_{t-1}) + \varepsilon_t$ DISEXP):Optional costs The error of the aforementioned model is considered as the actual profit management through discretionary spending (AB_DISX). Real profit management through production costs) ReEM3–PROD(ReEM3: $PROD_t/A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \alpha_2(S_t/A_{t-1}) + \alpha_3(\Delta S_t/A_{t-1}) + \alpha_4(\Delta S_{t-1}/A_{t-1}) + \varepsilon_t$ PROD):Production costs($\Delta S : \text{Sales changes}$) This year minus the previous year(The error of the aforementioned model is considered as the actual profit management through production costs (AB_PROD).</p>
Company activity indicators	ROA	Return on assets, net profit divided by total assets for the current year
	ROE	Return on equity, net profit divided by total equity for the current year.
	FL	Financial leverage, the ratio of total short-term and long-term debt to equity value
	RG	Revenue growth is current year revenue minus previous year revenue divided by previous year revenue.
	Loss	Profitability, a dummy variable equal to 1 if firms have operating losses, and 0 otherwise.
Corporate Features	MTB	Market-to-book value is the market price of the stock at the end of the year divided by the book price of the stock at the end of the year.
	CFO	Operating cash flow, operating cash flow divided by total assets of the previous year
	Size	Firm size, natural logarithm of total assets at the end of the year
Corporate	BS	Board members, number of board members

Dimensions (variables)	Symbol	Component (measurement criterion)
governance	OC	The largest shareholder is measured, the largest shareholder
	IO	Institutional ownership, the total percentage of company shares owned by banks, insurance companies, financial institutions, holding companies, organizations and institutions, and government companies.

Discussion and Conclusion

The aim of this study is to identify factors affecting the modeling of a socially responsible board of directors and its impact on earnings management with respect to corporate governance. Also, this research is descriptive with a qualitative method, and the Delphi method was used to analyze the data.

Corporate social responsibility, as one of the key concepts in modern management, plays a fundamental role in improving the financial and non-financial performance of organizations. In this regard, factors in different areas of performance, disclosure, social responsibility strategy, corporate characteristics, and corporate governance structure are examined. Each of these dimensions plays an important role in guiding the behavior of the board of directors and its impact on earnings management. In the following, these factors are analyzed in detail. One of the most important factors in this model is the company's social responsibility performance. Performance in the area of social responsibility includes environmental, social dimensions, and interactions with stakeholders. Environmental measures such as optimizing energy consumption, managing natural resources, and complying with environmental standards not only increase the company's credibility in the area of social responsibility, but also help strengthen financial sustainability by reducing long-term costs. On the social dimension, the board of directors can create economic added value and have positive effects on earnings management behavior by managing conflicts of interest, setting compensation policies, and investing in social infrastructure. These actions, by strengthening stakeholder trust, push the company toward greater transparency and reduce the incentive to manipulate earnings.

Corporate social responsibility disclosure is another key factor considered in this model. Disclosure of information related to corporate social responsibility practices increases the transparency and accountability of the company and increases the trust of investors and

stakeholders. This disclosure includes environmental, social, employee interactions, and product features. Companies that provide comprehensive and transparent reports in this area are usually more resistant to non-transparent behaviors such as earnings management. A board that emphasizes the importance of disclosure allows for closer monitoring and reduces financial deviations by reducing information asymmetry between the company and stakeholders. A company's corporate social responsibility strategy, which includes planning and policymaking at the macro level of the company, has a direct impact on the behavior of the board of directors and earnings management. Strong strategies in the area of social responsibility, such as the formation of specialized corporate social responsibility committees and independent audits of social responsibility reports, can help a company establish higher standards in reporting and performance. Boards that follow these strategies are usually more sensitive to non-transparent behaviors and use preventive tools to reduce earnings management. On the other hand, corporate characteristics also affect board behavior and earnings management. Factors such as company size, operating cash flow, and market-to-book ratio enhance a company's ability to implement social responsibility measures and financial transparency. Larger companies, with more resources, have a better ability to implement corporate social responsibility policies and are usually more visible to the media and stakeholders. This makes these companies commit to greater transparency in reporting and limit earnings management behaviors. Corporate governance, as one of the fundamental pillars of this model, plays a decisive role in board behavior. The composition of the board of directors, the degree of independence of members, and the role of institutional shareholders are among the factors that affect the quality of decision-making and oversight of earnings management. The presence of independent members on the board of directors and institutional shareholders can exert greater oversight over the company's activities and

prevent non-transparent behaviors. In contrast, concentrated ownership may lead to short-term decisions that conflict with the principles of social responsibility.

Abbasi and Ghoumi (2017) introduced board characteristics including CEO duality, CEO tenure, board size, and independence, which affect three models of real earnings management. As emphasized in previous research, especially research related to corporate governance, transparency, and reducing earnings management, the results of the present study also indicate the positive impact of corporate governance on these aspects. This alignment could indicate the importance of having appropriate board structures and governance policies in preventing profit-seeking behavior and enhancing financial transparency. Also, the negative and significant effect of social responsibility disclosure on earnings management, which was observed in previous studies such as Pakdelan et al.'s (1401) study, has also been confirmed in the results of this study. These findings emphasize that transparent disclosure of corporate social responsibility can directly or indirectly affect the reduction of earnings management behaviors, because more and better disclosure of social responsibility can prevent companies' incentives to manipulate earnings. The results of the present study regarding the role of the board of directors inclined to implement social responsibility are also consistent with the results of previous studies such as the study by Shatnavi (2021). These studies show that boards that pay attention to social responsibility are more likely to reduce earnings management behaviors and increase transparency in financial reporting, including conservative reporting, and generally improve the quality of financial reports. Similar results have been observed in Halfaya and Musa's (2017) study, which shows that corporate social responsibility strategies not only lead to improved disclosure quality, but can also be effective in reducing earnings management behaviors.

In summary, the factors influencing the modeling of a board of directors supporting social responsibility over earnings management are interconnected and complementary. These factors help improve the financial and social sustainability of companies by creating transparency, reducing opportunities for earnings management, and strengthening social responsibility. Coordination between these factors and

creating a balance between financial and social interests plays a fundamental role in the success of this model and the achievement of corporate governance objectives.

Practical suggestions of the research emphasize strengthening the role of the board of directors in supporting social responsibility. Selecting board members with a social responsibility approach through criteria such as experience in this field and expertise related to sustainability can be effective. Organizing training programs for board members and promoting social responsibility disclosure through the development of standard reports and the use of international frameworks can provide greater transparency and credibility to corporate information. Forming specialized social responsibility committees on the board of directors and strengthening corporate governance structures can also contribute to greater transparency and reduce earnings management behaviors. Using modern technologies such as blockchain and developing incentive policies for information disclosure can strengthen companies' motivation for greater transparency. Research limitations include dependence on historical and financial data, limited access to experts, and the lack of available financial information, which reduces the sample size and affects the results. Also, economic conditions, local laws, and environmental and organizational changes can affect the results. Time and financial constraints in data collection and processing also affected the breadth of the analyses and some aspects may have been excluded from the scope of the study. These limitations highlight the need for further research in this area.

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