

Female Leaders and Earnings Management: An Exploration of Chief Positions

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Abstract: *Female leader affects earnings management and the quality of the financial report. This study wants to investigate the effect of female leaders on real earnings management. We use the nine chief positions with a female presence as a leader. The data were obtained from Indonesia's public listed company on the S&P Global Market Intelligence database from 2012-2020. For real earnings management measures, we used data two years earlier. The data sample selected was 3.420 firm-year observations. The sample was separated into 12 classifications, according to IDX Industrial Classifications. Female leader positions as chief executive, chief accounting, and chief administration negatively affect real earnings management. While female leader positions as chief technology and chief marketing have a positive effect on real earnings management. We find that industrial has a different effect on real earnings management. Many studies are predicting female chief leaders and real earnings management. The most significant finding is female roles as finance managers. However, no research predicts real earning management using female leaders in various chief positions.*

Keywords: *Female, Leader, Chief, Real, Earnings, Management*

Abstrak— *Pimpinan perempuan mempengaruhi manajemen laba dan kualitas laporan keuangan. Penelitian ini ingin mengetahui pengaruh direktur perempuan terhadap manajemen laba riil. Kami menggunakan sembilan posisi direktur dengan seorang perempuan sebagai pemimpinnya. Data tersebut diperoleh dari perusahaan publik Indonesia pada database S&P Global Market Intelligence dari 2012-2020. Untuk ukuran manajemen laba riil, kami menggunakan data dua tahun sebelumnya. Sampel data yang dipilih adalah 3.420 pengamatan. Sampel dipisahkan menjadi 12 klasifikasi, menurut klasifikasi Industri BEI. Posisi direktur perempuan dalam fungsi eksekutif, akuntansi, dan administrasi berpengaruh negatif terhadap manajemen laba riil. Sedangkan posisi direktur perempuan dalam fungsi teknologi dan marketing berpengaruh positif terhadap manajemen laba riil. Kami menemukan bahwa industri memiliki efek yang berbeda pada manajemen laba riil. Banyak penelitian yang memprediksi keberadaan perempuan sebagai pemimpin perusahaan dan manajemen laba riil. Temuan yang paling signifikan adalah peran perempuan sebagai pemimpin*

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keuangan. Namun, tidak ada penelitian yang memprediksi manajemen laba riil menggunakan perempuan di berbagai posisi direktur..

Kata Kunci: *Perempuan, Pemimpin, Direktur, Riil, Manajemen, Laba*

1. Introduction

The need for females in a firm's leadership is critical to boosting performance (Albaum & Peterson, 2006; Dwivedi et al., 2021). The representation of females in a firm's leader notably outperforms of organization. Firms should overlook the prospect of employing more women in leadership roles. This leadership transition phenomenon is called workplace marginalization (Luo et al., 2017). In Indonesia, female leaders have reached 22% (Setiawan et al., 2020). The percentage of female leaders in firms has risen rapidly in a decade, from 6% to 22%. This evidence helps the firms to realize the critical role of the female in top-level leadership and insight for the transitional leader in the future. Moreover, the public is paying more attention to firms with increasing female participation (Li et al., 2021).

The previous researchers find out that firms' female leaders can limit earnings management and increase the financial report quality. (Adams & Ferreira, 2007; Hillman et al., 2007; Li et al., 2021; Setiawan et al., 2020). They prove that females in chief positions improve the quality of the financial report and fewer earnings management. female present in leadership position helps to improve accountability of manager's bad performance. (Adams & Ferreira, 2007). The female leader also brings different experiences and enriches communication. This fact will improve the quality of decisions and make them more conservative in managing their earnings. In the Indonesian context, firms' leaders are separated into two categories: executive board and supervisory board (Arieftiara & Utama, 2018). The executive board represents the function of the chief position. The responsibility of the chief in firms are separated into specific functions. The prominent positions are Chief Executive Officer (CEO), Chief Finance Officer (CFO), and Chief Information Officer (CIO). The next leader is the supervisory board. This position monitors the executive roles to enhance with firm's

objective and shareholder interest. For Indonesia context, this position is famous as the board of commissioners (BOC).

Earnings management is divided into two kinds of strategies: accrual-based and real earnings management (Li et al., 2021; Luo et al., 2017; Sun et al., 2014). According to accounting principles, accrual-based earnings management is the strategy to increase or decrease reported income temporarily. On the other hand, real earnings management is a strategy to manage the timing of sales, investment, or financial transactions (Li et al., 2021; Luo et al., 2017). The firm's leadership uses real earnings management to control sales, inventory, research and development, training, and publicity expenses. The previous studies show that firms are more likely to use real earnings management since it is harder to detect and control than accrual-based earnings management (Cohen et al., 2008; Ge & Kim, 2014; Kuo et al., 2014; Li et al., 2021; Talbi et al., 2015)

The previous studies found that female CFO, female CEO, and female board negatively affect real earnings management (B. Francis et al., 2015; Hili & Affes, 2012; Hillman et al., 2007; Li et al., 2021; Liu et al., 2016; Luo et al., 2017; Peni & Vähämaa, 2010; Setiawan et al., 2020; Srinidhi et al., 2011; Temile et al., 2018). However, there is no research predicting real earnings management using various female leadership positions. This position refers to the chief position that affected to financial report process and impacted real earnings management. We use nine chief positions that affected real earnings management practices (Visvanathan, 2008). Chief Finance Officer (CFO), Chief Executive Officer (CEO), Chief Accounting Officer (CACO), Chief Compliance Officer (CCOO), and Chief Administration Officer (CADO) tend to reduce real earnings management. CFO, CEO, and CACO are responsible for controlling the sales and inventory. CCOO is responsible for controlling publicity expenses, and CADO controls training expenses. The rest of the chief position tends to increase real earnings management. They are Chief Operating Officer (COO), Chief Investment Officer (CIVO), Chief Technology Officer (CTO), and Chief Marketing Officer. COO is responsible for increasing sales. CIVO and CTO are responsible for increasing research and development expenses. Then, CMO is responsible for increasing publicity expenses.

According to the research result, we extend the literature of female leaders affecting real earnings management. The extension is the effect of the difference of chief position on real earnings management practices. We find that chief executive, chief accounting, and chief administration have a negative effect on real earnings management practices. In contrast, chief technology and chief marketing have a positive effect on real earnings management practices. This evidence supports the critical role of females in top leadership and encourages firms to improve the proportion of females in leadership positions. This result also supports the theory of friendly board (Adams & Ferreira, 2007) that female participation enhances the firm's performance and resources-based theory (Barney, 1996) that claimed the outperformed women in managerial positions.

2. Theoretical Framework and Hypothesis Development

2.1. Earnings management strategies

The famous strategies for earnings management are accrual-based earnings management and real earnings management (Cohen et al., 2008; Li et al., 2021; Luo et al., 2017). These strategies control accounting methods in different ways. Accrual-based earnings management uses discretionary accrual as the determinant to adjust earnings (Ghazali et al., 2015; Li et al., 2021; Liu et al., 2016; Mohanram, 2003). The positive discretionary accrual means firms like to up their earnings management. On another side, the negative discretionary accrual means firms are likely to down their earnings management. Several researchers point out that accrual-based earnings management is difficult to recognize by firms outsiders, as long as following the accounting rules and methods to manage earnings (Dechow & Skinner, 2000; Kothari et al., 2005; Li et al., 2021). This matter makes accrual-based earnings management popular.

In the current research, real earnings management has become preferable to accrual-based earnings management (Cohen et al., 2008; Ge & Kim, 2014; Kuo et al., 2014; Li et al., 2021). Firms use real earnings management because it is harder to detect

and control. In an emerging country like Indonesia, real earnings management is preferable to accrual-based earnings management since the corporate governance and firms' ethics are weak (Li et al., 2021).

Real earnings management strategies are detected through three methods, including sales acceleration, overproduction, and discretionary expense decrease (Roychowdhury, 2006). In sales acceleration, firms leader have incentives to attract customers by providing sales discounts, relaxing credit policies, and delaying sales time (Dechow & Skinner, 2000; Sun et al., 2014). In overproduction, firm leaders increase the operating profit by increasing the output or reducing the production cost of the sold product (Sun et al., 2014). In discretionary expense decrease, firm's leader controlling research and development expenses, publicity expenses, and employee training expenses (Liu et al., 2016). These expenses are future-oriented and have little impact on the firm's current production activities.

2.2. The female executive board and real earnings management.

The presence of a female firms leader affected earnings management practices because they are conservative in spending (Adams & Ferreira, 2007; Setiawan et al., 2020). An executive board position is directly involved in the financial report process (B. Francis et al., 2015). So, a female in an executive board position is significant to control earnings management practices because they are naturally risk-averse (Gavious et al., 2012; Gul et al., 2009). The previous researcher finds that females as Chief Executive Officer (CEO) and Chief Finance Officer (CFO) tend to cautious and risk-averse than males (Gavious et al., 2012; Gul et al., 2009). Other studies also note that the presence of a female in a firms leader plays an important role to control real earnings management practices (Cohen et al., 2008; Dechow & Skinner, 2000; Hillman et al., 2007; Kuo et al., 2014; Setiawan et al., 2020).

In this study, we predict the negative effect of females in positions as Chief Finance Officer (CFO), Chief Executive Officer (CEO), Chief Accounting Officer (CACO), Chief Compliance Officer (CCOO), and Chief Administration Officer (CADO) to real earning management practices. This prediction assumes that CFO, CEO, and CACO

tend to control the sales volume and inventory. In contrast, CCOO and CADO will reduce research and development expenses, training expenses, and publicity expenses. The different effect of the female leader is in Chief Investment Officer (CIVO), Chief Technology Officer (CTO), and Chief Marketing Officer (CMO) that positively to real earnings management. This prediction assumes that CIVO, CTO, and CMO tend to increase inventory, research and development, training, and publicity expenses. Thus, we proposed the first hypothesis:

H1a: Female on the position as chief finance, chief executive, chief accounting, chief compliance, and chief administration negatively affect real earnings management

H1b: Female on the position as chief operational, chief investment, chief technology, and chief marketing positively affect real earnings management

2.3. The female supervisory board and real earnings management.

The female presence in supervisory board positions is better and more responsible in corporate governance practices than males (Adams & Ferreira, 2007; Hillman et al., 2007). Female board leader is more effective in monitoring, bringing different perspectives, and improving the communication style. (Hillman et al., 2007). The female board also reduces the information asymmetry, is more conservative, and limits the real earnings management practices (Srinidhi et al., 2011). Thus, we proposed the second hypothesis:

H2: Female proportions on board of commissioner negatively affect real earnings management

3. Research Method

3.1. Data and sources

The research aims to explore the female leader positions to real earnings management. in particular, we explore the nine positions in a firm representing executive boards and supervisory boards to real earnings management practices. The data were obtained from Indonesia's public listed company on the S&P Global Market

Intelligence database from 2012-2020. For real earnings management measures, we used data two years earlier. To screen the outlier, we eliminated data with a negative Debt Equity Ratio (DER) to prevent the deficiencies in equity. Finally, the data sample selected was 3.420 firm-year observations. According to IDX Industrial Classifications (IDX-IC), the sample consists of 380 firms every year and is separated into 12 classifications. Table 1 shows the firm's observation of each industry, which are the most significant proportions is consumer cyclical (16.84%), and the smallest is listed investment product (0.2%).

Table 1.
Sample distribution by IDX industrials classification (IC)

| INDUSTRY | Freq. | Percent | Cum. |
|---------------------------|--------------|----------------|-------------|
| Basic Materials | 279 | 8.16 | 8.16 |
| Consumer Cyclicals | 576 | 16.84 | 25 |
| Consumer Non-Cyclicals | 414 | 12.11 | 37.11 |
| Energy | 297 | 8.68 | 45.79 |
| Financials | 450 | 13.16 | 58.95 |
| Healthcare | 54 | 1.58 | 60.53 |
| Industrials | 342 | 10 | 70.53 |
| Infrastructures | 270 | 7.89 | 78.42 |
| Listed Investment Product | 9 | 0.26 | 78.68 |
| Properties & Real Estate | 423 | 12.37 | 91.05 |
| Technology | 135 | 3.95 | 95 |
| Transportation & Logistic | 171 | 5 | 100 |
| Total | 3420 | 100 | |

3.2. Variables definitions

The dependent variable in this study is real earnings management (REM). The determinants of REM include sales acceleration, discretionary expenditure, and overproduction (Roychowdhury, 2006). Thus, operating cash flow (OCF), discretionary expenses (DE), and overproduction (OP), as real earning management, are estimated by

ordinary least squares (OLS) regressions for each year, respectively, and formulated as follows:

$$\frac{OP}{A_{i,t-1}} = \beta_0 + \beta_1 \left(\frac{1}{A_{i,t-1}} \right) + \beta_2 \left(\frac{NS_{i,t}}{A_{i,t-1}} \right) + \beta_3 \left(\frac{\Delta NS_{i,t}}{A_{i,t-1}} \right) + \beta_4 \left(\frac{\Delta NS_{i,t-1}}{A_{i,t-1}} \right) + \varepsilon_{1t} \quad \text{Eq.1}$$

$$\frac{OCF}{A_{i,t-1}} = \beta_0 + \beta_1 \left(\frac{1}{A_{i,t-1}} \right) + \beta_2 \left(\frac{NS_{i,t}}{A_{i,t-1}} \right) + \beta_3 \left(\frac{\Delta NS_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{2t} \quad \text{Eq.2}$$

$$\frac{DE}{A_{i,t-1}} = \beta_0 + \beta_1 \left(\frac{1}{A_{i,t-1}} \right) + \beta_2 \left(\frac{NS_{i,t}}{A_{i,t-1}} \right) + \varepsilon_{3t} \quad \text{Eq.3}$$

$$REM_{i,t} = \varepsilon_{1t} - \varepsilon_{2t} - \varepsilon_{3t} \quad \text{Eq.4}$$

In the above equation, *i* is denoted as a firm, *t* denoted as the year, OCF denoted as operating cash flow, DE is denoted as the sum of sales expenses and administrative expenses, OP is denoted as the sum of the cost of goods sold (COGS) and inventory variation, A denoted as total assets, and NS denoted as net sales. Thus, Equation 4 is denoted as the sum of three standardized residuals calculated from three separate regression models (Equation 1, Equation 2, Equation 3).

The independent variables in this study are the female leader in various chief positions. We use a dummy variable, code 1, to represent the female in a managerial role and 0 otherwise. We use nine different chief positions as Chief Finance Officer (CFO), Chief Executive Officer (CEO), Chief Accounting Officer (CACO), Chief Compliance Officer (CCOO), Chief Administration Officer (CADO), Chief Investment Officer (CIVO), Chief Technology Officer (CTO), and Chief Marketing Officer (CMO). Another independent variable is the proportion of females on the board of commissioners (BOC).

The control variables are Debt Equity Ratio (DER), Return on Equity (ROE), the firms' loss (LOSS), and external auditor (AUD). DER is a ratio of total debt to the equity that negatively affects real earnings management (Arun et al., 2015; Setiawan et al., 2020). ROE is the determinant for firm profitability, calculated by return divided by equity. Firms with a higher profitability performance are more likely to manage earnings downwards (Watts & Zimmerman, 1990), so we predict the negative effect on real earnings management. LOSS represents the poor financial condition of the firm (Arun et al., 2015; Luo et al., 2017). A poor financial condition may encourage

managers to increase their income (Jaggi & Lee, 2002). Thus, LOSS will be code 1 to represent the negative net income, and 0 otherwise. We predict the negative effect of LOSS on real earnings management. AUD refers to the Big 4, representing the best independent auditor firms. Big 4 is more able to constrain earnings management than non-Big four because they are more concerned about reputation issues (Arioglu, 2020; J. R. Francis & Wang, 2008). Thus, Big 4 as a variable is code 1 for that Big 4 auditors audit a firm, and 0 otherwise. We predict the negative effect of AUD on real earnings management. All defined variables are listed in Table 2.

Table 2.
Variables definitions

| Dependent variables | |
|------------------------------|--|
| REM | Real earnings management. The sum of standardized residuals of operating cash flow model, overproduction model, and discretionary expenses model expressed in Equation 4 |
| Independent variables | |
| CFO | Chief financing officer, dummy code 1 indicates female, and 0 otherwise |
| CEO | Chief executive officer, dummy code 1 indicates female, and 0 otherwise |
| CACO | Chief accounting officer, dummy code 1 indicates female, and 0 otherwise |
| CCOO | Chief compliance officer, dummy code 1 indicates female, and 0 otherwise |
| CADO | Chief administration officer, dummy code 1 indicates female, and 0 otherwise. |
| COO | Chief operating officer, dummy code 1 indicates female, and 0 otherwise |
| CIVO | Chief investment officer, dummy code 1 indicates female, and 0 otherwise |
| CTO | Chief technology officer, dummy code 1 indicates female, and 0 otherwise |
| CMO | Chief marketing officer, dummy code 1 indicates female, and 0 otherwise |
| BOC | Board of the commissioner, the proportion of female commissioners per total member |
| Control variables | |
| DER | The ratio of total debt to equity |
| ROE | The ratio of return to equity |
| LOSS | Firm loss, dummy code 1 for the firms with negative income, and 0 otherwise. |
| AUD | Big 4 auditors, dummy code 1 indicates big 4 auditors, and 0 otherwise. |

Hypotheses were tested by the Panel data regression model, using STATA. We check the variance inflation factor (VIF) and multicollinearity problem to ensure our research model is free from bias (Gujarati & Porter, 2009). The first hypotheses (H1a and H1b) will test using the formula in Equation 5, and the second hypothesis (H2) will test using Equation 6.

$$REM_{i,t} = \beta_0 + \beta_1 CFO_{i,t} + \beta_2 CEO_{i,t} + \beta_3 CACO_{i,t} + \beta_4 CCOO_{i,t} + \beta_5 CADO_{i,t} + \beta_6 COO_{i,t} + \beta_7 CIVO_{i,t} + \beta_8 CTO_{i,t} + \beta_9 CMO_{i,t} + \beta_{10} DER_{i,t} + \beta_{11} ROE_{i,t} + \beta_{12} LOSS_{i,t} + \beta_{13} AUD_{i,t} + \varepsilon_{i,t} \quad \text{Eq.5}$$

$$REM_{i,t} = \gamma_0 + \gamma_1 CFO_{i,t} + \gamma_2 CEO_{i,t} + \gamma_3 CACO_{i,t} + \gamma_4 CCOO_{i,t} + \gamma_5 CADO_{i,t} + \gamma_6 COO_{i,t} + \gamma_7 CIVO_{i,t} + \gamma_8 CTO_{i,t} + \gamma_9 CMO_{i,t} + \gamma_{10} BOC_{i,t} + \gamma_{11} DER_{i,t} + \gamma_{12} ROE_{i,t} + \gamma_{13} LOSS_{i,t} + \gamma_{14} AUD_{i,t} + \varepsilon_{i,t} \quad \text{Eq.6}$$

We add additional analysis to test the group invariant and time-invariant. The group invariant is used to check any differences between Industrial Classification (IDX-IC), with the formula in Equation 7. In contrast, time-invariant is used to check any differences in the year, with the formula in Equation 8.

$$REM_{i,t} = \delta_0 + \delta_1 CFO_{i,t} + \delta_2 CEO_{i,t} + \delta_3 CACO_{i,t} + \delta_4 CCOO_{i,t} + \delta_5 CADO_{i,t} + \delta_6 COO_{i,t} + \delta_7 CIVO_{i,t} + \delta_8 CTO_{i,t} + \delta_9 CMO_{i,t} + \delta_{10} BOC_{i,t} + \delta_{11} DER_{i,t} + \delta_{12} ROE_{i,t} + \delta_{13} LOSS_{i,t} + \delta_{14} AUD_{i,t} + \delta_{15} DummyIC + \varepsilon_{i,t} \quad \text{Eq.7}$$

$$REM_{i,t} = \theta_0 + \theta_1 CFO_{i,t} + \theta_2 CEO_{i,t} + \theta_3 CACO_{i,t} + \theta_4 CCOO_{i,t} + \theta_5 CADO_{i,t} + \theta_6 COO_{i,t} + \theta_7 CIVO_{i,t} + \theta_8 CTO_{i,t} + \theta_9 CMO_{i,t} + \theta_{10} BOC_{i,t} + \theta_{11} DER_{i,t} + \theta_{12} ROE_{i,t} + \theta_{13} LOSS_{i,t} + \theta_{14} AUD_{i,t} + \theta_{15} DummyIC + \theta_{16} DummyYear + \varepsilon_{i,t} \quad \text{Eq.8}$$

4. Results and Discussion

4.1. Descriptive statistics

As shown in Table 3, the overall observations consist of 3420 firm-year. The mean value of REM is negative, at 0.0244. The result suggests that firms in Indonesia, on

average, prefer to manipulate their earnings from sales, discretionary expenses, and overproduction in a conservative approach (Ghazali et al., 2015). The mean score of managerial positions is between 0.53% to 18.95%. These mean scores reflected the proportion of females in various managerial positions. The average ratio of the females as the board of commissioners (BOC) is 11.55%, which indicates the percentage of female participation on boards. These findings on the percentage of female finance managers and the percentage of the female board of directors in the last decade are lower than previous research in the same country (Setiawan et al., 2020)

Table 3.
Descriptive statistics

| Variable | Obs. | Mean | Std. Dev. | Min | Max |
|----------|-------|---------|-----------|---------|--------|
| REM | 3,420 | -0.0244 | 0.2768 | -1.6683 | 1.9984 |
| CFO | 3,420 | 0.1895 | 0.3919 | 0 | 1 |
| CEO | 3,420 | 0.0632 | 0.2433 | 0 | 1 |
| COO | 3,420 | 0.0289 | 0.1677 | 0 | 1 |
| CIVO | 3,420 | 0.0053 | 0.0724 | 0 | 1 |
| CACO | 3,420 | 0.1053 | 0.3069 | 0 | 1 |
| CTO | 3,420 | 0.0132 | 0.1140 | 0 | 1 |
| CADO | 3,420 | 0.0211 | 0.1436 | 0 | 1 |
| CCOO | 3,420 | 0.0421 | 0.2009 | 0 | 1 |
| CMO | 3,420 | 0.0526 | 0.2233 | 0 | 1 |
| BOC | 3,420 | 0.1155 | 0.1747 | 0 | 0.8000 |
| DER | 3,420 | 0.3304 | 0.4743 | 0 | 1.9970 |
| ROE | 3,420 | 0.0013 | 0.6686 | -1.9975 | 1.9990 |
| LOSS | 3,420 | 0.1754 | 0.3804 | 0 | 1 |
| AUD | 3,420 | 0.0357 | 0.1855 | 0 | 1 |

4.2. Correlation matrix, VIF, and regression

The correlation coefficients of all variables of this research are displayed in Table 4. A score greater than 0.8 of the coefficients is suspected of multicollinearity problems (Gujarati & Porter, 2009). Table 4 shows that the highest correlation coefficient of

0.396 exists in the relationship between REM and ROE. Therefore, there is no multicollinearity between independent variables.

Table 4.
Correlation Matrix

| | REM | CFO | CEO | COO | CIVO | CACO | CTO | CADO | CCOO | CMO | BOC | DER | ROE | LOSS | AUD |
|------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----|
| REM | 1 | | | | | | | | | | | | | | |
| CFO | -0.0437 | 1 | | | | | | | | | | | | | |
| CEO | -0.0351 | -0.0151 | 1 | | | | | | | | | | | | |
| COO | 0.0268 | 0.0367 | 0.0197 | 1 | | | | | | | | | | | |
| CIVO | -0.0015 | 0.1504 | -0.0189 | -0.0126 | 1 | | | | | | | | | | |
| CACO | -0.0573 | 0.2937 | 0.0167 | 0.0942 | -0.0249 | 1 | | | | | | | | | |
| CTO | 0.0315 | 0.1210 | 0.0650 | -0.0199 | -0.0084 | 0.0356 | 1 | | | | | | | | |
| CADO | -0.0384 | 0.1162 | 0.0373 | -0.0253 | -0.0107 | 0.0692 | 0.1439 | 1 | | | | | | | |
| CCOO | -0.0157 | -0.0345 | -0.0006 | 0.0420 | -0.0153 | 0.0562 | 0.0908 | 0.0605 | 1 | | | | | | |
| CMO | 0.0655 | 0.0063 | -0.0127 | 0.0999 | -0.0171 | 0.0728 | 0.0762 | 0.1296 | 0.0679 | 1 | | | | | |
| BOC | -0.0400 | 0.2658 | 0.2542 | 0.1056 | 0.0387 | 0.1130 | -0.0055 | 0.1547 | 0.0316 | 0.1758 | 1 | | | | |
| DER | -0.0622 | 0.0567 | -0.0050 | 0.0214 | -0.0161 | 0.0018 | 0.0499 | 0.0993 | 0.0002 | 0.0042 | 0.0016 | 1 | | | |
| ROE | -0.3960 | 0.0173 | -0.0046 | -0.0674 | -0.0053 | -0.0118 | -0.0102 | 0.0387 | -0.0393 | -0.0651 | 0.0222 | -0.0741 | 1 | | |
| LOSS | -0.1309 | -0.0210 | 0.0351 | -0.0430 | -0.0336 | 0.0171 | -0.0533 | -0.0087 | 0.0373 | -0.0468 | -0.0573 | -0.0166 | 0.1062 | 1 | |
| AUD | -0.0206 | 0.1363 | -0.0046 | 0.0326 | 0.1821 | 0.1138 | -0.0222 | -0.0282 | 0.1324 | 0.0535 | 0.1119 | 0.0604 | -0.1296 | -0.0721 | 1 |

Table 5.
Variance Inflation Factor

| Variable | VIF | 1/VIF |
|----------|------|--------|
| BOC | 1.62 | 0.6192 |
| CFO | 1.51 | 0.6613 |
| CACO | 1.25 | 0.8020 |
| DER | 1.22 | 0.8181 |
| CEO | 1.16 | 0.8595 |
| AUD | 1.16 | 0.8648 |
| CMO | 1.13 | 0.8856 |
| LOSS | 1.12 | 0.8959 |
| CADO | 1.10 | 0.9059 |
| CCOO | 1.08 | 0.9239 |
| CTO | 1.08 | 0.9271 |
| CIVO | 1.07 | 0.9359 |
| COO | 1.06 | 0.9400 |
| ROE | 1.04 | 0.9572 |

Also, the autocorrelation problem was detected with a VIF score of more than 10 (Gujarati & Porter, 2009). In table 5, our highest VIF is 1.62 on BOC. So, there is no problem with autocorrelation. Passing the multicollinearity and autocorrelation test means our data is free from bias.

The panel data regression for our hypotheses, Equation 5 and Equation 6, firstly check with the Hausman test to confirm the best model using fixed-effect or random effect (Gujarati & Porter, 2009). The result of the Hausman test, shown in Table 6, confirms that the fixed effect is the best model for our formula.

Table 6.
Hausman test

| | Model 1 (Eq. 5) | Model 2 (Eq.6) |
|------------|------------------------|-----------------------|
| Chi-square | 132.19 | 126.96 |
| Prob. | 0.0000 | 0.0000 |

According to Equation 5 to Equation 8, the panel data regression runs four-time, including additional data analysis. The regression result is shown in Table 7, with Column 1 representing Equation 5, Column 2 representing Equation 6, Column 3 representing Equation 7, and Column 4 Representing Equation 8. For Columns 1 and 2, we use fixed effect as the consequences in the Hausman test in Table 6. Moreover, for Columns 3 and 4, we use mixed effect since the group invariant only detected using random effect, so the Hausman process could not perform in this part (Gujarati & Porter, 2009).

Table 7.
Regression result

| | Predicted sign | 1 | 2 | 3 | 4 |
|------|-----------------------|-------------|-------------|-------------|-------------|
| Cons | | 0.0114 ** | 0.0132 *** | 0.0065 | -0.0086 |
| CFO | (-) | -0.0116 | -0.0090 | -0.0090 | -0.0090 |
| CEO | (-) | -0.0629 *** | -0.0586 *** | -0.0586 *** | -0.0584 *** |
| CACO | (-) | -0.0250 ** | -0.0248 ** | -0.0248 ** | -0.0248 ** |
| CCOO | (-) | -0.0249 | -0.0244 | -0.0244 | -0.0243 |
| CADO | (-) | -0.0503 ** | -0.0474 ** | -0.0474 * | -0.0473 * |
| COO | (+) | 0.0253 | 0.0272 | 0.0272 | 0.0270 |

[continued]

| | Predicted sign | 1 | 2 | 3 | 4 |
|--------------|----------------|-------------|-------------|-------------|-------------|
| CIVO | (+) | 0.0281 | 0.0277 | 0.0277 | 0.0275 |
| CTO | (+) | 0.1032 *** | 0.1004 *** | 0.1004 *** | 0.1000 *** |
| CMO | (+) | 0.0310 ** | 0.0339 ** | 0.0339 ** | 0.0338 ** |
| BOC | (-) | | -0.0234 | -0.0234 | -0.0236 |
| DER | (-) | -0.0481 *** | -0.0482 *** | -0.0482 *** | -0.0484 *** |
| ROE | (-) | -0.1548 *** | -0.1545 *** | -0.1545 *** | -0.1546 *** |
| LOSS | (-) | -0.0551 *** | -0.0556 *** | -0.0556 *** | -0.0574 *** |
| AUD | (-) | -0.0838 *** | -0.0827 *** | -0.0827 *** | -0.0828 *** |
| IC: | | | | | |
| IC (2) | | | | -0.0681 *** | -0.0681 *** |
| IC (3) | | | | -0.0061 | -0.0064 |
| IC (4) | | | | 0.0610 *** | 0.0608 *** |
| IC (5) | | | | 0.0336 * | 0.0333 ** |
| IC (6) | | | | 0.3366 *** | 0.3360 *** |
| IC (7) | | | | -0.0057 | -0.0061 |
| IC (8) | | | | -0.0334 * | -0.0336 ** |
| IC (9) | | | | -0.0620 ** | -0.0622 *** |
| IC (10) | | | | -0.0175 | -0.0177 |
| IC (11) | | | | 0.0632 *** | 0.0630 *** |
| IC (12) | | | | -0.0054 | -0.0060 |
| Year: | | | | | |
| 2013 | | | | | 0.0128 |
| 2014 | | | | | 0.0060 |
| 2015 | | | | | 0.0312 ** |
| 2016 | | | | | 0.0222 |
| 2017 | | | | | 0.0219 |
| 2018 | | | | | -0.0016 |
| 2019 | | | | | 0.0291 * |
| 2020 | | | | | 0.0203 |
| Obs. | | 3420 | 3420 | 3420 | 3420 |
| R-square | | 0.1846 | 0.1848 | 0.2270 | 0.2287 |
| F | | 53.07 | 49.33 | 996.87 | 1004.15 |
| Prob. | | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

[continued]

Note: IC (1) is energy, IC (2) is basic materials, IC (3) is industrials, IC (4) is consumer non-cyclical, IC (5) is consumer cyclical, IC (6) is healthcare, IC (7) is financials, IC (8) is properties & real estate, IC (9) is technology, IC (10) is infrastructures, IC (11) is transportation & logistic, and IC (12) is listed investment product

*** is significant at 1%; ** is significant at 5%; and * is significant at 10%

4.3. The effect of the female executive board on real earnings management.

The regression result is in Table 7, Column 1, presenting the result of panel data regression for our first hypothesis. This finding is consistent with previous research (Adams & Ferreira, 2007; Hillman et al., 2007; Setiawan et al., 2020; Srinidhi et al., 2011). These results imply that firms with female leaders affected real earning management. In particular, we find that female Chief Executive Officer (CEO), Chief Accounting Officer (CAO), and Chief Administration Officer (CAO) have a negative effect on real earnings management. H1a is supported. Another finding is that female Chief Technology Officer (CTO) and Chief Marketing Officer (CMO) positively affect real earnings management. H1b is supported.

This finding shows that female leader roles in executive, accounting, and administration tend to downwards their earnings. In contrast, female roles in technology and marketing tend to upward their earnings. Since female leaders are conservative, cautious in spending, and less aggressive, they also act with their responsibility as the firm's leader. For example, chief technology and marketing tend to increase their earnings because they are responsible for research and development expenses also publicity expenses (Gavious et al., 2012; Gul et al., 2009; Hillman et al., 2007; Setiawan et al., 2020).

4.4. The effect of the female supervisory board on real earnings management

The regression result is in Table 7, Column 1, presenting the result of panel data regression for our second hypothesis. Unfortunately, our prediction is not supported. The responsibility of females in firms monitoring is not significant because of the small proportion. Female BOC did not directly affect the financial report process, so they

could not significantly affect real earnings management. This fails similar to previous research (Hili & Affes, 2012; Joecks et al., 2013; Kuo et al., 2014; Peni & Vähämaa, 2010).

4.5. Additional analysis

This additional analysis was used to test the effect of Industrial classification and year effect on real earnings management. The regression result in Table 7, Column 3, and 4 show the variation of the result. We found that industrials have a different effect on real earnings management. In column 3, we can find that basic material, properties, real estate, and technology negatively affect real earnings management. These industries are focused on future expenses, so they react to downward their earnings. On the other hand, consumer cyclical, consumer non-cyclical, healthcare, transportation, and logistics tend to upward their earnings. In a year's effect, we found a significant effect on real earnings management in 2015, when Indonesia entrance ASEAN Economic Community, and in 2018, post the global crisis issue.

4.6. A policy recommendation

A policy recommendation arises from the results of this study. Female employment opportunities in leadership positions in Indonesia public listed companies should be further increased to ensure gender balance. This leadership transition is called workplace marginalization (Luo et al., 2017). In a decade, females play an increasingly important role in all fields of society and even the proportion of their participation in a leadership position in firms, such as managers and board of directors. A policy of increasing the proportion of female participation as managers and board of directors in firms may help limit real earnings management effectively and improve the quality of financial reporting. This is a benefit to firms' long-term development and also the interests of outsider investors. Furthermore, additional opportunities as manager and board of director roles for a female could help mitigate prejudice against females and increase their employment opportunities to use their talents effectively in the workplace.

5. Conclusion, Implication, and Limitation

5.1. Conclusion

In this study, we explore the effect of female leaders on real earnings management. The result confirms that female executive, accounting, and administration leaders tend to downwards real earnings management. In contrast, the female role in technology and marketing tends to upward real earnings management. Moreover, we find the different effects in industrial and year. This study also concluded the different actions between female chief as CEO, CACO, CADO with the female chief as CTO and CMO in real earnings management practices.

5.2. Implication and Limitation

We have a limitation in this study. The sample firm in this study comes from an emerging country, Indonesia. In addition, the corporate governance in the emerging country is relatively weak. Moreover, female participation as managers and boards in firms is limited. Firms have a low proportion of females as leaders in Indonesia. Thus, the actual impacts of female leaders in firms on earnings management may be limited in the research. For further studies, the researcher may use the firms in developing countries with better corporate governance functions.

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