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The role of research & development as mediating the effect of male CEO masculinity face on earnings management: evidence from Indonesia

Indra Prasetyo^{1*}, Nabilah Aliyyah¹, Esa Wahyu Endarti¹, Rusdiyanto Rusdiyanto² and Aulia Rahmawati³

Abstract: This study aims to prove the consistency of Agency Theory, Behavioral Consistency Theory and Upper Echelon Theory as a solution to explain the role of research & development in mediating the influence of male CEO masculinity on earnings management. This study uses a quantitative approach with a population and research sample using companies on the Indonesia Stock Exchange in 2016–2021. The study collected images of faces identified as male CEOs from data from the Indonesia Stock Exchange website and company websites and using a Google search. The data analysis method in this study uses Structural Equation Modeling (SEM) with Stata Software which connects theories, concepts and data that can be carried out on research variables. The findings explain that the decrease and increase in research and development practices have an impact on increasing and decreasing the value of CEO masculinity men also have an impact on the increase and decrease in the value of research & development companies. The empirical findings have implications for the consistency of Agency Theory, Behavioral Consistency Theory and Upper Echelon Theory. While the findings have practical implications, the findings as policy makers are related to the face of male CEO masculinity as a determinant of earnings management practices and research & development costs.

Subjects: Sociology & Social Policy; Psychological Science; Introductory Psychology; Educational Psychology; Development Studies; Gender & Development; Economics and Development; Economics; History of Economic Thought; Finance



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JEL Classification: G32; G02; M1; G34; Z1

1. Introduction

The role of the male CEO in the company is very important to determine the success of the company he leads. Male CEOs have an important role for the company's success from the performance of its leaders. The CEO in carrying out his leadership in making policies used for the company, the CEO is the manager of the company

Agency theory explains the contractual relationship between shareholders and the CEO as an agent (Jensen & Meckling, 1976). Shareholders have a male CEO as an agent to perform tasks in the interests of shareholders, including the delegation of decision-making authority from shareholders to a male CEO as an agent (Mahiswari & Nugroho, 2014). Companies on the Indonesia Stock Exchange whose capital consists of shares, shareholders act as principals while male CEOs act as agents. Whereas the theory of behavioral consistency (Epstein, 1979b) Men have a more aggressive nature than women, the aggressive nature of men can affect earnings management and leverage

The originality of this study can be seen as a difference with previous research (Jia et al., 2014) explaining that the face of masculinity of male CEOs has a positive effect on earnings management. However, only examining the role of male CEO masculinity faces in terms of research & development and leverage, there is no research that explains the role of research & development to mediating the effect of male CEO masculinity faces on earnings management, because higher earnings management has an impact on increasing research & development practices by male CEOs. Whereas in agency theory (Jensen & Meckling, 1976) explains that the role of research & development mediating the influence of male CEO characteristics on earnings management. Meanwhile, the use of earnings management variables, based on opinions (Scott, 2015) explains that earnings management is a practice in the preparation of financial statements that do not violate generally accepted accounting principles, so as to increase or degrade accounting profits as desired by the characteristics of a male CEO as an agent. The characteristics of a male CEO as a company manager know more about the company's data and the company's future prospects than shareholders. Research & development can be seen in the opportunistic attitude characteristic of male CEOs as agents with agency theory (Jensen & Meckling, 1976). So to provide empirical evidence the role of research & development mediating the influence of the masculinity of male CEOs affecting earnings. Empirical findings can complement the literature to provide empirical evidence that the influence of the research & development role mediating the masculinity of male CEOs on earnings has never been done empirically before, thus providing evidence in the field. Previous research (Jia et al., 2014) explained that the face of male CEO masculinity had an effect on earnings management.

The face of masculinity is a concept of masculine behavior that exists in men with implications for aggressiveness, having a hard character tends to be emotional to perform actions (Jewitt, 1997). The face of male CEO masculinity correlates with testosterone, aggressiveness and social status affects earnings management (Jia et al., 2014). The face of masculinity has factors that can affect the performance of a male CEO in managing a company (Tanjaya & Santoso, 2020). The character of a male CEO with a masculine face affects good company management, the face of masculinity is a personal aspect, the masculinity of a person is carried from birth (Kamiya et al., 2018), in the neuroendocrinology literature the face of masculinity in men predicts masculine behavior habits related to aggressive behavior. The masculinity face of a tall male CEO can be predicted to be more aggressive in managing the company (Tanjaya & Santoso, 2020).

The characteristics of male CEOs influence the company's decision-making process (Bertrand & Schoar, 2003). The masculinity face of male CEOs has a confident nature and often practices

earnings management. The overconfidence nature of male CEOs' characterization often does earnings management (Graham et al., 2013; Kamiya et al., 2018; Malmendier & Tate, 2005), Acquisition (Doukas & Petmezas, 2007; Kamiya et al., 2018; Kim, 2013), innovation (Hirshleifer et al., 2012; Kamiya et al., 2018). The characteristics of male CEOs affect earnings management (Gomulya et al., 2017; Kamiya et al., 2018; Wong et al., 2011; Yiping Jia et al., 2014). Research in the field of neuroendocrinology explains that a man's face affects a person's aggressive behavior (Carré & McCormick, 2008; Christiansen & Winkler, 1992). Characteristics of male CEOs influence a person's aggressive behavior (Campbell et al., 2011) Characteristics of male CEOs tend to negotiate for personal gain (Wong et al., 2011). Thus (Stirrat & Perrett, 2010) explains that men who have a high masculinity face are considered trustworthy. Characteristics of male CEOs who have a higher masculinity face have better performance compared to the characteristics of male CEOs who have a lower masculinity face (Kamiya et al., 2018, 2018; Wong et al., 2011).

Research provides clear and focused boundaries. This study is an important issue of the role of research & development mediating the masculinity face of male CEOs as the root of the problem with earnings management This research limits companies on Indonesia's Stock Exchange in the 2016–2021 period. This study limits to analyze the facial variables of male CEO masculinity, leverage and research & development as mediating variables. Male CEO masculinity face variables are measured using ImageJ software.

2. Literature review and hypothesis development

2.1. Agency theory

Agency theory is a consequence of the separation of control over agents represented by male CEOs who have direct access to company information data compared to shareholders. Relationship between agents represented by male CEOs and shareholders to delegate authority as company managers (Jensen and Meckling (1976). The agent represented by the male CEO with the shareholders must be the same to increase the company through share ownership. However, it is possible that the agent represented by the male CEO has different thoughts from the shareholders (MAYANGSARI, 2001) so it is hoped that the role of agency theory provides an important solution in decision making for agents represented by male CEOs in carrying out the practice of research & development and leverage.

Agency costs in three types: monitoring, bonding, and residual costs (Jensen & Meckling, 1976). According to agency theory, humans are naturally selfish, restricted in their ability to anticipate the future, and always avoid taking risks (Eisenhardt, 1989a). From the assumption of human nature, it can be seen that the role of male CEO characteristics affects policymaking and the implementation of earnings management, leverage and research & development cost policies.

2.2. Behavioral consistency theory

The face of male CEO masculinity correlates with testosterone, aggressiveness and social status affects the practice of investment research & development and earnings management seen from the theory of behavioral consistency's point of view (Epstein (1979b), behavioural consistency can be shown as behavior as a prelude to predicting most people in a given time. The theory of behavioural consistency assumes the opinion of a person who can influence events that give rise to emotions, behavioral consistency theory explains that male CEO masculinity is correlated with testosterone, aggressiveness and social status affect earnings management and investment research & development (Epstein, 1979b).

2.3. Upper echelon theory

Upper Echelon theory developed (Hambrick & Mason, 1984) explain the assumptions that will occur in a company by studying the characteristics of the company's top management team. Hambrick and Mason (1984) describes the distinguishing characteristics that are influenced by the characteristics of male CEOs on psychological aspects in terms of cognitive in managing the company. The decision-making process was initially divided into two models, namely rational

and improvement (Fredrickson, 1984; Fredrickson & Mitchell, 1984; Miller & Friesen, 1983). The rational model focuses on prudence, completeness of information, good planning and analysis, with various alternatives and choosing the best alternative (Camillus, 1981; Quinn et al., 1988). On the other hand, the Incremental model relies more on intuition, speed, spontaneity and not in a formal environment because it realizes that there are limitations in terms of rationale or budget. (Ismail & Zhao, 2017). In the rational model approach, the role of a leader (Selznick, 1996) environmental factor (Andrews et al., 1971) and strategic decision models developed (Quinn et al., 1988) impact on the quality of the company's decision-making. In the incremental model approach, the strategic formulation of the decisions taken is a dynamic that will work (Mintzberg, 1978). This rational model process is then used as a starting point to develop a more comprehensive and complete model to conduct a more complete and thorough study (Fredrickson, 1984). A comprehensive approach is considered to provide sharpness in seeing opportunities and provides stability when execution is carried out with caution, thereby reducing the risk of failure (Eisenhardt, 1989b; Quinn et al., 1988). The holistic approach has its drawbacks when dealing with a dynamic environment, because a dynamic business environment requires speed of decision making (Eisenhardt & Bourgeois, 1988)

2.4. Face, testosterone and behavior

Previous studies provide empirical evidence on the relationship of male facial size with testosterone and masculine behavior. The face of the male CEO is the basis for the association of male facial size in this study. Male face size can predict masculine behavior (Y Jia et al., 2014). Based laboratory evidence (Carré & McCormick, 2008; Christiansen & Winkler, 1992) explains that men's faces predict having an aggressive nature. The practice of research & development with the face of a male CEO has a relationship with masculine behaviour (Jia et al., 2014). Men's faces positively affect masculine behavior, while testosterone tends to practice research & development (Eisenegger et al., 2010; Jia et al., 2014). The relationship between testosterone and the behaviour of male CEOs affects the brain both before birth and during the growth period (Jia et al., 2014). A group of nerve cells plays a role in-memory processing and emotional reactions as mediators between testosterone in brain regions to evaluate social interactions (Bos et al., 2012; Jia et al., 2014).

Testosterone regulates growth acceleration in adolescents (Johnston et al., 2001). Testosterone affects adolescent growth (Jia et al., 2014; Verdonck et al., 1999). Previous studies provided evidence empirically that male and female development differs in the bizygomatic (between the left cheekbone to the right cheekbone), but for the height of the upper face, there is no difference in the growth period (Jia et al., 2014). The findings empirically prove that testosterone affects male facial development (Folstad & Karter, 1992). A man's face affects masculine behaviour during infancy (Alrajih & Ward, 2014; Jia et al., 2014). There is a relationship between testosterone and the ratio of the width of the male face (Lefevre et al., 2013). Several studies have proven the existence of a positive relationship between the percentage of male face width to testosterone. Previous research explained that testosterone has a positive relationship with facial development (Lefevre et al., 2013). Higher or lower testosterone in men affects the masculine face (Y Jia et al., 2014; Pound et al., 2009).

2.5. The face of male CEO masculinity and earnings management

The face of male CEO masculinity correlates with testosterone, aggressiveness and social status affects the practice of Earnings Management and investment research & development seen from the theory of behavioral consistency's point of view (Epstein, 1979b), Previous research explained that the masculinity of male CEOs has a positive impact on earnings management practices, meaning that the higher the masculinity of male CEOs has an impact on improving earnings management, these findings are supported by Behavioral Consistency Theory (Jia et al., 2014). Development of research that links accounting practices with the characteristics of top management (Bolton & Bruunermeier, 2008; Fee et al., 2013; Jia et al., 2014). The development of research

in accounting, finance, and economics extends to the characteristics of male CEOs in the company's policy-making process (Bolton & Bruunermeier, 2008; Fee et al., 2013; Jia et al., 2014).

The characteristic role of male CEOs affects the process of presenting the company's financial statements (Bertrand & Schoar, 2003). The characteristic function of male CEOs positively affects Earnings Management practices (Bamber et al., 2010; Brochet et al., 2011; Dyreng et al., 2010; Feng et al., 2011; Ge et al., 2011; Jia et al., 2014). The characteristics of male CEOs affect the resulting incentive results (Chava & Purnanandam, 2010; Jia et al., 2014). The characteristics of a certain male CEO who is overly confident in his ability to implement Earnings Management techniques (Dikolli et al., 2012; Jia et al., 2014). The face of masculinity of male CEOs positively affects Earnings Management practices (Yuping Jia et al. (2014).

2.6. Research conceptual framework

The mediating factors in this study are explained in terms of the conceptual framework by the interaction between independent and dependent variables. Research places the face of male CEO masculinity as an independent variables, earnings management as a dependent variables and research & development as a mediator variable. Based on the explanation above, the conceptual framework of the study (figure1) can be described as follows:

2.7. Research hypothesis

2.7.1. Research & development mediating the influence of a male CEO's masculinity face on earnings management

An agency relationship is a contract that occurs between the characteristics of a male CEO as an agent and shareholders (Jensen & Meckling, 1976). Earnings management practices are influenced by conflicts of interest between shareholders and the characteristics of male CEOs as agents, where they put each other's interests first in order to maximize their utility. With this strategy, the characteristics of a male CEO as an agent can reduce the possibility of getting pressure due to the dissatisfaction of shareholders who have an interest in carrying out earnings management (Hillman et al., 2001).

Research & Development practices have a positive effect on earnings management. In particular, companies engaged in research & development practices seem to have relatively higher earnings management, the impact of the country's economic conditions with changes in the

Figure 1. Research conceptual framework.

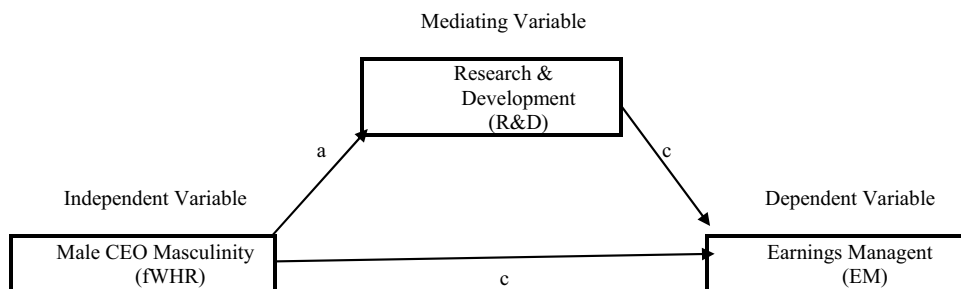


Figure 2. Relationship between Independent, Mediating and Dependent Variables (Baron & Kenny, 1986; Zhao et al., 2010).

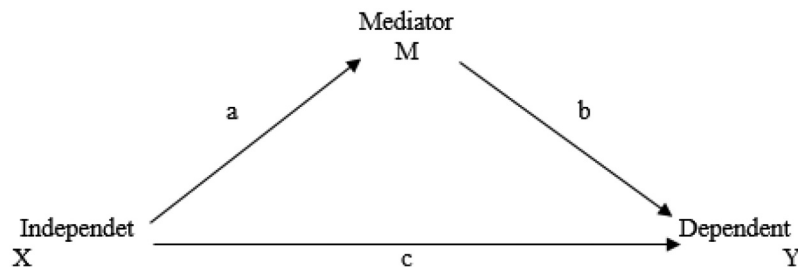
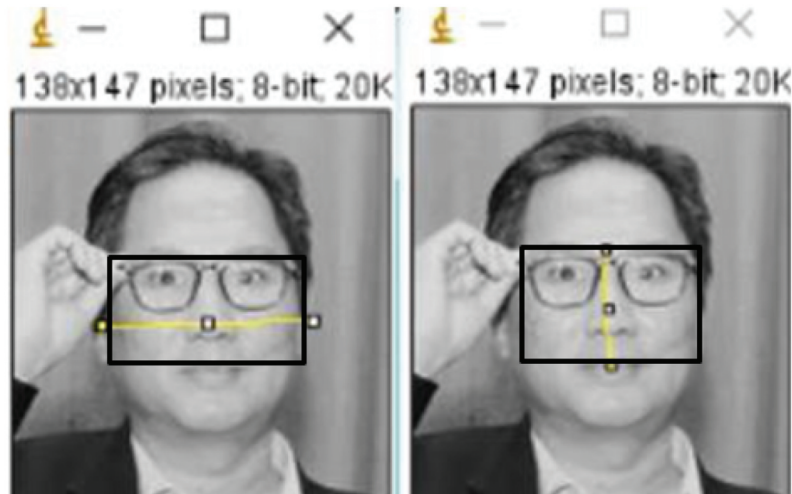


Figure 3. Male CEO Masculinity Face Measurement (fWHR).



nature of the cross-border institutional environment also affects earnings management (Dang et al., 2018). Research that explains the relationship between the face of male CEO masculinity and the tendency to practice earnings management (Jia et al., 2014). The masculinity face of male CEOs has a tendency to engage in earnings management practices. Masculine behavior positively affects earnings management practices (Jia et al., 2014) egocentric behavior (Wright et al., 2012). Characteristics of male CEOs have a tendency to practice earnings management (Baker, 2000; Garen, 1994). Incentives affect earnings management practices (Jia et al., 2014; Dechow et al., 2011; Wong et al., 2011). The characteristic role of male CEOs with masculine faces positively affects earnings management practices (Jia et al., 2014). The face of male CEO masculinity correlates with testosterone, aggressiveness, self-confidence positively affects profit and earnings management practices, viewed from the behavioral consistency theory's perspective (Epstein, 1979b).

Based on the description above, research & development is a very safe manipulation, because earnings management activities are legitimate and do not violate generally accepted accounting principles (Scott, 2015). Research & Development practices are expected to mediate the influence of male CEOs' masculinity faces on earnings management. The hypothesis proposed is as follows:

H₁: Research & Development Mediating the Positive Influence of a Male CEO's Masculinity Face on Earnings Management

2.8. Data analysis techniques

Data analysis is a step that follows the selection and collection of study data (Sudaryanto et al., 2022; Utari, Iswoyo et al., 2021). Data analysis in the study using Stata Software on research for several reasons:

- (1) The study aims to confirm existing theories and concepts using data. Stata software was used for this study because it can Structural Equation Modelling (SEM).
- (2) The research model is relatively complex, because there is a proxy for research & development to act as a mediating variable to see how the role of research & development mediating the influence of the male CEO's masculinity face on earnings management.
- (3) The model that is built there is a tiered causality relationship, which has a distinctive feature, so it is expected that the mediator variable to see how the independent and dependent variables are linked.

Variable mediator is an intermediate variable that acts as a mediator between dependent and independent variables. Testing mediating to prove the role of research & development as a mediating variable serves to mediate the relationship between the facial variables of male CEO masculinity on earnings management.

Criteria for determining the influence of mediating in a relationship (Baron & Kenny, 1986; Zhao et al., 2010) explains as follows:

- a. The independent variables should have a significant impact on the mediator variables.
- b. The mediator variable should have a significant impact on the dependent variables
- c. The independent variables should have a significant impact on the dependent variables.

The following figure 2 is a picture that is the process of determining the type of mediating variable (Baron & Kenny, 1986; Zhao et al., 2010):

Zhao et al. (2010) conduct research by developing the types of mediating research that have been carried out previously by (Baron & Kenny, 1986) by identifying three patterns consistent with the mediator and two consistent patterns without a mediator as follows:

- a. Complementary mediator: the influence of the mediator (axb) and the direct influence (c) they are both genuine and orient themselves in the same broad direction.
- b. Competitive mediator: the influence of the mediator (axb) and the direct influence (c) both exist and point in opposite directions.
- c. Indirect-only mediator: there is an influence of the mediator (axb), however there is no direct impact
- d. Direct-only nonmediation: there is a direct influence (c), but there is no indirect influence.

No-effect nonmediation: no influence either directly or indirectly.

3. Research methods

3.1. Research methodologies and approaches

This study uses a quantitative approach, to provide meaning by interpreting statistical figures (Aliyyah, Siswomihardjo et al., 2021; Prasetyo et al., 2021). This study aims to provide empirical evidence of the role of research & development in mediating the effect of male CEO masculinity on earnings management (Endarto, Taufiqurrahman et al., 2021; Indrawati et al., 2021) population and research sample using companies on the Indonesia Stock Exchange in 2016–2021. This study collects face images of male CEOs from the Indonesia Stock Exchange website and utilizes Google searches. The data analysis method in this study uses Regression Structural Equation Modeling (SEM), with Stata Software which connects theories, concepts and data that can be carried out on the variables of this study.

3.2. Operational definitions and measurements

The face of masculinity of male CEOs is variable independent (fWHR), variable earnings management as variable dependent (EM), variable research & development as variable mediator (R&D).

3.2.1. Independent variables (fWHR)

Independent variables can affect other variables (Abadi et al., 2021; Aliyyah, Prasetyo et al., 2021). The study used the male CEO's masculinity face variable as an independent variable. The face of masculinity is a concept of masculine behaviour that exists in men with implications for aggressiveness, has a complex character tends to be emotional in carrying out actions (Jewitt, 1997).

Measurement of male CEO masculinity face variables using ImageJ software, research converts images of male CEOs' faces into grayscale images with a height of 8 bits (Kamiya et al., 2018).

The ImageJ software measures the distance between two points on each of the study's male CEOs' faces by dragging the mouse across the image; the vertical line size Represents the distance from the top of the lip to the top of the eyelid. While the horizontal line represents the maximum distance between the left cheekbone to the right cheekbone (Kamiya et al., 2018). Accordingly, the study independently assigned a photo quality score between zero and three following criteria:

- 0: As a result of this poor posture, either one or both ears are obscured, or the photographer captures a picture of the face that causes difficulty in measuring the face's height.
- 1: It appears like only half of the ear is visible since the person is leaning slightly to one side.
- 2: Both ears can be seen on the face, with their roots visible.
- 3: Proper standing or sitting posture is characterised by a straight back and ears that can be seen all the way up to the crown of the head.

The study used quality scores number two and three based on guidelines (Kamiya et al., 2018). The measurement scale of this study using the percentage ratio scale can be seen in the following figure 3:

Information:		
Horizontal line	:	Represents the maximum distance between the left cheekbone to the right cheekbone
Vertical Line	:	Represents the distance from the top of the lip to the top of the eyelid.

3.2.2. Dependent variables earnings management (EM)

Dependent variables are variables whose values cannot be influenced by other variables (Kalbuana, Prasetyo et al., 2021; Kalbuana, Suryati et al., 2021). Variable dependent in the study uses earnings management. Earnings Management is a practice in the process of preparing financial statements, so that it can increase or decrease accounting profits as desired by management. The characteristics of a male CEO as a company manager know more data about the state of the company and the company's future prospects than shareholders (Scott, 2015). Earnings Management on research using model measurement (Kothari et al., 2005) refinement of the model (Jones, 1991) by including return on assets, this model adds return on assets in the calculation of discretionary accruals, so as to be able to measure Earnings Management more accurately. The measurement scale of this study uses a percentage ratio scale. Here's the model equation (Kothari et al., 2005) with the following formula:

(1) Calculating TA (total accrual) i.e. net profit for year t less operating cash flow for year t with the following formula:

$$TAC = NI_{it} - CFO_{it}$$

The following is an estimate of total accrual (TA) using the Ordinary Least Square method:

$$\frac{TAC_{it}}{A_{it-1}} = \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 \left(\frac{\Delta REV_{it}}{A_{it-1}} \right) + \beta_3 \left(\frac{PPE}{A_{it-1}} \right) + \epsilon$$

(2) The NDA (non-discretionary accruals) are calculated using the formula above, which includes the regression coefficient.:

$$NDA_{it} = \beta_1 \left(\frac{1}{A_{it-1}} \right) + \beta_2 \left(- \frac{\Delta REV_{it}}{A_{it-1}} - \frac{\Delta REC_{it}}{A_{it-1}} \right) + \beta_3 \left(\frac{PPE_{it}}{A_{it-1}} \right) + \beta_4 \left(\frac{ROA_{it}}{A_{it-1}} \right) + \epsilon$$

(3) Finally, the formula for determining DA (discretionary accruals) as a metric of Earnings Management is as follows:

$$DA_{it} = \frac{TAC_{it}}{A_{it-1}} - NDA_{it}$$

Information:

NDA _{it}	=	Non Discretionary Accruals of the corporation i in the period of years t
TAC _{it}	=	Total accruals of the corporation i in the time/period t
NI _{it}	=	Net profit of the corporation i in the time/period of years t
CFO _{it}	=	Corporation's operating cash flow in year t
A _{it-1}	=	Total assets of corporation i in the time/period t-1
ΔRev _{it}	=	The revenue of the corporation i in year t is reduced by the revenue company I in year t-1
PPE _{it}	=	Fixed assets of the corporation i in the time/period t
DA _{it}	=	Discretionary accruals of the corporation i in the time/period to t
ΔRecit	=	Accounts receivable of the corporation i in year t minus the income of the corporation i in year t-1
ROA _{it}	=	Return on assets of the corporation i in the time/period d to t
ε	=	Error

3.2.3. Variable mediator (R&D)

Variable mediator is an intermediate variable which functions to mediate the relationship between independent variables and dependent variables (Baron & Kenny, 1986; Kalbuana, Prasetyo et al., 2021; Kalbuana, Suryati et al., 2021; Mehmetoglu, 2018; Zhao et al., 2010). Variable mediating in the study using research & development (Jia et al., 2014). research & development is a practice in the process of preparing financial statements, so that it can increase or decrease accounting profits as desired by management. The characteristics of a male CEO as a company manager know more data about the state of the company and the company's future prospects than shareholders (Scott, 2015).

Research & development are an investment made by the company on a new science basis, to produce more efficient products based on existing resources (Tuna et al., 2015). Research & development are measured using the research & development cost intensity ratio (Arifian & Yuyetta, 2012; Padgett & Galan, 2010) with the following formula:

$$R\&D = \frac{\text{Total Research \& Development Expenditure}}{\text{Sales}}$$

Description:

Research & Development _{i,t}	=	Research & Development i in year t
Total Research & Development Expenditure _{i,t}	=	Total Research & Development Expenditure i in year t
Sales _{i,t}	=	Sales i in year ke t

Table 1. Variable Description		
Information		Description
i	=	Company cross-section data (company name)
t	=	Company time series data (2016–2021)
fWHR	=	The Face of Male CEO Masculinity
EM	=	Earnings Management
R&D	=	Research & development
α	=	Constant
β ₁ , β ₂ , β ₃	=	Variable regression coefficient EM, fWHR
β ₁ , β ₂ , β ₃	=	Variable regression coefficients EM, fWHR, R&D
ε	=	Error

3.2.4. Descriptive statistics

Descriptive statistics are statistics that can describe the picture of the research object through analytical data (Prasetyo, Aliyyah, Rusdiyanto Kalbuana et al., 2021; Utari, Iswoyo et al., 2021), without conducting analysis from data on the face variables of male CEO masculinity, variable earnings management and variable research & development.

3.2.5. Pearson correlation test

Pearson correlation testing is used to see how the independent and dependent variables are linked by assuming Pearson correlations are normally distributed data (Prasetyo, Aliyyah, Rusdiyanto Kalbuana et al., 2021; Rusdiyanto et al., 2021). If there is any correlation between two variables, the results will be either positive (+) or negative (-). Having a positive correlation value indicates that the link is one-way. When the independent variable grows, the dependent variable also grows. This is known as unidirectional growth correlation values that are negative signify a lack of directionality in the relationship. In other words, if the value of the independent variable is great, then the dependent variable decreases between 0 and 1, there is a correlation (Endarto, Taufiqurrahman et al., 2021; Prasetyo, Aliyyah, Rusdiyanto, Kalbuana, Suryati et al., 2021). With Pearson correlation formulations as follows:

$$r_{xy} = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{\{n\sum X^2 - (\sum X)^2\}\{n\sum Y^2 - (\sum Y)^2\}}}$$

Information:		
r	=	Correlation value
X	=	Variable X
Y	=	Variable Y

3.2.6. Research regression model

Regression analysis to find out how close the relationship that occurs between one variable and another. Regression analysis has the function of predicting or predicting the magnitude of the value of an independent variable if the dependent variable is changed (Prasetyo, Aliyyah, Rusdiyanto Kalbuana et al., 2021; Rusdiyanto et al., 2021). A regression analysis of panel data was used to test the role of Research & Development (R&D) mediating the influence of the male CEO's masculinity face (fWHR) on Earnings management (EM). Based on the independent variables and dependent variables that have been described, an equation model is obtained which will be used as follows:

Table 2. Descriptive Statistics

Independent Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
EM	1925	.003	.007	.000	.046	.000	.036	3.132	12.117
Mediating Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
R&D	170	15.234	2.549	6.234	21.802	6.491	21.797	-.190	4.575
Dependent Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
fWHR	1781	2.086	6.287	.110	267	1.340	2.790	42.038	1771.784

Table 3. Pearson Correlation Test

Variables	(1)	(2)	(3)
(1) Earnings Management (EM)	1.000		
(2) Research & Development (R&D)	0.001	1.000	
	(0.985)		
(3) Male CEO Masculinity (fWHR)	0.059	-0.086	1.000
	(0.013)	(0.278)	
(1) Earnings Management (EM)	1.000		
(2) Research & Development (R&D)	0.001	1.000	
(3) Male CEO Masculinity (fWHR)	0.059	-0.086	1.000

The role of research & development mediates the influence of the male CEO's masculinity face on leverage

$$R\&D_{i,t} = \beta_0 + \beta_1 fWHR_{i,t} + \varepsilon \tag{1}$$

$$EM_{i,t} = \beta_0 + \beta_1 R\&D_{i,t} + \varepsilon \tag{2}$$

$$EM_{i,t} = \beta_0 + \beta_1 fWHR_{i,t} + \varepsilon \tag{3}$$

To explain from the model of variable face masculinity of male CEOs, variable learnings management, and variable mediating of research & development can be explained in the [table 1](#) as follows:

4. Results of research and discussion

4.1. Variable descriptive statistics

The results of descriptive statistics can be presented with a minimum, maximum, mean, standard deviation of the studied variable from a sample of enterprises. In addition to presenting based on a sample of companies on Indonesia's Stock Exchange in the period 2016–2021, testing this sample based on companies on Indonesia's Stock Exchange, can be seen in the [table 2](#) below:

Based on the table independent above shows the number of observations (N) there was 1925, from 1925 this observation the minimum earnings management (EM) value was .000, and the maximum earnings management (EM) value was .046, the average value from 1925 or mean was .003 with a standard deviation of .007. Based on the table mediating variable above, it shows the number of observations (N) there are 170, out of 170 observations the minimum research & development (R&D) value is 6.234, and the maximum research & development (R&D) value is 21.802, the average value of 170 observations or mean was 15.234 with a standard deviation of 2.549. Based on the table dependent variable above shows the number of observations (N) there were 1781, from 1781 this observation the value of Male CEO Masculinity (fWHR) (minimum) was .110, and the value of Male CEO Masculinity (fWHR) (maximum) was .267, the average value from 1781 or mean was 2.086 with a standard deviation of 6.287.

4.2. Pearson correlation test

In the Pearson correlation test test to see how strong or how weak the relationship of research & development roles mediating the influence of the male CEO's masculinity face on leverage. In this

Table 4. Earnings Management Mediator Model Analysis				
VARIABLES	(1)	(2)	(3)	(4)
	Earnings			
Management	Earnings			
Management	Earnings			
Management	Earnings			
Management				
Research & Development (R&D)		0.00		
		(0.00)		
Male CEO Masculinity (fWHR)	-1.18	0.01***		
	(1.08)	(0.00)		
Constant	17.36***	-0.01**	6.31***	0.00***
	(2.05)	(0.01)	(0.71)	(0.00)
Observations	170	170	170	170
Standard errors in parentheses *** p <0.01, ** p <0.05, * p <0.1				
Output SEM Indirect Earnings Management				
	Earnings			
Management	Earnings			
Management	Earnings			
Management	Earnings			
Management				
Research & Development (R&D)		0.00		
		(0.00)		
Male CEO Masculinity (fWHR)	-1.18	0.01***		
	(1.08)	(0.00)		
Constant	17.36***	-0.01**	6.31***	0.00***
	(2.05)	(0.01)	(0.71)	(0.00)
Observations	170	170	170	170
Standard errors in parentheses *** p <0.01, ** p <0.05, * p <0.1				
Output SEM Total Effect Earnings management				
	Earnings			
Management	Earnings			
Management	Earnings			
Management	Earnings			
Management				
Research & Development (R&D)		0.00		
		(0.00)		

(Continued)

Table 4. (Continued)

VARIABLES	(1)	(2)	(3)	(4)
Male CEO Masculinity (fWHR)	-1.18	0.01***		
	(1.08)	(0.00)		
Constant	17.36***	-0.01**	6.31***	0.00***
	(2.05)	(0.01)	(0.71)	(0.00)
Observations	170	170	170	170

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

test, if the Pearson correlation value (*r*) is above 0.05 (5%), then there is a strong relationship the role of research & development mediating the influence of the male CEO’s masculinity face on leverage, if the Pearson correlation value is below 0.05 (5%) then the relationship of research & development role mediates the influence of the male CEO’s masculinity face on earnings management is declared weak.

Based on the [table 3](#) above, it can be interpreted that the variable leverage, the face of masculinity of male CEOs and research & development have a value above 0.05 (5%). Thus, it can be explained that all of these variables are declared valid to be used in model testing. The reliability test results above explain the value above 0.05 (5%). This proves that all variables used are the same reliable if tested.

4.3. Earnings management mediation analysis mediation model

The process for analyzing mediation on an estimation model requires two approaches. The first approach based on (Baron & Kenny, 1986) is carried out several stages in analyzing the significance between the specifications of the mediating variables to strengthen the relationship between the independent variables to the dependent variables, so that it can be interpreted that the mediating variable affects in full as a mediating variable.

The second approach is based on an approach (Zhao et al., 2010) to test mediating with multiple tests. In the first test, an estimate of indirect impact was carried out divided by the overall impact or called the Ratio Indirect to Total Effect (RIT) which had an independent variable impact on the dependent variable mediating by the mediating variable. In the next test, an estimate of the indirect effect was carried out divided by a direct impact or called the Ratio Indirect Effect to Direct Effect (RID) which indicates the magnitude of the impact of the independent variable on the dependent variable mediating by the mediating variable. The last is the Sobel test, which compares p-value with z-value as the basis for the hypothesis of mediation between variables as shown in [table 4](#).

In the first stage of testing the influence of the male CEO masculinity face on research & development with a p-value significance level of $0.27 \leq 0.05$ (5%) the results of the empirical analysis were declared to have passed the first stage of the regression test. The male CEO masculinity face had a positive effect on research. & development with a significance level of p-value $0.27 \leq 0.05$ (5%), meaning that the higher the masculinity face value of male CEOs has an impact on decreasing research & development, conversely the lower values of male CEO masculinity faces have an impact on increasing research & development. The findings are not in line with the findings (Jia et al., 2014) explained that the masculinity of the male CEO’s face has a positive influence on research & development, meaning that the higher the value of the masculinity of the male CEO’s face has an impact on increasing research & development, conversely, the lower the masculinity value of the male CEO has an impact on the decline in research & development.

In the Second Phase, testing the influence of research & development on earnings management with the results of a significance level of $p\text{-value } 0.63 \geq 0.05$ (5%) the results of this empirical analysis are declared to have passed the second regression test to test the effect of research & development on earnings management practices with a significance level of $p\text{-value } 0.63 \geq 0.05$ (5%), meaning that the higher research & development has an impact on improving earnings management practices, on the contrary the lower research & development has an impact on decreasing earnings management practices. The findings are consistent with the findings (Dang et al., 2018) which explains that research & development has a positive influence on earnings management practices. This means that the higher the value of research & development has an impact on improving earnings management practices, and vice versa, the lower research & development does not have an impact on decreasing earnings management practices.

In the Third Stage The influence of the masculinity of the male CEO's face on earnings management practices with a significance level of $p\text{-value } 0.73 \geq 0.05$ (5%) this result is declared not to pass the third regression test of 0.73, meaning that the higher the masculinity face value of the male CEO has no impact on increasing earnings management practices, and conversely the lower the masculinity face value of the male CEO has no impact on the decrease in earnings management practices. The findings are inconsistent with their findings (Jia et al., 2014) explaining that the masculinity of male CEOs has a positive influence on earnings management practices, meaning that the higher the value of male CEO masculinity faces, the impact on improving earnings management practices, and vice versa, the lower the value of male CEO masculinity. The masculinity of male CEOs has an impact on the decline in earnings management practices. While the Sobel test obtained $p\text{-value}$ with a significance level of $0.66 \geq 0.05$ (5%). Conclusion of the approach (Baron & Kenny, 1986), the first stage of testing, the second stage of testing is significant and the third stage of testing is not significant, while in the Sobel test the level of significance $p\text{-value}$ obtained a value of $0.66 \geq 0.05$ (5%). This means that the role of research & development mediates the positive influence of the masculinity face of male CEOs on earnings management practices, meaning that the decrease and increase in the value of research & development have an impact on increasing and decreasing the value of the masculinity face of male CEOs also having an impact on increasing and decreasing the value of earnings management practices. The third hypothesis is accepted because the $p\text{-value}$ is $0.66 \geq 0.05$ (5%). The third finding is supported by the hypothesis proposed by research & development Mediating a Positive Influence on the face of Male CEO Masculinity on earnings management practices. The findings include complementary types of mediators.

On Monte Carlo Testing tested the influence of male CEO masculinity faces on earnings management practices with a significantly $p\text{-value}$ of $0.002 \leq 0.05$ (5%), meaning that the higher the masculinity face value of the male CEO has an impact on improving earnings management practices, and vice versa the lower the value of the CEO masculinity face. Men have an impact on the decline in earnings management practices. The empirical findings are in line with the findings (Jia et al., 2014) explained that the masculinity of male CEOs has a positive influence on earnings management practices. This means that the higher the face value of male CEO masculinity has an influence on earnings management practices. This means that the higher the masculinity of the male CEO's face has an impact on increasing earnings management practices, and vice versa, the lower the masculinity of the male CEO's face has an impact on the decline in earnings management practices.

Second Test of Ratio Indirect to Total Effect (RIT) formula (Indirect effect/Total effect)/ $(0.003/0.228) = 0.014$, Meaning that about 1 % of the effect of the role of research & development mediating the influence of the ceo's masculinity face on earnings management.

Third Test of Ratio Indirect Effect to Direct Effect (RID) formula (Indirect effect/Direct effect)/ $(0.003/0.231) = 0.014$, That is, the mediation effect is about 0.0 times the direct effect of the influence of the male CEO's masculinity face on earnings management mediated by research & development. Based

on the description above, it can be concluded that the practice of research & development mediating the positive influence of the CEO's masculinity face on earnings management. The proposed hypothesis is accepted. The findings are supported by the hypothesis proposed by Research & Development Mediating the Positive Influence of the Male CEO's Masculinity Face on Earnings management using two approaches (Baron & Kenny, 1986; Zhao et al., 2010) with its analysis procedure using the procedure (Mehmetoglu, 2018). The findings empirically belong to the complementary mediator type.

4.4. Discussion of research result

Empirical findings reveal that male CEO masculinity is correlated with testosterone, aggressiveness and social status affect research & development and earnings management practice, viewed from the perspective of behavioral consistency theory (Epstein, 1979b). Meanwhile, agency theory explains the consequences of the separation of control of male CEOs as agents who have direct access to company information data compared to shareholders. Jensen and Meckling (1976) explained that the contract between shareholders and the characteristics of male CEOs as agents to delegate authority and operational activities of the company. The purpose of the characteristics of male CEOs as agents with shareholders must be the same, to improve the company through the prosperity of shareholders but sometimes the characteristics of male CEOs as agents have conflicting thoughts with shareholders (MAYANGSARI, 2001). So agency theory provides an important solution in the decision-making process of male CEO characteristics related to the policy-making process of earnings management practices and research & development policy makers. While the Upper Echelon Theory (Hambrick & Mason, 1984) explain the assumptions that occur in the company by studying the characteristics of the company's top management team. Hambrick and Mason (1984) explain the distinguishing characteristics of male CEOs on psychological and cognitive aspects of corporate management. The decision-making process is divided into two rational models and improvements (Fredrickson, 1984; Fredrickson & Mitchell, 1984; Miller & Friesen, 1983). The rational model focuses on caution, completeness of information, planning and analysis with various alternatives and choosing the best alternative (Camillus, 1981; Quinn et al., 1988).

The findings empirically have implications for company management as policy makers regarding the face of male masculinity, which have an impact on earnings management practice policies and research & development policies, so that the empirical findings can be used by company management and the government. The findings empirically provide evidence in the field of behavioral accounting by looking at the face of masculinity as a determinant of earnings management practices and research & development. In addition, the findings are empirically enriching in the field of behavioral accounting and become a reference for future research.

Yuping Jia et al. (2014) explained that a man's face can predict masculine behavior. Whereas (Carré & McCormick, 2008; Christiansen & Winkler, 1992) explained that a man's face predicts a person's aggressive nature. The face of male CEO masculinity has a positive effect on the company's financial statement presentation process. Yuping Jia et al. (2014) provide empirical evidence of the relationship between male CEO masculinity faces and masculine behavior. Whereas (Dikolli et al., 2012; Jia et al., 2014) provide empirical evidence that the characteristics of male CEOs having excessive trust affect earnings management practices. In particular, research & development firms seem to have an impact on earnings management practices. Kamiya et al. (2018) provides empirical evidence that the face of male CEO masculinity has a positive effect on investment. This means that the higher the masculinity of the male CEO's face has an impact on increasing the value of the company's investment, on the contrary, the lower the masculinity of the male CEO's face has an impact on the decrease of the company's investment. Financing decisions are focused on investment policies, high investment can increase company profits.

Jia et al. (2014) provides empirical evidence that the masculinity of male CEOs has a positive effect on earnings management practices. This means that the higher the masculinity of the male CEO has an impact on increasing earnings management, and vice versa the lower the masculinity

of the CEO has an impact on the decline in earnings management, financing decisions are focused on earnings management practice policies, high earnings management practices can have an impact on company profitability. The higher the characteristics of male CEOs have an impact on increasing earnings management practices, and vice versa, the lower the characteristics of male CEOs have an impact on decreasing earnings management. (Chava and Purnanandam (2010); Cronqvist et al., 2012; Huang & Kisgen, 2013; Malmendier et al., 2011).

5. Conclusion

The role of research & development mediates the effect of male CEO masculinity on earnings management. The findings provide empirical evidence that the role of research & development has an impact on increasing and decreasing the masculinity of male CEOs having an impact on increasing and decreasing earnings management. The findings are empirically supported by agency theory, behavioral consistency theory and echelon theory which explain that the face of CEO masculinity affects research & development and earnings management practices. Meanwhile, agency theory explains the characteristics of the role of male CEOs in making research & development policies and corporate earnings management. The findings are empirically supported by ImageJ software that the masculinity of male CEOs has a positive influence on research & development and earnings management practices.

The empirical findings have implications for the company's management as policy makers regarding the face of male masculinity, which have an impact on earnings management practices and research & development policies, so that the empirical findings can be used by company management and the government. The findings empirically provide evidence in the field of behavioral accounting by looking at the face of male CEO masculinity as a determinant of earnings management practices and research & development. In addition, it enriches empirical findings in the field of behavioral accounting and becomes a reference for conducting future research.

5.1. Research limitations

This study has limitations that cannot be avoided. Disclosure of limitations aims to make this research understandable with a non-misleading interpretation. In addition, the disclosure of limitations also has the aim that further research can fill in the blanks which are the limitations of this study:

- (1) The element in conducting content analysis in determining the measurement of the masculinity face value of male CEOs using imageJ software cannot distinguish images of male CEOs that have been modified/edited, taking pictures of male CEOs is obtained from the company's annual report in the 2016–2021 period and the use of search image of male CEO on Google.
- (2) The sample used in this study is limited to taking pictures of male CEOs found in the company's annual reports in the 2016–2021 period and using male CEO image searches on google, researchers cannot distinguish pictures of male CEOs that have gone through modifications.

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