

The testing of common risk factors toward portfolio's excess return

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Submitted: Apr 05, 2022; Reviewed: Apr 06, 2022; Accepted: Apr 26, 2022

Abstract: *This study aims to examine common risk factors' effects in the Fama and French Five-Factor Model plus Momentum Factor on The Bisnis-27 Index Stocks component during the 2016-2020 period. This research's common risk factors include market risk premium, firm size, book-to-market equity ratio, profitability, investment, and momentum. A quantitative approach will be used in this study by using multiple linear regression. The regression in this study was generated by the common effects model method. This study reveals that a portfolio's excess return is simultaneously affected by common risk factors that are in place this study. The findings in this study show that market risk premium, book-to-market ratio, company size, and momentum positively affect portfolios' excess returns. The greater the market risk premium, the smaller the size of the company, the larger the book-to-market ratio, and the stock's past performance, as reflected by the momentum, has implications for the acquisition of a larger excess return on the portfolio. Meanwhile, there is no significant influence between profitability and investment factor on portfolios' excess returns.*

Keywords: *book-to-market equity ratio; firm size; investment; market risk premium; momentum; profitability*

Abstrak: *Penelitian ini bertujuan untuk menguji pengaruh common risk factor yang ada pada Model Fama and French Five Factor ditambah Faktor Momentum terhadap imbal hasil saham perusahaan komponen Indeks Bisnis-27 periode 2016-2020. Common risk factor yang diuji pada penelitian ini yakni premi risiko pasar, rasio book-to-market equity, ukuran perusahaan, profitabilitas, investasi, dan momentum. Pendekatan kuantitatif akan digunakan pada penelitian ini dengan menggunakan regresi linier berganda. Regresi pada penelitian ini dihasilkan dengan menggunakan metode common effect model. Hasil penelitian mengungkap bahwa common risk factor yang ada pada penelitian ini secara simultan memengaruhi imbal hasil portofolio. Temuan penelitian menunjukkan bahwa premi risiko pasar, rasio book-to-market, ukuran perusahaan, dan momentum memberikan pengaruh positif*

terhadap kelebihan imbal hasil portofolio. Semakin besar premi risiko pasar, semakin kecil ukuran perusahaan, semakin besar book-to-market equity ratio serta kinerja masa lalu saham yang direfleksikan oleh momentum berimplikasi terhadap perolehan kelebihan imbal hasil portofolio yang semakin besar. Sementara itu, tidak ditemukan adanya pengaruh profitabilitas dan investment terhadap kelebihan imbal hasil portofolio secara signifikan.

Kata kunci: *investasi; momentum; premi risiko pasar; profitabilitas; rasio book-to-market equity; ukuran perusahaan*

1 INTRODUCTION

Every investor basically expects a return on their investment. According to Hardjopranoto (2020), investment is an act of delaying consumption for asset ownership to obtain a return on it. In investing, investors will encounter uncertainty. Changes in dynamic world conditions make expectations often do not match actual conditions. Differences between expectations and actual conditions can interfere with the achievement of investors' goals. The difference between expectations and actual conditions is referred to as risk. The achievement of economic value must be accompanied by the willingness of the perpetrators to "take" risks (Hardjopranoto, 2020).

There are a number of models that explain the relationship between risk and return, one of which is the Capital Asset Pricing Model (CAPM) that was developed by Lintner (1965) and Sharpe (1964). CAPM can explain the relationship of market returns as a systematic risk with expected returns. The CAPM is an important "milestone" in finance because it is able to compute the opportunity cost of capital, which cannot be described quantitatively (Hardjopranoto, 2020).

Over time, many people have doubted the effectiveness of the CAPM model. The weakness of the CAPM model can be seen from the use of market returns as the only risk consideration. The use of market factors as a primary factor in risk measurement is considered inappropriate. The many factors other than market factors that affect asset returns and risk are reasons for doubt about the effectiveness of the CAPM. Early on, Lintner (1965) showed results against the CAPM. In addition to being judged not to have sufficient factors, Basu (1977) found that the CAPM method did not even give better returns than the calculation of a portfolio with a low price earning ratio.

Fama & French (1992) found that there are a number of other factors that influence expected returns, apart from market factors. Fama & French (1992) assume that book-to-market equity and firm size have a significant effect on portfolio excess return. The bigger the company, the more difficult it will be to increase its profits. On the other hand, the smaller the book-to-market equity value, the greater the chance that the stock price will jump toward its fair value. Furthermore, Fama & French (1993) 'perfected' the CAPM by including book-to-market equity ratio and firm size.

Over time, previous findings were further developed. Jegadeesh & Titman's (1993) revealed that following the momentum was able to provide significant abnormal returns. The momentum strategy is carried out by buying the winning shares and selling the losers' shares. Grinblatt et al. (1995) find that funds that follow a momentum strategy perform better before management fees and transaction fees. According to these findings, Carhart (1997) added momentum to the Fama-French (1993) model. Then the model created by Carhart (1997) is known as the four-factor model.

In subsequent developments, Fama & French (2014) found that there were a number of other factors that influenced excess stock returns. Fama & French (2014) published a model that is able to explain the return factor better than The Three-Factor Fama-French Model (1993), which was later referred to as the Five-Factor Fama-French (FF5) model. In the FF5 model, profitability and investment variables as factors that affect portfolio excess returns was added. The addition of investment and profitability factors into the model is based on empirical findings that these two factors are able to explain the average yield generated by the BE/ME ratio factor. The dividend discount model and the market value formula of Miller & Modigliani (1961) were used by Fama & French (2014), which describe the relationship between probability expectations and expected returns. In the equation used, it is explained that the higher the expected earnings, the higher the expected returns. The equation shows that the fair value of shares is obtained from discounting earnings per share minus changes in book value per share. Thus, if the greater the change in investment seen from the book value is compared to the change in earnings per

share, the fair value will be lower. The low fair value will have implications for the returns to be obtained.

Hendra et al. (2017) found that firm size and market return had a significant positive effect on excess return, but no effect was found. Book-to-market and momentum significantly. Wijaya et al. (2017) found that almost all the factors of The Five-Factor Fama Model had a significant effect on excess stock returns, except for the HML factor. Meanwhile, Zheng et al. (2020) revealed that market return, SMB, and HML have a significant positive effect on stock returns in Indonesia. This is different to what Wijaya et al. (2017), Zheng et al. (2020) had found, that RMW and CMA actually have a significant negative effect. In the WML variable, Zheng et al. (2020) and Hendra et al. (2017) both showed insignificant results. The findings of various results raise the desire to further investigate the influence of common risk factors on returns.

The capital market in Indonesia, which is still developing, has different characteristics from the stock market of developed countries such as the United States (Wijaya et al., 2017). Stock price volatility in developing countries is higher than volatility in developed countries (Tandelilin, 2010). In line with volatility, the portfolio's excess return of the Indonesian capital market is able to exceed the capital market in developed countries (Salomons & Grootveld, 2003). The different characteristics of the capital market raise the question of whether The Fama-French Five-Factor Model in Indonesia is in accordance with the findings of Fama & French (2014), as well as the influence of the momentum factor on returns. Therefore, research on six common risk factors was conducted to examine their effect on portfolio excess stock returns in Indonesia, especially The Bisnis-27 Index in the 2016-2020 period.

2 METHOD

This research is included in basic research with the aim of conclusive research. This study will test the hypothesis of The Five-Factor Fama-French Model plus the momentum factor (common risk factors). This type of research is causal, with the aim of knowing whether the market risk premium, book-to-market equity, firm size, profitability, investment, momentum, and have an effect on portfolio excess returns. This study used a quantitative approach. The approach used in this study is a quantitative approach using data analysis in the form of statistical analysis.

2.1 Research variable

Excess stock returns will be used as the dependent variable. Dependent variable means as the variable that is being measured and depends on the change of independent variables. At the same time, the independent variable defined as the variable that can be manipulated and not influenced by any other variables. The market risk premium, book-to-market equity ratio, firm size, profitability, investment, and momentum will be the independent variable.

2.1.1 Excess Return Portfolio ($R_t - R_f$)

Returns can be calculated from the comparison of the closing prices of listed companies. The yield variable can be measured by the natural logarithm of the closing price of the stock divided by the share's closing price of the previous period. Once the yield is known, then the portfolio excess return can be calculated. According to Hardianto (2009), the portfolio excess return is the difference in stock returns minus the risk-free rate of return.

2.1.2 Market Risk Premium ($R_m - R_f$)

Market risk premium measures the difference between the overall average stock market return minus the risk-free return. Information on market returns will be obtained from the natural logarithm of the difference in the JCI Stock Index every month. After finding the market yield, this yield is then subtracted from the risk-free rate of return. A risk-free rate of returns is obtained from The Bank Indonesia 7 Days Reverse Repo Rate (BI7DRR) on a monthly basis.

2.1.3 Firm Size (SMB)

Firm size is a value that can indicate the size of the company (Komara et al., 2020). Total assets, sales, or market capitalization are the indicators of how big the size of the company is. The size of the company

correlates directly with the size of its market capitalization. Stocks can then be categorized into large-sized companies (B) and small-sized companies (S). The division of shares into large and small groups is separated by the median value.

2.1.4 Book-to-Market Equity (HML) Ratio

Book-to-market equity (BE/ME) is a ratio that shows the result of a comparison between the book value of equity and its market value. On this factor, stocks will be grouped into stocks with low BE/ME (L), medium (M), and high (H). Group H represents 30% of the company's shares with the highest BE/ME ratio, and group L represents 30% of the shares with the lowest BE/ME ratio. While the rest can be classified as companies with a medium BE/ME ratio (neutral/ medium). HML is the difference in returns from high BE/ME ratio shares with low BE/ME ratios (Hardianto, 2009).

2.1.5 Profitability-Robust Minus Weak (RMW)

Robust minus Weak (RMW) is a proxy in comparing company profitability. Profitability can be measured in various ways, but this research will focus on looking at the ROE ratio. The robust (R) stock group is 30% of stocks with the highest ROE value. Meanwhile, the weak stock group is 30% of the stocks that have the lowest ROE value.

2.1.6 Investment-Conservative Minus Aggressive (CMA)

Conservative minus Aggressive (CMA) is a proxy for comparing the investment level of a number of companies. The investment shows how big the company's investment level is, which is indicated by changes in asset value each period. Companies that are in the 30th percentile or 30% of companies with low investment levels will be categorized as conservative firms. Meanwhile, companies at least or higher than the 70th percentile will be classified as aggressive companies.

2.1.7 Momentum-Winner Minus Loser (WML)

Winner minus Loser (WML) is a proxy in comparing the momentum performance of companies' shares. Momentum shows how much the company's stock is performing. Stocks will be grouped based on their performance over the last 12 months. As much as 30% of the shares of low-performing companies will be categorized as loser companies. Meanwhile, 30% of the shares of companies with the highest performance will be classified as winners.

2.2 Population and sample

All stocks listed in The Bisnis-27 Index on the Indonesia Stock Exchange during the 2016-2020 period are used as the population. The characteristics of the sample that can be said to meet the requirements: (1) Are shares of the component companies of The Bisnis-27 Index on the Indonesia Stock Exchange for the period 2016-2020; (2) Shares consistently stay on The Bisnis-27 Index during 2016-2020; (3) The historical data on closing prices of shares are available in full for the period 2016-2020; (4) The complete quarterly financial report information is available on the IDX website or the company's website for the 2016-2020 period; (5) The sample company must record a positive equity value during the 2016-2020 period.

2.3 Model

Analysis of the linear relationship between the hypothesized variable in this study will use a multiple linear regression test. There are five independent variables in this study, namely market risk premium, firm size, book-to-market equity ratio, profitability, investment, and momentum. Meanwhile, there is only one dependent variable, namely portfolio excess stock return. The Five-Factor Fama-French Model plus the Momentum Factor can be expressed in the regression model as follows:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_1(R_{m,t} - R_{f,t}) + \beta_2SMB + \beta_3HML + \beta_4RMW + \beta_5CMA + \beta_6WML + \varepsilon \dots \dots \dots (1)$$

Information:

- R_{i,t} - R_{f,t} = Excess return portfolio
- R_{m,t} - R_{f,t} = Market risk premium
- α_i = Intercept regression
- SMB = The Return on the small company's stock portfolio is reduced by the return on the large company's stock portfolio
- HML = Returns on high BE/ME ratio stock portfolios minus low BE/ME ratio stock

RMW	=	portfolio returns Return on the company's stock portfolio robust minus the yield of a weak stock portfolio
CMA	=	The yield on the conservative company's stock portfolio is reduced by the return on the aggressive stock portfolio
WML	=	Winner's stock portfolio is reduced by the return on the loser's stock portfolio
$\beta_1; \beta_2; \beta_3; \beta_4; \beta_5; \beta_6$	=	Regression coefficient

3 RESULTS AND DISCUSSION

3.1 Descriptive analysis

Table 1 shows that there were 1440 observations with a total of twenty-four cross-sections. Statistical information is processed from portfolio performance which contains 18 of The Bisnis-27 Index' stocks for the 2016-2020 period that meet the criteria. The average positive ER value indicates that during 2016-2020, investing in 18 shares of The Bisnis-27 component was able to provide positive excess returns and exceed the market premium (JCI). The market risk premium also showed positive results, where the performance of shares on the Indonesia Stock Exchange Index (Jakarta Composite Index or JCI) was able to provide returns that exceeded the BI7DRR level for the last five years. Table 1 also shows that HML, RMW, and WML have a positive average value. This value indicates that companies with high book-to-market equity ratios, high profitability, and historically 12 months of showing stocks with good performance tend to produce greater yields. On the other hand, SMB and CMA show negative values. A negative variable value indicates that large company shares and investing aggressively tend to generate better stock performance.

Table 1. Descriptive statistic

	ER	MRP	SMB	HML	RMW	CMA	WML
Mean	0.007906	0.000239	-0.003327	0.000665	0.010680	-0.002956	0.023081
Median	0.012107	0.004781	-0.000895	-0.000191	0.001214	0.002405	0.018214
High	0.330811	0.087149	0.131876	0.123325	0.379599	0.082645	0.230907
Low	-0.609225	-0.187094	-0.104382	-0.133866	-0.112143	-0.137114	-0.086586
Standard Deviation	0.076814	0.041923	0.043374	0.056610	0.071364	0.048680	0.060503
Number of Observations	1440	1440	1440	1440	1440	1440	1440

Source: Eviews10 output (processed)

3.2 Regression analysis

Table 2 describes the relationship of the independent variables of market risk premium ($R_m - R_f$), small minus big, and high minus low to the excess return portfolio ($R_i - R_f$). This equation has an intercept value of 0.0067, which indicates that if the independent variable is zero, then the portfolio excess return value is 0.008034. In addition to producing a linear equation model, Table 2 also shows other information. Table 2 shows that the adjusted R-squared value is 0.549495. The adjusted R-squared value shows that MRP, SMB, HML, RMW, CMA, and WML are able to explain their effect on the excess return portfolio ($R_i - R_f$) by as much as 54.95% during the 2016-2020 period. Meanwhile, 45.05% of the excess return portfolio was explained by factors other than MRP, SMB, HML, RMW, CMA, and WML.

Partially, the influence of the MRP, SMB, HML, RMW, CMA, and WML varies on the stock excess returns. The influence of the six common risk factors can be seen from the various coefficient values. MRP, SMB, HML, and WML show positive coefficient values. Therefore, the larger the market risk premium ($R_m - R_f$), the smaller the size of the company, the greater the book-to-market ratio, and the historical stock performance has implications for the greater excess of stock returns. Meanwhile, the t-value of the RMW and CMA variables shows a value below the t-table value of 1.9616. Based on the value of t arithmetic, it can be said that there is no effect of ROE level as a proxy for profitability and changes in assets as a proxy for investment returns on the stock.

Table 2. Multiple linear regression test results panel data Fama-French Model 5 Factors plus Momentum Factor

Variable	Coefficient	t-Value	Probability	Hypothesis
C	0.006700	4.515719	0.0000***	
MRP	1.269291	32.96833	0.0000***	+
SMB	0.122215	3.673489	0.0002***	+
HML	0.103200	3.644945	0.0003***	+
RMW	-0.034178	-1.290631	0.1970	+
CMA	0.020442	0.642596	0.5206	+
WML	0.072176	2.844353	0.0045***	+
<i>R-squared</i>	0.551373			
<i>Adjusted R-squared</i>	0.549495			
<i>F-statistics</i>	293.5322			
<i>Probability (F-statistic)</i>	0.000000			

Source: Eviews 10 Output (processed)

*, **, ***: Significant at level 0.10, 0.05 and 0.01

Notes:

- C: Intercept (constant)
- MRP: Market risk premium (Rm -Rf)
- SMB: Small minus big
- HML: High minus low
- RMW: Robust minus weak
- CMA: Conservative minus aggressive
- WML: Winner minus loser

The results of the regression, showed by Table 3, describes the effect of the independent variables on the excess return in each portfolio. There are 24 portfolios that were tested by regression. If you look at each portfolio, the influence of the six common risk factors on the excess return on the portfolio can be captured more clearly. The magnitude of the influence of the common risk factor can be seen in the adjusted R-square regression value for each portfolio. A high adjusted R-square value indicates that the influence of the six common risk factors on portfolio returns is also getting bigger. The lowest adjusted R-squared value is in the S/N portfolio. The highest adjusted R-squared is in the S/W portfolio with an adjusted R-square value of. The average adjusted R-square value for each portfolio is 0.732763. Meanwhile, the lowest adjusted R-square value is in the S/N portfolio at 0.483221.

Table 3. The multiple linear regression test results on The Fama-French Five Factors Model and Momentum Factor in each portfolio

Size factors and book-to-market ratio								
Portfolio	Regression coefficient							adj. R2 -
	Intercept	MRP	SMB	HML	RMW	CMA	WML	
S/L	0.004406	1.544555***	0.549529***	-0.476530***	0.074405	0.140483	0.076730	0.760126
S/M	0.003582	1.322007***	0.418324***	0.069496	-0.075166	-0.021273	0.113659	0.643130
S/H	0.011631**	1.023264***	0.848789***	0.737087***	-0.056977	-0.060712	0.035006	0.879263
B/L	0.007570**	0.906707***	-0.320352***	-0.217625***	-0.018865	-0.117888	0.066276	0.647185
B/M	0.011703**	1.555121***	-0.243395*	-0.021080	-0.151390	0.093078	0.051118	0.716943
B/H	0.000346	1.427998***	-0.619612***	0.568758***	0.112517	0.083308	0.108001	0.854372
Portfolio formed according to the characteristics of size and profitability factors								
Portfolio	Regression coefficient							adj. R2 -
	Intercept	MRP	SMB	HML	RMW	CMA	WML	
S/W	0.010796*	1.169002***	0.721441***	0.204345**	-0.352815***	-0.109476	0.046116	0.894433
S/N	-0.004429	1.119015***	0.590628***	0.365190**	0.009698	0.262416	0.266735*	0.483221
S/R	0.011347*	1.740909***	0.602752***	0.006285	0.593669***	0.129317	-0.042891	0.775108
B/W	0.010676*	1.563917***	-0.392553***	-0.118674	-0.743722***	0.161733	-0.002358	0.847103
B/N	0.007039*	1.346605***	-0.378309***	0.071785	-0.049591	-0.001865	0.073763	0.786411
B/R	0.009406**	0.988993***	-0.318926***	0.089452	0.316491***	-0.076252	0.045103	0.584760
Portfolio formed according to the characteristics of size and investment factors								

Portfolio	Regression coefficient							adj. R ² -
	Intercept	MRP	SMB	HML	RMW	CMA	WML	
S/A	0.004436	1.105513***	0.703831***	0.130633	-0.051742	0.842707***	0.026184	0.723813
S/N	0.011707*	1.291364***	0.556438***	0.104937	-0.117356	0.161633	0.160207	0.692329
S/C	0.002982	1.157258***	0.673426***	0.265256***	-0.016002	-0.666175***	-0.093477	0.884867
B/A	0.004561	1.206445***	-0.432101***	0.105043	0.031362	0.178277**	0.001875	0.744354
B/N	0.008609*	1.255525***	-0.321455***	0.035308	-0.082530	0.015689	0.064993	0.707898
B/C	0.007257	1.153888***	-0.328539***	-0.043063	-0.004840	-0.329223	0.155177*	0.646842
Portfolio formed according to the characteristics of <i>size and momentum factors</i>								
Portfolio	Regression coefficient							adj. R ² -
	Intercept	MRP	SMB	HML	RMW	CMA	WML	
S/L	0.014304**	1.46603***	0.737314***	0.090302	-0.012405	0.046243	-0.380787***	0.784811
S/N	0.003539	1.433691***	0.548413***	-0.220177	-0.228234	-0.121394	0.015083	0.629074
S/W	0.004969	1.247892***	0.366608***	0.430302***	-0.029787	0.021100	0.759625***	0.823910
B/L	0.002409	1.008183***	-0.487044***	0.308937***	0.016828	-0.085818	-0.391760***	0.769801
B/N	0.006816	1.310476***	-0.240621**	-0.037452	0.074155	-0.022260	0.095382	0.699946
B/W	0.005135	1.118619***	-0.301416**	0.028282	-0.057965	-0.033033	0.482472***	0.582451

Source: Output Eviews 10

*, **, ***: Significant at level 0.10, 0.05 and 0.01

Notes:

- S/L: The stock portfolio is small and has a low book-to-market ratio
- S/M: Portfolio of small stocks with a medium book-to-market ratio
- S/H: Portfolio of stocks that are small in size and have a high book-to-market ratio
- B/L: The portfolio of stocks is large and has a low book-to-market ratio
- B/M: The portfolio of stocks is large and has a medium book-to-market ratio
- B/H: The stock portfolio is large and has a high book-to-market ratio
- S/W: Portfolio of small and weak stocks (low ROE)
- S/N: Neutral stocks (medium ROE)
- S/R: Portfolio of small and robust stocks (high ROE)
- B/W: Portfolio of large and weak stocks (low ROE)
- B/N: Neutral stocks (medium ROE)
- B/R: Portfolio of large and robust stocks (high ROE)
- S/A: Aggressive stock portfolio (low asset growth)
- S/N: Neutral stocks (medium asset growth)
- S/C: Conservative stock portfolio (high asset growth)
- B/A: Aggressive stock portfolio (low asset growth)
- B/N: Neutral stocks (medium asset growth)
- B/C: Portfolio of stocks that are large and conservative (high asset growth)
- S/L: Portfolio of undersized and loser stocks (historically low-performance stocks)
- S/N: Portfolio of small and neutral stocks (medium stock historical performance)
- S/W: Portfolio of stocks of small size and winners (historical high-performance stocks)
- B/L: Portfolio of large stocks and losers (low historical performance of stocks)
- B/N: Portfolio of large, neutral stocks (medium stock historical performance)
- B/W: Portfolio of large stocks and winners (historical high-performance stocks)

3.3 The effect of market risk premium ($R_m - R_f$) on excess return portfolio ($R_i - R_f$)

In accordance with the alleged hypothesis, the market risk premium (MRP) variable positively affects the excess return of the portfolio. The MRP variable produces a regression coefficient value of 1.269291. This shows that every time there is one unit change in the MRP, the portfolio excess return will change in the same direction as 1.269291 units. The probability value of the variable is 0.0000 below the significance level of 0.05, so the hypothesis (H_1), which states that MRP has a significant positive effect on excess portfolio returns, is acceptable. Partial linear regression results for each of the 24 portfolios also strengthen the statement of the relationship between market risk premium and portfolio excess returns. In 24 tested portfolios, all portfolios simultaneously showed that MRP had a positive effect on the excess return of each of these portfolios. The results of the probability of the effect of MRP on excess return in 24 portfolios are also below the level of significance, so the effect of MRP on excess Return is significant.

Similar to previous research by Hendra et al. (2017), Wijaya et al. (2017), and Zheng et al. (2020) revealed that the market risk premium factor has a significant unidirectional effect on excess portfolio

returns. Studies done by Irawan & Murhadi (2012) and Komara et al. (2020) also supported this statement. The positive effect of market risk premium on portfolio excess return can be explained through the CAPM model. Referring to the CAPM model that was developed by Sharpe (1964) and further developed by Lintner (1965) and Mossin (1966), the CAPM explains how the relationship between market factors such as systematic risk and asset prices has implications for expected returns.

By looking at the CAPM model, it will be seen that market returns and the sensitivity of asset prices to market returns will have an impact on the expected returns on these assets. However, Fama & French (1992) doubt the validity of the CAPM model and refute it with evidence that there is no strong relationship between market beta and stock returns. Based on his findings, Fama-French (1993) began to develop a multifactor model that better explains returns, including the one used in this study.

There are a number of other studies that are able to refute the doubts of Fama & French (1993) regarding the factor of market returns. Bruner et al. (2008) found that the CAPM model is able to explain its effect on expected returns better when used in a market condition that is emerging, rather than in market that had already developed with higher R-squared values. Bruner et al. (2008) also found that the multifactor model does not necessarily add useful additional information, especially in emerging markets. The findings of Zheng et al. (2020) reveal that market returns have a significant positive effect on a number of 9 stock exchanges in Asia, such as China, Japan, Thailand, and Indonesia.

H₁: Market risk premium positively affects excess return portfolio.

3.4 The effect of SMB as a proxy of firm Size on excess return portfolio ($R_t - R_f$)

The information in Table 2 shows that the factor regression coefficient is positive at 0.122215. Changes in the value of SMB worth one unit will have an impact on changes in the direction of the value of excess portfolio returns of 0.122215 units. The probability that the SMB variable affects the excess return on the portfolio is 0.0002. The probability value of the SMB variable is below the 0.05 significance level, so the hypothesis (H₂) can be accepted. In accordance with the information on the SMB variable, it can be concluded that the SMB variable has a significant positive effect on portfolio excess returns.

The results of the study on the SMB variable support the findings of Fama & French (1993), which revealed that small-sized companies tend to generate higher returns than large-sized companies. In addition, research by Hendra et al. (2017), Wijaya et al. (2017), and Zheng et al. (2020) found a positive effects of firm size on portfolio excess returns. Switzer (2012) revealed that differences in portfolio performance based on assets could be associated with different risk factors in the business cycle. The factor driving the differences in performance is the difference in interest in examining the benefits of asset allocation strategies that vary in time.

H₂: SMB (firm size) positively affects excess return portfolio.

3.5 Effect of HML as a proxy of book-to-market equity ratio on excess return portfolio ($R_t - R_f$)

Looking at the information on the results of the study in Table 2, the book-to-market ratio has given the expected results. In the regression, HML as a proxy for the book-to-market equity ratio has a regression coefficient of 0.103200. Each increase or decrease in the book-to-market equity ratio by one unit will have an impact on an increase or decrease in the direction of the excess return portfolio of 0.103200. At the same time, the probability value of the HML variable is 0.0003, which is lower than the level, so hypothesis H₃ is accepted. Thus, the HML variable affected excess Return positively and significantly.

In accordance with the research of Fama & French (1993), and Rosenberg et al. (1985), the results of the HML variable also prove that the excess return of the portfolio is significantly influenced by the HML variable. Research by Hendra et al. (2017) and Zheng et al. (2020) also reveal that there is a significant relationship between HML and portfolio excess returns. Fama & French (1993) reveal that stocks with high BE/ME ratios produce higher yields than those with low BE/ME ratios. The higher the BE/ME ratio, the cheaper the shares are traded, thus creating an opportunity to earn higher returns.

H₃: HML (book to market equity ratio) positively affects excess return portfolio.

3.6 Effect of RMW as a profitability proxy on excess return ($R_t - R_f$)

Observing the results of previous studies, it was found that RMW as a proxy for profitability has a negative effect on portfolio excess returns. It is known that the regression coefficient value generated by RMW is -0.034178. Each time there is a change in the value of RMW by 1 unit, it will reduce the

excess return portfolio value by -0.034178 units. The significance value of 0.1970, which exceeds the significant level of 0.05, makes H_0 cannot be rejected, and H_4 cannot be accepted. These values findings reveal that the RMW variable as a proxy for profitability does not have a significant effect.

The negative effect of the RMW variable on the excess return of the portfolio, which is not significant, is a strange thing. Logically, the company's shares with high productivity, which is reflected in the high level of ROE, should produce high returns as well. The results of research by Wijaya et al. (2017) and Fama & French (2014) reveal that RMW as a proxy for profitability will affect portfolio excess significantly positively. Robust companies should produce performance returns that are in accordance with their productivity. Novy-Marx (2012) explains that investors from highly productive companies would demand high returns. The statement that there should be a relationship between productivity and high returns can be observed with the dividend valuation equation.

$$M_t = \sum_{\tau=1}^{\infty} \frac{E(D_{t+\tau})}{(1+r)^\tau} \dots\dots\dots(2)$$

Or it can be translated and divided by the book value of the *t*-period,

$$\frac{M_t}{B_t} = \frac{\sum_{\tau=1}^{\infty} \frac{E(Y_{t+\tau} - \delta B_{t+\tau})}{(1+r)^\tau}}{B_t} \dots\dots\dots(3)$$

Notes:

- Mt = Price in period t
- E(Dt+τ)= Expected dividend period e t+τ
- r = Expected return on the stock in the long term
- Bt = Book value period t
- Yt+τ = Expected earnings period t+τ
- δBt+τ = Changes in book value of period t and period t- 1

Equation 2, which is further elaborated in Equation 3, is able to explain how the level of profitability should affect the price level of a stock (M_t). Looking at the formula, the expected dividend $E(D_{1+\tau})$ is obtained from the expected earnings ($Y_{1+\tau}$) in the $1+\tau$ period, minus the change in the book value investment for the $1+\tau$ period. The greater the value of expected earnings compared to the book value of equity, the nature of the value of shares will be even greater. The high stock value affects the level of returns obtained. However, a question arises that casts doubt on whether the probability performance will positively affect stock values as well.

Returning to equation 3, it can be seen that in finding the value of shares in period t (M_t), it is obtained by the sum of the values of $E(D_{1+\tau})$ discounted by the rate of r. In accordance with the statement of Novy-Marx (2012), investors from highly productive companies will demand high returns. Then the level of required return (r) will be higher and reduce the opportunity for investors to generate returns because the price reflected has been adjusted to a high level of required return as well. For example, a company with a robust ROE level will usually have a PER level as a proxy for high stock premiums as well. For example, as of December 2020, stocks with high ROE, such as BBKA and CPIN, have PER values of 30.26 and 27.33. Meanwhile, stocks with low ROE, such as ASII and TLKM, have lower PER, namely 14.73 and 17.74.

H_4 : RMW (Profitability) positively affects excess return.

3.7 Effect of CMA as an investment proxy on excess return portfolio ($R_i - R_f$)

The results of the study show that the CMA variable as a proxy for investment has a positive influence on the excess return on the portfolio. The positive influence of the CMA variable can be seen from the regression coefficient value of 0.020442. The probability value of the CMA variable is 0.5206, which exceeds the 0.05 significance level, so H_5 cannot be accepted. So even though it is known that the excess return of the portfolio is positively influenced by the CMA, the effect is not significant.

The results of the study on the CMA variable were not in accordance with what had been previously hypothesized. It is hypothesized that the CMA variable as a proxy for investment affects portfolio excess returns significantly, as found by Wijaya et al. (2017) and Fama & French (2014). Fairfield et al. (2003),

Richardson & Sloan (2003), and Titman et al. (2004) show a negative relationship between average returns and investment. Lee et al. (2017) stated that the higher the expected net cash flow to the current market value, the higher the yield. The calculation of the expected net cash flow is obtained by looking at the relationship between cash flows received and outflows in equation 3.

Besides being able to explain the effect of profitability on excess return, equation three can describe the relationship between investment and returns. The expected dividend value in equations 2 and 3 is obtained from expected earnings minus the investment in equity. The smaller the investment required to generate expected earnings, the bigger the expected dividend. Therefore, Fama & French (2014) suspect that companies with conservative investments will produce better stock performance than aggressive companies due to reinvestment.

A number of arguments can be used to doubt the significant positive effect of the CMA variable as an investment proxy on portfolio excess returns. In addition, there are also a number of studies that doubt the relationship between CMA and yield, such as Saleh's (2020) study. The first argument, the level of investment in accordance with the life cycle will create great benefits for the company and have implications for the value of the stock itself. For example, a company that is in the period of product development and growth requires a large investment to fund its business. The large growth in corporate funding that is still in this phase will provide great benefits for both the company and investors. Meanwhile, for companies that are in a decline phase, funding growth can actually have a negative impact on the company and its investors. This statement is supported by the findings of Anderson & Zeitham (1984), who found that investment spending at the growth stage was able to generate high profits. In addition, investments can be used as leverage. For example, a company invests in capital goods with debt financing. With funding can provide benefits through tax savings, increased cash flow, and increased EPS. The company can bear a lower cost of capital with debt due to tax benefits, which has implications for cash flow and EPS received by investors.

H₅: CMA (Investment) positively affect excess return.

3.8 Effect of WML as a momentum proxy on excess return portfolio ($R_i - R_f$)

Based on the results, momentum proxy is able to have a positive influence on the excess return portfolio value. With a regression coefficient value of 0.072176, every one unit change in WML will have an impact on changes in the value of the excess return portfolio in the direction of 0.072176 units. Meanwhile, the significance value of the WML variable is 0.0045, which exceeds the 0.05 significance level, so that the H₆ of the study can be accepted. Based on the information previously described, the WML variable has a significant positive effect on portfolio excess returns.

The results of the WML variable obtained previously are in line with a number of other studies. Jegadeesh & Titman's (1993) revealed that following the momentum was able to provide significant abnormal returns. Grinblatt et al. (1995) and Carhart (1997) find that funds following a momentum strategy perform well before management fees and transaction fees. Stocks that produce good or bad performance tend not to change significantly. Meanwhile, in testing common risk factor models such as The Six Factor Model and The Four Factor Model, Munawaroh & Sunarsih (2020) and Candika (2017) state that WML or UMD (Up minus Down) has a positive influence on the momentum factor on portfolio excess returns. Munawaroh & Sunarsih (2020) argue for stocks that perform well for one year, investors will respond positively by buying them.

H₆: WML (Momentum) positively affects excess return.

4 CONCLUSION

In accordance with the analysis and discussion of the results of panel data regression and hypothesis testing both simultaneously and partially on each variable, a number of conclusions can be summarized. The common risk factor variables tested, namely ($R_m - R_f$), SMB, HML, RMW, CMA, and WML, were simultaneously able to have an effect on portfolio excess returns. Based on the results of this study, in forming a portfolio, investors are expected to pay close attention to the that a significant positive market risk premium ($R_m - R_f$) indicates that the capital market provides incentives that are higher than the risk-free interest rate on the money market, meaning that the formation of a portfolio will generate excess returns. The results also show that the portfolio components of The Bisnis-27 that produces excess

returns is dominated by small-size stocks (SMB), which can provide significant benefits, supported by undervalued stocks with a high market-to-book ratio (HML). The significant momentum results show that the portfolio that gets abnormal returns is dominated by the winner stock (WML) strategy. As for profitability (RMW) and investment (CMA), it is not significant because in a crisis due to the COVID-19 pandemic, the average profitability of stocks decreased, and the ones that we're able to survive were conservative stocks. So that RMW and CMA proved insignificant.

The market risk premium variable ($R_m - R_f$) is a variable that significantly influences the direction of the excess return of the portfolio of components of The Bisnis-27 Index for the 2016-2020 period. In fact, the significant effect of market risk premium on excess return is also seen in the entire portfolio. SMB, HML and WML also show a strong relationship with excess returns on the portfolio of components of The Bisnis-27 Index for the 2016-2020 period. Although there are a number of factors that are strongly related to excess portfolio returns, RMW and CMA as proxies for investment factors are also unable to show a significant effect on excess returns on the components of The Bisnis-27 Index for the 2016-2020 period.

In making investment decisions, investors should look at everything holistically. market yield factors, firm size, market-to-book equity value, and momentum can affect the yield received. Therefore, when investing and forming a portfolio, investors must consider which stocks are selected according to certain characteristics so that portfolio returns are optimal. We recommend that when investing, investors should see whether the current market conditions are favorable or not. Market conditions that continue to fall can be an indication that this time is not the best time to invest because the returns received by investors can be eroded by a decline in stock prices. Investors have to wait for the right moment to invest. If the stock momentum is high, then maybe investors can invest at that time. Meanwhile, investors in choosing securities must see whether the premium on these securities is too large or not. Shares sold at a premium that is too expensive, as seen from the book-to-market equity ratio, can reduce the returns obtained by investors if it's not accompanied by high future growth. Meanwhile, investors can look into smaller companies because they are able to provide greater returns. Small companies have greater growth opportunities than large companies.

Although there is empirical evidence about the effect of six common risk factors on portfolio's excess return, these factors have not been able to explain the overall effect of returns. The effect of these six common risk factors is evident from the adjusted R-squared value of 0.5495, indicating that the six factors are only able to explain 54.95% of portfolio's excess return. There are still a number of 45.05% other factors that are relevant to returns but have not been reflected in this research model. Further research should include other factors so as to be able to explain the influence of common risk factors on returns in a better and more holistic manner.

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