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Diversity of the board, nomination committee and earnings management in the two-tier system

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Abstract

Purpose – The purpose of this study was to analyze the impact of diversity on the board of directors, board of commissioners and nomination committees on accrual earnings management.

Design/methodology/approach – This study used three dimensions of diversity, namely gender, age and nationality. These three elements are further grouped into the board of directors diversity index and the board of commissioners diversity index. The nomination committee is measured by the quality of its characteristics. The sample of this study consists of manufacturing companies listed on the Indonesia Stock Exchange from 2015 to 2023, which meets the research criteria.

Findings – This study found that the diversity of directors, commissioners and nominating committees reduces accrual earnings management.

Research limitations/implications – Board diversity and nomination committees improve the quality of financial reporting and corporate governance so that companies can rethink the composition of the board to achieve company goals.

Practical implications – Provide evidence of the importance of the diversity of the board and the quality of nomination committees, so provide input policy and regulations to regulators.

Social implications – This paper provides evidence that supporting diversity on company boards and the quality of nomination committees can improve company performance and the Indonesian economy as a whole, thereby supporting the vision of a golden Indonesia by 2045.

Originality/value – To the best of the author's knowledge, research investigating board diversity in a two-tier system with separate boards of directors and a board of commissioners and nomination committees on earnings management has never been conducted.

Keywords Board diversity, Nomination committee, Earnings management, Two-tier system, Corporate governance

Paper type Research paper

1. Introduction

One of the goals of managers is to exceed the goals that have been established because they will serve as the foundation for evaluating their performance. Earnings management (EM) is one technique for achieving this goal. EM refers to a manager's policy of changing profits by exploiting weaknesses in accounting standards (accrual earnings management/AEM) to mislead users of financial performance to gain personal profit (opportunistic behavior) (Pham *et al.*, 2019; Putra *et al.*, 2021; Putra and Setiawan, 2024a, b).

The board is one of the corporate governance mechanisms. Board composition plays a role in reducing agency costs; an effective board structure can align the interests of management

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and stakeholders. According to Hillman *et al.* (2009), board diversity demonstrates a commitment to minorities, boosting the company's legitimacy. Previous research discovered several benefits of diversity, including increased investment efficiency and governance (Ullah *et al.*, 2020), increased innovation (Wang, 2022), predicting financial distress (Yousaf *et al.*, 2021), thus improving performance (Taljaard *et al.*, 2015), and helping corporate boards gain a better understanding of market share and access to resources (Mishra and Jhunjhunwala, 2013). Research on diversity and earnings management has been carried out, such as gender diversity in executives (Mensah and Onumah, 2023; Orazalin, 2019), the characteristics of the board, chief executive officer (CEO), and audit committee (Al-Absy *et al.*, 2019; Bouaziz *et al.*, 2020). This study differs from earlier studies in that it attempts to investigate various variations in board and EM.

According to the regulations in Indonesia, Indonesia adopts a two-tier system where there are two bodies, namely the board of directors (BOD) and the board of commissioners (BOC). The BOD is tasked with managing the company, while the BOC oversees the running of the company and provides advice to the BOD. Meanwhile, in the one-tier system, the board is a body that houses the executive director as the company manager, while the non-executive director is the company supervisor. Therefore, in a two-tier system, there will be no CEO who also doubles as the BOC because the BOC has its own chairman so that there is a balance between the company's managers and supervisors (Putra *et al.*, 2024). Nam and Nam (2004) stated that the BOC in Indonesia is more "active" in carrying out supervisory functions compared to three other countries in Asia (Malaysia, South Korea, and Thailand). This is our motivation to study the corporate governance system in Indonesia. Many previous studies (Mensah and Onumah, 2023; Orazalin, 2019; Wan Mohammad *et al.*, 2016) only focused on one-tier systems, even though two-tier systems are unique, namely the separation between BOD and BOC.

The BOD is assisted by several divisions, while the BOC forms several committees, such as the audit and nomination and remuneration committees. We consider three types of board diversity: gender, age, and nationality. These three diversities are innate demographic characteristics that humans are born with, so they will influence a person's habits, behavior, and mindset, which will have an impact on the decisions they make. Gender equality is an intriguing issue because of the presence of organizations advocating for men's and women's equality. Previous research found gender diversity increasing investment in innovation (Zona *et al.*, 2013), increasing company performance (Reguera-Alvarado *et al.*, 2017), and enriching problem-solving by considering alternatives more thoroughly (Campbell and Mínguez-Vera, 2008). Related to reporting, women are increasing corporate reporting practices (Ginesti *et al.*, 2018), increasing the quality of information (Gavious *et al.*, 2012), and improving the accuracy of analytical forecasts (Wan Ismail *et al.*, 2023), thus limiting EM (Orazalin, 2019), but Waweru and Prot (2018) find women are unable to limit EM.

Houle (1990) suggests that senior board members lend their experience and external networks; middle-aged members serve at the executive level; and younger members learn new things and develop knowledge. The results of research on board age are very mixed, as they relate to higher enthusiasm and the ability to take risks (Ararat *et al.*, 2015), increased company performance (Kagzi and Guha, 2018), and experience in decision-making (Ng and Feldman, 2008). Huang *et al.* (2012) discovered that CEO age has a positive effect on the quality of financial reporting and a negative effect on making risky decisions (Zhou and Wang, 2014), while Qi *et al.* (2018) found senior BOD did not practice EM. Indonesia's free trade relations, as well as foreign share ownership, have resulted in an influx of investors and resources, as well as people filling various board positions. The findings of research on the diversity of nationalities and board cultures show that corporate governance is being implemented correctly (Kaczmarek and B. Nyuur, 2022) because it can control (Badru *et al.*, 2017) and create unique strategies across countries (Le and Kroll, 2017) or have knowledge of international markets and improve board performance (Estélyi and Nisar, 2016) and increase environmental, social, and governance disclosure (Toumi *et al.*, 2022).

The nomination committee (NC) was formed by Financial Services Authority (OJK) Regulation Number 34/POJK.04/2014. Nomination is the process of proposing someone to be nominated to the BOD or the BOC. The NC will consider the board's skills, experience, expertise, and diversity, increasing investor confidence (Hutchinson *et al.*, 2015). The characteristics of the NC reduce the number of busy BOD and BOC (Eulaiwi *et al.*, 2016) and will recommend independently (Darmadi, 2013) the best board. Several studies have found an increase in company performance (Chaudhry *et al.*, 2020; Vinjamury, 2020) and reduced the risk of financial distress (Ashraf *et al.*, 2022). However, Puni and Anlesinya (2020) found the NC reduced company performance.

We were interested in conducting this research because of the importance of the diversity of BOD, BOC, and NC in limiting EM and the lack of literature on this matter. Previous studies were conducted in countries that adopted a one-tier system; they focused on executive diversity (Qi *et al.*, 2018), all board members (Mensah and Onumah, 2023; Orazalin, 2019), and CEOs (Bouaziz *et al.*, 2020; Huang *et al.*, 2012). Unlike previous studies, this study examines the effect of the diversity of BOD and BOC, which have different duties and authorities. This is what makes the two-tier system unique.

Previous research in Indonesia has not separated the diversity of BOD and BOC (Auliyanti Nurbach *et al.*, 2019; Darmadi, 2011; Elsye Hatane *et al.*, 2019; Tantri and Sholihin, 2012). Kusumastati *et al.* (2022) succeeded in establishing a diversity index of BOD and BOC but have not explored the NC. Other research conducted in Indonesia, such as Darmadi (2013), found that the educational qualifications of members of the BOD are important for company performance, and CEOs who have degrees from prestigious domestic universities perform much better than those from other universities. Focusing on the BOC, Hanafi *et al.* (2013) found that governance carried out by a large number of BOCs increases bank profitability and its handling of risk, and different types of BOCs have different impacts on bank risk and profitability. Trinugroho *et al.* (2022) researched the busyness of the BOC and company performance; they are finding a negative association between busyness and company performance. Kurnia and Ardianto (2024) researched gender diversity in a two-tier system. They found that women in the BOC increased cyber security disclosure (CSD), and women in the BOD decreased CSD. Meanwhile, Schumann *et al.* (2024) researched the diversity of boards in Germany, which adopted a two-tier system, but they only focused on the BOD without examining the BOC. They found that gender and nationality diversity in the BOD decreased earnings management. Chaudhry *et al.* (2020) investigated the chairman of the NC in Pakistan; however, they only focused on the chair of the NC. Different from previous research, the motivation for this research is to find out whether the diversity of BOD, BOC, and NC is able to reduce EM.

This research has several contributions to the EM literature. First, expand the EM literature with aspects of board diversity consisting of gender, age, and nationality, which are innate to humans from birth. Indonesia has just been designated as a developed country by the World Trade Organization (WTO), so improvements in corporate governance are needed to attract investors. Corporate governance in Indonesia is still weak compared to other developed countries, but we prove diversity of the BOD, BOC, and NC can hinder EM. Second, this research was conducted in Indonesia, which adopts a two-tier system, which to our knowledge has never been done before. Third, this study provides suggestions to regulators to create regulations that require companies to form NC because we found that there are still many companies that do not have NC, but we found that NC can hinder EM. Finally, our research also finds that diversity of BOD and BOC reduces EM and improves corporate governance through the selection policies and structure of board members implemented by the NC. The results of this study are more specific compared to research on a one-tier system because usually one-tier system research does not differentiate between diversity in the BOD (company management) and BOC (company supervisors) (Mensah and Onumah, 2023; Orazalin, 2019).

The rest of the manuscript is organized as follows: Section 2 describes a review of the relevant literature; Section 3 describes the research methods, which include research design,

sample, data analysis techniques, and measurements; Section 4 presents research findings and the interpretation of results; and Section 5 discusses policy recommendations and research limitations.

2. Literature review and hypothesis development

2.1 Literature review

This study used agency theory and resource dependence theory. Agency theory explains the agency relationship as a contract between the principal (owner), which binds the agent (manager) to manage the company based on the interests of the principal. Managers will receive compensation in the form of salaries, bonuses, and facilities, as well as compensation in other forms. The focus of agency theory is agency conflict. Agency conflicts arise due to differences in interests between the principal and the agent. The principal has an interest in maximizing his welfare, while the agent also wants prosperity by utilizing funding sources originating from the company (opportunistic behavior). This occurs because there is an asymmetry of information between the principal and the agent regarding the condition of the company, which encourages the agent to convey information that does not correspond to the actual situation, especially if the information is related to measuring the agent's performance. One form of action is EM. One way to align these interests is by conducting effective monitoring. In Indonesia, the agent's duties are carried out by the BOD, while the BOC is a company organ that is responsible to the shareholders (principals) to supervise the running of the company and provide advice to the BOD. Meanwhile, the NC is a committee under the BOC that is tasked with monitoring the performance of the BOD and BOC.

Resource dependence theory explains that the BOD and BOC play a role as a provider of resources between the company and its environment, which will increase its legitimacy. There are two perspectives on this theory. The first perspective is the environmental linkage perspective, which explains that board members who have different backgrounds will individually contribute various resources to the company. The second perspective explains that internal controls and administrative actions carried out by the board can affect the company's efficiency. This theory posits that diverse BOD and BOC can identify and evaluate strategies by considering more alternatives (Kagzi and Guha, 2018). In other words, a diverse board is an important factor in limiting EM. General Guidelines for Indonesian Corporate Governance (PUGKI) 2021 recommend diversity in gender, age, and cultural background to fill the composition of the BOD and BOC. This diversity is expected to improve the capabilities and performance of the BOD and BOC so that it can improve company performance without conducting EM.

2.2 Hypothesis development

Gender diversity is an important governance mechanism for companies (Gallego-Álvarez *et al.*, 2010). Women can manage debates and provide alternative solutions (Quintana-García and Benavides-Velasco, 2016) to inhibit manipulation (Luo *et al.*, 2017). Men are more at risk (Hoang *et al.*, 2019), and women are more risk-averse (Sghaier and Hamza, 2018), so women will avoid earnings management (Gull *et al.*, 2018) and improve accounting quality to maintain reputation and risk lawsuits (Srinidhi *et al.*, 2011). Several studies have found a negative relationship between female BOD and EM (Gavious *et al.*, 2012; Schumann *et al.*, 2024), while others found no relationship with EM (Waweru and Prot, 2018).

Senior BOD members have more experience, expertise, and networks, whereas younger BOD members are more open-minded and eager to learn new things (Houle, 1990). Age diversity is regarded as having greater enthusiasm and risk-taking capacity (Ararat *et al.*, 2015). Young CEOs have more volatile income (Zhou and Wang, 2014), making them exposed to risks and inefficiencies in investing (Ullah *et al.*, 2020). Andreou *et al.* (2017) discovered that companies with young CEOs are more likely to experience stock market crashes due to a

flood of negative information at the outset of their careers. Senior BOD are more dedicated to the organization (Mathieu and Zajac, 1990) and focus on financial stability and careers (Wiersema and Bantel, 1992) because they already have expectations about income at retirement age, so they will avoid risky activities. Huang *et al.* (2012) discovered a link between CEO age and financial reporting quality, which is corroborated by other research that discovered a negative link between CEO age and EM (Qi *et al.*, 2018). Schumann *et al.* (2024) stated that BOD members who will work for a long time are less likely to mortgage the company's future. Meanwhile, Davidson *et al.* (2007) found that senior CEOs who were nearing retirement were associated with EM practices, while Al-Absy *et al.* (2019) found no relationship between the age of the audit committee chairman and EM.

BOD with a diverse range of nationalities has a broader perspective on worldwide market access (Estélyi and Nisar, 2016), enhancing international interchange of goods and services and the quality of board resources (Kaczmarek and Nyuur, 2022). Foreign BOD can improve decision-making and business strategy (Ruigrok *et al.*, 2007). According to Enofe *et al.* (2017), because foreign BODs are not from the local environment, they think more independently and are hesitant to become engaged in contentious issues. This is in line with the opinion of Schumann *et al.* (2024), who said that BODs with various nationalities have broader knowledge, thus increasing the company's ability to solve problems. In addition, investors also interpret that companies that have foreign BODs will improve corporate governance standards (Schmid and Dauth, 2014). Schumann *et al.* (2024) found that BOD nationality diversity reduces EM. However, Bouaziz *et al.* (2020) found a positive relationship between CEO nationality and EM, while Al-Absy *et al.* (2019) found audit committee chairs with local ethnicity reduced earnings management. Pham *et al.* (2022) found that CEO cultural heritage was associated with corporate reporting errors, internal control weaknesses, and accounting conservatism, but Wan Mohammad *et al.* (2016) found the board's ethnicity had no effect on the quality of financial reporting, such as EM.

Gender, age, and nationality are innate demographic characteristics that humans have had since birth. These characteristics will form habits, behaviors, and thought patterns that will influence every decision taken. Based on previous research and the perspective of agency theory, female directors carry out supervision by avoiding risky decisions such as avoiding EM, while from the perspective of resource dependence theory, the presence of women on the BOD is proof that the company upholds gender equality so that it will create its own value and reputation for the company. Related to age diversity, based on agency theory, older BOD have expertise with experience and networks that can be used to supervise other BOD and managers under their division in preventing EM, while young directors carry out supervision through new things such as utilizing technology, while from the perspective of resource dependence theory, collaboration of expertise, experience, and networks of senior and young BOD will increase the value and performance of the company because it utilizes knowledge and technological developments. Meanwhile, based on agency theory, foreign BODs have connections, knowledge, and resources from outside that can increase supervision of the performance of the divisions they supervise. While from the perspective of resource dependence theory, the combination of foreign and local BOD with various knowledge, connections, and experiences will improve company performance without using EM. In addition, the existence of diversity in gender, age, and nationality will improve the reputation and create its own value for the company because stakeholders assume that the company supports diversity and suppresses discrimination. Based on the explanation above, we propose the following hypothesis:

H1. Board of directors diversity has a negative effect on earnings management.

Gender diversity on the BOC is a control that can increase insight and independence because women are more concerned with ethical issues (Nekhili *et al.*, 2022) and follow rules, regulations, and governance, thereby increasing supervision (Luo *et al.*, 2017), reducing agency costs and information asymmetry (Reguera-Alvarado *et al.*, 2017), and limiting EM

(Luo *et al.*, 2017; Orazalin, 2019). Almarayeh *et al.* (2024) stated that although women's BOCs and men's have the same ability to detect earnings management, the response of BOC women tends to be faster (Gavious *et al.*, 2012; Gull *et al.*, 2018), so the presence of women in the BOC is associated with higher financial reporting quality (Labelle *et al.*, 2010). This viewpoint is consistent with the findings of several studies that found a negative association between the participation of women on BOC and EM (Gavious *et al.*, 2012; Gull *et al.*, 2018; Srinidhi *et al.*, 2011). However, several studies did not find an influence between the two (Almarayeh *et al.*, 2024; Le and Nguyen, 2023); even Khan and Kamal (2024) found a positive relationship.

Senior BOCs, like BODs, have knowledge and experience in supervising and advising, whereas young BOCs are eager to learn new things and master the use of technology (Kusumastati *et al.*, 2022), so collaboration between the two will improve BOC quality. Foreign BOCs represent foreign shareholders who have greater ideas about monitoring the company's operations if they originate from nations with stronger shareholder rights (Lee *et al.*, 2018), allowing the supervisory function to work effectively (Badru *et al.*, 2017). BOC from various cultures and life experiences will contribute points of view that help improve the quality of decision-making (Ruigrok *et al.*, 2007), allowing them to avoid EM because they will be open-minded and transparent in carrying out supervision as a party independent (Chiu *et al.*, 2013). As previously explained, gender, age, and nationality are demographic characteristics that humans carry from birth, which will shape habits, behavior, and thought patterns, thus influencing how the BOC supervises and provides advice to the BOD. Same as the BOD on the agency theory, gender, age, and nationality diversity of BOC will improve the supervisory function through various traits, characters, experiences, and skills to suppress EM actions. Meanwhile, according to dependence resource theory, BOC with various backgrounds is a resource that has various abilities to achieve company goals through the ability to think and quality suggestions for BOD decision-making by avoiding EM. In addition, diversity in the BOC will create its own value for the company because the company's assumption supports diversity and equality. Based on previous theories and studies, we propose the following hypothesis:

H2. Board of Commissioners diversity has a negative effect on earning management.

NC is a committee under the BOC that is tasked with helping the BOC assess the performance of the BOD and BOC and determining the criteria and selection process for BOD and BOC that will serve in the company (Putra, 2024; Putra and Setiawan, 2024a, b). A diversified BOC is more effective in monitoring, while a growing BOC will think about strategic issues (Adams *et al.*, 2010). Furthermore, they stated that the BOC shows the professionalism of the company. When the company becomes bigger, the role of the BOC is greater in corporate governance. In Indonesia, the chairman of the NC is an independent commissioner, so it is expected to improve corporate governance. Previous studies have found that the NC will broaden the board's diversity (Ruigrok *et al.*, 2006) so that it enhances the board's ability to carry out its responsibilities, strengthens the board's human capital through recruitment and retention of suitable talent (Kanapathippillai *et al.*, 2024), increases narrative remuneration disclosure (Kanapathippillai *et al.*, 2016), and increases company performance (Bansal and Singh, 2022; Vinjamury, 2020), reduces EM (Nuhu *et al.*, 2023), and the independence of this committee increases environmental performance (Moisello *et al.*, 2024), but Puni and Anlesinya (2020) found this committee reduced company performance. While Chaudhry *et al.* (2020) found that experienced NC chairs significantly improved company performance, and NC chairs with supervisory and human resources expertise improved company performance. In addition, board chairmen who are also NC chairmen reduce financial stability (Al-Absy, 2020), and board chairmen who are also NC chairmen, members, or are fully involved in NC increase EM (Al-Absy *et al.*, 2018).

Agency theory explains the role of NC as a supervisor of BOD and BOC in carrying out the management and control roles effectively (Ruigrok *et al.*, 2006) so that NC has the authority to

recommend someone to remain in office on the company's board or not. Meanwhile, according to resource dependency theory, the purpose of NC is to adjust the composition of the board to the demands posed by the company's external environment (Ruigrok *et al.*, 2006). According to this theory, NC will recommend the right person because they assess someone based on the skills, knowledge, and character they have to occupy a position on the company's board. Therefore, with proper performance and recommendation assessment for people who will serve in BOD and BOC, it is expected to reduce EM. Based on the explanation above, we propose a hypothesis.

H3. The nomination committee has a negative effect on earnings management.

3. Research methodology

3.1 Data and samples

Data were obtained from company annual reports, which cover the population of manufacturing companies listed on the Indonesia Stock Exchange (IDX). Manufacturing companies are the group of companies with the largest number on IDX, so this sector dominates stock trading in Indonesia. Manufacturing companies face the uncertainty of increasing sales and profits (Ahmed and Azim, 2015) because they always experience price adjustments between distributors and end customers (Rasmussen, 2013). Managers implement EM to improve performance due to uncertainty in sales, profits, and decreased performance (Ahmed and Azim, 2015).

We used purposive sampling and unbalanced data and applied criteria to manufacturing companies listed on the IDX from 2015 to 2023, namely: having complete research data published in the annual report and having the end of the financial reporting period on December 31. This research period is based on POJK No. 33/POJK.04/2014 concerning BOD and BOC, POJK No. 34/POJK.04/2014 concerning the Nomination and Remuneration Committee, as well as the annual report award, which includes board diversity criteria. Implementation of these regulations began in 2015. The final sample consists of 985 firm-year observations. We then processed the data using the STATA application. Table 1 presents the sampling process.

3.2 Data analysis method

The dependent variable in this research is AEM, which is measured using the Jones (1991) and the Jones Modified Model (Dechow *et al.*, 1995). We use AEM because previous research findings say AEM is the main proxy for estimating EM practices. Additionally, Guay *et al.* (1996) say managers use AEM to cover up poor company performance. This is supported by previous research that found that managers carry out EM by manipulating company accounting using AEM (Al-Absy *et al.*, 2019; Orazalin, 2019). The independent variables are the Board of Directors diversity index (BDDI), the Board of Commissioners diversity index (BCDI), and nomination committee quality (NCQ). Meanwhile, the control variables for this research are company performance (ROA), leverage (LEV), firm size (FS), firm age (FA),

Table 1. Research samples

The number of manufacturing companies in Indonesia in 2023	166
The population of manufacturing company annual reports for the 2015–2023 period available	1,155
Data on company boards is incomplete	98
Inaccessible annual report	55
The end of the financial reporting period is not December 31	17
Number of samples for annual observation reports	985

Source(s): Created by authors

audit quality (AUDQ), size of the BOD (BDS), the BOD meetings (BDM), the size of the BOC (BCS), the BOC meetings (BCM), independent commissioners (ICOM), managerial ownership (MO), institutional ownership (IO), and foreign ownership (FO). Moreover, this research also controls for industry and observation year. Table 2 and Appendix 1 and 2 present the definition and operationalization of variables.

3.2.1 Research model. To test the effect of BDDI, BCDI, and NCQ on EM, this study used the following regression equation:

$$EM_{i,t} = \alpha + \beta_1 BDDI_{i,t} + \beta_2 BCDI_{i,t} + \beta_3 NCQ_{i,t} + \beta_4 ROA_{i,t} + \beta_5 LEV_{i,t} + \beta_6 FS_{i,t} + \beta_7 FA_{i,t} + \beta_8 AUDQ_{i,t} + \beta_9 BDS_{i,t} + \beta_{10} BDM_{i,t} + \beta_{11} BCS_{i,t} + \beta_{12} BCM_{i,t} + \beta_{13} ICOM_{i,t} + \beta_{14} MO_{i,t} + \beta_{15} IO_{i,t} + \beta_{16} FO_{i,t} + e_{i,t} \quad (I)$$

4. Empirical results

4.1 Descriptive statistics

According to Table 3, the mean AEM for the Jones model is 0.027, with a standard deviation of 0.261, and the minimum and maximum values are −1.073 and 5.170, respectively. The Dechow model's mean AEM is 0.005, with a standard deviation of 0.143 and lowest and highest values of −0.878 and 2.560. The BDDI and BCDI mean values are 0.921 and 0.897, respectively, indicating that the BOD is more diverse than the BOC. While the standard deviation values are 0.350 and 0.366, respectively, with a minimum of 0 and 0 and a maximum of 1.722 and 1.677, the NCQ has a mean and standard deviation of 0.769 and 1.673, with a minimum and maximum value of 0 and 5. This finding shows that NCQ is still low because this task is still mandated to the BOC. The mean values of ROA and LEV are 0.025 and 0.601, with standard deviations of 0.123 and 0.633, while the minimum values are −0.995 and 0.063, respectively, and the maximum values are 0.675 and 5.165, respectively. The mean values of FS and FA are 28.666 and 3.064, with standard deviations of 1.656 and 0.469, while the minimum values are 24.420 and 1.099 and the maximum values are 33.537 and 3.714. While the mean AUDQ value is 0.423 with a standard deviation of 0.495 and the minimum and maximum values are 0 and 1. This means that less than half of the sample companies were audited by the Big 4 firms. The mean BDS and BDM are 4.858 and 15.211, with a standard deviation of 1.779 and 8.397, while the minimum scores are 2 and 3 with a maximum score of 14 and 60. The minimum score for BDM is a violation of regulation because the BOD is mandated to meet once a month. The mean BCS and BCM are 4.181 and 7.153, with a standard deviation of 1.769 and 3.605, while the minimum values are 2 and 1 with a maximum value of 14 and 38. This is also a violation of regulation because the BOC is required to hold one meeting every two months. The mean of ICOM and MO is 1.522 and 0.080, with a standard deviation of 0.786 and 0.194, while the minimum is 1 and 0, and the maximum values are 6 and 0.985. The mean of IO and FO is 0.634 and 0.303, with a standard deviation of 0.320 and 0.306; the minimum value is the same, 0.001, and the maximum value is 0.997 and 0.998. These values reflect that there are companies that are majority owned by MO, IO, and FO.

4.2 Correlation matrix

Correlation tests are carried out to determine the relationship between two variables. If the correlation coefficient of the independent variables is greater than 0.8, then multicollinearity occurs. Conversely, if the correlation coefficient of the independent variables is smaller than 0.8, then multicollinearity does not occur. The results of the correlation test that we carried out on Tables 4 and 5 show that both models are free from multicollinearity.

Table 2. Definition and operational variables

Variable	Variable name	Acronym	Measurement
Dependent	AEM Jones (1991)	AEM Jones (1991)	Model AEM by Jones (1991)
	AEM Dechow *et al*. (1995)	AEM Dechow *et al*. (1995)	The Jones (1991) model, modified by Dechow *et al*. (1995)
Independent	Gender	Gender	Blau index for men and women Kusumastati *et al*. (2022)
	Age	Age	Blau index from 5 categories, namely age under 35, 36–45, 46–55, 56–65 and over 66 years Kusumastati *et al*. (2022)
	Nationality	Nationality	The Blau Index comes from Indonesia and is not Indonesian Kusumastati *et al*. (2022)
	Board of Directors diversity index	BDDI	The sum of the blau index values for gender, age and nationality of the board of directors Kagzi and Guha (2018), Kusumastati *et al*. (2022)
	Board of Commissioners diversity index	BCDI	The sum of the blau index values for gender, age and nationality of the board of commissioners Kusumastati *et al*. (2022), Yousaf *et al*. (2021)
	Nominating committee quality	NCQ	A composite score that measures quality based on five characteristics of the nomination committee, namely committee size is given a value of 1 if the number of committee members is greater than the median value and 0 otherwise; independence is given a value of 1 if the proportion of independent members in the committee is greater than the median value and 0 otherwise; the independence of the committee chairman is given a value of 1 if the committee chairman is an independent person and 0 otherwise; expertise is given a value of 1 if at least one of the members is an expert in accounting and finance and 0 otherwise; meetings are assigned a value of 1 if the number of committee meetings is greater than the median value and 0 otherwise. The committee's quality score is between 0 and 5 Kanapathippillai *et al*. (2016)
Control	Company Performance	ROA	Net profit divided by total assets
	Leverage	LEV	Total liabilities divided by total assets
	Firm size	FS	Natural logarithm of total assets
	Firm age	FA	The natural logarithm of company age since the IPO
	Audit quality	AUDQ	dummy variable, 1 if audited by Big4 and 0 otherwise
	BOD SIZE	BDS	The total number of boards of directors in the company
	BOD MEET	BDM	Number of company board of directors meetings in one year
	BOC SIZE	BCS	The total number of boards of commissioners in the company
	BOC MEET	BCM	Number of meetings of the company's board of commissioners in one year
	Independent commissioners	ICOM	Number of independent commissioners of the company
	Managerial Ownership	MO	Total manager shares divided by total shares

(*continued*)

Table 2. Continued

Variable	Variable name	Acronym	Measurement
	Institutional Ownership	IO	Total shares owned by the institution divided by total shares
	Foreign Ownership	FO	Total shares owned by foreigners divided by total shares

Source(s): Created by authors

Table 3. Descriptive statistics

Variable	Obs	Mean	Std. Dev	Min	Max
AEM model Jones	985	0.027	0.261	−1.073	5.170
AEM the Dechow model	985	0.005	0.143	−0.878	2.560
BDDI	985	0.921	0.350	0	1.722
BCDI	985	0.897	0.366	0	1.667
NCQ	985	0.769	1.673	0	5
ROA	985	0.025	0.123	−0.995	0.675
LEV	985	0.601	0.633	0.063	5.165
FS	985	28.666	1.656	24.420	33.537
FA	985	3.064	0.469	1.099	3.714
AUDQ	985	0.423	0.495	0	1
BDS	985	4.858	1.779	2	14
BDM	985	15.211	8.397	3	60
BCS	985	4.181	1.769	2	14
BCM	985	7.153	3.605	1	38
ICOM	985	1.522	0.786	1	6
MO	985	0.080	0.194	0	0.985
IO	985	0.634	0.320	0.001	0.997
FO	985	0.303	0.306	0.001	0.998

Source(s): The data was processed by the STATA application, and the table were created by the authors

Table 4 shows the correlation matrix of the AEM variables of the Jones model, which shows that BCDI and NCQ have a negative correlation with AEM, whereas BDDI does not correlate. The control variables LEV, FA, BDS, ICOM, and IO exhibit a negative correlation, but FO is positively correlated, while the other variables do not correlate. The correlation matrix shown in Table 5 demonstrates that NCQ has a negative correlation with the Dechow model's AEM, whereas the variables BDDI and BCDI do not correlate with AEM. FA, BDS, BCM, ICOM, and IO have a negative correlation with AEM, while FS and FO have a positive correlation with AEM, but other control variables do not correlate with AEM.

4.3 Diversity of the board, nomination committee and earnings management

We use a fixed effect model with unbalanced data that has been commonly used in accrual earnings management research. We do not test for heteroscedasticity and autocorrelation because our model uses robust standard error techniques so that it is automatically free from heteroscedasticity and autocorrelation (Gujarati and Porter, 2009). The regression results are shown in Table 6. BDDI has a negative effect on AEM with a coefficient of −0.025 ($p < 0.1$) on the Jones model and with a coefficient of −0.002 ($p < 0.1$) on the Dechow model. This means that gender, age, and nationality diversity on the BOD can reduce AEM. Women who fill the BOD cause the BOD to obey the rules so that it will remind men who are braver in making

Table 4. Correlation analysis AEM Jones model

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) AEM	1.000																
(2) BDDI	−0.056	1.000															
	(0.147)																
(3) BCDI	−0.064*	0.299*	1.000														
	(0.099)	(0.000)															
(4) NCQ	−0.084*	0.114*	0.000	1.000													
	(0.028)	(0.003)	(0.590)														
(5) ROA	0.026	0.027	−0.052	−0.069*	1.000												
	(0.507)	(0.482)	(0.179)	(0.072)													
(6) LEV	−0.068*	−0.074*	−0.045	−0.136*	0.057	1.000											
	(0.077)	(0.053)	(0.246)	(0.000)	(0.142)												
(7) FS	0.043	0.057	0.158*	0.342*	−0.154*	−0.133*	1.000										
	(0.270)	(0.137)	(0.000)	(0.000)	(0.000)	(0.001)											
(8) FA	−0.132*	0.136*	0.035	−0.071*	−0.123*	0.017	0.027	1.000									
	(0.001)	(0.000)	(0.359)	(0.066)	(0.001)	(0.558)	(0.491)										
(9) AUDQ	0.037	−0.165*	−0.113*	0.114*	−0.063	0.030	0.000	−0.058	1.000								
	(0.335)	(0.000)	(0.003)	(0.003)	(0.105)	(0.441)	(0.592)	(0.135)									
(10) BDS	−0.075*	0.297*	0.211*	0.149*	−0.033	−0.016	0.417*	0.082*	−0.090*	1.000							
	(0.052)	(0.000)	(0.000)	(0.000)	(0.393)	(0.578)	(0.000)	(0.034)	(0.019)								
(11) BDM	−0.037	−0.154*	−0.063	0.082*	0.013	0.075*	0.155*	−0.018	0.124*	−0.029	1.000						
	(0.342)	(0.000)	(0.103)	(0.033)	(0.730)	(0.052)	(0.000)	(0.538)	(0.001)	(0.455)							
(12) BCS	0.020	0.051	0.112*	0.173*	−0.114*	−0.070*	0.493*	0.086*	0.006	0.513*	0.216*	1.000					
	(0.513)	(0.183)	(0.004)	(0.000)	(0.003)	(0.068)	(0.000)	(0.026)	(0.574)	(0.000)	(0.000)						
(13) BCM	0.001	−0.113*	−0.030	−0.027	0.025	−0.007	−0.036	−0.022	0.105*	0.002	0.267*	−0.085*	1.000				
	(0.584)	(0.003)	(0.439)	(0.486)	(0.512)	(0.562)	(0.349)	(0.560)	(0.007)	(0.568)	(0.000)	(0.027)					
(14) ICOM	−0.081*	0.019	0.036	0.047	−0.086*	−0.082*	0.406*	0.076*	0.061	0.446*	0.264*	0.504*	−0.015	1.000			
	(0.035)	(0.524)	(0.356)	(0.225)	(0.025)	(0.033)	(0.000)	(0.048)	(0.117)	(0.000)	(0.000)	(0.000)	(0.596)				
(15) MO	−0.035	−0.047	−0.068*	0.120*	−0.023	0.004	0.101*	0.018	0.037	−0.004	0.178*	0.180*	0.018	0.122*	1.000		
	(0.365)	(0.222)	(0.077)	(0.002)	(0.556)	(0.518)	(0.009)	(0.549)	(0.338)	(0.508)	(0.000)	(0.000)	(0.535)	(0.001)			
(16) IO	−0.066*	0.007	0.143*	0.044	0.116*	0.029	−0.075*	−0.002	0.069*	0.033	−0.042	−0.072*	−0.049	0.039	−0.054	1.000	
	(0.089)	(0.559)	(0.000)	(0.250)	(0.003)	(0.455)	(0.050)	(0.568)	(0.074)	(0.392)	(0.275)	(0.060)	(0.207)	(0.311)	(0.164)		
(17) FO	0.106*	−0.027	0.045	0.026	0.140*	−0.021	0.026	−0.050	−0.053	0.037	0.109*	0.044	0.059	−0.003	0.029	−0.092*	1.000
	(0.006)	(0.485)	(0.242)	(0.503)	(0.000)	(0.593)	(0.494)	(0.199)	(0.167)	(0.338)	(0.005)	(0.250)	(0.125)	(0.546)	(0.456)	(0.017)	

Note(s): *$p < 0.1$

Source(s): Processed table of the STATA application

Table 5. Correlation analysis AEM the Dechow model

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1) AEM	1.000																
(2) BDDI	−0.034	1.000															
	(0.375)																
(3) BCDI	0.062	0.299*	1.000														
	(0.105)	(0.000)															
(4) NCQ	−0.077*	0.114*	0.000	1.000													
	(0.045)	(0.003)	(0.990)														
(5) ROA	−0.002	0.027	−0.052	−0.069*	1.000												
	(0.967)	(0.482)	(0.179)	(0.072)													
(6) LEV	−0.025	−0.074*	−0.045	−0.136*	0.057	1.000											
	(0.510)	(0.053)	(0.246)	(0.000)	(0.142)												
(7) FS	0.079*	0.057	0.158*	0.342*	−0.154*	−0.133*	1.000										
	(0.039)	(0.137)	(0.000)	(0.000)	(0.000)	(0.001)											
(8) FA	−0.091*	0.136*	0.035	−0.071*	−0.123*	0.017	0.027	1.000									
	(0.018)	(0.000)	(0.359)	(0.066)	(0.001)	(0.658)	(0.491)										
(9) AUDQ	0.060	−0.165*	−0.113*	0.114*	−0.063	0.030	0.000	−0.058	1.000								
	(0.121)	(0.000)	(0.003)	(0.003)	(0.105)	(0.441)	(0.992)	(0.135)									
(10) BDS	−0.103*	0.297*	0.211*	0.149*	−0.033	−0.016	0.417*	0.082*	−0.090*	1.000							
	(0.007)	(0.000)	(0.000)	(0.000)	(0.393)	(0.678)	(0.000)	(0.034)	(0.019)								
(11) BDM	−0.026	−0.154*	−0.063	0.082*	0.013	0.075*	0.155*	−0.018	0.124*	−0.029	1.000						
	(0.504)	(0.000)	(0.103)	(0.033)	(0.730)	(0.052)	(0.000)	(0.638)	(0.001)	(0.455)							
(12) BCS	0.033	0.051	0.112*	0.173*	−0.114*	−0.070*	0.493*	0.086*	0.006	0.513*	0.216*	1.000					
	(0.389)	(0.183)	(0.004)	(0.000)	(0.003)	(0.068)	(0.000)	(0.026)	(0.874)	(0.000)	(0.000)						
(13) BCM	−0.064*	−0.113*	−0.030	−0.027	0.025	−0.007	−0.036	−0.022	0.105*	0.002	0.267*	−0.085*	1.000				
	(0.098)	(0.003)	(0.439)	(0.486)	(0.512)	(0.862)	(0.349)	(0.560)	(0.007)	(0.968)	(0.000)	(0.027)					
(14) ICOM	−0.091*	0.019	0.036	0.047	−0.086*	−0.082*	0.406*	0.076*	0.061	0.446*	0.264*	0.704*	−0.015	1.000			
	(0.019)	(0.624)	(0.356)	(0.225)	(0.025)	(0.033)	(0.000)	(0.048)	(0.117)	(0.000)	(0.000)	(0.000)	(0.696)				
(15) MO	−0.009	−0.047	−0.068*	0.120*	−0.023	0.004	0.101*	0.018	0.037	−0.004	0.178*	0.180*	0.018	0.122*	1.000		
	(0.815)	(0.222)	(0.077)	(0.002)	(0.556)	(0.918)	(0.009)	(0.649)	(0.338)	(0.908)	(0.000)	(0.000)	(0.635)	(0.001)			
(16) IO	−0.083*	0.007	0.143*	0.044	0.116*	0.029	−0.075*	−0.002	0.069*	0.033	−0.042	−0.072*	−0.049	0.039	−0.054	1.000	
	(0.031)	(0.859)	(0.000)	(0.250)	(0.003)	(0.455)	(0.050)	(0.968)	(0.074)	(0.392)	(0.275)	(0.060)	(0.207)	(0.311)	(0.164)		
(17) FO	0.072*	−0.027	0.045	0.026	0.140*	−0.021	0.026	−0.050	−0.053	0.037	0.109*	0.044	0.059	−0.003	0.029	−0.092*	1.000
	(0.063)	(0.485)	(0.242)	(0.503)	(0.000)	(0.593)	(0.494)	(0.199)	(0.167)	(0.338)	(0.005)	(0.250)	(0.125)	(0.946)	(0.456)	(0.017)	

Note(s): *$p < 0.1$

Source(s): Processed table of the STATA application

Table 6. Regression results

Independent variable	Jones	Dechow
BDDI	−0.025* (0.073)	−0.002* (0.054)
BCDI	−0.140** (0.037)	−0.096** (0.013)
NCQ	−0.026* (0.081)	−0.018* (0.088)
ROA	0.071* (0.054)	0.010* (0.081)
LEV	0.014 (0.800)	0.023 (0.484)
FS	−0.029 (0.152)	−0.016 (0.555)
FA	0.191** (0.027)	0.102* (0.062)
AUDQ	−0.086** (0.015)	−0.057*** (0.005)
BDS	−0.034** (0.040)	−0.019** (0.046)
BDM	−0.001 (0.707)	−0.003* (0.084)
BCS	−0.017** (0.031)	−0.007* (0.081)
BCM	−0.003 (0.539)	−0.003* (0.081)
ICOM	−0.140*** (0.002)	−0.056** (0.028)
MO	−0.041 (0.664)	−0.040 (0.470)
IO	−0.161*** (0.001)	−0.083*** (0.004)
FO	−0.191*** (0.000)	−0.109*** (0.000)
Industry	Yes	Yes
Year	Yes	Yes
Prob > chi2	0.000	0.000
Overall *r*-squared	0.159	0.146
Number of samples	985	

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): The data was processed by the STATA application, and the table were created by the authors

risky decisions (Hoang *et al.*, 2019). In addition, the cooperation between senior BODs who are experienced and think about sustainability after retirement, young BODs who are proficient in technology and want to learn new things, and foreign BODs who have experience, knowledge, and are independent makes them reluctant to do AEM. This diversity of BODs causes them to remind each other of the effects of AEM in the future for themselves and the company. These results are in line with previous studies (Bouaziz *et al.*, 2020; Qi *et al.*, 2018; Schumann *et al.*, 2024) as well as agency theory and resource dependence theory because BOD with gender, age, and nationality diversity will produce diverse skills and experiences that will also increase supervision of fellow BODs and managers below them to avoid opportunistic behavior such as conducting AEM. Therefore, H1 is accepted.

BCDI has a negative effect on AEM with a coefficient of −0.140 ($p < 0.05$) on the Jones model and with a coefficient of −0.096 ($p < 0.05$) on the Dechow model. These results indicate that gender, age, and nationality diversity of BOC will increase supervision and thus reduce AEM. Women are more meticulous, rule-abiding, and better at monitoring than men (Luo *et al.*, 2017), so when working together with senior BOCs with experience, young BOCs with the latest knowledge that follows the development of the times, and foreign BOCs with experience and independence will provide the best supervision and advice for the BOD. For example, female BOCs will respond quickly if there are indications of AEM (Gull *et al.*, 2018); this will be discussed with senior BOCs who have experience and independent foreign BOCs. The results of their discussions will provide the best advice for the BOD to avoid AEM. Thus, the monitoring and input functions provided by the BOC can help prevent the emergence of AEM. The results of this study support agency theory and resource dependence theory because the diversity of BOC with various existing resources will increase the supervisory function on BOD so that there is harmony between BOD and BOC to satisfy the interests of all stakeholders by reducing the level of AEM. The results of this study also support previous studies (Kagzi and Guha, 2018; Orazalin, 2019; Yousaf *et al.*, 2021) so that H2 is accepted.

NCQ has a negative effect on AEM with a coefficient of −0.026 ($p < 0.1$) on the Jones model and with a coefficient of −0.018 ($p < 0.1$) on the Dechow model, which means that the nomination committee will supervise, assess performance, recommend continuing or replacing, and select new BOD and BOC to reduce AEM. NCQ will provide supervision and assessment of BOD and BOC performance according to actual conditions. If the NC assesses that the BOD or BOC is not feasible to continue, it will be recommended to be replaced with a new one that meets the company's criteria and needs. NC will recommend new BOD and BOC based on demographic diversity, expertise, and experience so as to improve the company's performance and value without conducting AEM (Nuhu *et al.*, 2023). The results of this study are in accordance with previous studies (Bansal and Singh, 2022; Moisello *et al.*, 2024; Nuhu *et al.*, 2023; Putra, 2024), as well as agency theory and resource dependence theory. Based on agency theory, NC is a committee under BOC that is tasked with supervising and assessing the performance of BOD and BOC and nominating new BOD and BOC. Meanwhile, based on resource dependency theory, NC will increase the diversity of BOD and BOC so that they have different abilities and experiences that can prevent AEM. Therefore, H3 is accepted. For the control variables in the Jones model, AUDQ, BDS, BCS, ICOM, IO, and FO have a negative effect on AEM, but ROA and FA have a positive effect, while in the Dechow model, AUDQ, BDS, BDM, BCS, BCM, ICOM, IO, and FO have a negative effect on AEM, but ROA and FA have a positive effect.

4.4 Additional test

Using the Dechow model, we also conducted additional tests using absolute values, positive (income increase), and negative (income decrease) as shown in Table 7. This is important to do because management not only manipulates by increasing income but can also reduce income to be transferred to the following year's income. Table 7 shows that BDDI and NCQ have a negative influence on AEM (absolute value), while BCDI has no effect. The ineffectiveness of BCDI is due to weak supervision and a lack of diversity in BCDI. Meanwhile, only the control

Table 7. Additional tests using the Dechow model

Independent variable	Absolute value	Negative value	Positive value
BDDI	−0.023** (0.012)	0.004 (0.876)	−0.049** (0.014)
BCDI	0.004 (0.830)	0.016 (0.688)	0.043 (0.693)
NCQ	−0.012*** (0.004)	−0.005 (0.330)	−0.014*** (0.009)
ROA	0.004** (0.014)	−0.112* (0.097)	0.203** (0.034)
LEV	−0.004 (0.971)	0.015 (0.571)	0.005 (0.737)
FS	−0.004 (0.732)	0.039 (0.188)	−0.017 (0.427)
FA	0.054* (0.096)	0.052 (0.712)	0.049* (0.075)
AUDQ	−0.011* (0.085)	−0.022* (0.073)	−0.018** (0.014)
BDS	−0.006* (0.074)	−0.002 (0.586)	−0.011** (0.031)
BDM	−0.000 (0.575)	0.000 (0.692)	−0.001 (0.538)
BCS	−0.005* (0.073)	0.005* (0.058)	−0.019** (0.046)
BCM	−0.002 (0.160)	−0.002 (0.583)	0.002 (0.489)
ICOM	−0.004* (0.051)	−0.058 (0.481)	−0.101* (0.084)
MO	0.029 (0.521)	−0.006 (0.837)	0.041 (0.314)
IO	−0.001** (0.020)	−0.008* (0.083)	−0.013* (0.058)
FO	−0.002* (0.093)	−0.012* (0.052)	−0.006** (0.022)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Prob > chi2	0.001	0.028	0.014
Overall *r*-squared	0.166	0.064	0.068
Number of samples	985	488	497

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): The data was processed by the STATA application, and the table were created by the authors

variables ROA, AUDQ, IO, and FO have a negative influence, and BCS has a positive influence on AEM, which has a negative value, while AEM has a positive value, showing the results that BDDI and NCQ have a negative influence on AEM. These results indicate that BDDI and NCQ only focus on EM strategies that are income-increasing strategies, meaning that BDDI and NCQ focus on reducing management's income-increasing strategy, whereas income-decreasing strategies can lead to an income-smoothing strategy, namely shifting this year's revenue to next year's revenue. This is, of course, also very detrimental to investors and other stakeholders.

We also try to make NCQ and IO moderating variables. This is important to do because BOD and BOC are selected and recommended by the nomination committee so that, by making it a moderating variable, it can be known whether the nomination committee strengthens or weakens the diversity of BOD and BOC in limiting EM. Meanwhile, based on descriptive statistics, IO is the largest shareholder in Indonesian manufacturing companies. Making it a moderating variable is important to find out whether IO also strengthens or weakens the diversity of BOD and BOC in limiting EM. It can be seen in Table 8 that NCQ strengthens the negative influence of BDDI and BCDI, while IO strengthens the influence of negative BDDI, BCDI, and NCQ on EM. These results show the important role of NCQ in monitoring, assessing performance, and recommending new BOD and BOC to reduce the occurrence of EM. Meanwhile, IO plays a role in improving BOD management and decision-making as well as BOC and NCQ supervision to reduce EM. In addition, we also tested gender, age, and citizenship outside the BDDI and BCDI indices to find out which characteristics are most powerful in limiting EM. Table 9 shows that gender is the characteristic that most influences the decline in EM in both BOD and BOC because it has the highest coefficient value.

Table 8. Additional test using NCQ and IO as a moderating variable

Independent variable	Jones	Dechow	Jones	Dechow
BDDI	−0.029** (0.027)	−0.010* (0.061)	−0.009* (0.085)	−0.008* (0.082)
BCDI	−0.074* (0.086)	−0.057* (0.085)	−0.099* (0.061)	−0.075* (0.075)
NCQ	−0.016** (0.057)	−0.015** (0.046)	−0.033* (0.087)	−0.028* (0.078)
BDDI × NCQ	0.030** (0.029)	0.025** (0.035)		
BCDI × NCQ	0.001* (0.093)	0.002* (0.082)		
BDDI × IO			0.016* (0.071)	0.012* (0.074)
BCDI × IO			0.035* (0.065)	0.021* (0.074)
NCQ × IO			0.022** (0.047)	0.020** (0.031)
ROA	0.013* (0.081)	0.040* (0.053)	0.018** (0.043)	0.046* (0.093)
LEV	−0.007 (0.776)	−0.021 (0.244)	−0.008 (0.755)	−0.021 (0.242)
FS	−0.013 (0.545)	−0.002 (0.842)	−0.014 (0.537)	−0.004 (0.776)
FA	0.008** (0.032)	0.014* (0.082)	0.028* (0.076)	0.005* (0.093)
AUDQ	−0.013** (0.036)	−0.016* (0.076)	−0.012** (0.031)	−0.015* (0.085)
BDS	−0.013** (0.029)	−0.009* (0.082)	−0.014** (0.017)	−0.010* (0.062)
BDM	−0.000 (0.986)	−0.001* (0.065)	−0.014 (0.994)	−0.001** (0.046)
BCS	−0.005** (0.045)	−0.002* (0.053)	−0.005** (0.017)	−0.003* (0.052)
BCM	0.000 (0.946)	−0.006* (0.072)	0.000 (0.986)	−0.005** (0.040)
ICOM	−0.048** (0.020)	−0.026* (0.064)	−0.046** (0.032)	−0.033* (0.079)
MO	−0.009 (0.232)	−0.065 (0.212)	−0.099 (0.664)	−0.064 (0.922)
IO	−0.041*** (0.004)	−0.029** (0.019)	−0.023*** (0.003)	−0.004** (0.021)
FO	−0.090** (0.011)	−0.058** (0.018)	−0.086*** (0.007)	−0.054** (0.014)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Prob > chi2	0.000	0.009	0.000	0.0010
Overall *r*-squared	0.145	0.144	0.197	0.135
Number of samples	985			

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): The data was processed by the STATA application, and the table were created by the authors

Table 9. Additional test using characteristics BOD and BOC

Independent variable	Jones	Dechow
Gender BOD	−0.055* (0.091)	−0.099* (0.086)
Age BOD	−0.034 (0.350)	−0.021** (0.042)
Nationality BOD	−0.006* (0.092)	−0.013* (0.075)
Gender BOC	−0.136** (0.025)	−0.096* (0.075)
Age BOC	−0.004* (0.095)	−0.011* (0.084)
Nationality BOC	−0.112** (0.038)	−0.084* (0.085)
NCQ	−0.018** (0.010)	−0.015*** (0.001)
ROA	0.011* (0.099)	0.037* (0.058)
LEV	−0.009 (0.720)	−0.020 (0.263)
FS	−0.018 (0.438)	−0.005 (0.708)
FA	0.007* (0.094)	0.018* (0.082)
AUDQ	−0.018* (0.093)	−0.017* (0.078)
BDS	−0.014** (0.011)	−0.009* (0.091)
BDM	−0.000 (0.770)	−0.006* (0.063)
BCS	−0.005** (0.046)	−0.002* (0.068)
BCM	−0.000 (0.851)	−0.002* (0.085)
ICOM	−0.047** (0.028)	−0.025* (0.086)
MO	−0.100 (0.232)	−0.068 (0.248)
IO	−0.042*** (0.004)	−0.028** (0.020)
FO	−0.085** (0.018)	−0.055** (0.030)
Industry	Yes	Yes
Year	Yes	Yes
Prob > chi2	0.000	0.015
Overall *r*-squared	0.123	0.128
Number of samples	985	

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): The data was processed by the STATA application, and the table were created by the authors

4.5 Robustness test

To check robustness and increase the reliability of the results, we used the model of Kothari *et al.* (2005) and the earnings smoothing model by Leuz *et al.* (2003) scaled by cash flow from operations as presented in Appendix 1. This is done to ensure that the regression results are consistent across conditions and measurement models. Meanwhile, the use of the Leuz model is done to clarify the results of Table 7. The results of the robustness test presented in Table 10 show consistency with the main results measured by the Jones and Dechow model. However, in the Leuz models, BDS and BCS increase earnings smoothing. In the EM model, endogeneity may arise between variables (Le and Nguyen, 2023). Endogeneity problems can produce biased and inconsistent estimators when there is a lag in the dependent variable. We use the System Generalized Method of Moment (SYSGMM) with a two-step model because it is more efficient and has a standard error that is strong against heteroscedasticity and autocorrelation (Roodman, 2009). The results of the SYSGMM regressions are shown in Table 11 with consistent results when using FE.

5. Conclusion

Our study examines the effect of board diversity and nomination committees on EM in Indonesian manufacturing companies that use a two-tier system. Board diversity variables consist of gender, age, and nationality, which are grouped into the BDDI and the BCDI. This study presents strong and trustworthy empirical data on the diversity of boards, NC, and AEM with multiple controls, robustness, and further tests using a sample of 985 manufacturing companies listed on the IDX between 2015 and 2023. This study finds that BDDI, BCDI, and

Table 10. Robustness test using other AEM models

Independent variable	Kothari	Leuz
BDDI	−0.016* (0.082)	−0.053* (0.087)
BCDI	−0.144** (0.031)	−0.096** (0.021)
NCQ	−0.026* (0.091)	−0.030** (0.026)
ROA	0.072* (0.050)	0.087* (0.061)
LEV	0.012 (0.826)	0.036 (0.316)
FS	−0.028 (0.568)	0.030 (0.265)
FA	0.191* (0.072)	0.017 (0.996)
AUDQ	−0.087** (0.013)	−0.051* (0.053)
BDS	−0.034** (0.038)	0.063*** (0.000)
BDM	−0.001 (0.701)	−0.082* (0.094)
BCS	−0.018* (0.085)	0.012* (0.075)
BCM	−0.003 (0.581)	−0.008* (0.095)
INDCOM	−0.138*** (0.002)	−0.032* (0.055)
MO	−0.038 (0.692)	−0.071* (0.075)
IO	−0.164*** (0.001)	−0.018* (0.088)
FO	−0.188*** (0.000)	−0.028* (0.087)
Industry	Yes	Yes
Year	Yes	Yes
Prob > chi2	0.000	0.002
Overall *r*-squared	0.159	0.121
Number of samples	985	

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Source(s): The data was processed by the STATA application, and the table were created by the authors

NCQ reduce AEM because they improve management and monitoring functions, reduce agency problems, and facilitate access to resources.

In more detail, the results of the study explain that one form of improving corporate governance is to increase diversity in the BOD and BOC. The nomination committee is a committee tasked with evaluating and recommending someone to become a BOD or BOC. The results of this study prove that the diversity of the BOD and BOC and a quality nomination committee can reduce EM. Reducing EM will improve the quality of financial reporting because it is free from manipulation and fraud, thereby increasing the company's performance and value. This increase in company performance and value certainly contributes to state revenues, thus supporting the vision of a golden Indonesia in 2045. In addition, PUGKI 2021 has also provided recommendations for selecting BOD and BOC based on diversity and suggested the formation of a nomination committee. However, there are no official laws and regulations that require it. Therefore, this study has important implications for companies, investors, and regulators. Companies and regulators can put pressure on AEM by encouraging and developing policies that prioritize board diversity and require the formation of quality NCs to evaluate and nominate BODs and BOCs. The presence of a diverse board not only enhances the management and oversight functions of the BOC but also allows companies to gain access to important external resources. The NC, as a committee that nominates the BOD and BOC based on their qualities and characteristics, will determine the best criteria for nominating the BOD and BOC. As a result, shareholders through the GMS must assess the composition of the board because the composition of the BOD and BOC affects the company's goals. For regulators, we emphasize the creation of regulations and laws that require diversity of the BOD and BOC based on gender, age, and nationality and the formation of a quality NC. For investors, our research can be used as a reference for investing, namely choosing companies with diverse BODs and BOCs and companies that have NCQ because our findings show a

Table 11. Regression using SYS GMM estimation

Independent variable	Jones	Dechow	Kothari	Leuz
Jones L1	0.322*** (0.000)			
Dechow L1		0.248*** (0.000)		
Kothari L1			0.321*** (0.000)	
Leuz L1				0.078** (0.042)
BDDI	−0.045** (0.039)	−0.050** (0.049)	−0.054* (0.091)	−0.140*** (0.003)
BCDI	−0.053* (0.062)	−0.022* (0.080)	−0.083** (0.023)	−0.074** (0.031)
NCQ	−0.010* (0.064)	−0.041* (0.056)	−0.018** (0.048)	−0.017** (0.041)
ROA	0.131** (0.029)	0.041* (0.078)	0.263** (0.011)	0.139** (0.020)
LEV	−0.017 (0.787)	0.001 (0.997)	0.025 (0.729)	0.014 (0.443)
FS	−0.136*** (0.001)	−0.085* (0.058)	−0.196** (0.022)	0.031 (0.747)
FA	0.195* (0.060)	0.094** (0.044)	0.309** (0.026)	0.012 (0.624)
AUDQ	−0.017*** (0.005)	−0.006** (0.043)	−0.021* (0.074)	−0.052** (0.044)
BDS	−0.017** (0.021)	−0.037** (0.022)	−0.005* (0.070)	0.018** (0.039)
BDM	−0.001 (0.666)	−0.000 (0.699)	−0.000 (0.877)	−0.069** (0.024)
BCS	−0.006** (0.035)	−0.005 (0.505)	−0.003 (0.753)	0.038* (0.056)
BCM	−0.003* (0.068)	−0.003* (0.057)	−0.002* (0.076)	−0.032* (0.074)
ICOM	−0.018* (0.061)	−0.036** (0.024)	−0.045** (0.035)	−0.043* (0.095)
MO	−0.010 (0.912)	0.005 (0.957)	−0.001 (0.990)	−0.014* (0.059)
IO	−0.006* (0.085)	−0.041** (0.011)	−0.040* (0.080)	−0.019* (0.077)
FO	−0.050** (0.032)	−0.035** (0.043)	−0.030* (0.065)	−0.014* (0.082)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Prob > chi2	0.000	0.000	0.000	0.002
AR (1)	−3.804 (0.000)	−3.798 (0.000)	−4.459 (0.000)	−4.225 (0.002)
AR (2)	−0.509 (0.610)	−0.566 (0.571)	−0.604 (0.545)	−0.692 (0.535)
Number of samples	869			

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$ The two-step GMM technique uses robust standard errors to control for heteroscedasticity and autocorrelation
Source(s): The data was processed by the STATA application, and the table were created by the authors

negative impact on AEM. Therefore, diversity in the ranks of the BOD and BOC and a qualified nomination committee will improve governance, align management and stakeholder goals, and support the vision of a golden Indonesia in 2045.

Our study has several limitations that could be considered for improvement in future research. First, our study only uses gender, age, and nationality as indicators of diversity. We suggest that future research examine other demographic diversities such as religion as well as cognitive diversities such as education level, tenure, and expertise. Second, our study relied solely on quantitative methods and did not include interviews or other qualitative data. Therefore, we recommend that future research combine quantitative and qualitative methods to better understand the mechanisms underlying the relationship between board diversity, nomination committees, and EM. Third, our measurement of EM is only based on AEM. For that, in future research, we also suggest examining REM, which can be used by managers to manipulate earnings. Finally, fourth, this research was conducted in Indonesia, which adopts a two-tier system. Therefore, we suggest comparing countries that adopt a one-tier system and a two-tier system to provide a greater contribution.

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Appendix 1
Accrual earnings management measurement

(1) Model of Jones (1991):

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha\left(\frac{1}{TA_{it-1}}\right) + \beta_i\left(\frac{\Delta REV_{it-1}}{TA_{it-1}}\right) + \beta_2 + \left(\frac{PPE_{it}}{TA_{it-1}}\right) + \varepsilon_{it}$$

(2) Jones Modified Model (Dechow *et al*., 1995):

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha\left(\frac{1}{TA_{it-1}}\right) + \beta_1\left(\frac{\Delta REV_{it} - \Delta AR_{it}}{TA_{it-1}}\right) + \beta_2\left(\frac{PPE_{it}}{TA_{it-1}}\right) + \varepsilon_{it}$$

(3) Model of Kothari *et al*. (2005).

$$\frac{TAC_{it}}{TA_{it-1}} = \alpha\left(\frac{1}{TA_{it-1}}\right) + \beta_1\left(\frac{\Delta REV_{it} - \Delta AR_{it}}{TA_{it-1}}\right) + \beta_2\left(\frac{PPE_{it}}{TA_{it-1}}\right) + \beta_3 ROA_{it-1} + \varepsilon_{it}$$

(4) Model of Leuz *et al*. (2003):

$$Accruals_{it} = (\Delta CA_{it} - \Delta Cash_{it}) - (\Delta CL_{it} - \Delta STD_{it} - \Delta STD_{it} - \Delta TP_{it}) - Dep_{it}$$

TAC_{it} is the total accruals in year t, which are the difference between net profit and operating cash flow. TA_{it-1} is total assets in year $t-1$, ΔREV_{it} is change in income in year t, ΔAR_{it} is change in receivables in year t, PPE_{it} is gross fixed assets in year t, ROA is return on assets, α and β are parameter estimations and ε_{it} is residue. ΔCA_{it} is change in total current assets, $\Delta Cash_{it}$ is change in cash/cash equivalents, ΔCL_{it} is change in total current liabilities , ΔSTD_{it} is change in short term debt included in current liabilities, ΔTP_{it} is change in income taxes payable, and Dep_{it} is depreciation and amortization expense for firm i in year t. The earnings smoothing model by Leuz *et al*. (2003) scaled by cash flow from operations

Appendix 2
Blau index

$$\text{Blau Index} = 1 - \sum_{i=1}^{n} \text{pi2}$$

Pi is the percentage of board members in each category and n is the total number of board members. The maximum blau index value is 0.5, which means that each diversity has the same number. For example, for gender diversity, the blau index value is 0.5, which means the number of men and women on the board is the same.

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