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The Effect of Fama French Three Factor Model on Stock Return: Case Study of Insurance Companies Listed on the Indonesia Stock Exchange, 2017-2020

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Abstract:
This study aims to determine the Effect of the Fama French Three Factor Model on Stock Return (Case Study of Insurance Companies Listed on the Indonesia Stock Exchange in 2017-2020). The data used in this study is secondary data collected from as many as 16 companies. The sampling technique used is purposive sampling technique. The method used to analyze the relationship between the independent variable and the dependent variable is the panel data regression method. The results partially concluded that the stock beta has a positive and significant effect on stock returns in insurance companies on the Indonesia Stock Exchange, firm size has a positive and significant effect on stock returns on insurance companies on the Indonesia Stock Exchange, Book to market has a negative and significant effect on stock returns in insurance companies on the Indonesia Stock Exchange. Simultaneously, stock beta, firm size and book to market have no effect on stock returns in insurance companies on the Indonesia Stock Exchange.

Keywords: Stock beta, firm size, book to market, stock returns

1.Introduction

Return Share - One of the goals of investors investing is to get a return. According to Stevanie & Mindosa (2019), return is income expressed as a percentage of the initial investment capital. Investment income in this stock is the profit obtained from buying and selling shares, where if the profit is called capital gain and if it is a loss, it is called capital loss. Jogiyanto (2017) stated that stock returns are: 'return is yield and capital gain (lost)'.
- Yield, namely - cash flow that is paid periodically to shareholders (in the form of dividends),
- Capital Gain (loss), namely - the difference between the share price at the time of purchase and the share price at the time of sale.

1.1. Fama French Three Factor Model

Fama and French (1995), in Ervina (2021), suggest two other variables that affect the rate of return, namely - size (company size) and book to market ratio. This research is known as the Fama-French Three Factor Model. Size is seen from the market capitalization value of the stock which is the product of the stock price and the number of shares outstanding. Furthermore, according to Ervina (2021), in 2014, Fama-French added another variable that can affect the rate of return, namely - profitability and investment. This model is known as the Fama-French Five Factor Model. The results of this study found that the level of profitability is directly proportional to the return. As for investment, companies with high total assets will get low returns.

According to an empirical study, conducted by Trimech *et al* (2009), the relationship between stock returns and market risk premium factors, firm size, and book to market significantly depends on the object and period used. Therefore, additional variables are needed to enhance the strength of the Fama French Three Factor Model. Fama and French Three Factor Model research in Indonesia has been widely carried out.

1.1.1. Stock Beta

The beta of the stock indicates the risk that will be accepted by investors. The beta of this stock is an element of the market risk premium. According to Fahmi (2015), the market risk premium is the additional return to the risk-free interest rate required to compensate investors for the average amount of risk. In the stock market, the market risk premium can be said to be the minimum level of return required by investors to invest in the stock market. The higher is the beta, the higher does the stock price change. Therefore, investors ask for an additional return on the compensation for these shares. With a high return, it produces a high excess return as well.

Fawziah (2021), Sudiyatno and Irsyad (2015), Putri, Sasongko and Mulya (2021), in their research found that market beta had a significant effect on stock returns.

1.1.2. Firm Size (Company Size)

Firm size or company size is the scale of the company seen from the total assets of the company at the end of the year and total sales. Srimindarti (2018) states that company size can be assessed from several aspects. The size of the company size can be based on the total value of assets, total sales, market capitalization, number of workers and so on. The greater the value of these items is, the greater the size of the company is. According to Riyanto (2013), company size is the size of the company seen from the amount of equity value, sales value or asset value.

With the increasing demand for shares in companies with large capitalization, the stock price will increase causing the return obtained to also increase. With a high return, it will produce a high excess return as well. Fawziah (2021), in his research, found that firm size has no effect on stock returns. Sudiyatno and Irsat (2015), Hendra, Muhardi and Wijaya (2017) found that firm size has a negative effect on stock returns. Putri, Sasongko and Mulya (2021) found that firm size had a positive effect on stock returns.

1.1.3. Book to Market

Book to Market is a reflection of the appreciation or assessment of investors on the book value of a company through stock prices. Book to marketers, derived from the balance sheet, provides information about the net value of the company's resources. Book to market is the comparison between the book value per share and the market value of the shares. The book value per share reflects the value of the company and the value of the company is reflected in the value of its economic net worth. Fawziah (2021), in his research, found that the book-to-market ratio has no effect on stock returns. Sudiyatno and Irsat (2015), Putri, Sasongko and Mulya (2021), Hendra, Muhardi and Wijaya (2017) found that the book-to-market ratio had a negative effect on stock returns.

1.2. Conceptual Framework

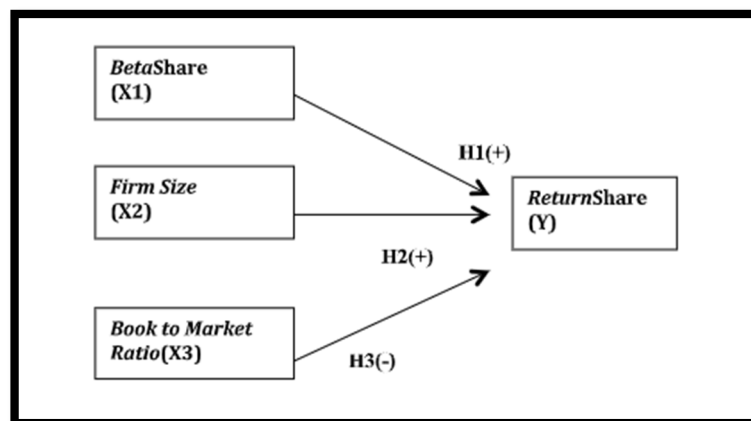Based on the explanation above, a conceptual framework can be described as shown below:

Figure 1: Conceptual Framework

2. Research Methods

2.1. Research Location and Object

The location of this research was carried out on insurance companies listed on the Indonesia Stock Exchange for the period 2017-2020 which were accessed through the website: www.idx.co.id; while the objects of this research are stock beta, firm size, market to book value and stock returns on insurance companies listed on the 2017-2020 BEI.

2.2. Population and Sample

The population in this study consists of 16 insurance companies listed on the Indonesia Stock Exchange. The sample in this study amounted to 16 companies.

2.3. Data Collection Technique

The data collection technique used in this research is the documentation technique. Documentation is the data used in this study obtained from www.idx.co.id. The data referred to is secondary data in the form of annual reports of insurance companies for the period 2017-2020. The data in this study were downloaded through the official website: www.idx.co.id.

2.4. Classic Assumption Test

The classical assumption tests used are: Normality, Heteroscedasticity, Multi-collinearity and Auto-correlation Tests using the E-views program.

2.5. Data Analysis Method

The estimation of an economic model is needed in order to be able to know the actual condition of an observed object. The models in question are as follows:

$RS_{it} = 0 + 1 BS_{it} + \beta_2 FS_{it} + 3 BM_{it} + e_{it}$

Where:
RS: Stock Return
0: Regression Coefficient
BS: *Beta Share*
FS: *Firm Size*
BM: *Book to market*
E: Bullying level

2.6. Panel Data Analysis

Analysis of the data used to solve the problem in this study is multiple regression analysis with the help of E-views. Panel data is a group of individual data that is studied over a period of time so that panel data provides information on the observations of each individual in the sample (Gujarati, 2012).

2.6.1. Model Selection Technique

To choose the best model among CEM, FEM and REM in the study, several tests were carried out. The several tests for selecting the panel data regression model are the Chow test and the Hausman test.

2.7. Hypothesis Test

Hypothesis testing conducted in this study was conducted to determine the effect of the independent variable on the dependent variable with the exchange rate as a moderating variable. This test consists of t-test (partial test) and F-test (simultaneous test).

2.8. Statistical Descriptive Analysis Research Results

The results of the statistical descriptive analysis can be seen in the table below:

	RS	BS	FS	BM
Mean	0.011406	0.139063	23.33984	15.56672
Median	0.055000	0.110000	23.10500	15.81000
Maximum	1.990000	1.0000000	27.85000	25.08000
Minimum	-10,000000	-0.980000	19.16000	4.980000
Std. Dev.	1.368691	0.421564	1.729223	5.121611
Observations	64	64	64	64

Table 1: Descriptive Statistics
Source: Data Processed, 2022

Based on Table 1 above, it can be explained related to the description of each variable as following:

- *Stock returns* have an average value frequency of 0.01 with a standard deviation of 1.36. In this case, the mean RS frequency is smaller than the standard deviation which indicates that the frequency data is a poor representation of the overall data and is not normally distributed. The highest value (maximum) RS is 1.99 and the lowest value is -10 with 64 observations.
- *Stock beta* has an average value frequency of 0.13 with a standard deviation value of 0.42. In this case, the mean frequency of BS is smaller than the standard deviation which indicates that the frequency data is a poor representation of the overall data and is not normally distributed. The highest value (maximum) of BS is 1.00 and the lowest value is -0.98 with 64 observations.
- *Firm Size* has an average value frequency of 0.01 with a standard deviation value of 23.33. In this case, the mean FS frequency is smaller than the standard deviation which indicates that the frequency data is a poor representation of the overall data and is not normally distributed. The highest value (maximum) of FS is 27.85 and the lowest value is 19.16 with 64 observations.

- *Book to market* has an average value frequency of 15.56 with a standard deviation of 5.12. In this case, the mean frequency of BM is greater than the standard deviation which indicates that the frequency data is a good representative of the overall data and is normally distributed. The highest value (maximum) of BM is 25.08 and the lowest is 4.98 with 64 observations.

2.8.1. Correlation Analysis

Correlation analysis is a useful step to see how the independent variable is related to the dependent variable. The results of the correlation analysis test in this study can be seen in the table below:

Correlation t-Statistics				
Probability	**RS**	**BS**	**FS**	**BM**
RS	1.0000000			

BS	0.037881	1.0000000		
	0.298488	-----		
FS	-0.178812	0.205081	1.0000000	
	-1.431028	1.649879	-----	
BM	-0.207395	0.098814	0.056683	1.0000000
	-1.669323	0.781893	0.447044	-----

Table 2: Correlation Analysis Results

Based on Table 2 above, it shows that the stock beta variable, which is shortened to BS, has a positive and insignificant relationship with stock returns with a correlation value of 0.03. Furthermore, firm size, which is abbreviated as FS, has a positive and insignificant relationship with stock returns with a correlation value of -0.17 and book to market, which is abbreviated as BM, has a negative and insignificant relationship with stock returns with a correlation value of -0.20.

2.9. Panel Data Regression Selection Technique

There are three models in panel data regression, namely - Common Effect Model (CEM) or Pooled Least Square, Fixed Effect Model (FEM) and Random Effect Model (REM). The results of testing the three models are as follows:

Variable	*CEM*		*FEM*		*BRAKE*	
	Coefficient	**Sig**	**Coefficient**	**Sig**	**Coefficient**	**Sig**
C	4.279	0.076	-4.748	-0.204	4.223	0.059
BS	0.313	0.449	0.985	0.033	-0.321	0.401
FS	-0.147	0.145	0.331	0.061	-0.145	0.123
BM	-0.055	0.102	0.199	0.011	0.055	0.077

Table 3: Test Results of the Three Models
Source: Research Results (2022)

Based on Table 3 above, it can be seen that all values of coefficients and significance for the panel data regression model are based on the common effect model (CEM), fixed effect model (FEM) and Random Effect Model (REM) in this study.

Of the three models, this study uses the Fixed Effect Model because the probability value of the Chow test and Hausman test is below 0.05. The following is the result of the chow test and is a test that compares the CEM model and the FEM model. The chow test table in this study is as follows:

Effects Test	Statistics	df	Prob.
Cross-section F	1.727615	(15.45)	0.0794
Cross-section Chi-square	29.107750	15	0.0156

Table 4: Chow Test Results
Source: Research Results (2022)

Based on Table 4 above, it can be seen that the probability value of line C*hi Square* is 0.01. This value is below 0.05. Based on the Chow test, the best model in this study is the Fixed Effect Model (FEM); so, it is necessary to test to see between the Fixed Effect Model (FEM) and the Random Effect Model. The results of the Hausman test in this study are as follows:

Test Summary	Chi-Sq. Statistics	Chi-Sq. df	Prob.
Random cross-section	13.497520	3	0.0037

Table 5: Hausman Test Results
Source: Research Results (2022)

Based on Table 5 above, it can be seen that the probability value is 0.003. This value is below the error rate value of 0.05. Based on the Hausman test, the best model in this study is the fixed effect model (FEM). So, this research uses Fixed Effect Model (FEM).

2.9.1. Classic Assumption Test
The stages of the test results in the classical assumption test are as follows:

2.9.2. Normality Test
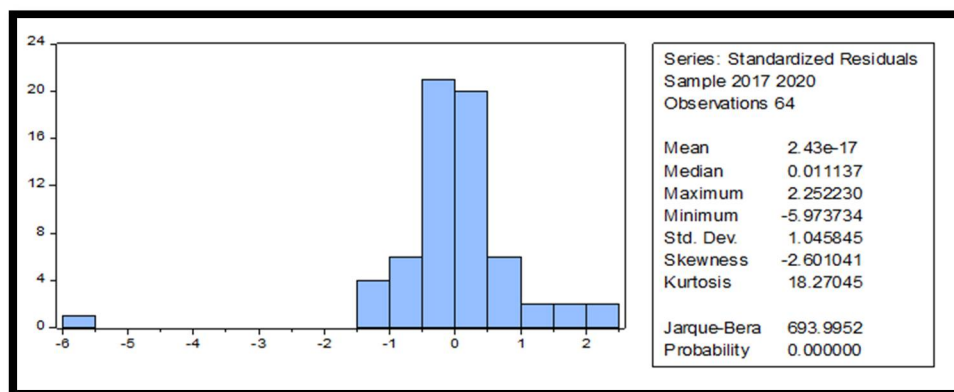The results of the Jarque-Bera test for normality testing can be seen as follows:

Figure 2: Normality Test Results
Source: E-views Results, Processed Data (2022)

Based on Figure 2 above, it can be seen that the Jarque Bera value is 693.9952 with a probability value of 0.0000. The Chi Square table value in this study by calculating df = 3 at a significance level of 5% produces a figure of 7.81. Therefore, the Jarque Bera value is greater than the Chi Square table value and the probability value is below 0.05; so, it can be concluded that the data in this study are not normally distributed. However, the type of data used in this study is panel data where the cross section has different data trends so that the problem of normality can be ignored (Gujarati, 2012).

2.9.3. Multi-collinearity Test
The results of the multi-collinearity test are shown in Table 6 below:

Variable	RS	BS	FS	BM
RS	1.0000000			

BS	0.037881	1.0000000		
	0.298488	-----		
FS	-0.178812	0.205081	1.0000000	
	-1.431028	1.649879	-----	
BM	-0.207395	0.098814	0.056683	1.0000000
	-1.669323	0.781893	0.447044	-----

Table 6: Multi-collinearity Test Results

The results of the multi-collinearity test can be seen based on the correlation test. The table above shows that this model is free from the problem of multi-collinearity correlation below 0.8. BS has a correlation of 0.03 < 0.8, FS has a correlation of -0.17 < 0.8 and BM has a correlation of -0.20 < 0.8.

2.9.4. Auto-correlation Test
Testing is done by looking at the value of Durbin Watson. The results of the auto-correlation test are shown in Table 7 below:

Durbin – Watson Stat	1,561

Table 7: Auto-correlation Test

The results of the output E-views show that the Durbin Watson value is 1.561 because the dw value is between -2 and +2. In this study, it is concluded that there are no interfering errors between time series.

2.9.5. Heteroscedasticity Test
The results of the heteroscedasticity test can be seen in Table 8 below:

| F-statistics | 0.010187 | Prob. F(1.61) | 0.9199 |
| Obs*R-squared | 0.010519 | Prob. Chi-Square(1) | 0.9183 |

Table 8: Heteroscedasticity Test Results

The results of Table 8 above show that in this study there was no interference error between one observation and another observation. This can be seen from the results of statistical testing, namely by comparing the values of obs* R-square and 2 tables. The estimation results of the heteroscedasticity test are 0.01 and the value of 2 table with a degree of confidence of 5% and df (3) is 7.81 because the value of Obs*R-squared is 0.01 < 7.81; it can be concluded that the above model passes heteroscedasticity. This can be seen from the Chi-Squared probability of 0.918 which is greater than 0.05.

2.10. Fixed Effect Model Results

The results of the Fixed Effect Model panel data regression are as follows:

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	-4.748906	3.686590	-1.288157	0.2043
BS	0.985327	0.448214	2.198342	0.0331
FS	0.331384	0.172770	1.918064	0.0615
BM	-0.199860	0.075480	-2.647871	0.0111
R-squared	0.416119			
Adjusted R-squared	0.182567			
F-statistics	1.781698			
Prob(F-statistic)	0.059243			
Durbin-Watson stat	2.134585			

Table 9: Panel Data Regression Equation (Fixed Effect Models)

Based on Table 9 above, the regression equations that can be arranged in this study are as follows:
Stock Return = -4.748+ 0.985 BS + 0.331 FS - 0.199 BM
Based on the above equation, it shows that the constant value is -.748, meaning that if BS, FS and BM are considered constant (value 0), then RS has a fixed value of -4.748. Therefore, the results of the panel data regression interpretation can be explained as follows:

- *Beta* the stock has a value of 0.985 to stock returns, meaning that there is a positive relationship (unidirectional) that is, every 1% increase in stock beta causes stock returns to increase by 1%.
- *Firm size* having a value of 0.331 on stock returns means that there is a positive relationship (unidirectional) that is, every 1% increase in firm size causes stock returns to increase by 1%.
- *Book to market* has a value of -0.199 on stock returns, meaning that there is a negative relationship (not unidirectional), that is, every 1% increase in book to market causes stock returns to decrease by 1%.

3. Hypothesis Testing Results and Discussion

3.1. F Test (Simultaneous Test)

Based on Table 9, it can be seen that the calculated F is 1.781 < F table 2.758 at a = 0.05 which means that F count < F table, then the hypothesis rejected. Therefore, simultaneously the independent variables, namely - BS, FS and BM, have no effect on RS in insurance companies on the Indonesia Stock Exchange.

3.2. t test (Partial)

3.2.1. The Effect of Stock Beta on Stock Return

Based on the test results using the E-views 10 application, it is known that the t-count value of the stock beta is 2.198 with a probability of 0.03. The probability value is classified as significant below 0.05. In other words, H1 in this study is acceptable, meaning that stock beta has a positive and significant effect on stock returns in insurance companies on the Indonesia Stock Exchange. The results of the study are in line with research conducted by Fawziah (2021), Sudiyatno and Irsyad (2015), Putri, Sasongko and Mulya (2021), in their research finding that market beta has a significant effect on stock returns.

The results of this study indicate that a company, that has a high level of market risk, means that its share price follows the activities that occur in the stock market. The higher is the beta, the higher does the stock price change. Therefore, investors ask for an additional return on the compensation for these shares. With a high return, it produces a high excess return as well.

3.2.2. Effect of Firm Size on Stock Return

Based on the test results using the E-views10 application, it is known that the t-count value of the stock beta is 1.918 with a probability of 0.06. The probability value is classified as significant below 0.1. In other words, H2 in this study is acceptable, meaning that firm size has a positive and significant effect on stock returns in insurance companies on the Indonesia Stock Exchange. The results of this study are in line with the research of Putri, Sasongko and Mulya (2021), who

found that firm size had a positive effect on stock returns. However, the results of this study are not in line with Fawziah (2021), who, in his research, found that firm size had no effect on stock returns. Sudiyatno and Irsat (2015), Hendra, Muhardi and Wijaya (2017) found that firm size has a negative effect on stock returns.

The results of this study indicate that companies with large capitalization values tend to have low risk. This is because large companies tend to have better control over market conditions, so they are better able to face economic competition. Hence, investors are more confident to invest their funds in companies that have a large capitalization value. With the increasing demand for shares in companies with large capitalization, the stock price will increase causing the return obtained to also increase. With a high return, it will produce a high excess return as well.

3.2.3. Effect of Book to Market on Stock Return

Based on the test results using the E-views10 application, it is known that the t-count value from book to market is 2.647 with a probability of 0.01. The probability value is classified as significant below 0.05. In other words, H3, in this study, is acceptable, meaning that book to market has a negative and significant effect on stock returns in insurance companies on the Indonesia Stock Exchange. The results of the study are in line with research conducted by Sudiyatno and Irsat (2015), Putri, Sasongko and Mulya (2021), Hendra, Muhardi and Wijaya (2017) who found that the book-to-market ratio has a negative effect on stock returns.

The results of this study indicate that the book to market ratio is used to see the company's ability to create firm value relative to the amount of capital invested. Companies that have a high book to market ratio value indicate that the company is experiencing distress and undervaluation. Thus, investors are reluctant to buy shares of companies that have a high B/M ratio.

A high B/M value indicates that investors are pessimistic about the company so that the market value is lower than the book value. With a high B/M value, the company is undervalued. With a pessimistic view of investors towards the company, it makes investors reluctant to buy shares of the company. Thus, the stock price will decrease due to the lack of demand from investors which will make returns and excess returns decrease.

4. Conclusions and Recommendations

4.1. Conclusion

Based on the discussion that has been described, it can be concluded that:
- Partially *beta stock* has a positive and significant effect on stock returns in insurance companies listed on the Indonesia Stock Exchange Year 2017-2020.
- Partially *firm size* has a positive and significant effect on stock returns in insurance companies listed on the Indonesia Stock Exchange Year 2017-2020.
- Partially *Book to market* has a negative and significant effect on stock returns in insurance companies listed on the Indonesia Stock Exchange Year 2017-2020.
- Simultaneously beta stock, *firm size* and *book to market* have no effect on stock returns in insurance companies listed on the Indonesia Stock Exchange Year 2017-2020.

5. Suggestion

Based on the research results and conclusions, what can be suggested for insurance companies are:
- For the management of insurance companies in Indonesia to prioritize book to market results in running their companies; this is because in this study it was found that Book to market had a negative effect which had an impact on decreasing stock returns.
- For academics to explore more about the development of FAMA and French three factor models.
- Suggestions for other researchers to add other variables to see stock returns for the sake of perfection in the next research.

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