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The effects of Fama-French five factor and momentum factor on Islamic stock portfolio excess return listed in ISSI

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Abstract

Purpose – The purpose of this study is to examine the effect of Fama-French five-factor and momentum factor on Islamic stock portfolio excess returns listed in the Indonesia Sharia Stock Index (ISSI).

Methodology – This study used return data from ISSI group, starting from January 2013 to December 2017, which are then formed into time series data with excess monthly stock portfolio. This study adapted the Fama and French (2015) methodology using 2x3 and 2x2 to form the portfolio and applied Ordinary Least Square (OLS) with monthly data frequency to test the relevance of the model to the expected stock return of 183 companies.

Findings – The results showed that the risk premium, the book-to-market ratio which is proxied by High Minus Low (HML), the investment that is proxied by Conservative Minus Aggressive (CMA), and the momentum which is proxied by Up Minus Down (UMD) has a positive effect on the excess return of the company's stock portfolio registered in Indonesia Sharia Stock Index (ISSI) during the period. While, the size and profitability variable do not affect the expected stock return.

Research limitations – The results of this study provides relevant information about the relationship between risk and stock return using Fama and French five-factor model and momentum. However, future researchers can expand the scale of the research by adding research periods and using daily return research data. It is intended that the results are more representative of the actual market conditions at the moment.

Originality – Researches on the factors that influence the selection of Islamic stock portfolios based on excess return using Fama-French five-factor including the momentum factor are still limited. This study contributes to the asset pricing development by investigating factors influencing performance of ISSI's portfolio excess return using five-factor model and momentum factor.

Introduction

In investing, of course, investors will be careful in choosing a stock portfolio. This is because the capital market is an investment that has high risk (Sudiyatno & Irsad, 2011). The decision to invest depends on the determinination of the level of risk faced, and the level of return that will be obtained (Acaravci & Karaomer, 2017). The accuracy of the method in calculating stock portfolio returns also needs to be considered.

Portfolio theory is well-known for the basic concept of risk diversification, which is allocating investment in securities that have low correlation. If several securities have a correlation coefficient ≤ 0, the benefits of diversification will be even higher. As we know, an asset held as part of a portfolio is less risky than the same asset held on isolation. One important

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use of the concept of portfolio risk is to choose an efficient portfolio, which is defined as a portfolio that provides the highest expected return for any given risk level (Markowitz, 1952). Based on portfolio theory, the risk portfolio can be eliminated by diversification. But there is one type of risk which cannot be eliminated by diversification, namely market risk. Market risk is measured by the standard deviation of returns on a well-diversified portfolio, one that consists of all stocks of trade in the market.

The model to estimate the rate of return, known as the asset pricing model, is very influential on investment decisions. Several theories were developed to identify the determinants of asset prices. Most theories regarding asset pricing only focus on one type of instrument. The single-factor model is also known as the capital asset pricing model on the scene in the 1960s (Sharped, 1964). The CAPM specifies the relationship between risk and required rates of return on assets when they are held in well-diversified portfolios (Brigham & Erchardt, 2015). The return of investment on the CAPM is influenced by the single factor, it was beta and it was said that beta illustrated how much a stock was moved compared to the market. While, unsystematic risk is considered irrelevant because it can be eliminated through diversification (Reinganum, 1981; Breeden, 1989; Fama & French, 1992). The relation between expected return and market beta of the CAPM is just the minimum variance condition that holds in any efficient portfolio (Fama & French, 2004).

Fama and French (1992) assumed that beta as an indicator of market risk is believed to be not the only factor that can explain the average returns provided by beta. They came up with the three-factor model with its two additional factors being size and value (e.g. book-to-market value). This model was a significant improvement over the CAPM because it adjusted for outperformance tendency but the three-factor model is hardly a panacea. The most serious problem is the momentum effect of Jagadeesh and Titman (1993). The momentum effects can be defined as the tendency of stocks that do well relative performance to the market over the last three to twelve months tend to continue to do well for the next few months, and the stocks that do poorly in one period tend to continue to do poorly until sustained which has an abnormal performance during that period (Carhart, 1997). Moreover, the effect of momentum is left unexplained by the three-factor model, as well as by the CAPM (Fama & French, 2004).

In the multi-factor models that were developed subsequently, Carhart (1997) introduced four-factor model by adding one factor on the FF three-factor model namely momentum. This momentum factor is believed by Carhart to reduce the error pricing of portfolio returns. Candika (2017) stated that the strength of Carhart's model of the four-factor on stock excess returns in Indonesia influences excess returns and can be used in valuing stock prices. Empirical evidence related to the momentum effect had been documented in most developed and emerging markets. Some of them found that the momentum effect provides good performance and had a positive effect on excess return over the time (Geczy & Samonov, 2016; Doukas & McKnight, 2005; Zaremba & Shemer, 2018a).

Fama and French (2015) complemented the model of three-factor by added two factors that can capture premium returns. The theoretical starting point for the five-factor model is the dividend discount model as the model states that the value of a stock today is dependent upon future dividends (Fama & French, 2015). This five-factor model also motivated by the previous empirical findings which found that profitability and investment factors influence the rate of return on assets (Fama & French, 2018). Fama and French (2015) found that a model described by size, value, profitability, and investment in average stock returns performed better than the FF three-factor model of shares in the United States. However, the main problem of this five-factor research model is its failure to capture low returns on small stocks whose returns behave like companies that invest heavily even though profitability is low. With the addition of profitability and investment factors, the value factor in the FF three-factor model becomes excessive for the visualization of average returns in the sample under the study.

Fama and French five-factor model not only applies well to Borsa Istanbul (BIST), but also explains variations in excessive portfolio returns (Acaravci & Karaomer, 2017; Yang et al., 2017), and is able to offer a better description of emerging market equity returns (Foye, 2018).

Huang (2019) confirmed that the FF five-factor model is superior to other traditional asset pricing models in explaining individual stock returns in China. Indonesian researchers found that FF five-factor model better explains the excess return of a stock portfolio in Indonesia if compared to the FF three-factor model (Sutrisno & Ekaputra, 2016; Wijaya, Murhadi, & Utami, 2015). In contrast, Kubota and Takehara (2018) found that FF five-factor model underperforms in asset returns, that RMW profitability and CMA investment are not statistically significant when GMM tests are carried out by Hansen-Jagannathan measurements.

Candika (2017) found that the excess market return variable is positively related to all models. SMB also had a significant impact on five portfolios. The HML variable is significant for portfolio return. While the momentum that is proxied by the UMD variable is only significantly positive for the return of 2 portfolio models. However, the FF three-factor is unable to explain the strong momentum effect in the New Zealand stock market (Nartea et al., 2009). Fama and French (2018) researched about the maximum squared Sharpe ratio for model factors as a metric for ranking asset pricing models. One of the models is add the momentum on the FF five-factor to be six factor model. He found that the base model that combines small and big stocks in its spread factors HML, RMW C, CMA, and UMD performs as well on all tests. On the contrary, the research which done by Fan et al., (2015) found that the momentum effect in most of the 43 examined equity markets in Europe for the period of 1981-2009 cannot be explained by the three-factor model of Fama and French (1993) and the four-factor model of Carhart (1997).

Although many literatures about the Fama-French five-factor model have been published in the form of article journals, conference papers, proceedings, and book chapters, the specific publication on the issues of integrating the model of FF five-factor and momentum factor called as six-factor model into Islamic finance (Islamic stock portfolios), is clearly very limited. The existence of a new model, in this case is the Fama and French five-factor model, is an alternative to find out the level of return on investment or returns that are increasingly representative. Based on Fama & French (2004, 2017, 2018), the researchers assumed that the momentum factor needs to be tested to determine the extent of investor's response to stock returns listed in ISSI to analyze whether or not there is a momentum effect and whether it affects sharia stock returns in Indonesia or not. The main difference of this research with the previous studies lies on the object of the research, namely the Indonesian Sharia Stock Index (ISSI) and by adding the momentum factor. Therefore, selecting the right portfolio becomes even more critical for Muslim investors. Considering that investment in the Islamic market is not only attractive to Muslim investors, but also investors in general as well. In fact, some researchers argue that Sharia Stock Index listing has negative effect towards corporation financial performance (Meidawati et al., 2020). The choice of ISSI is also aimed to answer investor's doubts about sharia capital market transactions in Indonesia.

This article also includes the momentum factor in the Fama and French models. With the existence of this research, the author can contribute to asset pricing development. Besides, this study also has practical implications as a way for investment managers to determine their sharia stock portfolios. This study aims to examine and to explain the model of FF five-factor and momentum factor (six-factor model) that is expected to have a strong influence on ISSI's stock portfolio excess return. The six-factor model includes *beta*, firm size, *book-to-market* ratio, profitability, investment, and momentum.

Literature Review and Hypothesis Development

Risk premium (Market) and its effect on stock portfolio excess return

Market risk premium is described by the market beta, in which a risk that cannot be eliminated through diversification. Beta is a systematic risk gauge of a security or portfolio relative to market risk (Hartono, 2014). Beta itself shows the sensitivity between security returns and market returns. The beta itself is a regression coefficient between two variables, obtained from the excess level of market portfolio profits (excess return of market portfolio) (Husnan, 2009). In CAPM theory, beta acts as a risk gauge. The use of this beta is under portfolio theory which states that if financiers diversify well, then the risk gauge will be included as the contribution of risk from

additional shares into the portfolio. Beta equal to 1 explains that there is a relationship if market returns move up (down), securities or portfolio returns also move up (down) as much as following the market returns (Hartono, 2014).

In the market portfolio held by investors, beta is a contribution of risk itself (Husnan, 2009). The higher the beta, the more sensitive the stock returns are to market changes. The higher the beta, the higher the volatility of the stock, so that investors will ask for additional returns on these shares (Candika, 2017). Research on the effect of the risk premium on excess portfolio returns is mostly done in Indonesia, as done by Sudiyatno and Irsad (2011). Similar studies have also been conducted by Pasaribu (2010) as well as Gleny and Tjong (2014) which show that risk premium has a positive effect on excess return in Indonesia.
H1: Risk premium (*beta*) has a positive effect on ISSI's stock portfolio excess return.

Size and its effect on stock portfolio excess returns

Firm size is the size of a company. Size in Fama and French research is measured by using market capitalization. Market capitalization can be obtained from the calculation of stock prices multiplied by the number of shares issued in that year. Thus, the market capitalization of a company shows the size of the company. In the theory of size effects, small-value stocks with a small-capitalization have an average historical return that is higher than the market portfolio. In addition, small stocks with high market risk tend to provide a high return, even with a higher accounting beta (Berk & De Marzo, 2014).

Fama and French (1992) stated that small companies tend to use their profits for business expansion, so that the portion of retained earnings will be greater than the distributed dividends. Banz (1981) found that the relationship between returns and company characteristics revealed a side effect, which is the tendency for small company shares to have a higher return than large company shares. Reinganum (1981) also revealed that there was an abnormal return on shares of small companies, where small companies generally have relatively lower beta. The firm size variable in the asset pricing model is stock excess return, where there is a deviation between stock portfolio returns and large market capitalization.

Zubir (2013) mentions that there are 3 reasons why small companies provide greater returns than companies with large market capitalization; 1) Companies with small market capitalization value have a greater risk than larger companies, so investors will determine the greater returns, 2) There is a price correction due to an error in determining the share price of small companies. 3) Small companies tend to have high growth rates which will directly influence their cash flow as well as affect the stock price.

Market capitalization is obtained by multiplying the closing stock price by the number of shares issued. The size in this study was proxied by Small Minus Big (SMB) (Sudiyatno & Irsyad, 2011). The company size variable in the asset pricing model is stock excess return, which is the difference between stock excess return with small market capitalization and stock excess return with large market capitalization. The size which is proxied by Small Minus Big (SMB) has a positive effect on the expected portfolio returns. Banz (1981) concluded that company size has a large influence in explaining returns. Research by Groot et al. (2012) shows that low market capitalization will bring higher returns compared to companies that have high market capitalization.
H2: Size has a positive effect on ISSI's stock portfolio excess return.

***Book-to-market* equity and its effect on stock portfolio excess returns**

Fama and French (1992), as well as Nartea et al. (2009), found that their empirical test study related to the *book-to-market* relationship with returns showed that stocks that have a high *book-to-market* will tend to have a greater rate of return when compared to shares of companies with *book-to-market* with low value. If the stock price on the market is lower than the book price, and causes a high ratio, the stock is called undervalued. Conversely, when the price on the market is higher than the price contained in the book, then the share price is considered to be overvalued, so it has a low ratio (Hartono, 2014).

Book-to-market equity in this study is proxied by *High Minus Low* (HML). HML is the difference between a monthly return on stocks that have a high *book-to-market* ratio and stocks with a low *book-to-market* (Zubir, 2010). Research by Fama & French (1992) found that, with a high *book-to-market* ratio, it can lead to a risk because of low market value and the company can be defined as a problematic company. On the other hand, companies with high ratios will reflect inefficient market conditions which also will expose risk for investors. Sutrisno and Ekaputra (2016) and Fama and French (2015) also mentioned that *book-to-market* which is proxied by *High Minus Low* (HML) has a positive relationship to stock portfolio excess returns.
H3: *book-to-market* equity has a positive effect on ISSI's stock portfolio excess return.

RMW profitability and its effect on stock portfolio excess returns

Profitability describes the level of corporate profits. The higher the company's profit, the higher the rate of return obtained by investors is. Profitability which is proxied by *Robust Minus Weak* (RMW) is the difference between the average return on two portfolios that have high operating profitability and the average return on two portfolios that have low operating profitability every month (Sutrisno & Ekaputra 2016). Research by Fama and French (2015) and Chiah, Chai, and Zhong (2015) indicated that profitability has a positive relationship with the return. Wijaya, Murhadi, and Utami (2015) found that companies with a high level of profitability (*robust*) will produce a higher return than companies with low profitability (*weak*).
H4: Profitability has a positive effect on ISSI's stock portfolio excess return.

CMA investment and its effect on stock portfolio excess return

Investment shows the level of investment of all companies that issued Islamic shares listed in the ISSI 2013-2017 research period. *Conservative Minus Aggressive* (CMA) is a form of projection of investment where calculates the difference between the average of low monthly returns with a low level of investment (*conservative*) with the average of high return with a high level of investment (aggressive). The greater the difference between *conservative* and *aggressive* is shows that company growth is improving since it will also increase excess return.

The Retention Growth Model theory states that most companies pay or use their net income whether for dividends, re-invested, or retained. The higher the rate of return obtained on retained earnings, the greater the growth rate is (Brigham & Ehrhardt, 2015). Fama and France (2015); Chiah, Chai, and Zhong (2015); Sutrisno and Ekaputra (2016) show that investment has a positive effect on excess return.
H5: Investment has a positive effect on ISSI's stock portfolio excess return.

Momentum and its effect on stock portfolio excess returns

Momentum was first examined by Jagadeesh and Titman (1993). The momentum can be used as a strategy for investing, known as the momentum investment strategy. A momentum strategy is an investment strategy where positive (negative) returns in the past will continue for a certain period in the future (Beigi et al., 2016). Jagadeesh and Titman(1993) found that stocks on U.S. with do well (winner) or do poorly (loser) performance for three to twelve months tend not to experience significant changes for the next period. The profit obtained by investors is based on the abnormal return assumption. Momentum is also a phenomenon in stock movements where current stock prices are influenced by past stock prices. This theory is in line with the theory of market efficiency in a weak form (Ross et al., 2015).

Boussaidi and Dridi (2020) found that good earning news is followed by positive abnormal returns; while bad earning news is followed by abnormal negative returns over 12 months after the announcement date in the Tunisian stock market. The strategy of buying winning shares in the past period and then selling them in the coming period when the stock price rises based on past data is called a momentum strategy (Kowanda & Pasaribu, 2012). Gleny and Tjong (2014) defined momentum strategy as a tendency of investor's behavior to collect stocks that are considered good and sell shares that are considered bad.

Shares that are considered superior (winners) are stocks that have performed well in the past with historical data during 3, 6, and 12 months, and vice versa.The intuition behind this strategy is that considering the stocks that performed well in the past will certainly do well in the future, according to the findings of Jagadeesh and Titman (1993). Investors, in predicting future returns, are based on past income and returns (Baker & Filbeck, 2013). The existence of a momentum effect in the momentum strategy indicates that investors tend to follow the positive response arising from good stock performance in the past, which is characterized by buying activity on stocks that show a positive return. Research by Fama and French (2012), Kowanda and Pasaribu (2012), and Gleny and Tjong (2014) found that momentum had significant positive effect on the entire stock portfolio. Candika (2016) found that momentum had a significant positive effect on 2 of 10 portfolio models.

H6: Momentum has a positive effect on ISSI's stock portfolio excess return.

Methods

The method used in this research was a quantitative approach. The related variable in this study is ISSI's stock portfolio excess return. The independent variable in this study was the Fama-French five-factor which includes market return, size, *book-to-market* ratio, profitability, and investment as well as momentum factor.The population in this study were companies that are included in the ISSI group from January 2013 to December 2017 which were then formed into time series data with monthly stock portfolio excess. The number of samples used were 183 companies. The sampling technique in this study was purposive sampling taken with certain considerations using the following criteria: (1) Shares of companies listed in ISSI from January 2013 to December 2017, (2) Companies that consistently and consecutively publish annual financial reports during the research period, (3) Excludes shares of those companies in financial sector, and (4) Excludes stocks with negative equity.

Variables of SMB, HML, RMW, CMA, and UMD were obtained by constructing a portfolio from sample data. The portfolio formation follows the procedures of Fama and French (2015) as well as Avaravci and Karaomer (2017) for the five-factors of Fama & French on the annual basis. SMB calculation is based on market capitalization value. HML is calculated based on *book-to-market* equity value. RMW is the proxy of profitability that measure use net income divided by book equity ratio. CMA is the proxy of investment. The level of investment of a company is measured based on the growth rate of total assets from the fiscal year ended in year t-2 to the fiscal year ended in t-1 divided by total assets in year t-2 (Fama & French, 2015).

After the calculation, shares are then grouped by *size* (market capitalization) in which 50% containing shares with the highest market capitalization value and 50% containing shares with the lowest market capitalization value. HML, RMW, and CMA are grouped into three subs; 30% of them is companies with high scores on each factor, 30% of them is companies with the lowest calculation of each factor, and the remaining 40% represents medium composition. Whereas, the UMD portfolio is constructed following the Carhart model (1997) with monthly calculations of stock returns. UMD is the momentum factor. The 30% momentum variable contains stocks with the highest average prior month return (UMDB) and 30% contains shares with the lowest prior month return (UMDS). After grouping the shares, a portfolio is formed as follows:

Table 1. Formation of Portfolios by grouping them into size-BE/ME portfolios, size-Op, size-Inv, and size-Mom

Panel A: size-BE/ME				Panel B: size-Op		
Size	*Hight* (H)	*Medium* (M)	*Low* (L)	*Robust* (R)	*Medium* (M)	*Weak* (W)
Small (S)	SH	SM	SL	SR	SM	SW
Big (B)	BH	BM	BL	BR	BM	BW
Panel C: size-Inv				Panel D: size-Mom		
Size	*Conservative* (C)	Medium (M)	*Aggressive* (A)	*Up* (U)	Medium (M)	*Down* (D)
Small (S)	SC	SM	SA	SU	SM	SD
Big (B)	BC	BM	BA	BU	BM	BD

Table 2. Summary of the formation of Size, BE/ME, Profitability, Investment, and Momentum Factors

Sort	Breakpoints	Factor and Their Component	
2x3 sort on;	-size; median value BE/ME,	$SMB_{BE/ME}$	= (SL+SM+SH)/3–(BL+BM+BH)/3
-Size-BE/ME	Op., Inv., Mo.; 30%, 40%,	SMB_{OP}	= (SR+SM+SW)/3–(BR+BM+BW)/3
-Size-Op	dan 30%	SMB_{INV}	= (SC+SM+SA)/3–(BC+BM+BA)/3
-Size-Inv		SMB	= ($SMB_{BE/ME}$+SMB_{OP}+SMB_{INV})/3
-Size-Mom		HML HML	= (SH + BH)/2 – (SL + BL)/2
		RMW	= (SR + BR)/2 – (SW + BW)/2
		CMA	= (SC + BC)/2 – (SA + BA)/2
		UMD	= (SU + BU)/2 – (SD + BD)/2
2x2 sort on;	-size; median value BE/ME,	SMB	= (SH+SL+SR+SW+SC+SA)/6-
-Size-BE/ME	Op., Inv., Mo.; 30%, 40%,		(BH+BL+BR+BW+BC+BA)/6
-Size-Op	dan 30%	HML	= (SH + BH)/2 – (SL + BL)/2
-Size-Inv		RMW	= (SR + BR)/2 – (SW + BW)/2
-Size-Mom		CMA	= (SC + BC)/2 – (SA + BA)/2
		UMD	= (SU + BU)/2 – (SD + BD)/2

This study applied multiple linear regression analysis with the *Ordinary Least Square* (OLS) method. Before conducting the analysis, the researchers firstly conducted a prerequisite test in the form of a stationary test and a classic assumption test. The regression model used is as follows:

$$R_{it} - R_{ft} = a_i + \beta_i (R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + m_i UMD_t + e_{it}$$

In the equation above, R_{it} is the month *t* return on *i*. $R_{mt} - R_{ft}$ is the return on the value-weight portfolio of ISSI. R_{ft} itself is the average monthly risk-free rate. SMB (Small Minus Big) is the difference between small stock portfolio return with a large stock portfolio. HML (High Minus Low) is the difference between stock portfolio return high BE/ME and stock portfolio return with low BE/ME. RMW (Robust Minus Weak) is the difference between return of high profitability stock portfolio (robust) and a low profitability stock portfolio (weak). CMA (Conservative Minus Aggressive) is the difference in return on conservative stock portfolios with high profitability (aggressive) stock portfolios. UMD (Up Minus Down) is obtained by stock portfolio return of winner shares reduced by stock portfolio returns of losers shares. α is an Intercept. Whereas, βi is the market Beta or regression coefficient. S_p, $h_{p,\ RP,}$ c_p are the regression coefficients for each factor.

Results and Discussion

In panels A and B of Table 3, the average value of the excess return is 0.92% per month with a standard deviation of 0.036. The average value of the market risk premium (MRP) is -0.02% per month with 0.034 standard deviation. The monthly average for the *book-to-market* (HML) factor is 0.43% with a standard deviation of 0.046. The monthly average profitability factor (RMW) is 0.66% with a standard deviation of 0.042. The average value of the investment factor (CMA) is 0.17% per month, and the monthly average for the momentum factor (UMD) is 1.44% with the respective standard deviation of 0.044 and 0.043.

This study used a data stationarity test using the Augmented Dickey-Fuller (ADF) method at the data level. The stationarity test results on each study variable showed a t-statistic value that was smaller than the critical value. It means that all research variables were stationary (did not have a root unit) at the data level.

The normality test in this study used the *Shapiro-Wilk* W test model. Thus, the data in this study were normally distributed or free from normality assumptions.In this study, the multicollinearity test used the *Variance Inflation Factor* (VIF) model with a significance level of <10. For the regression model, both 2x3 and 2x2 portfolios, there is no multicollinearity problem. This heteroscedasticity test applied *Pagan Breusch*. The test results can be declared to be free from heteroscedasticity when the Chi-Square probability value is >5%. Heteroscedasticity

test results showed that the Chi-Square probability of 0.0971 and 0.2809 was greater than 5%. The research model is declared free from autocorrelation problems if the chi-squared probability value is higher than the significance level of 5%. The test results showed that the probability of Chi-square of 0.1674 and 0.3107 is more than 0.05 respectively. So, the regression model is free from the autocorrelation problem.

Table 3. Summary of Descriptive Statistics

Panel A: Statistical Summary of the Six-factor Portfolio Model 2x3							
Var.	*Excess Return*	MRP	SMB	HML	RMW	CMA	UMD
Obs.	60	60	60	60	60	60	60
Mean	0.0091	-0.0002	0.0052	0.0042	0.0065	0.0016	0.0144
Median	0.011	0.0055	0.0085	0.0002	0.0014	0.0017	0.018
Min	-0.091	-0.084	-0.126	-0.177	-0.071	-0.103	-0.079
Max	0.092	0.065	0.063	0.117	0.181	0.175	0.201
Std.Dev.	0.0357	0.034	0.033	0.046	0.042	0.044	0.043
Panel B: Statistical Summary of the Six-factor Portfolio Model 2x2							
Var.	*Excess Return*	MRP	SMB	HML	RMW	CMA	UMD
Obs.	60	60	60	60	60	60	60
Mean	0.009	-0.0002	0.0038	0.004	0.006	0.002	0.014
Med.	0.011	0.006	0.007	0.0002	0.0013	0.0016	0.018
Min.	-0.091	-0.084	-0.185	-0.177	-0.071	-0.103	-0.079
Max.	0.092	0.065	0.068	0.117	0.181	0.175	0.202
Std.Dev.	0.0357	0.034	0.039	0.046	0.042	0.045	0.043

Source: Secondary data processed by Stata 14

Based on the results of multiple linear regression tests with the *Ordinary Least Square* (OLS) method using Stata 14 presented in Table 4, the regression equation model was obtained as follows:

$$R_{pt} - R_{ft} = 0{,}0033891 + 0{,}9182868_{MRP} + 0{,}1175177_{SMB} + 0{,}2958566_{HML} + 0{,}1471286_{RMW} + 0{,}2387784_{CMA} + 0{,}1867158_{UMD} + e_{pt} \quad (1)$$

$$R_{pt} - R_{ft} = 0.0043427 + 0.8811655_{MRP} + 0.0128590_{SMB} + 0.2974452_{HML} + 0.1265457_{RMW} + 0.2175844_{CMA} + 0.1706751_{UMD} + e_{pt} \quad (2)$$

Equation (1) shows the regression equation formed with version 2x3 and equation (2) is a regression equation formed with version 2x2. Based on the results of the two regression equations in Table 4, it can be explained that the influence of risk premium, size, *book-to-market* equity, profitability, investment, and momentum has a positive effect on portfolio excess returns, both in the 2x3 and 2x2 versions. The constant values in the equation are 0.0033 and 0.0043, respectively. In other words, ISSI's stock portfolio excess return will increase by 0.34% in the 2x3 version of the portfolio and will increase by 0.43% in the 2x2 version of the portfolio if market conditions, company size, BE/ME, profitability, investment, and momentum do not change or constant.

Based on the test results of the coefficient of determination in Table 4, it is obtained the adjusted R-square value of 0.6961 for portfolios formed in the 2x3 version and 0.6866 for portfolios formed in the 2x2 version. This shows that between the two versions, the regression model formed in the 2x3 version is better in explaining the dependent variable. The ability of the independent variable risk premium, size, *book-to-market* equity, profitability, investment, and momentum in explaining the dependent variable excess ISSI stock portfolio is 69.61%. While the remaining 30.39% is explained by other variables, excluded from this study.

Based on the results of the simultaneous test (statistical F test) presented in Table 4, all models, both formed in the 2x3 and 2x2 versions, have a probability value (F-Statistic) of 0.0000. With a significance level of 5% (0.05), Ha is accepted and Ho is rejected. Thus it shows that the

risk premium, size, *book-to-market* equity, profitability, investment, and momentum together have a significant effect on ISSI's stock portfolio excess returns in the 2013-2017 study period.

Table 4. Results of the Six-factor Model Regression

	Portfolio 2x3				Portfolio 2x2			
	Coef.	Std. Err.	t	P>|t|	Coef.	Std. Err.	t	P>|t|
MRP	0.9183	0.0948	9.68	0.000	0.8812	0.0958	9.20	0.000
SMB	0.1175	0.0905	1.30	0.200	0.0128	0.0785	0.16	0.871
HML	0.2959	0.0675	4.38	0.000	0.2974	0.0687	4.33	0.000
RMW	0.1471	0.0749	1.96	0.055	0.1265	0.0760	1.67	0.102
CMA	0.2387	0.0766	3.12	0.003	0.2176	0.0795	2.74	0.008
UMD	0.1867	0.0676	2.76	0.008	0.1707	0.0684	2.49	0.016
C	0.0033	0.0029	1.18	0.244	0.0043	0.0028	1.51	0.136
F	23.52				F	22.54		
Prob> F	0.0000				Prob > F	0.0000		
R^2	0.7270				R^2	0.7184		
Adj R^2	0.6961				Adj R^2	0.6866		

F is the F-statistic value for each portfolio. Prob> F shows the probability value of F for each portfolio. R^2 shows the value of R^2 for each portfolio. Adj R^2 is the adjusted R^2 average for each portfolio.

Considering the results of the coefficient of determination test (adj R-square) that the model formed using the 2x3 version portfolio is the best of the two versions, then in the t-statistic test analysis will only explain the results of the t-statistic test of the factors formed in the version 2x3 in detail. Based on the results of the t-statistic test in Table 4, it is obtained the results of the analysis for each independent variable as follows:

Effect of the risk premium on ISSI's stock portfolio excess return

Based on the magnitude of the *beta* risk premium coefficient which is proxied by market risk premium = 0.9183 is positive, it influences the excess return of the stock portfolio with a t-statistic value of 9.68 and sig-t = 0,000. Thus, following the hypothesis that the authors propose which accepts hypothesis 1; risk premium has a significant positive effect on excess return on stock portfolios. This shows that the higher the risk premium, the higher the stock portfolio excess return.

The risk premium that is proxied by the market risk premium here is a risk premium in the market portfolio that illustrates the size of the risk (Sudiyatno & Irsyad, 2011). Investment risk itself is the difference between the actual rate of return (actual return) with the expected rate of return (Tendelilin, 2010). It is in line with the concept of the *Capital Asset Pricing Model* (CAPM), where the higher the rate of return expected by investors, the higher the investment risk is, in other words, risk and return have a strong directional relationship (high risk high return). The results of this study are consistent with research conducted by Pasaribu (2009), Sutrisno and Ekaputra (2016), Acaravci and Karamoer (2017), Candika (2017), and Wijaya, Murhadi, and Utami (2015) who found that market risk had a significant positive effect to the excess return of the stock portfolio. The results of this study indicate that the risk premium (*beta*) is still a relevant factor in measuring stock portfolio excess returns.

Effect of size on ISSI's stock portfolio excess return

The second hypothesis proposed in this study is that size has a significant positive effect on stock portfolio excess returns. Based on the estimation results, the magnitude of the *beta* coefficient of size is proxied by *Small minus Big* (SMB) = 0.1175 with a t-statistic probability value of 0.200. Thus, the size factor does not have a significant effect on excess return on stock portfolios, although it is positively correlated. So this research accepts Ho and rejects hypothesis 2.

The results of this study are not under the theory of market efficiency which states that the relationship between returns and company characteristics reveals a size effect, namely the tendency of small-company stocks (small market capitalization value) to have a higher return than large company stocks (Tendelilin, 2010). Besides, small stocks with high market risk tend to provide high returns (Berk & De Marzo, 2014). The insignificant size factor in this study illustrates that the size of the company as seen from the market capitalization value of each issuer is not the main factor that is always used by investors as an indicator of making decisions for investment, but rather considers market risk.

The market capitalization value used as the basis for calculating the size factor illustrates that the movement of shares in ISSI is inseparable from the movements of JII and LQ45. When the market capitalization of a stock increases, the share price will also rise. The increase in stock prices will have an impact on the increase in stock returns. Unfortunately, considering Indonesia as an emerging market, the trading activities in stock market in Indonesia is still low (thin trading). Dimson (1979) and Lo and Mackinlay (1990) in Sutrisno and Ekaputra (2016) state that a market that experiences thin trading is likely to cause individual stock levels to affect portfolio levels. As a result, the standard error will be overestimated or underestimated.

Besides, this study is not in line with the work of Acaravci and Karaomer (2016) and Candika (2017) which show that small size companies have a significant positive effect, while large size companies do not have a significant positive effect. However, this research is following and supported by the results of research conducted by Sudiyatno and Irsad (2011) and Darusman and Prasetiono (2012).

Effect of book-to-market equity on ISSI's stock return portfolio

Based on the test results in Table 4, it can be seen that the *book-to-market* equity factor which is proxied by *High Minus Low* (HML) has a significant positive effect on the excess return on stock portfolios with significant t-statistic value of (0,000) <α (0.05). Thus, it can be concluded that hypothesis 3 in this study is accepted. This shows that stocks with high *book-to-market* equity factors will tend to provide higher returns when compared to shares of companies with low *book-to-market* equity.

Book-to-market equity proxied by HML is a ratio used to measure the difference between monthly returns of stocks that have a high *book-to-market* ratio and stocks with a low *book-to-market* (Zubir, 2010), where net assets are equal to total shareholders' equity, and shows the book value per share (Hartono, 2014). While the market value shows the multiplication of the number of shares issued with the *close price* of each company.

When the market value is higher than the book value, the *book-to-market* value will decrease. When the book value increases, investors expect that the expected return value of company shares also rises; and this is what really encourages them to buy it. The results of this study support the prior research conducted by Fama and French (2015), Chiah, Chai, and Zhong (2015), Sutrisno and Ekaputra (2016), and Candika (2017) which states that *book-to-market* has a positive effect on excess return stock portfolio.

Effect of Profitability on ISSI's Stock Portfolio Excess Return

Based on the partial test results (t) in Table 4, it shows that profitability which is proxied by *Robust Minus Weak* (RMW) does not significantly influence the ISSI stock portfolio excess return during January 2013-December 2017. Significance of t-value of (0.055)> α 5% (0.05) becomes the basis that the profitability factor has no significant effect. Thus, the higher the profitability value, the higher the stock return obtained is.

The profitability factor that describes the profit level of a company by using the ratio of Return on Equity (ROE) is the basis in this study, which is obtained by comparing net income with book measurement equity ratios due to reasons of data availability (Acaravci & Karaomer, 2017). Novy-Marx (2013) explains that investors in companies with high levels of productivity tend to demand high returns, and vice versa when the level of company productivity is low, then investors will not expect such high returns. The result that states the profitability factor in this

study is not significant may be due to a tendency of investors who do not pay attention to the profitability factor which is measured by using the Return on Equity (ROE) in investment decisions. Moreover, other factors like interest rates, combined price indexes, news and rumors etc, can also give influences so it results in a possibility that profitability has a smaller effect than other factors on stock prices. The results of this study are in line with the findings made by Sutrisno and Ekaputra (2016).

Effect of Investment on ISSI's Stock Portfolio Excess Return

Based on the magnitude of the *beta* investment coefficient, proxied by *Conservative Minus Aggressive* (CMA) = 0.2387784 which is positive, it influences the excess portfolio return of shares with a t-statistic value of 3.12 and sig-t = 0.003. Thus, it is in line with the hypothesis that the authors propose, which accepts Ha5; investment has a significant positive effect on excess return on stock portfolios. This shows that the higher the investment, the higher the stock portfolio excess return is.

According to Fama and French (2015), the level of investment of a company is measured based on the growth rate of total assets from the fiscal year. *Conservative Minus Aggressive* (CMA) is used in the formation of portfolios based on size-investment, where CMA is the difference between the average return on two portfolios with conservative investment and the average return on two portfolios with aggressive investment in every month (Sutrisno & Ekaputra, 2016).

The investment factor is included in the five-factor model to see the rate of return on assets based on the dividend discount model. There is a discount rate effect in the dividend discount model which states that within the expected rate of long-term return there is a relationship between stock prices and expected dividends (Fama & French, 2015). Dividends are considered as returns obtained when investors apply a passive portfolio strategy, which involves minimal expectations of investment returns (Fabozzi, 2002 in Darusman & Prasetiono, 2012).This study result found that there was consistency related to previous studies such as Fama and French (2015), Acaravci and Karaomer (2017) and Wijaya, Murhadi, and Utami (2015), which stated that investment proxied by CMA tended to have a positive effect on excess return stock portfolio.

Effect of Momentum on ISSI's Stock Portfolio Excess Return

The sixth hypothesis proposed in this study is that momentum has a significant positive effect on stock portfolio excess returns. Based on the estimation results, the beta coefficient of the momentum which is proxied by Up Minus Down (UMD) = 0.1867 with a t-statistic probability value of 0.008 $<\alpha$ (0.05). Thus, the momentum factor has a significant positive effect on the excess return on stock portfolios. So this research accepts *hypothesis 6*.

Momentum was first introduced in the research of Jagadeesh and Titman (1993). The results of this research found that the purchase of winning shares (winners) in the past period and selling losers' shares (losers) in the past period will obtain an *abnormal return*, where it can occur due to drastic changes in stock prices. The strategy of buying winner shares in the past period and then selling them in the coming period when the share price rises are called the momentum strategy (Darusman & Prasetiono, 2012). Investors tend to pay attention to the momentum factor when doubting information or when unclear information occurs. So this behavior can be called *overreaction* (Campbell, 2004). Fabozzi (2002) in Darusman and Prasetiono (2012) revealed that investors would tend to exploit overreaction to get *abnormal returns*. This happens when investors can identify extreme events and determine when the effect of *overreaction* in the market disappears.

This research is in line with the findings of Candika (2017) which revealed that UMD had a significant positive effect on stock portfolios with momentum of *up*. Investors will respond positively to stocks with good performance for one year by making a purchase. In the research of Fama and French (2018), it is revealed that the *asset pricing* model by adding the momentum factor produces good performance on the whole test. Fama-French (2012), Kowanda and Pasaribu (2012), and Gleny and Tjong (2014) also produced the same findings and support the results of

this study. However, this study contradicts the findings of Hendra, Wijaya, Murhadi, & Utami (2015) which revealed that momentum had an insignificant negative effect on returns.

Conclusion

Based on the results of the analysis of hypothesis testing, several things can be concluded as follows. The risk premium, *book-to-market* ratio which is proxied by *High Minus Low* (HML), investment that is proxied by *Conservative Minus Aggressive* (CMA), and momentum which is proxied by *Up Minus Down* (UMD) have a positive effect on the excess return of the company's stock portfolio registered in the Indonesian Sharia Stock Index (ISSI) during January 2013-December 2017. The higher the risk premium (*beta*), the excess portfolio return obtained by investors will also increase. The discount rate effect in the dividend discount model states that, in the expected rate of long-term return, there is a relationship between stock prices and expected dividends (Fama & French, 2015).

During the study period, the size of the company which is proxied by *Small Minus Big* (SMB) and profitability which is proxied by *Robust Minus Weak* (RMW) does not affect the ISSI stock portfolio excess returns. This makes the size of the company size does not have an impact on excess return. Based on this, the factors that can affect stock returns beside profitability are interest rates, combined stock price indexes, news and rumors, and so forth. In addition, it is also possible that there is a tendency of investors to not pay attention to profitability factors measured by Return on Equity (ROE) in investment decisions.

The results of this study provide relevant information about the relationship between risk and stock returns using the Fama and French five-factors model and momentum, especially on shariah shares registered on the Indonesian Sharia Stock Index (ISSI) during 2013 to 2017. From the results of this study, it is expected that academics can use this information for the development and improvement process. This research can be used as consideration for capital market players, especially investors in making investment decisions, namely choosing and determining the types of shares registered on ISSI that have maximum returns.

Still, there are limits in this research that can be developed and explored for further research. Future researchers can expand the scale of research by adding research periods and using daily return research data. It is intended that the results obtained are more representative of the actual market conditions at the moment. As for future researchers, it is recommended to apply operating profitability and cash profitability, following Fama & French (2018) research related to 'choosing factors', to calculate the variables in profitability.

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