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Analysis of the Fama French Five Factors Model on SRI-KEHATI Stock Return During the Pre-Pandemic, Pandemic, and Post-Pandemic Periods

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ABSTRACT

The appearance of the COVID-19 pandemic at the edge of 2019 created uncertainty and economic pressure in all countries, including Indonesia. The stock market was afflicted by COVID-19, as shown by the dynamics of the stock market before, during, also after the pandemic. The long-term performance of the IDX Composite Index from 2018 to 2024 grew positively by 13%, while the SRI-KEHATI index grew negatively by 3,46%. The performance of the SRI-KEHATI index shows a discrepancy with the investment objective, which is to obtain profits in the future. This study goals to govern whether stock returns of issuers drafted on the SRI-KEHATI index amidst the pre-pandemic, pandemic, also post-pandemic periods are impacted by the market risk premium, size (SMB), book to market equity (HML), profitability (RMW), also investment (CMA) factors. The research used all issuers written on the SRI-KEHATI index from the total population as samples using purposive sampling techniques. The data were inspected utilizing the Fama-MacBeth Regression method with the assistance of StataMP 7. The study's outcomes reveal that there is no effect from the market risk premium, SMB, HML, and RMW factors on stock returns across the three research periods. Meanwhile, the CMA factor has no significant effect at the pre-pandemic and pandemic periods, but possesses a positive and significant effect at the post-pandemic period.

Keywords: Market Risk Premium; Size (SMB); Book to Market Equity (HML); Profitability (RMW); Investment (CMA).

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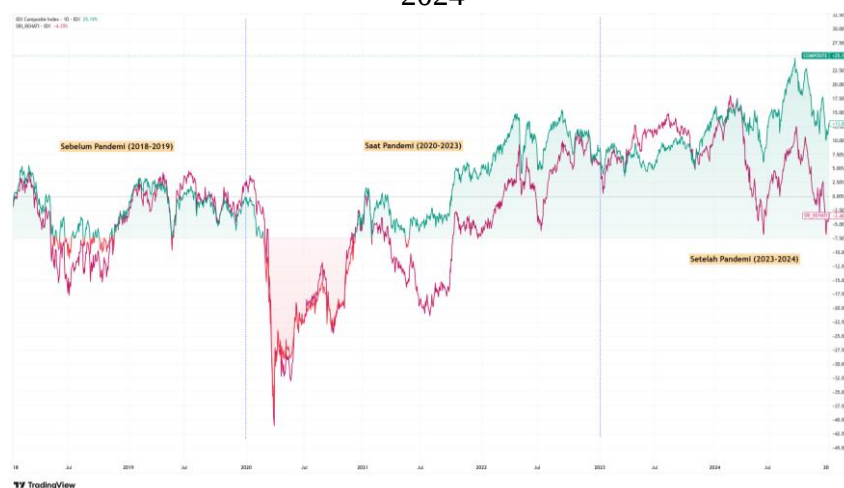
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INTRODUCTION

The number of investors in Indonesia grew significantly between 2020 and 2022. This is unique or unusual because during this period, the COVID-19 outbreak was spreading in various countries. The outbreak was reported a pandemic on March 11, 2020 (World Health Organization, 2020). The global economy, including Indonesia, was under pressure and uncertainty due to this pandemic. According to an article from Directorate General of State Assets (2023), the uncertainty owing to the COVID-19 pandemic prompted companies to cut revenues and conduct mass layoffs, causing people to become more selective in their spending. As an outcome, demand for goods and services declined, taking to a drop in company revenues and pressure on stock prices, which was reflected in a decline in the Indonesia Composite Index (IDX Composite Index).

Figure 1. Movement of the Indonesia Composite Index and the SRI-KEHATI Index 2018-2024



Source: TradingView, 2025

Based on data from TradingView (2025), the Indonesia Composite Index (IDX Composite Index) undergone a nosedive in the first quarter of 2020 due to market panic following the global spread of COVID-19, which caused the IHSG to fall by 27,95 percent from 6.299,54 to 4.538,93. Previously, the IDX Composite Index had been in a consolidation phase from 2018 to 2019. As the pandemic subsided, the IDX Composite Index showed a consistent recovery trend from the second quarter of 2020 to the end of 2022, closing at 6.850,6191, surpassing its pre-crisis position. However, from January 2023 to December 2024, the IDX Composite Index tended to stagnate with a limited increase of 267,09 points or 3,9 percent. The IDX Composite Index's long-term performance from 2018 to 2024 showed positive growth of 13 percent. The movement of the SRI-KEHATI index was not much distinguish from the IDX Composite Index in the 2018 to 2022 period. However, in the 2023 to 2024 period, the SRI-KEHATI index recorded negative growth. Unlike the IDX Composite Index, the long-term performance of the SRI-KEHATI index from 2018 to 2024 actually shows negative growth of -3,46 percent.

Based on the phenomenon of the difference in performance between the SRI-KEHATI index and the IDX Composite Index, it could be observed that the rate of return is not the only fundamental aspect of stock investment. According to Rochmah (2020), there are two

fundamental aspects that are always inherent in stock investment, namely return and risk. There are many models that are often utilized to inspect the risk of an asset by considering the correlation among the risk and the expected return, for instance the Capital Asset Pricing Model (CAPM), Arbitrage Pricing Theory (APT), also Fama French Three Factors Model, as well as the Five Factors Model.

Research on the CAPM model, APT model, and Fama French Three Factors Model and Five Factors Model has been conducted extensively. A study conducted by Putra and Susanti (2019) revealed that the five factor model is finer at elaborating returns when compared to the three factor model. Research from Istiqomah and Junarsin (2022) also states that the five factor model possess the biggest accuracy compared to CAPM, the 3-factor model, also the 4-factor model in forecasting stock returns. More specific research on the Fama French Five Factors Model has also been conducted, such as research by Yuliyana and Sembiring (2021) and Darma and Lestari (2022), which states that partially, market factors, size proxied by Small Minus Big (SMB), and value substituted by High Minus Low (HML) have a positive effect to excess return. The profitability factor proxied by Robust Minus Weakness (RMW) possesses a negative effect to excess return, while the investment factor acted for by Conservative Minus Aggressive (CMA) does not affect excess return. Then, research by Dewanto and Sumiati (2022) revealed that market excess return (MKT), book to market (HML), profitability (RMW), also investment pattern (CMA) possess a positive effect on stock returns, while size (SMB) possesses a negative effect on stock returns. Then, a study operated by Sholihati and Sunarsih (2023) revealed that risk premium affects excess return, whilst size, profitability, also investment do not affect excess return both before and after the declaration of COVID-19. The book-to-market ratio factor does not affect excess return before the disclosure of COVID-19, but it significantly affects excess return after the pronouncement of COVID-19. This differs from the study by Dewi and Komara (2024), which shows that market factors affect excess returns, whilst size (SMB), value (HML), profitability (RMW), also investment (CMA) do not affect excess returns. The research by Sitanggang and Rizkianto (2024) reveals different research results, where the size, profitability, value, investment, and market risk premium factors are not significant on affecting excess returns.

LITERATURE REVIEW

Asset Pricing

The decision to invest and how to efficiently allocate capital into financial assets are important matters that every investor around the world needs to decide. This is the bedrock for the importance of asset pricing on financial economics literature (Thalassinou, Khan, Ahmed, Zada, and Ihsan, 2023). Asset pricing was first developed by Harry Markowitz in 1952.

Mean Variance Model

There were three basic assumptions that underlay Markowitz's thinking at that time. First, investors would choose assets based on the mean variance maximizer aspect, in this case emphasizing efforts to maximize returns (mean) and minimize risk (variance). The second assumption was that investors would not consider the past performance of an asset when choosing it. Third, investment is always linear between risk and return. Markowitz's theory will only result in asset pricing if these three assumptions are met (Sumarto, 2016). Markowitz's theory is commonly termed as the mean-variance method (Dewanto and Sumiati, 2022).

Capital Asset Pricing Model

The Capital Asset Pricing Model was proposed by William Sharpe (1964) derived from the portfolio theory of Markowitz. The Capital Asset Pricing Model is a model that could simply elucidate the reality of a complex market (Adnyana, 2020). The Capital Asset Pricing Model is a model for assessing or regulating the price of an asset by considering the characteristics or risks of that asset. The Capital Asset Pricing Model serves to calculate the risk of an ineffective portfolio in the capital market, signified as β (beta).

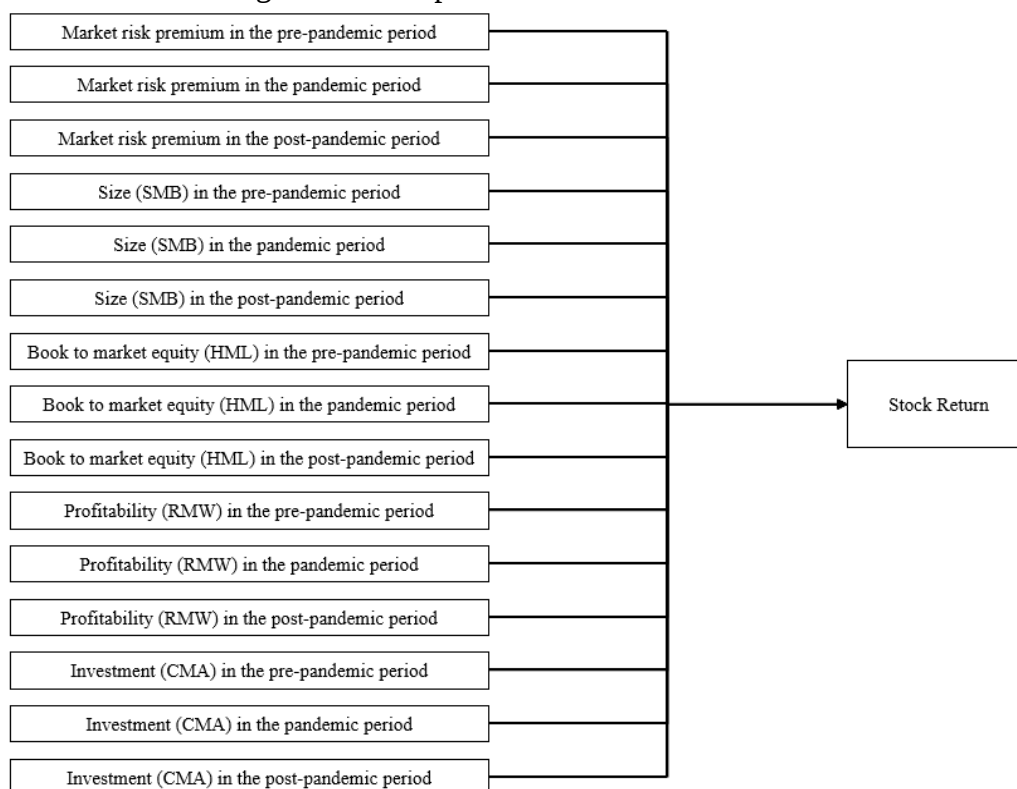
Fama French Three Factor Model

Eugene F. Fama and Kenneth R. French (1993) outlined a three factor model to ensnare the relationship among average return and size (market capitalization, price times shares outstanding) and the relationship amidst average return and price ratios for instance B/M. This three-factor model was drafted to further explain patterns not explained by the CAPM introduced by Sharpe (1964) and Lintner (1965).

Fama French Five Factor Model

Fama and French (2015) revisited their research on asset pricing models and produced the Fama French Five Factors Model by involving two factors, namely profitability and investment. Their research unfolds that the Fama French Five Factors Model is more capable at interpreting average returns than the Fama French Three Factors Model because the five-factor model is competent to elucidate around 71 percent to 94 percent of the total variance that occurs in the expected return of stocks in a portfolio formed derived from size, book-to-market ratio (B/M), profitability, also investment.

Figure 2. Conceptual Framework



Hypothesis:

- H1 : Market Risk Premium has a positive effect on stock return in the pre-pandemic period.
H2 : Market Risk Premium has a positive effect on stock return in pandemic period
H3 : Market Risk Premium has a positive effect on stock return in the post-pandemic period.
H4 : Size proxied by Small Minus Big has a positive effect on stock return in the pre-pandemic period.
H5 : Size proxied by Small Minus Big has a positive effect on stock return in the pandemic period.
H6 : Size proxied by Small Minus Big has a positive effect on stock return in the post-pandemic period.
H7 : Book to market equity proxied by High Minus Low has a positive effect on stock return in the pre-pandemic period.
H8 : Book to market equity proxied by High Minus Low has a positive effect on stock return in the pandemic period.
H9 : Book to market equity proxied by High Minus Low has a positive effect on stock return in the post-pandemic period.
H10 : Profitability proxied by Robust Minus Weakness has a positive effect on stock return in the pre-pandemic period.
H11 : Profitability proxied by Robust Minus Weakness has a positive effect on stock return in the pandemic period.
H12 : Profitability proxied by Robust Minus Weakness has a positive effect on stock return in the post-pandemic period.
H13 : Investment proxied by Conservative Minus Aggressive has a positive effect on stock return in the pre-pandemic period.
H14 : Investment proxied by Conservative Minus Aggressive has a positive effect on stock return in the pandemic period.
H15 : Investment proxied by Conservative Minus Aggressive has a positive effect on stock return in the post-pandemic period.

METHOD

Time and Place of Research

This research was constructed using secondary data from companies listed on the Indonesia Stock Exchange (IDX) from 2018 to 2024. The data was obtained from the official websites of each company and the official website of the Indonesia Stock Exchange. This research was operated from October 2024 to August 2025.

Research Design

This research is a quantitative descriptive study and a causality study. As reported by Sugiyono (2013), quantitative research is a research method derived from the philosophy of positivism and is employed to study a particular population or sample. Causality research is utilized to exposed the cause-and-effect relationship among the variables of market risk premium, size (SMB), book to market equity (HML), profitability (RMW), also investment (CMA) on stock return.

Definition and Operationalization of Variable

1. Stock Return

The dependent variable in this study is stock return after deducting free risk return. According to Hidajat (2018), stock return is the profit earned by investors from stock ownership, consisting of dividends, capital gains, and capital losses. However, not all companies distribute dividends periodically. Therefore, this study uses capital gains and capital losses in calculating stock returns.

2. Market Risk Premium

The Market Risk Premium variable is the additional return upon the risk free rate needed to indemnify investors for taking on average risk (Brigham and Houston, 2015). The market return utilized in this study is the quarterly return of the index that is the object of the study, in this case the SRI-KEHATI index. The risk free return used in this study is the Indonesia 1 Year Bond.

3. Size

Small Minus Big is the return on a divergent portfolio of small stocks minus the return on a disparate portfolio of large stocks. Large and small stocks describe firm size, which can be obtained by calculating the stock price compounded by the number of shares issued (Dewanto and Sumiati, 2022).

4. Book to Market Equity

High Minus Low is the deviation among the portfolio return of stocks with high book to market equity and stocks with low book to market equity. Book to market equity is obtained by dividing total equity by market capitalization (Buditomo, Candra, and Soetanto, 2024).

5. Profitability

Robust Minus Weakness is the deviation in portfolio returns amidst stocks with strong profitability and stocks with weak profitability. Fama and French (2015) utilize Operating Profit to measure profitability by subtracting cost of goods sold, sales, general, administrative expenses, also interest expenses from revenue, then dividing by book equity. This study uses Operating Profit to measure profitability.

6. Investment

Conservative Minus Aggressive is the difference in portfolio returns among stocks with high investment and stocks with low investment. Fama and French (2015) measure investment by dividing total asset growth for the fiscal year closing at t-1 by total assets at the edge of t-1.

Population and Sample

The population in this study consists of all companies drafted on the SRI-KEHATI Index from 2018 to 2024. The population size in this study is 50 companies. The sampling technique utilized in this study is purposive sampling based on several specific criteria. Based on the research sample determination, from a population of 50 companies, 10 companies were obtained as samples that achieved the sample criteria.

Data Analysis Method

This study applies the Fama-MacBeth Regression to inspect panel data. The Fama-MacBeth Regression, formulated by Fama and MacBeth (1973), is universally implemented in asset pricing to examine the relationship among risk factors and stock returns. By applying this

approach, the study aims to identify risk factors premium. The model is estimated in Two Stages of Regression.

RESULTS AND DISCUSSION

1. Fama-MacBeth Regression Model Test

The Fama-MacBeth Regression model was tested to discover the effect of independent variables to dependent variables employing the following regression equation:

$$R_{it}-R_{Ft}=\alpha_i+\beta_1 X_1+\beta_2 X_2+\beta_3 X_3+\beta_4 X_4+\beta_5 X_5+\varepsilon \quad (1)$$

The following are the coefficient and constant values of the independent and dependent variables in the three research periods using the Fama-MacBeth Two-Step Procedure.

Table 1. Fama-MacBeth Two-Step Procedure Results Coefficients and Constants

Independent Variable	Coefficient		
	Pre-Pandemic	Pandemic	Post-Pandemic
_b_Market Risk Premium	0,0236317	0,0050167	0,017116
_b_SMB	0,0158503	0,0053044	-0,0445204
_b_HML	-0,0012275	0,0056735	-0,0212472
_b_RMW	-0,024441	0,0242233	-0,0746659
_b_CMA	0,0076086	-0,0165315	0,1458625
Cons	-0,0443758	-0,0119478	-0,0143834

Source: secondary data processed using Stata MP 17, 2015

The constant value for the period before the pandemic was -0,0443758, meaning that if the market risk premium, SMB, HML, RMW, also CMA were 0, the stock return would be -0,0443758. The constant value for the pandemic period is -0,0119478, meaning that if the market risk premium, SMB, HML, RMW, also CMA are 0, then the stock return is -0,0119478. The constant value for the post-pandemic period is -0,0143834, meaning that if the market risk premium, SMB, HML, RMW, also CMA are 0, the stock return is -0,0143834.

2. Hypothesis Test

Coefficient of Determination Test

The determination coefficient in this study is derived from the Adjusted R-Squared value, as it is considered more appropriate for models involving more than one independent variable. The higher the Adjusted R-Squared value or the closer it is to 1, the greater the influence of the independent variables to the dependent variable.

Table 2. Adjusted R-Squared Test Results

Period	Adjusted R ²	Uji F
Pre-Pandemic	0,8924	0,7810
Pandemic	0,5722	0,9680
Post-Pandemic	0,3772	0,1862

Source: secondary data processed using Stata MP 17, 2015

Derived from the results of the coefficient of determination test, the Adjusted R-Squared value in the three research periods varied. The biggest Adjusted R-Squared value was obtained in the pre-pandemic period, namely 0,8924. This value indicates that the dependent variable of stock returns could be elucidated by independent variables comprising of market risk premium, SMB, HML, RMW, and CMA by 89,24 percent, while the rest 10,76 percent is elaborated by factors outside the variables studied.

Partial Significance Test (t-Test) Results

This study examines the effect of independent variables individually to the dependent variable at a significance level of 5 percent in part. The t-value is $< t_{\text{table}}$, and if the significance probability value is upon 0,05, then the independent variable possesses no significant effect to the dependent variable in part. If the calculated t-value is $> t_{\text{table}}$ and the significance probability value is beneath 0,05, then the independent variable possesses a halfway significant effect on the dependent variable.

Table 3. Partial Significance (t-Test) Results

Independent Variable	Pre-pandemic P> t	Pandemic P> t	Post-pandemic P> t
Market Risk Premium	0,402	0,951	0,573
SMB	0,748	0,895	0,211
HML	0,976	0,830	0,548
RMW	0,508	0,652	0,087
CMA	0,853	0,845	0,049

Source: secondary data processed using Stata MP 17, 2015

Discussion

Influence of the Market Risk Premium on Stock Return

The market risk premium variable was statistically proven to be insignificant in influencing the stock returns of companies composed in the SRI-KEHATI index in the three research periods. This finding is supported by the market risk premium probability value being greater than 0,05 in the periods before the pandemic, during the pandemic, also after the pandemic.

The results of this study indicate that the stock market in Indonesia is likely still inefficient and tends to be affected by factors other than market factors, for instance macroeconomic conditions

and investor sentiment outside the CAPM model. Information about the level of market risk only serves as a signal to investors that there is a certain level of risk in the market, so they need to be careful when investing (Rizqiyana and Arfianto, 2019). The results of this study in conformity with previous studies by Rizqiyana and Arfianto (2019), Sitanggang and Rizkianto (2024), and Saputri (2025), which show that market risk premium does not significantly affect stock returns.

Influence of the Size proxied by SMB on Stock Return

The size variable (SMB) was statistically proven to have no significant effect on stock returns in the three research periods. This finding is supported by the SMB probability value being greater than 0,05 in the periods before the pandemic, during the pandemic, and after the pandemic.

The results of this study indicate that the market capitalization size of a company is not a determining factor in the formation of stock returns. The stock performance of issuers with small market capitalization does not necessarily provide better returns than issuers with large market capitalization. Conversely, the stock performance of issuers with large or high market capitalization does not necessarily provide better returns (Handayani, Suhendro, and Wahyuningsih, 2022). This finding shows that the information reflected in company size does not seem to be strong enough to explain returns, possibly because the SMB variable overlaps with other fundamentals such as the investment strategies implemented by each company. The results of this study support the results of previous studies by Sholihati and Sunarsih (2023), Sitanggang and Rizkianto (2024), and Dewi and Komara (2024), which show that the size factor is not significant for stock returns.

Influence of the Book to Market Equity proxied by HML on Stock Return

The book to market equity (HML) variable was statistically proven to be insignificant in influencing the stock returns of companies included in the SRI-KEHATI index in the three research periods. This finding is supported by the HML probability value being greater than 0,05 in the periods before the pandemic, during the pandemic, and after the pandemic.

The results of this study indicate that the level of book-to-market equity is not a determining factor in the formation of stock returns. The stock performance of issuers with high book-to-market equity is not necessarily better or worse when compared to the stock performance of issuers with low book-to-market equity (Buditomo, Candra, Soetanto, 2024). High company valuations do not necessarily provide better returns, causing investors to be less interested in these stocks. A shift in investor preferences towards growth stocks over value stocks may be another factor that can explain this phenomenon. This is shown in the results of a study by Fardana and Hartono (2018), which states that the return on a growth stock portfolio is better than that of a value stock portfolio. These findings support previous studies by Bodo (2021), Sholihati and Sunarsih (2023), Dewi and Komara (2024), and Buditomo, Candra, and Soetanto (2024), which state that book-to-market equity is not significant in influencing stock returns.

Influence of the Profitability proxied by RMW on Stock Return

The profitability variable (RMW) is statistically proven to be insignificant in influencing the stock returns of companies included in the SRI-KEHATI index in the three research periods.

This finding is supported by the RMW probability value being greater than 0,05 in the periods before the pandemic, during the pandemic, and after the pandemic.

The results of this study indicate that weak profitability is also not a determining factor in the formation of returns. The performance of stocks with strong profitability is not necessarily better or worse when compared to the performance of stocks with weak profitability (Buditomo, Candra, and Soetanto, 2024). This condition indicates that investors do not consider profitability as a major consideration in making investment decisions. This is likely because most investors in the SRI-KEHATI index are short-term investors who prioritize capital gains over dividends (Dewi and Komara, 2024). The results of this study reinforce previous studies by Sutedja and Wijaya (2022), Sholihati and Sunarsih (2023), Dewi and Komara (2024), and Buditomo, Candra, and Soetanto (2024), which state that profitability is not significant in influencing stock returns.

Influence of the Investment proxied by CMA on Stock Return

The investment variable (CMA) was statistically proven to be insignificant in influencing the stock returns of companies included in the SRI-KEHATI index during the pre-pandemic and pandemic periods. This outcome is supported by the CMA probability value being greater than 0,05 during the pre-pandemic and pandemic periods. Meanwhile, the results of the study in the post-pandemic period show that the investment variable (CMA) has a significant positive effect on the stock returns of companies listed on the SRI-KEHATI index. This finding is supported by the CMA coefficient value of 0,1458625 and a probability value of 0,049, which is beneath 0,05 in the post-pandemic period.

The results of this study show the dynamics of the role of CMA factors in the three study periods. The CMA coefficient in the pre-pandemic period was negative and insignificant, indicating that companies with aggressive investment strategies tended to be more valued by the market, although the effect was not strong enough. This condition is in line with the relatively stable situation before the pandemic, where investors believed that companies with aggressive investment strategies still had the potential to grow higher and also had the potential to provide better returns, so that asset growth was not seen as a major risk (Buditomo, Candra, and Soetanto, 2024).

The CMA coefficient during the pandemic period changed direction to positive but was still insignificant, indicating a shift in investor preferences, where companies with conservative investment strategies began to be considered safer amid the uncertainty of the pandemic, although the effect was still not strong enough. This finding is in conformity with a study by Sitanggang and Rizkianto (2024), which shows that CMA factors did not affect stock portfolio returns during the pandemic, possibly due to high market volatility.

The CMA factor in the post-pandemic period turned positive and significant, reflecting that the market began to return to rationality in distinguishing companies based on their investment strategies, where companies with conservative investment strategies were valued more than companies with aggressive investment strategies. This finding is in line with Fama and French (2015), with positive and significant CMA coefficients, where companies that are conservative in their investments provide better returns than companies that are aggressive in their

investments. This finding is underpinned by the results of research by Dewanto and Sumiati (2022), who found that positive CMA significantly affects stock returns.

CONCLUSION

The results reveal that market risk premium, SMB, HML, and RMW are not significant in affecting stock returns in the three research periods. The CMA variable is not significant in affecting stock returns in the pre-pandemic and pandemic periods, but possesses a positive and significant effect in the post-pandemic period.

Derived from the research results, it is recommended that if a crisis recurs in the future, the Fama French Five Factors Model is less capable of estimating stock returns from issuers included in the SRI-KEHATI index, so it is advisable to consider other factors such as macroeconomic conditions, other financial indicators, and investor sentiment through behavioral finance. Meanwhile, for further research, it is recommended to use other variables and approaches that are considered to have a greater impact on stock returns, such as the Arbitrage Pricing Theory or other approaches through behavioral finance. In addition, future researchers are advised to use other samples, such as the Kompas 100 index and the LQ45 index.

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