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# The Influence of fWHR Male CEO on Research & Development

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**Abstract:** This research aims to obtain empirical evidence of the influence of the masculinity of male CEOs on the of research & development, this research seeks to identify the influence of the face of masculinity of male CEO's on the of research & development. The study used a quantitative approach with population and research samples using companies listed on the Indonesia Stock Exchange from 2016 to 2021. The study collected images of faces identified as male CEOs from data from the Indonesia Stock Exchange website and company as utilizing Google searches. The data analysis method in this study used Regression Ordinary Least Square (OLS) with Stata Software. Stata software is one of the regression completion procedures that has a high degree of flexibility in research that connects theories, concepts and data that can be done on variables in research. The findings empirically explain that the higher the face value of male CEO masculinity has an impact on reducing research & development costs, and vice versa the lower the face value of male CEO masculinity has an impact on increasing research & development. The practical implications of the research results can help the Indonesian Association of Accountants in developing Financial Accounting Standard No. 19 in Indonesia. The theoretical implications of the research results can explain the Theory of Agency and the Theory of Consistency of Behavior. The policy implications of the results of the study can provide empirical evidence that the higher the facial value of male CEO masculinity has an impact on reducing research & development, while also the lower the face value of male CEO masculinity has an impact on increasing research & development.

**Keywords:** CEO Male; fWHR; Masculinity; R&D; Stata

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

## 1. Introduction

The face of masculinity is a concept of masculine behavior that exists in men has implications for aggressive nature, has a character who is hard tends to be emotional to perform actions (Jewitt, 1997). The face of masculinity has factors that can affect the performance of a male CEO in managing a company (Tanjaya & Santoso, 2020). Kamiya et al., (2018) explained that the characteristics of male CEOs with masculine faces have an influence on the company's financial management process. Masculinity is a personal aspect, a person's masculinity is brought from birth. Kamiya et al., (2018) explain in the neuroendocrinology literature the face of male masculinity predicts masculinity habits

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of masculine behavior and aggressive behavior. The face of high male CEO masculinity can be predicted to be more aggressive in managing the company (Tanjaya & Santoso, 2020).

Bertrand & Schoar, (2003) explained that the characteristics of male CEOs have an influence on the company's decision-making process. Research in the field of neuroendocrinology explains that men's faces have an influence on aggressive behavior. According to (Carré & McCormick, 2008; Christiansen & Winkler, 1992) explains that the face of male masculinity has an influence on aggressive behavior. While (Campbell., et al (2011) explains that the face of male masculinity has an influence on a person's behavior. According to (Wong et al., 2011) explains that the characteristics of male CEOs tend to negotiate for personal gain. According (Stirrat & Perrett, 2010) explains that men who have high masculinity faces are considered trustworthy. As a result, (Kamiya et al., 2018; Kamiya, & Park, 2017; Wong et al., 2011) show empirical evidence that male CEOs with higher masculinity faces outperform male CEOs with lower masculinity faces.

## 2. Literature Review and Hypothesis Development

### 2.1 Face, Testosterone and Behavior

Previous research has provided empirical evidence of a link between testosterone and masculine behavior. CEO faces can be the basis for the interconnectedness of men's faces into a topic in this study. Jia et al., (2014) explain that a man's face can predict masculine behavior. Based on laboratory evidence (Carré & McCormick, 2008; Christiansen & Winkler, 1992) explained that men's faces predict aggressive traits. Jia et al., (2014) provide empirical evidence of a relationship between profit management practices and the faces of male CEOs who have masculine behaviors.

The male face has a positive influence on masculine behavior, while testosterone has a tendency to practice profit management (Eisenegger, Naef, Snozzi, Heinrichs, & Fehr, 2010; Jia et al., 2014). Jia et al., (2014) explained the relationship between testosterone and the behavior of male CEOs has an influence on the brain both before birth and during growth. A group of nerve cells plays a role in the processing of memory 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 spurts in adolescents (Johnston et al., 2001). Testosterone has an influence on growth in adolescents (Verdonck et al., 1999; Jia et al., 2014). Previous research provides empirical evidence that male and female growth differs in bizygomatic/ between the left cheekbone to the right cheekbone, but for upper facial height does not experience a difference in the growth period from the upper lip to the highest point of the eyelid (Jia et al., (2014). The findings empirically provide evidence that testosterone has an influence on the development of the male face (Folstad & Karter, 1992). While (Jia et al., 2014; Alrajih & Ward, 2014) explains that the structure of a man's face has an influence on masculine behavior during growth. Lefevre et al., (2013) provide empirical evidence of a link between testosterone and the ratio of men's facial width. Some studies prove a positive relationship between the ratio of the width of a man's face to testosterone. Previous research has explained that testosterone has a positive relationship with the face

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Lefevre et al., (2013). According to (Jia et al., 2014; Pound, Penton-Voak, & Surridge, 2009) explains that higher or lower testosterone in men has an influence on the masculine face.

**2.2 Research Conceptual Framework**

In order to explain the relationship between independent and dependent variables, as well as control variables, conceptual frameworks are used. This study places the masculinity of male CEOs as independent variables, research & development as dependent variables, size, profitability, Earnings management and leverage as control variables. Based on the explanation above, a conceptual framework of such a study is depicted in the picture below:

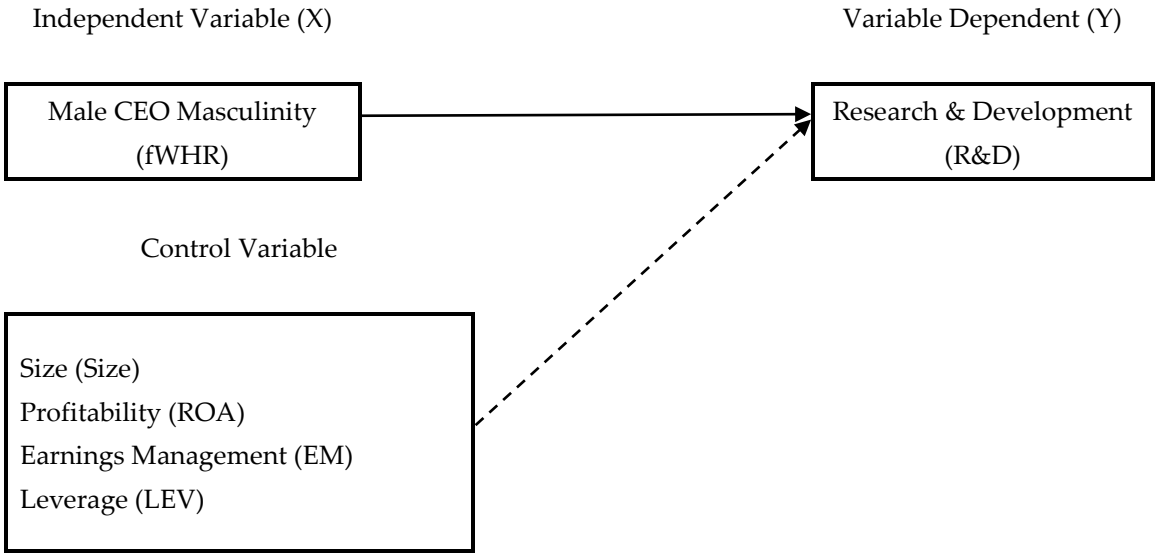


**Figure 1: Conceptual Framework of Research**

**2.2.1 The fWHR Male CEOs Affects R&D**

Jensen & Meckling (1976) finalized agency theory as a relationship between the characteristics of a male CEO as an agent and a shareholder in delegating authority to the characteristics of a male CEO as an agent for decision making on behalf of shareholders in running the company. Scott, (2014) explained that an employment contract is a set of rules that can control the mechanism for return or risk approved by shareholders with the characteristics of a male CEO as an agent. An effective contract is a contract that meets two aspects: (1) shareholders with characteristics of a male CEO as an agent have symmetrical information, meaning that both shareholders and characteristics of male CEOs as agents have the same amount of data, (2) the risks taken by the characteristics of male CEOs as agents in relation to the returns received. Agency theory is a relationship that can align the interests of shareholders with the characteristics of a male CEO as an agent in terms of decision making (Scott, 2014).

According to behavioral consistency theory, the masculinity of male CEOs correlates with testosterone, aggression, and confidence, and has an impact on R&D (Epstein, 1979). The character of male CEOs has an aggressive nature in conducting research & development (R&D) policies and costing to get long-term company profitability. Jia et al., (2014) provide empirical evidence that the masculinity of male CEOs has an influence on maintaining social status. While (Pindado et al., 2010) explained that research

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& development have an important role in increasing the value of the company, research & development is an intangible asset that has a focus on technology and science that is oriented towards long-term profitability of the company (Chan et al., 2014). Research & development are carried out to deal with the uncertainty of high product demand where product innovation is needed [27]. Companies that invest in research & development believe they can produce products that provide a competitive advantage. Investment research & development are used to develop new products to improve product quality and improve product processes, so as to reduce costs incurred by companies (David et al., 2009). Based on the description above, that research & development are the key to the company's success to gain a competitive advantage in the future (Padgett & Galan, 2010). The characteristic role of male CEOs has an influence on research & development policies and costs. The hypothesis proposed in this study is:

*$H_1$: The masculinity of male CEOs has a positive influence on research & development.*

## 3. Research Methods

### 3.1 Types and Approaches to Research

This research uses a quantitative approach, to give meaning in conjunction with the interpretation of statistical figures (Aliyyah, et al., 2021; Prasetio et al., 2021). This research intends to give empirical proof of the impact of male CEOs' masculinity on research and development expenses. The research approach is carried out using explanatory research (Endarto, et al., 2021; Indrawati et al., 2021) with population and research samples using companies listed on the Indonesia Stock Exchange in 2014-2018. The study collected images of faces identified as male CEOs from data from the Indonesia Stock Exchange website and company websites as well as utilizing Google searches. The data analysis method in this study used Regression Ordinary Least Square with Stata Software version 14.2. Stata version 14.2 software is one of the regression completion procedures that has a high degree of flexibility in research that connects theories, concepts and data that can be done on variables in research. Stata version 14.2 software is one of the regression completion procedures that has a high degree of flexibility in research that connects theories, concepts and data that can be done on variables in research.

### 3.2 Operational Definition and Measurement

The masculinity of male CEOs is an independent variable, a variable of research & development as a dependent variable, variable size, profitability (ROA), earnings management and leverage as variable control.

#### 3.2.1 Independent Variables

Independent variables are variables that can affect other variables (Abadi et al., 2021; Aliyyah, et al., 2021) this study used the facial variable of male CEO masculinity as an independent variable. The face of masculinity is a concept of masculine behavior that exists in men has implications for aggressive nature, has a character that is hard tend to be emotional in performing actions (Jewitt, 1997). Measuring the variable face masculinity of male CEOs using ImageJ software, this study turned the image of a male CEO's face into a gray scale image with a height of 8 bits (Kamiya et al., 2018).

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Each photograph of the study's male CEO's face was measured using the ImageJ software by selecting a dot on the face and dragging the mouse to another spot to get 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: It is apparent that both ears can be seen on the face, with their roots clearly visible.

3: Proper standing or sitting posture is characterized by a straight back and ears that can be plainly 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 image:

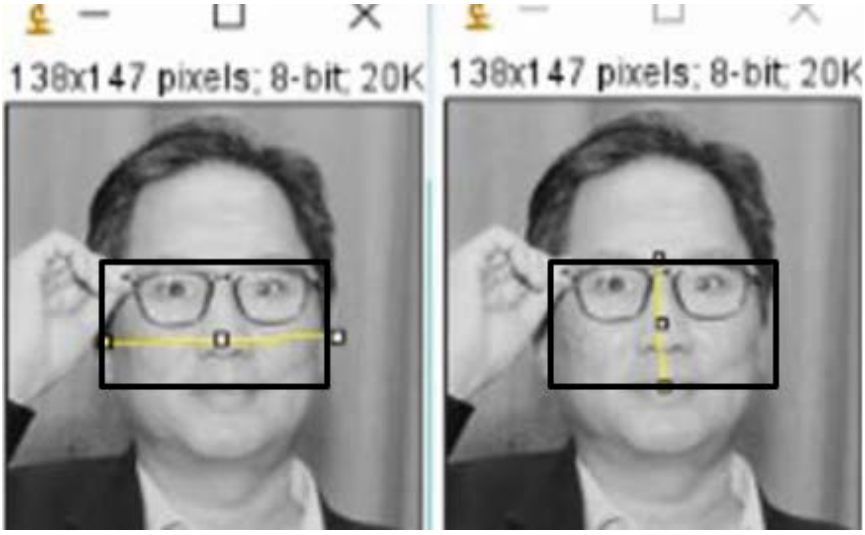


**Figure 2: Masculinity Male CEO Measurements**

| Description | | |
|---|---|---|
| Horizontal line | : | Represents the maximum distance between the left and right cheeks. |
| Vertical Line | : | Represents the distance between the upper lip to the highest point of the eyelid |

**3.2.2 Dependent variables**

Dependent variables are variables whose value cannot be influenced by other variables (Kalbuana, et al., 2021; Suryati, et al., 2021). Dependent variables in this study use research & development. 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 (Padgett & Galan, 2010; Arifian & Yuyetta, 2012) with the following formula:

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

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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 |

### 3.2.3 Control variables

Control variables are variables for controlling causal relationships to better obtain more complete and better empirical models (Kalbuana, et al., 2021; Suryati, et al., 2021). So that this variable can affect the indications that are again studied. The control variables used in the study were size and profitability (ROA).

**Size**

Size is a value that can classify a company into large or small types that are sourced on total assets, log size. the larger the total asset indicates the larger the size. the larger the size, so that the transactions carried out are more complete (Luwihono et al., 2021; Prabowo et al., 2020; Susanto et al., 2021; Shabbir et al., 2021) explain the scale of size measurement using firm size with the following formula:

SIZE = Ln total asset

**Profitability (ROA)**

Profitability is a tool that can be used to evaluate investments that have been invested by investors able to provide profits that are in accordance with the expected. Profitability measurement using Return on assets (ROA) which describes the division of net profit divided by total [49]–[51]. The measurement scale uses the percentage ratio scale, with the following formula:

$$\text{Return on asset} = \frac{\text{Net Profit}}{\text{Total asset}}$$

Description:

| | | |
|---|---|---|
| Return on assets$_{,t}$ | = | Return on company assets i in the year to t |
| Net Profit$_{,t}$ | = | Net profit of company i in the year to t |
| Total assets$_{,t}$ | = | Total assets of the company i in the year to t |

**Earnings Management (EM)**

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 = NIit – CFOit

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

$$\frac{\text{TAit}}{\text{Ait}-1} = \beta_1 \left(\frac{1}{\text{Ait}-1}\right) + \beta_2 \left(\frac{\Delta\text{REVit}}{\text{Ait}-1}\right) + \beta_3 \left(\frac{\text{PPE}}{\text{Ait}-1}\right) + \varepsilon$$

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

$$NDA_{it} = \beta_1 \left(\frac{1}{Ait-1}\right) + \beta_2 \left(- \frac{\Delta REVit}{Ait-1} - \frac{\Delta RECit}{Ait-1}\right) + \beta_3 \left(\frac{PPE}{Ait-1}\right) + \beta_4 \left(\frac{ROAit}{Ait-1}\right) + \varepsilon$$

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

$$DA_{it} = \frac{TAit}{Ait-1} - NDA_{it}$$

Description:

| | | |
|---|---|---|
| $NDA_{it}$ | = | 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 |
| $\Delta Rev_{it}$ | = | 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 |
| $\Delta Rec_{it}$ | = | 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 |
| $\varepsilon$ | = | Error |

**Leverage (LEV)**

Leverage illustrates the division of total liabilities by total assets. This financial ratio explains the amount of assets owned by companies financed by liabilities. The greater the value of the liability, the bigger the impact felt by investors in receiving the profits (Kamiya et al., 2018). Leverage measurement is the result of the division of total liabilities by total assets (Kamiya et al., 2018). This research measurement scale uses a percentage ratio scale with the following formula:

$$\text{Leverage} = \frac{\text{Total Liability}}{\text{Total asset}}$$

Description:

| | | |
|---|---|---|
| $Leverage_{i,t}$ | = | Leverage i in the year to t |
| $Total\ Liabilitas_{i,t}$ | = | Total liabilities of the company i in the year to t |
| $Total\ Assets_{,t}$ | = | Total assets of the company i in the year to t |

**3.3 Data Analysis Techniques**

Research data analysis is part of the data testing process after the selection and collection stage of research data. Data analysis is basically interpreted as estimating or by determining the quantitative influence of the change of an event on something else, as well as predicting or estimating other events (Sudaryanto et al., 2022; Utari, Sudaryanto, et al., 2021).

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**3.3.1. Descriptive Statistics**

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

**3.3.2. Pearson Correlation Test**

Using the pearson correlation assumption that the data is regularly distributed, the Pearson correlation test examines the relationship between two independent variables and one dependent variable (Prasetyo, et al., 2021; Rusdiyanto et al., 2021). Correlation testing produces positive (+) and negative (-) numbers. If the correlation value is positive, it means that the relationship is unidirectional. Unidirectional means that the independent variable is large, the dependent variable is also getting bigger. If generating a negative correlation value means that the relationship is not unidirectional, not unidirectional meaning that if the value of the independent variable is large, then the dependent variable is getting smaller. correlation numbers range from 0-1 (Endarto, Taufiqurrahman, Suhartono, et al., 2021; Prasetyo, et al., 2021). With pearson correlation formulation as follows:

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

Description:

| | | |
|---|---|---|
| r | = | Correlation value |
| X | = | Variable X |
| Y | = | Variable Y |

**3.3.3 Research Regression Model**

Regression analysis to find out how closely the relationship occurs between one variable and another variable. Regression analysis has a function to predict or forecast the magnitude of the value of an independent variable (Y) if the dependent variable (X) is changed (Prasetyo, et al., 2021; Rusdiyanto et al., 2021). The method used in this study used panel data regression analysis. Panel data is also called pool data, longitudinal data and micropanel data. The panel's data regression analysis was used to test the facial influence of male CEO masculinity (fWHR), on research & development (Y). Based on the bound variables and free variables that have been described, an equation model is obtained that will be used as follows:

$$R\&D_{i,t} = \beta_0 + \beta_1 fWHR_{i,t,} + \beta_2 Size_{i,t} + \beta_3 ROA_{i,t,} + \beta_4 EM_{i,t} + \beta_5 LEV_{i,t,} + \varepsilon \quad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

To explain from the variable model the face of male CEO masculinity, variable research & development, variable Size, profitability variable (ROA), can be explained as follows:

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Table 1: Variable Description

| Information | | Description |
|---|---|---|
| i | = | Company cross-section data |
| t | = | Company time series data |
| R&D | = | Research & Development |
| fWHR | = | The Masculinity Face of a Male CEO |
| Size | = | Company Size |
| ROA | = | Profitability |
| EM | = | Earnings Management |
| LEV | = | Leverage |
| $\alpha$ | = | Constant |
| $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ | = | Regression coefficients of R&D, fWHR, control, Size, ROA, EM, LEV |
| $\epsilon$ | = | Error |

## 4. Research Results And Discussions

### 4.1 Variable Descriptive Statistics

Table 2: Descriptive Statistics

| Variables (Y) | 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 | -.19 | 4.575 |
| **Variables (X)** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** | **p1** | **p99** | **Skew.** | **Kurt.** |
| fWHR | 1781 | 2.086 | 6.287 | .11 | 267 | 1.34 | 2.79 | 42.038 | 1771.784 |
| **Variables (C)** | **Obs** | **Mean** | **Std. Dev.** | **Min** | **Max** | **p1** | **p99** | **Skew.** | **Kurt.** |
| Size | 1925 | 23.12 | 5.011 | 11.862 | 31.592 | 12.927 | 30.952 | -.269 | 1.746 |
| ROA | 1925 | .078 | .108 | 0 | .925 | .001 | .528 | 3.626 | 20.785 |
| EM | 1925 | .003 | .007 | 0 | .046 | 0 | .036 | 3.132 | 12.117 |
| Leverage | 1925 | .482 | .246 | 0 | .99 | .01 | .93 | -.041 | 2.107 |

Based on the table ooutput stata variables dependent above shows the number of observations (N) there are 170, of these 170 observations the value of research & development minimum is 6.234, and the value of research & development maximum is 21.802 the average value of 170 observations or mean of 15.234 with a standard deviation of 2.549. Based on the table output stata variable independent above shows the number of observations (N) there are 1781, from 1781 this observation the face value of male CEO masculinity minimum is 0.11, and the face value of male CEO masculinity maximum is 267. average value of 1781 observation or mean of 2.086 with standard deviation of 6.287. Based on the table output stata variable control above shows the number of observations (N) there are 1925, from 1925 this observation the size value minimum is 11.862, and the size value maximum is 31.592, the average value of 1925 is 23.12, with a standard deviation of 5.011. Based on the table above shows the number of observations (N) there is 1925, from 1925 this observation the profitability value (ROA) minimum is 0, and the profitability value (ROA) maximum is 0.925, the average value of 1925 observation or mean is 0.078 with a standard deviation of 0.108. Based on the table above shows the number of observations (N) there is

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1925, from 1925 this observation the earnings management value minimum is 0, and the earnings management value maximum is 0.046, the average value of 1925 observation or mean is 0.003 with a standard deviation of 0.007. Based on the table above shows the number of observations (N) there is 1925, from 1925 this observation the leverage value minimum is 0, and the leverage value maximum is 0.099, the average value of 1925 observation or mean is 0.482 with a standard deviation of 0.246.

**4.2 Pearson Correlation Test**

Pearson tested the correlation test to see how strong or how weak the relationship between the masculinity face of male CEOs and research & development (R&D) costs. In this test, if the Pearson correlation value (r) is above 0.05 (5%), then there is a strong relationship between the masculinity face of male CEOs to research & development; if the Pearson correlation value is below 0.05 (5%), then the relationship between the masculinity face of male CEOs to research & development is declared weak

**Table 3: Pearson Correlation Test**

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| (1) Research & Development | 1.000 | | | | | |
| (2) CEO masculinity (fWHR) | -0.086 | 1.000 | | | | |
| | (0.278) | | | | | |
| (3) Size | -0.206 | -0.038 | 1.000 | | | |
| | (0.007) | (0.104) | | | | |
| (4) Probability (ROA) | 0.246 | 0.001 | -0.077 | 1.000 | | |
| | (0.001) | (0.953) | (0.001) | | | |
| (5) Earnings Managemeny | 0.001 | 0.059 | -0.055 | -0.042 | 1.000 | |
| | (0.985) | (0.013) | (0.016) | (0.068) | | |
| (6) Leverage | 0.151 | 0.006 | -0.189 | -0.147 | 0.111 | 1.000 |
| | (0.049) | (0.809) | (0.000) | (0.000) | (0.000) | |

| Variables | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| (1) Research & Development | 1.000 | | | | | |
| (2) CEO masculinity (fWHR) | -0.086 | 1.000 | | | | |
| (3) Size | -0.206* | -0.038 | 1.000 | | | |
| (4) Probability (ROA) | 0.246* | 0.001 | -0.077* | 1.000 | | |
| (5) Earnings Management | 0.001 | 0.059 | -0.055 | -0.042 | 1.000 | |
| (6) Leverage | 0.151 | 0.006 | -0.189* | -0.147* | 0.111* | 1.000 |

*** *p<0.01*, ** *p<0.05*, * *p<0.1*

Based on the table above, it can be interpreted that research & development, the masculinity face of male CEOs, size, Profitability (ROA), earnings management and leverage values above 0.05 (5%). Thus, it can be explained that all 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 reliably are the same if tested.

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### 4.3 Goodness of Fit Model

Hypothesis testing in research is very important; it can determine whether the research conducted is scientific enough or not. To find out the feasibility of the model scientifically, based on the results of three tests that have been tested Chow-test, Lagrange multiple tests and Hausman test model in accordance with the hypothesis proposed is the estimation of pooled least square (PLS) model with the following output results:

| Research & Development | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| CEO masculinity (fWHR) | -2.077 | 1.051 | -1.98 | .05 | -4.152 | -.001 | ** |
| Size | -.124 | .039 | -3.16 | .002 | -.202 | -.046 | *** |
| Probability (ROA) | 3.952 | 1.608 | 2.46 | .015 | .775 | 7.128 | ** |
| Earnings Management | -7.359 | 30.638 | -0.24 | .81 | -67.885 | 53.166 | |
| Leverage | 2.329 | .845 | 2.76 | .007 | .661 | 3.998 | *** |
| Constant | 20.657 | 2.423 | 8.52 | 0 | 15.869 | 25.444 | *** |
| Mean dependent var | | 15.122 | SD dependent var | | 2.530 | | |
| R-squared | | 0.170 | Number of obs | | 170 | | |
| F-test | | 6.299 | Prob > F | | 0.000 | | |
| Akaike crit. (AIC) | | 732.287 | Bayesian crit. (BIC) | | 750.738 | | |

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

### 4.4 Discussion of Research Results

Prob>F probability results have a value of 0.0000 ≤ 0.05 (5%). This indicates that together the regression coefficient has a significant value, meaning that the free variables together with the masculinity face of male CEOs have an influence on variables tied to research & development. The $R^2$ value has a value of 0.0887; this indicates that the determination level of the male CEO masculinity-free variable against the research & development cost-bound variable research & development is 0.0887. This means that 0.0887 variabilities of research & development can be explained by the variable free face of masculinity of male CEOs, Size, Profitability (ROA), earnings management and leverage. The discussion of the results of this research analysis is an analysis of the suitability of previous theories, opinions/concepts, or research that has been put forward by the results of previous research to overcome phenolamines in research. Here are the main parts that can be discussed in the analysis of research findings:

#### 4.4.1 Empirical Findings of Masculinity of Male CEOs Have a Negative Influence on Research & Development

The masculinity face of male CEOs shows that the results of the estimated negative coefficient do not match the initial hypothesis. The results of the t-test showed that the facial value of male CEO masculinity had a negative and significant influence on research & development with a p-value level of 0.05 ≤ 0.05 (5%). Furthermore, regarding the magnitude of the influence of the masculinity of male CEOs on research & development, it can be seen from the value of the male CEO masculinity face coefficient of -2.077. This shows that when the masculinity of male CEOs increases by 1 percent, the of research & development will decrease by -2.077 percent.

Empirical test results prove that the higher the masculinity face of male CEOs has an impact on reducing research & development, and conversely the lower the masculinity face

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of male CEOs has an impact on increasing research & development. The findings do not support the hypothesis proposed that the masculinity face of male CEOs has a positive influence on research & development; the hypothesis proposed Accepted (p-value of 0.05 ≤ 0.05 (5%).

Submission of initial hypothesis direction based on the findings of previous studies that lead positively (Jia et al., 2014; Kamiya et al., 2018). The difference in the direction of the initial hypothesis with the findings empirically is caused by the results of the measurement of the masculinity of male CEOs in Indonesia with the results of facial measurements of male CEO masculinity in the United States in the opposite direction. The results of the coefficient of determination empirically showed that the face measurement value of the masculinity of Indonesian male CEOs was in the opposite direction to the faces of male CEOs in the United States. The inequality of the findings empirically will have an impact on masculine behavior, thus impacting policy-making and research & development.

The results of empirical research findings are consistent with the findings of previous studies (Almor et al., 2020) conducting empirical research in the United States for the sampling period from 1999-2014, with empirical findings revealing that gender has a negative influence on research & development, meaning that the higher the gender has an impact on reducing research & development, vice versa, the lower gender has an impact on increasing research & development. While the findings of empirical research in Indonesia the sampling period from 2014-2018 with the results empirically revealed that the masculinity of male CEOs has a negative influence on research & development, meaning that the higher the face of masculinity of male CEOs has an impact on reducing research & development, and vice versa the lower the masculinity of male CEOs has an impact on increasing research & development. The findings are supported by behavioral consistency theory, which explains that the masculinity face of male CEOs correlates with testosterone, aggressive, and social status has an influence on research & development, from a behavioral consistency theory perspective (Epstein, 1979). Research & development expenses result in a degree of uncertainty from the output produced by the company. This uncertainty is the cause of the large number of funds issued and has an impact on agency problems between the characteristics of male CEOs as agents and shareholders [61]. Jensen & Meckling, (1976) explains agency relationships arise when shareholders hire male CEO characteristics as agents to provide services and delegate authority in decision-making. So agency theory provides an important solution to the decision-making characteristics of male CEOs regarding policy and costing research & development. The company capitalizes on research & development in order to achieve profit targets. The findings are empirically consistent with his findings (Nelson et al., 2002; Mariadi et al., 2012) provides empirical evidence that research & development capitalization is one of the common ways that male CEOs as agents do profit leveling. The results of the low coefficient of the determination indicate the low expenditure of research & development of companies on the Indonesia Stock Exchange (Mariadi et al., 2012).

Based on the findings empirically consistent with the findings (Mariadi et al., 2012) explained that only a small percentage of companies on the Indonesia Stock Exchange conduct research & development activities and has not become an obligation, so the selection of

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accounting methods for research & development is only an immaterial policy that cannot significantly affect the company's profit (Suharli & Arisandi, 2009; Mariadi et al., 2012)

**5. Conclusion**

The higher the masculinity face of male CEOs has an impact on reducing research & development, and vice versa, the lower the masculinity face of male CEOs has an impact on increasing research & development. The findings are empirically supported by agency theory and behavioral consistency theory explaining that the face of CEO masculinity has an influence on research & development. At the same time, agency theory explains the characteristic role of male CEOs as agents in policymaking and research & development. The findings empirically that ImageJ software supports empirical findings that the masculinity face of male CEOs has an influence on research & development. The findings empirically provide evidence that the existence of male CEOs has an influence on policymaking and research & development, supported by agency theory and behavioral consistency theory. The face illustrates the peculiarities of the male CEO's style in policymaking and research & development costing supported by agency theory and behavioral consistency theory.

The style of male CEOs can influence masculine behavior, and the behavioral consistency theory supports testosterone. The face of masculinity in biology and psychology explains a person's masculine behavior and supports the theory of behavioral consistency. The face of masculinity in accounting explains that the masculinity of male CEOs has an influence on the cost of research & development supported by agency theory and behavioral consistency theory. The findings empirically have implications for company management as policy-making related to the face of male masculinity has an influence on policy and research & development so that the findings can be helpful on the part of company management and government, the results of empirical findings provide evidence in the field of accounting for behavior by looking at the face of male CEO masculinity as a determinant of research & development

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**References**

[1] C. Jewitt, "Images of men: Male sexuality in sexual health leaflets and posters for young people," *Sociol. Res. Online*, vol. 2, no. 2, 1997, doi: 10.5153/sro.64.

[2] F. L. Tanjaya and E. B. Santoso, "Asosiasi Karakteristik CEO Terhadap Potensi Kesulitan Keuangan Perusahaan," *Media Akunt. dan Perpajak. Indones.*, vol. 1, no. 2, pp. 153–168, 2020.

[3] S. Kamiya, Y. H. (Andy) Kim, and S. Park, "The face of risk: CEO facial masculinity and firm riske," *Eur. Financ. Manag.*, vol. 25, no. 2, pp. 1–32, 2018, doi: 10.1111/eufm.12175.

[4] M. Bertrand and A. Schoar, "Managing With Style: The Effect Of Managers On Firm Policies," *Q. J. Econ.*, vol. CXVIII, no. 4, pp. 1169–1208, 2003.

[5] J. M. Carré and C. M. McCormick, "In your face: Facial metrics predict aggressive behaviour in the laboratory and in varsity and professional hockey players," *Proc. R. Soc. B Biol. Sci.*, vol. 275, no. 1651, pp. 2651–2656, 2008, doi: 10.1098/rspb.2008.0873.

[6] K. Christiansen and E. -M Winkler, "Hormonal, anthropometrical, and behavioral correlates of physical aggression in !Kung San men of Namibia," *Aggress. Behav.*, vol. 18, no. 4, pp. 271–280, 1992, doi: 10.1002/1098-2337(1992)18:4<271::AID-AB2480180403>3.0.CO;2-6.

[7] T. C. Campbell, M. Gallmeyer, S. A. Johnson, J. Rutherford, and B. W. Stanley, "CEO optimism and forced turnover," *J. financ. econ.*, vol. 101, no. 3, pp. 695–712, 2011, doi: 10.1016/j.jfineco.2011.03.004.

[8] E. M. Wong, M. E. Ormiston, and M. P. Haselhuhn, "A face only an investor could love: CEOs' facial structure predicts their firms' financial performance," *Psychol. Sci.*, vol. 22, no. 12, pp. 1478–1483, 2011, doi: 10.1177/0956797611418838.

[9] M. Stirrat and D. I. Perrett, "Valid facial cues to cooperation and trust: Male facial width and trustworthiness," *Psychol. Sci.*, vol. 21, no. 3, pp. 349–354, 2010, doi: 10.1177/0956797610362647.

[10] Y. H. (Andy) Kim, S. Kamiya, and S. Park, "The face of risk: CEO facial masculinity and firm risk," *Work. Pap.*, vol. 11, no. 04, pp. 1–82, 2017, doi: 10.1111/eufm.12175.

[11] Yuping Jia, L. Van Lent, and Y. Zang, "Masculinity, Testosterone, and Financial Misreporting," *Account. Res.*, no. 4, pp. 1–63, 2014, doi: 10.1111/1475-679X.12065.This.

[12] C. Eisenegger, M. Naef, R. Snozzi, M. Heinrichs, and E. Fehr, "Prejudice and truth about the effect of testosterone on human bargaining behaviour," *Nature*, vol. 463, no. 21, pp. 356–359, 2010, doi: 10.1038/nature08711.

[13] Y. Jia, L. Van Lent, and Y. Zeng, "Masculinity, Testosterone, and Financial Misreporting," *J. Account. Res.*, pp. 1–63, 2014, doi: 10.1111/1475-679X.12065.This.

[14] P. A. Bos, E. J. Hermans, N. F. Ramsey, and J. Van Honk, "The neural mechanisms by which testosterone acts on interpersonal trust," *Neuroimage*, vol. 61, no. 3, pp. 730–737, 2012, doi: 10.1016/j.neuroimage.2012.04.002.

[15] V. S. Johnston, R. Hagel, M. Franklin, B. Fink, and K. Grammer, "Male facial attractiveness: Evidence for hormone-mediated adaptive design," *Evol. Hum. Behav.*, vol. 22, no. 4, pp. 251–267, 2001.

[16] A. Verdonck, M. Gaethofs, C. Carels, and F. De Zegher, "Effect of low-dose testosterone treatment on craniofacial growth in boys with delayed puberty," *Eur. J. Orthod.*, vol. 21, pp. 137–143, 1999.

[17] I. Folstad and A. J. Karter, "Parasites, bright males, and the immunocompetence handicap," *Am. Nat.*, vol. 139, no. 3, pp. 603–622, 1992, doi: 10.1086/285346.

[18] S. Alrajih and J. Ward, "Increased facial width-to-height ratio and perceived dominance in the faces of the UK's leading business leaders," *Br. J. Psychol.*, vol. 105, no. 2, pp. 153–161, 2014, doi: 10.1111/bjop.12035.

[19] C. E. Lefevre, G. J. Lewis, D. I. Perrett, and L. Penke, "Telling facial metrics: Facial width is associated with testosterone levels in men," *Evol. Hum. Behav.*, vol. 34, no. 4, pp. 273–279, 2013, doi: 10.1016/j.evolhumbehav.2013.03.005.

[20] N. Pound, I. S. Penton-Voak, and A. K. Surridge, "Testosterone responses to competition in men are related to facial masculinity," *Proc. R. Soc. B Biol. Sci.*, vol. 276, no. 1654, pp. 153–159, 2009, doi: 10.1098/rspb.2008.0990.

[21] M. C. Jensen and W. H. Meckling, "Theory of The Firm : Managerial Behavior , Agency Costs and Ownership Structure," *J. financ. econ.*, vol. 3, pp. 305–360, 1976.

[22] J. Scott, *A matter of record: Documentary sources in social research*. John Wiley & Sons, 2014.

[23] R. B. Adams and V. Ragunathan, "Lehman Sisters," *Work. Pap.*, pp. 1–57, 2017, doi: 10.2139/ssrn.3046451.

[24] S. Epstein, "The stability of behavior: I. On predicting most of the people much of the time," *J. Pers. Soc. Psychol.*, vol. 37, no. 7, pp. 1097–1126, 1979, doi: 10.1037/0022-3514.37.7.1097.

[25] J. Pindado, V. De Queiroz, and C. De La Torre, "How do firm characteristics influence the relationship between R&D and firm value?," *Financ. Manag.*, vol. 39, no. 2, pp. 757–782, 2010.

[26] F. T. S. Chan, A. Nayak, R. Raj, A. Y.-L. Chong, and T. Manoj, "An innovative supply chain performance measurement system incorporating research and development (R&D) and marketing policy," *Comput. Ind. Eng.*, vol. 69, pp. 64–70, 2014.

[27] L. Lin and N. Kulatilaka, "Strategic options and firm value," *Manag. Financ.*, 2007.

[28] E. David, T. Tramontin, and R. Zemmel, "Pharmaceutical R & D: The road to positive returns," *Nat. Rev. Drug Discov.*, vol. 8, no. 8, p. 609, 2009.

[29] N. Aliyyah, S. W. Siswomihardjo, I. Prasetyo, P. Rusdiyanto, A. S. Rochman, and N. Kalbuana, "THE EFFECT OF TYPES OF FAMILY SUPPORT ON STARTUP ACTIVITIES IN INDONESIA WITH FAMILY COHESIVENESS AS MODERATION," *J. Manag. Inf. Decis. Sci.*, vol. 24, no. Special Is, pp. 1–15, 2021.

[30] J. E. Prasetio *et al.*, "Corporate Social Responsibility Community Development And Empowerment Program In

Indonesia," *J. Manag. Inf. Decis. Sci.*, vol. 24, no. 1, pp. 1–11, 2021.

[31] W. Utari, Sudaryanto, N. Jannah, N. Sobakh, and Rusdiyanto, "Consumer interest with regard to product completeness, promotion and location: The case of Indonesia | Купівельний інтерес у контексті повноти товару, його просування на ринку й місцезнаходження: приклад Індонезії | Покупательский интерес в контексте полн," *Econ. Ann.*, vol. 188, no. 3–4, pp. 127–133, 2021, doi: 10.21003/ea.V188-15.

[32] S. Sudaryanto, J. Courvisanos, I. R. Dewi, R. Rusdiyanto, and J. R. Yuaris, "Determinants of purchase intention during COVID-19: A case study of skincare products in East Java," *Innov. Mark.*, vol. 18, no. 1, pp. 181–194, 2022, doi: 10.21511/im.18(1).2022.15.

[33] I. Prasetyo *et al.*, "Effects of organizational communication climate and employee retention toward employee performance," *J. Leg. Ethical Regul. Issues*, vol. 24, no. Special Is, pp. 1–11, 2021.

[34] W. Utari *et al.*, "Effect Of Work Training, Competency and Job Satisfaction on Employee Productivity: A Case Study Indonesia," *Rev. Int. Geogr. Educ. Online*, vol. 11, no. 4, pp. 696–711, 2021, doi: 10.33403/rigeo.8006783.

[35] M. Indrawati, W. Utari, I. Prasetyo, Rusdiyanto, and N. Kalbuana, "HOUSEHOLD BUSINESS STRATEGY DURING THE COVID 19 PANDEMIC," *J. Manag. Inf. Decis. Sci.*, vol. 24, no. Special Is, pp. 1–12, 2021.

[36] B. Endarto *et al.*, "GLOBAL PERSPECTIVE ON CAPITAL MARKET LAW DEVELOPMENT IN INDONESIA," *J. Manag. Inf. Decis. Sci.*, vol. 24, no. Special Issue 1, pp. 1–8, 2021, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85113411656&partnerID=40&md5=1074bd3526601cda4a86fbdd7b52d1bd.

[37] Y. Jia, L. van Lent, and Y. Zeng, "Masculinity, Testosterone, and Financial Misreporting," *journal-of-accounting-Res.*, vol. 3, no. 0, pp. 1–63, 2014, doi: 10.1111/1475-679X.12065.This.

[38] Rusdiyanto *et al.*, "Company Profitability is Influenced by sales and Administration & General Costs: Evidence from Indonesia," *J. Leg. Ethical Regul. Issues*, vol. 24, 2021.

[39] N. Kalbuana *et al.*, "Earnings Management Is Affected By Firm Size, Leverage And Roa: Evidence From Indonesia," *Acad. Strateg. Manag. J.*, vol. 20, no. SpecialIssue2, pp. 1–12, 2021, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85107756548&partnerID=40&md5=f648ed22972be531e4986f7c43a47ad4.

[40] I. Prasetyo *et al.*, "Impact Financial Performance to Stock Prices: Evidence From Indonesia," *J. Leg. Ethical Regul. Issues*, vol. 24, pp. 1–11, 2021.

[41] N. Kalbuana *et al.*, "Interpretation of Sharia Accounting Practices in Indonesia," *J. Leg. Ethical Regul. Issues*, vol. 24, pp. 1–12, 2021, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85109955046&partnerID=40&md5=8f66a30f83e1efd68729c64f4c4bd33a.

[42] K. Tuna, E. Kayacan, and H. Bektaş, "The relationship between research & development expenditures and economic growth: The case of Turkey," *Procedia-Social Behav. Sci.*, vol. 195, pp. 501–507, 2015.

[43] R. C. Padgett and J. I. Galan, "The effect of R&D intensity on corporate social responsibility," *J. Bus. Ethics*, vol. 93, no. 3, pp. 407–418, 2010.

[44] D. Arifian and E. N. A. Yuyetta, "TERHADAP TANGGUNG JAWAB SOSIAL PERUSAHAAN ( CORPORATE SOCIAL RESPONSIBILITY ) (Studi Empiris: Perusahaan terdaftar di BEI)," *Accounting*, pp. 1–30, 2012.

[45] A. Luwihono *et al.*, "Macroeconomic effect on stock price: Evidence from Indonesia," *Accounting*, vol. 7, no. 5, pp. 1189–1202, 2021.

[46] B. Prabowo, E. Rochmatulaili, Rusdiyanto, and E. Sulistyowati, "Corporate governance and its impact in company's stock price: case study ," *Utop. y Prax. Latinoam.*, vol. 25, no. Extra10, pp. 187–196, 2020, doi: 10.5281/zenodo.4155459.

[47] H. Susanto *et al.*, "The impacts of earnings volatility, net income and comprehensive income on share price: evidence from Indonesia stock exchange," *Accounting*, vol. 7, no. 5, pp. 1009–1016, 2021, doi: 10.5267/j.ac.2021.3.008.

[48] M. S. Shabbir *et al.*, "Closed-loop supply chain network design with sustainability and resiliency criteria," *Environ. Sci. Pollut. Res.*, 2021, doi: 10.1007/s11356-021-12980-0.

[49] Rusdiyanto, D. Agustia, S. Soetedjo, and D. F. Septiarini, "The effect of cash turnover and receivable turnover on profitability," *Opcion*, vol. 36, no. Special Edition 26, pp. 1417–1432, 2020.

[50] Rusdiyanto *et al.*, "The effect of earning per share, debt to equity ratio and return on assets on stock prices: Case study Indonesian," *Acad. Entrep. J.*, vol. 26, no. 2, pp. 1–10, 2020.

[51] I. G. Juanamasta *et al.*, "The role of customer service through customer relationship management (Crm) to increase customer loyalty and good image," *Int. J. Sci. Technol. Res.*, vol. 8, no. 10, pp. 2004–2007, 2019.

[52] S. P. Kothari, A. Leone, and C. Wasley, "Performance Matched Accruals Measures," *J. Account. Econ.*, vol. 39, no. May, pp. 163–197, 2005.

[53] J. J. Jones, "Earnings Management During Import Relief Investigations," *Jour nal Account. reserch*, vol. 29, no. 2, pp. 193–228, 1991.

[54] N. Aliyyah *et al.*, "What Affects Employee Performance Through Work Motivation?," *J. Manag. Inf. Decis. Sci.*, vol. 24, pp. 1–14, 2021, [Online]. Available: https://www.scopus.com/inward/record.uri?eid=2-s2.0-85110461420&partnerID=40&md5=4b5e50800f8866ccdd52682c4b5a73f4.

[55] B. Endarto *et al.*, "The Obligations Of Legal Consultants In The Independent Legal Diligence Of The Capital Market Supporting Proportion Of Legal Prepparement," *J. Leg. Ethical Regul. Issues*, vol. 24, no. Special Is, pp. 1–8, 2021.

[56] S. Abadi *et al.*, "Indonesian Desirious Finality Of The Community In Regard," *J. Leg. Ethical Regul. Issues*, vol. 24, no. Special Is, pp. 1–10, 2021.

[57] I. Prasetyo, N. Aliyyah, Rusdiyanto, N. Kalbuana, and A. S. Rochman, "Corporate Social Responsibility Practices In Islamic Studies In Indonesian," *J. Leg. Ethical Regul. Issues*, vol. 24, no. Special Is, pp. 1–15, 2021.

[58] S. Kamiya, Y. H. (Andy) Kim, and S. Park, "The face of risk: CEO facial masculinity and firm risk," *Eur. Financ. Manag.*, vol. 25, no. 2, pp. 239–270, 2018, doi: 10.1111/eufm.12175.

[59] T. Almor, O. Bazel-Shoham, and S. M. Lee, "The dual effect of board gender diversity on R&D investments," *Long Range Plann.*, no. May, p. 101884, 2020, doi: 10.1016/j.lrp.2019.05.004.

[60] A. B. Hernández-Lara, J. P. Gonzales-Bustos, and A. Alarcón-Alarcón, "Social sustainability on corporate boards: The effects of female family members on R&D," *Sustain.*, vol. 13, no. 4, pp. 1–13, 2021, doi: 10.3390/su13041982.

[61] D. Aoun and J. Hwang, "The effects of cash flow and size on the investment decisions of ICT firms: A dynamic approach," *Inf. Econ. policy*, vol. 20, no. 2, pp. 120–134, 2008.

[62] M. W. Nelson, J. A. Elliott, and R. L. Tarpley, "How are earnings managed? Examples from auditors," *Examples from Audit. (November 2002)*, 2002.

[63] Y. MARIADI, S. SUTRISNO, and R. ROSIDI, "MOTIVASI MANAJEMEN LABA DALAM KAPITALISASI BIAYA RISET DAN PENGEMBANGAN," *EL MUHASABA J. Akunt.*, vol. 3, no. 2, 2012.

[64] M. Suharli and A. Arisandi, "Pengaruh Pemilihan Metode Akuntansi Atas Biaya Research and Development (R&D) Terhadap Price Earnings Ratio (Studi Empirik Pada Perusahaan Sektor Industri Periode 2002-2005)," *J. Appl. Financ. Account.*, vol. 1, no. 2, pp. 368–390, 2009.