| **RESEARCH ARTICLE**

# The Effect of Size, Tangibility, Debt Maturity, and Foreign Ownership on Investment Efficiency by Family Ownership as Moderating Factor

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| **ABSTRACT**

This research aims to empirically prove some of the effects of size, tangibility, debt maturity, foreign ownership toward investment efficiency, and the effect of Moderation from foreignownership toward investment efficiency. This research is quantitative. Data is sourced from the financial statements of manufacturing companies listed on the Indonesia Stock Exchange from 2016 - 2020, with as many as 15 samples. The data analysis used Eviews. The result of theresearch has shown that size significantly affects investment efficiency. Meanwhile, tangibility, debt maturity, and foreign ownership have no effect on investment efficiency.

## 1. Introduction

Every company must always want to beadvanced and developed continuously; in orderto realize its plan, the company will not only depend on the ability of its resources but must also search from the outside of the company, including searching the financial resources sourced from the institution outside the company. There are two types of corporate funding, namely: debt financing andequity financing (Parrino et al., 2018; Titman et al., 2014; Kieso et al., 2020). Debt financing is atype of funding for companies in the form ofloans obtained from third parties, with the generalrisk being in the form of interest. Meanwhile, equity financing is another form of funding through the issuance of shares. The funding aspect is an important thing for the company, especially in managing cash flow (Parrino et al., 2018; Titman et al., 2014; Kieso et al., 2020).

The ideal company cash flow, in general, might generate positive cash value from the operating activities, which are supported by both the investment activities and the company funding. A healthy cash flow can enable the company to run a business, take advantage of opportunities, expand a business or make profitable investments and ultimately generate profit as the measure of management achievement. One of the considerations of the investor in making investment decisions is to look at the management performance in the past period as a consideration for their investment (Nathaniel & Butar Butar, 2019). Ilham (2021) explained the management performance, which may be seen from the corporate financial statement published by the company, as the realization of management responsibility to the stakeholders. However, the presented financial statement may provide biased information due to a conflict of interest as described in agency theory (Biddle et al., 2009; Roychowdhury et al., 2019).

In order to overcome the agency problems, the company places the family member as both the agent and the owner as well. With the existence of the owner and management, which are handled by the family, it is hoped the issues of the agencies could be minimized. However, in a company with a high family composition and also occupies a high managerial, new agency issues will emerge, namely asymmetry information between majority share ownership which is a family with minority share ownership. Such as some phenomena happened in 2019 and 2020 which hit several large companies in the country, including the case of PT

Jiwasraya, Jouska's investment. In the case of PT Jiwasraya (Farisa, 2020), it was explained that there were problems with PT Jiwasraya's payment failure for the investment products it sold and promised high returns on deposit interest. At maturity time, many investors are harmed because of the presentation of engineered financial statement information so that the management performance in managing investor funds looks promising. Likewise, PT Jouska Financial Indonesia, which seeks to provide financial solutions for its clients by allocating a number of funds for investment, acts as a financial planner and investment manager who manages shares owned by its clients. From here, the investors could take a lesson that the financial statement quality needs to be considered in determining the investment. In reviewing the relationship of financial ratios such as size, debt maturity, tangibility, and foreign ownership with investment efficiency, there are moderating factors. One factor that could be considered to become moderating variable is the composition of family ownership (*FO*) as a manifestation of the concentration of ownership (Amore et al., 2022).

This research purpose is to: (1) Produce evidence empirically in order to test the effect of Size against investment efficiency. (2) Produce evidence empirically in order to test the effect of Tangibility upon investment efficiency. (3). Produce evidence empirically in order to test the effect of *Debt Maturity* upon *investment efficiency*. (4) Produce evidence empirically in order to test the effect of *Foreign Ownership* upon *investment efficiency*. (5) Produce evidence empirically in order to test the moderating effect of family ownership on the effect of the size variable on the investment efficiency variable. (6) Produce evidence empirically in order to test the moderating effect of family ownership upon the effect of the Tangibility variable on investment efficiency. (7) Produce evidence empirically in order to test the moderating effect of family ownership upon the effect of the Debt Maturity variable on investment efficiency. (8) Produce evidence empirically in order to test the moderating effect of family ownership upon the effect of the Foreign Ownership variable on investment efficiency. Meanwhile, several contributions that could be expected from this research are; theoretical contributions and practical contributions.

## 2. Literature Review
Consumption plays a vital role in contributing to a large percentage of a country's economic output, wherein it analyzes the

### A. Agency Theory
*In agency Theory,* according to Sugiyanto et al. (2021), the management is the agent, and the capital owner is the principal of the "nexus of contract" cooperation contract. This contract contained the agreement which explained that the management of the company must work optimally to provide maximum decisions such as high profit to the capital owner. The agency problems emerge when the investor, as the principal, delegates the business management to the agent (Setiany & Wulandari, 2015).

According to Baker (2019) that the concept that describes the relationship between the grantor principal (contract) and the agent (the recipient of the contract), agency theory is a relationship between shareholders as principals whereas the management as the agent. The conclusion that can be drawn from some of the expert opinions above is that agency problems occur when the company leader as the principal wants to make tax payments efficient in order to gain profits by avoiding taxation related to differences in executive character and the number of assets.

### B. Signaling Theory
The signal theory, according to Brigham & Houston. (2014) is the company's action in giving signals to investors about the company's condition that can influence the decision-making. Signal theory discusses how the success or failure of management (agent) should be communicated to owners or investors (principal). Signal theory stressed the importance of information sent out by the company upon investment decisions by the outside parties of the company. The signal theory states that good companies will tend to signal their superiority to the market. On the other hand, the signal will make investors and other stakeholders increase the company value and then make a more advantageous decision for the company (Whiting & Miller, 2008).

### C. Investment Efficiency
Investment is a commitment or a number of funds or resources belonging to the entity that is carried out at this time for the purpose of obtaining a number of benefits in the future. Investment is the allocation or sacrifice of a number of funds that are currently carried out in the hope of gaining benefits in the future (Imania, 2020). Over-investment represents a condition in which the company's investment is higher than expected, while under-investment represents the opposite of over-investment, that is, the condition of the investment being made lower than expected previously. Overinvestment is the condition in which managers make investment decisions that are over the budgeted capacity of the funds for the investment, purchase investment products without ignoring whether the investment has a negative NPV, and prefer the poor performance investment (Butar Butar, 2019) Nathaniel and Butar Butar (2019) revealed that investment is one of the activities carried out by the company in order to develop and maximize the value of the company. In the perfect financial marketplace, the whole project of net par value (NPV) must fund and to be carried out. In a perfect financial market, all net present value (NPV) projects must be financed and executed.

### D. Family Ownership

According to Shahzad & Ehsan (2021), family companies have an important role in both the local and regional economies because they are able to provide permanent economic stability (F. Shahzad et al., 2017); Stein, 1989; Chen et al., 2008). In addition, Schmid et al. (2014) stated that companies with a family ownership system are more efficient than publicly owned companies since the supervision costs are smaller.

In a family business, family members depend economically on the others, and the business is strategically connected to the family relationship quality. It also combines a range of situations ranging from single-generation family companies to husband and wife, children, and nephews (Amore et al., 2022). Accompanied by strong kinship relationships and supported by good communication to run a family business (Hackman & Kramer, 2021)

### E. Size

The company size can be seen as small or big of the company, which is seen from the selling level, the number of workers, or the number of assets owned by the company (Macfarlane, 2002). Bigger the total assets, the more capital invested by the investors in the company. The company has a large total asset, showing that the company has obtained the stage of growth maturity where at this stage, the company's cash flow is positive and considered a good prospect in the relatively long term; in addition, it also reflects that the company is relatively more stable and more able to produce profit than the company with small assets total (Sulistiono et al., 2020).

The larger the company, the higher the investors' interest in investing its share compared to the small one. Since investors wish for a stable profit which is a large company generally has a stable profit than the small one. The company size is considered able to affect the company value since the larger the company's size or scale, the easier the company gains funding sources both internally and externally (Rudangga & Sudiarta, 2016).

### F. Debt Maturity

Debt maturity represents a policy carried out by the company in determining the maturity of the debt that the company will use (Nathaniel & Butar Butar, 2019). Regarding investment efficiency, debt maturity can be used to reduce the issue of overinvestment and underinvestment. When there is a positive NPV project, the company may finance it with short term debt and reduce the underinvestment problem since the debt will be liquidated in the short term, and profitability will be fully for the company. Debt maturity is a policy implemented by the company in choosing the debt payment timing which will be used by the company. The debt maturity timing is divided into two: short term debt maturity and long term debt maturity. Debt maturity is measured by the following ratio:

$$\text{Debt Maturity} = \frac{\text{Short term debt}}{\text{debt total}}$$

### G. Tangibility

Assets represent every resource and property owned by the company for use in its operations. A company generally has two types of assets that are current assets and fixed assets. Large or small fixed assets represent one of the company's considerations in making investments since investment requires large funds. Therefore, in the financial statement position on the asset side, the component of fixed assets is more dominant than current assets (Nathaniel & Butar Butar, 2019). According to Tran (2020), tangibility is all the resources and assets owned by the company to be used in its operations. Tangibility is to be measured by the ratio as follows:

$$\text{TANG} = \frac{\text{Total Tangible Fixed Assets}}{\text{Total Assets}}$$

### H. Foreign Ownership

Foreign ownership represents the proportion of the company's common share owned by individuals, legal entities, the government, and parts thereof with overseas status, or individuals, legal entities, and the government who are not from Indonesia. (Rahayu, 2020). Tran & Dang, 2021 declared that foreign investors might reduce opportunistic managerial behavior such as the extraction of personal profits and monitoring of the company in order to maximize the profit of the shareholder, which lowers the agency cost caused by managers' opportunistic behavior and, in turn, improves the company performance and the investment

efficiency. According to Nathaniel & Butar Butar (2019), foreign ownership is the amount of share ownership in a company owned by a foreign entity/institution/individual.

### 2.1 Framework of Thinking
The framework of thinking aims to answer specific problems rationally by flowing the way of thinking from the base of thought (premise) based on a benchmark of thought (postulates/assumptions/axioms) to the thought (the results of thinking/deductions/hypotheses) according to a logical framework (logical construct) (Apollo, 2007).

### 2.2 Hypothesis
This research aimed to determine and prove the hypothesis:
$H_1$: There is an effect of the size variable upon the investment efficiency variable.
$H_2$: There is an effect of tangibility upon the investment efficiency variable.
$H_3$: There is an effect of debt maturity upon the investment efficiency variable.
$H_4$: There is an effect of foreign ownership upon the investment efficiency variable.
$H_5$: There is a moderating effect of family ownership upon the effect of the Size variable on Investment Efficiency.
$H_6$: There is a moderating effect of the family ownership on the influence of the Tangibility variable on Investment Efficiency.
$H_7$: There is a moderating effect of the family ownership upon the influence of the debt maturity variable on Investment Efficiency.
$H_8$: There is a moderating effect of family ownership upon the influence of foreign ownership on investment efficiency.

## 3. Methodology
### 3.1. Research Design
This research used a quantitative method with an associative approach causal technic. The data used is secondary data type balanced panel data. The research data taken from the company financial report listed on the Indonesia Stock Exchange (IDX) contained annual reports of manufacturing companies from the period 2016 to 2020.

### 3.2. Theoretical Framework
### 3.2.1. Investment efficiency
The investment is a commitment to the number of funds or resources owned by an entity that is carried out at this time with the aim of obtaining a number of benefits in the future. The allocation or sacrifice of a number of funds that are currently carried out in the hope of gaining benefits in the future (Imania, 2020). Jannah (Rahmawati & Haryono, 2020) argues that a manager must be able to avoid the emergence of asymmetric information between stakeholders in order to facilitate his steps in making investment decisions and avoid the emergence of problems that often occur that is over-investment and under-investment so that it is referred to as efficient investment. Or with other words, efficient investment is the investment in the right projects that produce a positively high NPV.

### 3.2.2. Size
Company size represents an indicator that indicates the company's financial power. The larger the company, the higher the investors' interest in investing its share compared to the small one. Since investors wish for a stable profit, which is a large company generally has a stable profit than the small one (Sulistiono, 2010). The company size is considered able to affect the company value since the larger the company's size or scale, the easier the company gains funding sources both internally and externally (Rudangga & Sudiarta, 2016).

### 3.2.3. Tangibility
All the resources and assets that a company owns for use in its operations are called assets. A company generally has two types of assets that are current assets and fixed assets. Large or small fixed assets represent one of the company's considerations in making investments since investment requires large funds. Therefore, in the financial statement position on the asset side, the component of fixed assets is more dominant than current assets (Nathaniel & Butar Butar, 2019). According to Tran (2020), tangibility is all the resources and assets owned by the company to be used in its operations. Tangibility is to be measured by the ratio as follows:

$$TANG = \frac{Total\ Tangible\ Fixed\ Assets}{Total\ Assets}$$

### 3.2.4. Debt Maturity
In order to determine the debt maturity that will be used by the company, the company uses a debt maturity policy. (Nathaniel & Butar Butar, 2019). In reducing the problem of overinvestment and underinvestment, the companies can use investment efficiency, namely debt maturity. When there is a positive NPV project, the company may finance it with short term debt and

reduce the underinvestment problems since debt will be liquidated in a short time, and its profitability will be entirely for the company (Harahap et al., 2021). (Cherni, 2022) has conducted research on the impact of debt maturity upon leverage in the context of investment risk and liquidity; the result of the analysis shows that shortening the debt maturity may reduce underinvestment problems.
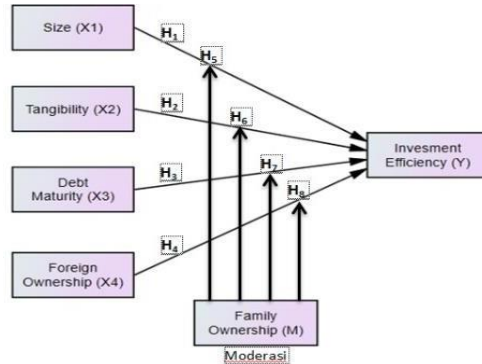
### 3.3. Conceptual Framework



**Figure 3. 1 Framework of Thought**

## 4. Results and Discussion
### 4.1 Results
### A. Research Object Description
The research object being researchedconsists of 15 manufacturing companies which islisted on the Indonesia Stock Exchange (IDX). These companies are not only listed on the IDX but are also family-owned companies. The data from the 15 companies were taken over a five-year period, from 2016 to 2020.

### B. Research Data Analysis
The data analysis technique in this research used descriptive statistical analysis and inferential statistics. The descriptive statistical analysis technique is used to describe research data obtained from secondary data from 15 manufacturing companies in the period 2016 to 2020, for the data analysis technique inferentially being conducted by using eviews program, in order to obtain the conclusion of hypothesis test results, which could be used as the consideration in formulating an investment strategy.

### C. Descriptive Statistics Analysis
From the results of the descriptive statistics, it canbe concluded as follows:

a) The variable of investment efficiency (INEF)has a minimum value of -0.6000000 owned by PT Pelangi Indah Canindo Tbk in 2020, with a maximum value of 0.574000 owned by PT Kirana Megatara Tbk in 2017.
b) The variable of size has a minimum value of25.18800, which is owned by PT Kedaung Indah Can Tbk in 2018, with a maximum value of 30.12500, which is owned by PT Kirana Megatara Tbk in 2017.
c) The variable of Tangibility (TANG) has a minimum value of 17.74700, which is ownedby PT Duta Pertiwi Nusantara Tbk, in 2018, with a maximum value of 209.5670 owned by PT Kedaung Indah Can Tbk, in 2016.
d) The variable of Debt Maturity (DEMA) has aminimum value of 2.727000, which is ownedby PT Duta Pertiwi Nusantara Tbk, in 2020, with a maximum value of 97.28600, which isowned by PT Voksel Electric Tbk, in 2017.
e) The variable of Foreign Ownership (FORO) has a minimum value of 5.050000, which is owned by PT Shoes Bata Tbk., in 2020, witha maximum value of 76.16000, which is owned by PT Pelangi Indah Canindo Tbk., in2016.

### D. Inferential Statistics Analysisa). Model Approach
In order to process panel data as in this research, so been conducted a trial model was made using a three-model approach, namely the CEM (Common Effect Model) model, the FEM (Fixed Effect Model) model, and the REM (Random Effect Model) model. The three modelsare as follows:

### 1. CEM (Common Effect Model)
The test results in table 4.2 show the results of the processing of the panel data regression test between size, tangibility, debt maturity, and foreign ownership toward family ownership with family ownership as a moderatorusing the common effect model.

### 2. FEM  (Fixed Effect Model)

The test results in table 4.3 show theresults of the processing of the panel data regression test between size, tangibility, debt maturity, and foreign ownership of family ownership with family ownership as moderating by using the Fixed effect model.

**Table 4.2 The Results of the Common EffectModel**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| C | -1.354199 | 0.607124 | -2.230513 | 0.0291 |
| SIZE | 0.042382 | 0.021411 | 1.979463 | 0.0519 |
| TANG | -0.001325 | 0.004358 | -0.303966 | 0.7621 |
| DEMA | 0.004638 | 0.003382 | 1.371309 | 0.1749 |
| FORO | -0.001255 | 0.004544 | -0.276256 | 0.7832 |
| FAMO*SIZE | 0.000209 | 0.000375 | 0.558720 | 0.5782 |
| FAMO*TANG | 4.83E-05 | 9.63E-05 | 0.501287 | 0.6178 |
| FAMO*DEMA | -0.000122 | 8.32E-05 | -1.461241 | 0.1487 |
| FAMO*FORO | -2.58E-05 | 0.000135 | -0.191012 | 0.8491 |
| R-squared | 0.121095 | Mean dependent var | | 0.016440 |
| Adjusted R-squared | 0.01461 | S.D. dependent var | | 0.196277 |
| S.E. of regression | 0.194843 | Akaike info criterion | | -0.321081 |
| Sum squared resid | 2.505605 | Schwarz criterion | | -0.042982 |
| Log likelihood | 21.04053 | Hannan-Quinn criter. | | -0.210039 |
| F-statistic | 1.136682 | Durbin-Watson stat | | 1.613725 |
| Prob(F-statistic) | 0.351009 | | | |

Source: Eviews 9 data processing results

I.

**Table 4.3 The Results of the Fixed Effect Model**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | Effects Specification | | |
| | | Cross-section fixed (dummy variables) | | |
| R-squared | 0.513364 | Mean dependent var | | 0.016440 |
| Adjusted R-squared | 0.307480 | S.D. dependent var | | 0.196277 |
| S.E. of regression | 0.163337 | Akaike info criterion | | -0.538908 |
| Sum squared resid | 1.387314 | Schwarz criterion | | 0.171788 |
| Log likelihood | 43.20905 | Hannan-Quinn criter. | | -0.255135 |
| F-statistic | 2.493459 | Durbin-Watson stat | | 1.646058 |
| Prob(F-statistic) | 0.003556 | | | |

Source: Eviews 9 data processing results

*3. REM (Random Effect Model)*

**Table 4.4 The Results of the Random Effect Model**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | Effects Specification | | |
| | | | S.D. | Rho |
| | | Cross-section random | 0.037936 | 0.0512 |
| | | Idiosyncratic random | 0.163337 | 0.9488 |
| | | Weighted Statistics | | |
| R-squared | 0.113056 | Mean dependent var | | 0.014590 |
| Adjusted R-squared | 0.005548 | S.D. dependent var | | 0.193050 |
| S.E. of regression | 0.192514 | Sum squared resid | | 2.446069 |
| F-statistic | 1.051605 | Durbin-Watson stat | | 1.642394 |
| Prob(F-statistic) | 0.407527 | | | |
| | | Unweighted Statistics | | |
| R-squared | 0.120174 | Mean dependent var | | 0.016440 |
| Sum squared resid | 2.508232 | Durbin-Watson stat | | 1.601689 |

Source: Eviews 9 data processing results

The test results in table 4.3 showthe results of the processing of the panel data regression test between size, tangibility, debt maturity, and foreign ownership of family ownership with family ownership as moderating by using the Fixed effect model.

*4) Panel Data Regression Models*

The estimation of the three modelsabove that is the Common Effect Model, Fixed Effect Model, and Random Effect Model, followed by the Chow test, Hausman test, and Langrange multiplier test, to choose the best model approach.

The Chow test is very useful in choosing thebest comparison model between the CommonEffect Model (CEM) and the Fixed Effect Model(FEM).

**H0** : Common Effect Model is accepted,Fixed Effect Model is rejected
**H1** : Fixed Effect Model is accepted, Common Effect Model is rejected

Chow test conditions:

- If the Cross Section Chi Square <0,05, then select  FEM model.
- If Cross Section Chi Square > 0.05,then select the CEM model

From the results of the Chow test above, table 4.5 can be seen that the Prob for the Chi-square Cross-Section has a value of 0.00001 < 0.05, so the model selected is the Fixed Effect Model (FEM); it can be concluded that the Fixed Effect Model is more appropriate than theCommon Effect Model. Because the Fixed EffectModel was selected, further testing is needed with the Hausman test.

In order to compare which of the RandomEffect Model (REM) and Fixed Effect Model(FEM) is the best model, the Hausman test is performed. The results of the hypothesis are as follows:

**H0** :   Random Effect Model is accepted,Fixed Effect Model is rejected.
**H1** :   Fixed Effect Model is accepted,  RandomEffect Model is rejected

Chow test conditions:

- If Cross Section Chi Square < 0.05,then choose the FEM model
- If Cross Section Chi Square > 0.05,
  then choose the REM model

**Table 4.5 The Results of the Chow Test**

| Effects Test | Statistic | d.f. | Prob. |
|---|---|---|---|
| Cross-section Faktor | 2.994024 | (14,52) | 0.0020 |
| Cross-section Chi-square | 44.337050 | 14 | 0.0001 |

Sumber: Hasil olah data Eviews 9

**Table 4.6 The Results of Hausman Testing**

| Test Summary | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob. |
|---|---|---|---|
| Cross-section random | 33.684773 | 8 | 0.0000 |

Sumber: Hasil olah data Eviews 9

The model chosen is the Fixed Effect Model (FEM) because the Cross-Section Chi-square has a value of 0.00000 < 0.05, then it can be concluded that the Fixed Effect Model is moreappropriate than the Random Effect Model. The panel data regression model selected is the Fixed Effect Model because the Chow test and Hausman test produce the same conclusion.

**Table 4.7 the Results of t h e Fixed Effect Model**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| | | Effects Specification | | |
| | | Cross-section fixed (dummy variables) | | |
| R-squared | 0.513364 | Mean dependent var | | 0.016440 |
| Adjusted R-squared | 0.307480 | S.D. dependent var | | 0.196277 |
| S.E. of regression | 0.163337 | Akaike info criterion | | -0.538908 |
| Sum squared resid | 1.387314 | Schwarz criterion | | 0.171788 |
| Log likelihood | 43.20905 | Hannan-Quinn criter. | | -0.255135 |
| F-statistic | 2.493459 | **Durbin-Watson stat** | | **1.646058** |
| Prob(F-statistic) | 0.003556 | | | |

Source: Eviews 9 data processing results

The classical assumption test is used totest whether the selected model, that is, the Fixed Effect Model (FEM), has good regression feasibility or not. A good regression model is onethat is free from violations of classical assumptions. A classical assumption test for panel data is still required to be done. In order to avoid the problem of heteroscedasticity and autocorrelation, it is done by giving weight to theselected model.

From the test results of table 4.7, the estimation of the Fixed Effect Model model, it can be seen in the output of the Fixed Effect model that the Durbin Watson value is 1.646058.There is an autocorrelation where (4-DW) > dU <DW 2.3539 >1.7390 < 1.646058, it should be du < 1.646058. So to improve the Durbin Watson value from the violation of the classical assumption of autocorrelation, it is carried out using a Cross Section Weighted model toproduce the following output:

**Table 4.8 The Results of the Weight FixedEffect Model**

| Effects Specification | | | |
|---|---|---|---|
| Cross-section fixed (dummy variables) | | | |
| Weighted Statistics | | | |
| R-squared | 0.918058 | Mean dependent var | -0.055127 |
| Adjusted R-squared | 0.883390 | S.D. dependent var | 0.492337 |
| S.E. of regression | 0.155443 | Sum squared resid | 1.256458 |
| F-statistic | 26.48159 | Durbin-Watson stat | 1.850130 |
| Prob(F-statistic) | 0.000000 | | |
| Unweighted Statistics | | | |
| R-squared | 0.500052 | Mean dependent var | 0.016440 |
| Sum squared resid | 1.425266 | **Durbin-Watson stat** | **1.823155** |

Sumber: Hasil olah data Eviews 9

From the test results of Table 4.8 Weight Fixed Effect Model, it can be seen in the output of the Fixed Effect model that Durbin Watson's value is 1.823155. There is no autocorrelation where (4-DW) > dU < DW 2.14998 >1.7390 < 1.850130. From the results ofthe improvement in the value of Durbin Watson, the classic assumption of autocorrelation was avoided.

In the panel data regression, to meet the BLUE (Best Linear Unbiased Estimation) assumption, the minimum classical assumption test must be multicollinearity, heteroscedasticity, and autocorrelation tests (Nurfauzi et al., 2019). According to (Ghozali, 2016), the multicollinearity test aims to test whether theregression model is found to have a correlation between independent (independent) variables. A good regression model should be multicollinearity free. From the test results in table 4.8, the relationship between independent variables is not > 0.8, which can be seen in the relationship between independent variables < 0.8 (Va Ind < 0.8), thenthere is no violation of multicollinearity.

### B. Hypothesis Test
Data processing with Eviews that the effect of the T test and F test no longer need to use a special formula because the results of T and F already exist in the output model. In the previous test, a Fixed Effect Model was determined, carried out with a Cross Section Weighted model to produce the right model to use in this research.

Table 4.9 The Results of the Weight Fixed Effect Model

| Effects Specification | | | |
|---|---|---|---|
| Cross-section fixed (dummy variables) | | | |
| Weighted Statistics | | | |
| R-squared | 0.918058 | Mean dependent var | -0.055127 |
| Adjusted R-squared | 0.883390 | S.D. dependent var | 0.492337 |
| S.E. of regression | 0.155443 | Sum squared resid | 1.256458 |
| F-statistic | 26.48159 | Durbin-Watson stat | 1.850130 |
| Prob(F-statistic) | 0.000000 | | |
| | | Unweighted Statistics | |
| R-squared | 0.500052 | Mean dependent var | 0.016440 |
| Sum squared resid | 1.425266 | **Durbin-Watson stat** | **1.823155** |

Source: Eviews 9 data processing results

Based on the results of the hypothesis test in table 4.9, several results can be obtained with the conclusion of the results as shown in Table 4.10.

## C. Discussion

### 1. The Effect of Size on Investment Efficiency

The result of the research proved that the size variable significantly affects the investment efficiency variable, while tangibility, debt maturity, and foreign ownership have no effect on investment efficiency. So that in formulating investment, the company can prioritize the consideration of company size. This is supported by the theory that the size of the company is measured by the level of sales, the number of employees, or the number of assets owned by the company, where the greater the total assets, the more capital the company has (Nguyen et al., 2020).

H1:     There is an effect of the Size variableon the Investment Efficiency variable.

### 2. The Effect of Tangibility on Investment Efficiency

The research results prove that the tangibility financial ratio does not affect investment efficiency. This means that the amount of tangibility in the financial ratios presented in the financial statements of 15 manufacturing companies listed on the Indonesia Stock Exchange in the 5-year period that has beencarried out in this study has not been able to become a benchmark for a company to makeefficient investments.

**Table 4.10 Results of Partial Hypothesis Testing**

| No. | Description | Prob | Result |
|---|---|---|---|
| 1 | Size takes a significant effect on investment efficiency | Significant | Accepted |
| 2 | Tangibility takes no significant effect on investment efficiency | Not significant | Rejected |
| 3 | Debt Maturity takes no significant effect on investmentefficiency | Not significant | Rejected |
| 4 | Debt Maturity takes nosignificant effect on investment efficiency | Not significant | Rejected |
| 5 | Family Ownership takes no significant effect on moderating size variable on investment efficiency | Not significant | Rejected |
| 6 | Family Ownership takes no significant effect on moderating the tangibility variable on investment efficiency | Not significant | Rejected |
| 7 | Family Ownership takes no significant effect on moderating the debt maturity on investment efficiency | Not significant | Rejected |
| 8 | Family Ownership takes no significant effect on moderating foreign ownership variables on investment efficiency | Not significant | Rejected |

H2:     There is an effect of Tangibility on theInvestment Efficiency variable.

### 3. The Effect of Debt Maturity on Investment Efficiency

The results of the research prove that the short term debt maturity financial ratio has no effect on investment efficiency. This means that the amount of debt maturity in the financial ratiospresented in the financial statements of 15 manufacturing companies listed on the IndonesiaStock Exchange in the 5-year period that hasbeen carried out in this research has not been able to become a benchmark for a company to make efficient investments. This shows that theresults of the regression analysis show that debt maturity and tangibility take a positive effect on investment efficiency. Regarding investment efficiency, debt maturity can be used to reduce the problem of overinvestment and underinvestment.

H3: There is an effect of Debt Maturity on the Investment Efficiency variable.

### 4. The Effect of Foreign Ownership onInvestment Efficiency

The results of the research prove that foreign ownership of shares takes no effect on investment efficiency. This means that the total value of shares owned by foreign parties presented in the financial statements of 15 manufacturing companies listed on the IndonesiaStock Exchange in the 5-year period that hasbeen carried out in this research has not been able to become a

benchmark for a company to make efficient investments.

Foreign ownership of shares has an important meaning in monitoring management because the presence of foreign ownership will reduce information asymmetry and will encourage more optimal supervision of management performance. Foreign investors have a more effective monitoring function than individual investors. This research is supported by research conducted by Tran (2020), which revealed that foreign ownership has a negative effect on investment efficiency. The results of this research are supported by research conducted by Imania (2020), which revealed that size has a positive and significant effect on investment efficiency.

H4: There is an effect of Foreign Ownership on the Investment Efficiency variable.

### 5. Moderation Effect of Family Ownership on Between Variable Size and Investment Efficiency.
The results of hypothesis testing indicate that family ownership cannot moderate the size of investment efficiency. This means that the level of family ownership in 15 manufacturing companies listed on the Indonesia Stock Exchange in the 5-year period that has been carried out in this research has not been able to affect the size of investment efficiency in a company.

H5: There is a moderating effect of Family Ownership on the effect of the Size variable on Investment Efficiency.

### 6. The Effect of Moderation on Family Ownership Between Tangibility Variables on Investment Efficiency
The results of hypothesis testing indicate that family ownership cannot moderate tangibility on investment efficiency. This means that the level of family ownership in 15 manufacturing companies listed on the Indonesia Stock Exchange in the 5-year period that has been carried out in this research has not been able to affect the size of investment efficiency in a company.

Nathaniel & Butar Butar (2019) shows that tangibility has a positive effect on investment efficiency. In this research, the financial ratio of tangibility not only has no effect on investment efficiency, but it also cannot moderate tangibility on investment efficiency.

H6: There is a moderating effect of Family Ownership on the effect of the Tangibility variable on Investment Efficiency.

### 7. The Effect of Moderation on Family Ownership on Debt Maturity Variables on Investment Efficiency.
The results of hypothesis testing indicate that family ownership cannot moderate debt maturity on investment efficiency. This means that the level of family ownership in 15 manufacturing companies which is listed on the Indonesia Stock Exchange in the 5-year period that has been carried out in this research has not been able to affect the debt maturity on investment efficiency in a company.

The study by Nathaniel & Butar Butar (2019) shows that debt maturity has a positive effect on investment efficiency. In this study, the financial ratio of debt maturity not only has no effect on investment efficiency it also cannot moderate the tangibility to investment efficiency.

H7: There is a moderating effect of Family Ownership on the effect of the Debt Maturity variable on Investment Efficiency.

### 8. Moderation Effect of Family Ownership on Foreign Ownership Variables on Investment Efficiency
The results of hypothesis testing show that family ownership cannot moderate foreign ownership on investment efficiency. This means that the level of family ownership in 15 manufacturing companies listed on the Indonesia Stock Exchange in the 5-year period that has been carried out in this research has not been able to affect the size of investment efficiency in a company. The results of this research are supported by research conducted by Tran (2020), which shows that foreign ownership has a positive effect on investment efficiency. In this study, the amount of foreign ownership not only has no effect on investment efficiency it also cannot moderate foreign ownership on investment efficiency.

H8: There is a moderating effect of Family Ownership on the effect of Foreign Ownership on Investment Efficiency.

### 5. Conclusions
This research is to identify the influence between variable s*ize, tangibility, debt maturity, and foreign ownership.* This research is to identify the effect of variable size, tangibility, debt maturity, and foreign ownership with the family ownership variable as moderating variable on the investment efficiency variable. The results of hypothesis testing in this research can be concluded as follows: 1). There is a significant influence between the Size variable and the Investment Efficiency variable, so hypothesis 1 is proven or accepted. 2). There is no significant effect between the Tangibility variable on the Investment Efficiency variable, so hypothesis 2 is

not sufficient evidence. 3). There is no significant effect between the Debt Maturity variable on the Investment Efficiency variable, so hypothesis 3 is not sufficient evidence. 4). There is no influence between the Foreign Ownership variable on the Investment Efficiency variable, so hypothesis 4 is not sufficient evidence. 5). There is no effect of the moderating variable of Family Ownership on theeffect of the variable Size on Investment Efficiency, so hypothesis 5 is not sufficient evidence. 6). There is no moderating effect of Family Ownership on the effect of the Tangibilityvariable on Investment Efficiency, so hypothesis 6 is not sufficient evidence. 7). There is no moderating effect of Family Ownership on the effect of the Debt Maturity variable on Investment Efficiency, so hypothesis 7 is notsufficient evidence. 8). There is no moderating effect of Family Ownership on the effect of the Foreign Ownership variable on Investment Efficiency, so hypothesis 8 is not sufficient evidence.

There are several limitations in this research that may hinder the steps of this research, including the collection of secondary data on manufacturing companies on the Stock Exchange in the period 2016 to 2020; as a company that has a family ownership relationship, it has limited access and limitations on the completeness of data according to theobservation category determined in the study. Besides that, the research period, which is only limited to 5 years, can also be one of the barriers to this research because it is to find out more about the more volatile data on family ownershipif the research period is longer than 5 years. And furthermore, this research only considers investment efficiency in terms of the value of thecompany's growth, while investment efficiency can still consider other variables that have not been used and have a large contribution, so they can be reconsidered for future research.

For companies, the source of funding is animportant aspect of managing cash flow. Thecompany can generate positive cash value from its operational activities, which are supported by investment and corporate funding activities. A healthy cash flow will be able to take opportunities to expand the business or make investments so that it will be able to attract investors and be able to take steps to prevent the occurrence of over/under-investment. For investors, lenders, and stakeholders to make decisions in carrying out investment activities, it is necessary to conduct a more detailed analysis, not only by looking at the balance sheet and loss statements in the financial statements presented by management but also looking at the notes to the financial statements which are an integral part of the financial statements as a whole. So that in retrieving the information contained in the financial statements may meet the criteria that the size of the companycan be used as a basis for making investment decisions. For further research, there are still research results that are not in line with this research, so the research theme on the effect of tangibility, debt maturity, and foreign ownership on investment is still needed to strengthen the theories that have been used in this study. And the existence of the gap in this research can still leave room for future discussion.

**Conflicts of Interest:** The authors declare no conflict of interest.
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## References

[1] Amore, M. D., Garofalo, O., & Guerra, A. (2022). How Leaders Influence (un)Ethical Behaviors Within Organizations: A Laboratory Experiment on Reporting Choices. *Journal of Business Ethics*. https://doi.org/10.1007/s10551-022-05088-z

[2] Baker, R. M. (2019). The Agency of the Principal-Agent Relationship: An Opportunity for HRD. *Advances in Developing Human Resources*, *21*(3). https://doi.org/10.1177/1523422319851274

[3] Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How Does Financial Reporting Quality Improve Investment Efficiency? *Journal of Accounting and Economics*, *12*`(1). https://doi.org/10.2139/ssrn.1146536

[4] Brigham, & Houston. (2014). *Dasar-Dasar Manajemen Keuangan.* Salemba Empat.

[5] Butar-Butar, S. (2019). Analisis Kritis Atas Kebijakan Revaluasi Aset Kementerian Keuangan Tahun 2015. *PRAXIS*, *1*(2). https://doi.org/10.24167/praxis.v1i2.1885

[6] Chen, S. X., Benet-Martínez, V., & Bond, M. H. (2008). (Chen, et al., 2008). *Journal of Personality*, *76*(4).

[7] Cherni, F. (2022). The Quality of Institutions on Capital Structure: Evidence from MENA Region. *Applied Mathematics and Information Sciences*, *16*(2). https://doi.org/10.18576/amis/160203

[8] Daito A. (2007). *Metodologi Penelitian Penyusunan Skripsi/Tesis/Disertasi*. Program Pascasarjana Universitas Padjajaran. Bandung

[9] Farisa, F. C. (2020). Suntikan Rp 22 Triliun untuk Jiwasraya yang Tuai Kritik. *Kompas.Com*. https://nasional.kompas.com/read/2020/10/05/07093001/suntikan-rp-22-triliun-untuk-jiwasraya-yang-tuai-kritik?page=all

[10] Ghozali, I. (2016). Aplikasi Analisis multivariete dengan program IBM SPSS 23 (Edisi 8). *Cetakan Ke VIII. Semarang: Badan Penerbit Universitas Diponegoro*, *96*.

[11] Hackman, J. v., & Kramer, K. L. (2021). Kin Ties and Market Integration in a Yucatec Mayan Village. *Social Sciences*, *10*(6). https://doi.org/10.3390/socsci10060216

[12] Harahap, A. R., Irfan, I., Mayasari, M., & Siregar, N. M. (2021). Determinan Audit Report Lag Dengan Auditor Spesialisasi Industri Sebagai Variabel Moderating Pada Perusahaan Go Public Sektor Pertambangan Terdaftar Di Bei Periode 2014-2018. *JURNAL MUTIARA AKUNTANSI*, *6*(2). https://doi.org/10.51544/jma.v6i2.1996

[13] Ilham, R. (2021). *Pengelolaan Data Potensi dan Peluang Investasi pada Kawasan Mandeh Berbasis SIG Web*. Universitas Negeri Padang.

[14] Imania, I. (2020). *Pengaruh Audit Firm Size Terhadap Client Investment Efficiency* [Unair]. https://repository.unair.ac.id/102130/

[15] Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2020). Intermediate Accounting IFRS. In *Jurnal Akuntansi & Auditing Indonesia* (4th ed., Issue 1). John Wiley & Sons, Limited.

[16] Macfarlane, P. (2002). Structuring and measuring the size of business markets. *International Journal of Market Research*, *44*(1). https://doi.org/10.1177/147078530204400105

[17] Nathaniel, A. S., & Butar Butar, S. (2019). Determinan Efisiensi Investasi Perusahaan Publik di Indonesia. *Jurnal Akuntansi Bisnis*, *17*(2). https://doi.org/10.24167/jab.v17i2.2341

[18] Nguyen, H. M., Giang Vuong, T. H., Nguyen, T. H., Wu, Y. C., & Wong, W. K. (2020). Sustainability of both pecking order and trade-off theories in Chinese manufacturing firms. *Sustainability (Switzerland)*, *12*(9). https://doi.org/10.3390/su12093883

[19] Nurfauzi, E. A., Nuryakin, C., & Putra, B. C. (2019). Firms Bunching Response to Indonesian Income Tax Threshold. *JEJAK*, *12*(1). https://doi.org/10.15294/jejak.v12i1.18678

[20] Parrino, Bates, Gillan, & Kidwell. (2018). Fundamentals of Corporate Finance, 4th Edition. In *Fundamentals of Corporate Finance*. John Wiley & Sons, Limited. https://books.google.co.id/books?id=bC7lwAEACAAJ

[21] Rahayu, Y. (2020). Characterization of Flexible Rectangular Slot Antenna for Medical Applications. *International Journal of Advanced Trends in Computer Science and Engineering*, *9*(1.5). https://doi.org/10.30534/ijatcse/2020/2791.52020

[22] Rahmawati, N. W., & Haryono, N. A. (2020). Analisis faktor yang memengaruhi financial management behavior dengan mediasi locus of control. *Jurnal Ilmu Manajemen*, *8*(2).

[23] Roychowdhury, S., Shroff, N., & Verdi, R. S. (2019). The effects of financial reporting and disclosure on corporate investment: A review. *Journal of Accounting and Economics*, *68*(2–3). https://doi.org/10.1016/j.jacceco.2019.101246

[24] Rudangga, & Sudiarta. (2016). Pengaruh ukuran perusahaan, leverage, dan profitabilitas terhadap nilai perusahaan. *E-Jurnal Manajemen*, *5*(7).

[25] Setiany, E., & Wulandari, A. (2015). Kualitas Pelaporan Keuangan dan Asimetri Informasi di Industri Manufaktur Indonesia. *Jurnal Bisnis Dan Ekonomi*, *6*(2).

[26] Shahzad, F., Xiu, G. Y., & Shahbaz, M. (2017). Organizational culture and innovation performance in Pakistan's software industry. *Technology in Society*, *51*. https://doi.org/10.1016/j.techsoc.2017.08.002

[27] Shahzad, M. A., & Ehsan, A. (2021). Islamic House Financing through Diminishing Musharakah: A Cheaper Solution. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3818106

[28] Stein, J. C. (1989). Efficient capital markets, inefficient firms: A model of myopic corporate behavior. *Quarterly Journal of Economics*, *104*(4). https://doi.org/10.2307/2937861

[29] Sugiyanto, S., Syafrizal, S., & … (2021). The Effect Of Income Persistency, Capital Structure And Tax Allocation Between Period Of Earning Quality With Company Size As Moderating Variables. *Proceedings* ….

[30] Sulistiono, D., Hermawan, A., & Sukmawati, A. (2020). The effect of empowerment and employee engagement on job satisfaction, organizational commitment and its impact on the performance of PTPN V. *Jurnal Manajemen Dan Agribisnis*. https://doi.org/10.17358/jma.16.3.142

[31] Titman, Keown, & Martin. (2014). *Financial management: principles and applications* (12th ed.). Pearson Education Limited.

[32] Tran, M. D., & Dang, N. H. (2021). The Impact of Ownership Structure on Earnings Management: The Case of Vietnam. *SAGE Open*, *11*(3). https://doi.org/10.1177/21582440211047248

[33] Whiting, R. H., & Miller, J. C. (2008). Voluntary disclosure of intellectual capital in New Zealand annual reports and the "hidden value." *Journal of Human Resource Costing & Accounting*, *12*(1). https://doi.org/10.1108/14013380810872725