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Testing SCAPM and CAPM On Sharia Stock Portfolios: Evidence From The Jakarta Islamic Index (JII) For The 2019–2023 Period

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Abstract. *This study examines and compares the Capital Asset Pricing Model (CAPM) with the Sharia Compliance Asset Pricing Model (SCAPM) in constructing an optimal stock portfolio based on the sharia stock index on the Indonesia Stock Exchange, specifically the Jakarta Islamic Index (JII), during the 2019–2023 period. The primary aim is to evaluate whether the SCAPM, which incorporates mudharabah profit-sharing returns in place of the risk-free rate, offers more relevant insights for Muslim investors compared to the CAPM. Utilizing a quantitative approach and a two-step regression method, the research develops an optimal portfolio by calculating stock betas and analyzing the relationship between systematic risk and expected returns. The findings reveal that neither the CAPM nor the SCAPM models are valid for predicting risk and expected returns for the JII's optimal stock portfolio. This study is intended to guide sharia-compliant investors in making informed decisions and assist investment managers in designing strategies aligned with Islamic financial principles.*

Keywords: *Capital Asset Pricing Model (CAPM), Sharia Compliance Asset Pricing Model (SCAPM), Mudharabah, Optimum Portfolio, Sharia Stocks.*

1. INTRODUCTION

Investment involves committing money or resources in the present with the expectation of future benefits (Bodie, 2020). In Islam, investment encompasses not only financial knowledge but also spiritual lessons guided by Islamic principles, making it a part of muamalah, permissible activities unless explicitly prohibited. Therefore, Muslims are allowed to invest, provided it aligns with Islamic teachings and involves productive, sharia-compliant assets (Pardiansyah, 2017). Every investor must build an optimal portfolio to achieve the best results with an acceptable level of return and risk (Almunfarijah, 2017). Stock selection within the portfolio should consider the investor's readiness to face risks, depending on their risk preferences. The ultimate goal is to achieve optimal investment outcomes.

The Capital Asset Pricing Model (CAPM) analyzes portfolios based on the correlation between return and risk. According to Darmadji & Fakhruddin (2010), CAPM explains that investors expect compensation for the time value of money (represented by the risk-free rate) and investment risk (measured by beta). Investment risk consists of systematic and unsystematic risk (Sunariyah, 2000). Beta serves as a measure of systematic risk relative to market risk: a beta of 1 indicates an expected return equal to the market, a beta greater than 1 signifies higher risk and a potentially higher return than the market, while a beta less than 1 reflects lower risk with an expected return below the market (Hartono, 2017).

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Research by Aldy (2011) found that CAPM was valid for the Indonesia Stock Exchange (IDX) during 2006–2010. However, Sari & Ryandono (2018) concluded that CAPM was invalid for the Jakarta Islamic Index (JII) due to unmet assumptions, such as negative and insignificant beta values. Kurniawan & Sari (2023) identified an optimal portfolio using CAPM for IDX30 in 2020, including TBIG, MDKA, and UNTR, while Ayudin et al. (2019) found no optimal portfolio for IDX30 during 2016–2019. These discrepancies highlight the need to reassess CAPM's relevance to Islamic investments. Moreover, the use of the risk-free rate in CAPM is debated in Islamic finance, as it contradicts principles such as al-ghunam bil ghurm (risk accompanies return) and al-kharāj bi al-dhamān (profit requires liability) (Pardiansyah, 2017).

Islamic economics has been applied in various countries, including Indonesia, which has the largest Muslim population in the world, accounting for 86.7% of its population. However, the return on Islamic stock indices has decreased by 26.3% over a five-year period. This decline has led investors to explore optimal portfolio theory to minimize risk while maximizing return. Muslim investors are generally more interested in stocks within Islamic indices, building their portfolios with sharia-compliant stocks. They aim to develop investment models that adhere to Islamic principles, such as eliminating interest (riba) as a source of income. One such model is the Sharia Compliance Asset Pricing Model (SCAPM) (Faisol et al., 2022).

Previous studies have explored alternative methods to eliminate interest-based elements in portfolio models. Hanif (2011) modified the conventional CAPM by replacing the risk-free rate with inflation, while Derbali et al. (2017) replaced it with sukuk rates, arguing that inflation should be included due to the government's responsibility to protect public welfare. However, since inflation is lower than the risk-free rate, the SCAPM value is smaller than CAPM, potentially misrepresenting asset values. Faisol et al. (2022) suggested using mudharabah profit-sharing returns as a substitute for the risk-free rate in SCAPM. Building on this, the author aims to research the formation of an optimal portfolio using SCAPM with mudharabah returns as a replacement for the risk-free rate in the JII Index from 2019 to 2023. SCAPM is preferred as it avoids the interest-based elements of conventional CAPM, which are prohibited in Islam. The study will test the validity of both models and compare their differences, aiming to provide basis investment decisions aligned Islamic principles.

2. LITERATURE REVIEW

1. Capital Market

The capital market is a market for trading short- or long-term financial instruments, either in the form of debt or equity, issued by the government, public authorities, and private companies. According to Law No. 8 of 1995, the capital market involves activities related to the trading of securities, public companies issuing securities, and institutions and professions associated with securities (OJK, 2017).

2. Investment

Investment involves allocating money or other resources now with the expectation of future returns. It typically takes the form of real assets such as gold, land, and property, or financial assets like stocks, bonds, and mutual funds (Tandelilin, 2010). From an Islamic economics perspective, investment refers to fund collection or capital involvement in business activities that align with Sharia principles, both in terms of the object and the process (Pardiansyah, 2017).

3. Sharia Stock

Sharia stocks are ownership certificates issued by companies whose activities align with Sharia principles. These stocks represent capital investment in businesses free from activities like gambling, usury, and haram products, based on musyarakah and mudharabah contracts (Choirunnisak, 2019).

4. Mudharabah

Mudharabah is a partnership contract where the first party (shahibul maal) provides funds, and the second party (mudharib) manages the business. Profits are shared as agreed in the contract, while losses are borne by shahibul maal, unless due to mudharib's negligence. Mudharib is responsible for losses caused by fraud or negligence (Ananta, 2019).

5. Optimal Portfolio

The modern portfolio concept was introduced by Markowitz in his 1959 article "Portfolio Selection." His Portfolio Theory, based on the mean-variance approach, measures returns (mean) and risks (variance). It aims to maximize expected returns and minimize risks to create an optimal portfolio. According to Tandelilin (2010), an optimal portfolio is the best choice an investor can make from a set of efficient portfolios. The chosen portfolio aligns with

the investor's risk-return preferences. A rational investor will select an efficient portfolio, which optimizes either expected return or portfolio return. An efficient portfolio offers the highest expected return for a given risk or the lowest risk for a certain expected return (Hartono, 2017).

6. Capital Asset Pricinng Model (CAPM)

CAPM is an equilibrium model that illustrates the relationship between risk and return simply, using a single variable (beta) to represent risk (Bodie, 2020). Beta measures the volatility of a security's or portfolio's returns relative to the market return (Tandelilin, 2010). According to Markowitz's theory, investors diversify their portfolios and choose the optimal portfolio based on their preferences for expected return and risk.

7. Sharia Compliance Asset Pricing Model (SCAPM)

The Sharia Compliance Asset Pricing Model (SCAPM) is an alternative model developed from CAPM, based on the Islamic principle that prohibits interest, meaning fixed profits and risk-free income are not allowed. Therefore, a modification CAPM model is needed to align with Sharia principles & assist investors (Faisol et al., 2022).

8. Return and Risk

According to Tandelilin (2010), return is a key factor motivating investors to invest and serves as a reward for bearing the risks of an investment. Then, risk refers to the potential for future losses (Faisol et al., 2022). Risk is the uncertainty about future returns and is often associated with deviations from expected outcomes. To calculate risk, the standard deviation method is used, which measures the deviation of actual values from expected values.

9. Hyphothesis

Based on the problem formulation, literature review, and review of previous studies, two (2) hypotheses are formulated in this research, namely:

***H*1:** The SCAPM and CAPM models are valid and significantly positive in relation to the risk and return of the Jakarta Islamic Index (JII) optimal portfolio.

***H*2:** The SCAPM model significantly differs from the CAPM model in predicting the Jakarta Islamic Index (JII) portfolio return.

3. METHODS

1. Design, Method, and Sample

This is a quantitative research using a descriptive approach. The data used is secondary data, obtained indirectly through third-party sources. The secondary data consists of stocks listed in the Jakarta Islamic Index (JII) from 2019-2023, documented on the official Indonesia Stock Exchange website, www.idx.co.id. Other secondary data include books, articles, and relevant journals to support the research. Then, this study uses purposive sampling, where samples are selected based on predetermined criteria. The criteria for this research include companies listed in the JII index and consistently included during 2019-2023, totaling 14 companies.

2. Operational Definition of Variables

a. Independent Variable

Table 1. Operational Definition of Independent Variables

Variable	Definition
Actual Stock Return	Actual stock return is the difference between the current stock price and the previous period's price. It measures the realized level of profit (return). $$Ri = \frac{Pt - (Pt - 1) + Dt}{(Pt - 1)}$$ Details: Ri = return of stock i Pt = stock price at period t Pt-1 = stock price at period t-1 Dt = dividend distributed at time t (if any)
Actual Market Return	Actual market return is the ratio measuring the price change of a market index, in this case, the Composite Stock Price Index (IHSG). It compares the difference between the current and previous period market prices. $$Rm = \frac{IHSGt - (IHSGt - 1)}{(IHSHt - 1)}$$ Details: Rm : market return of the IHSG IHSGt : IHSG price at period t IHSGt-1 : IHSG price at period t-1
Beta (βi)	Beta helps investors understand how a stock behaves relative to the overall market, making it a key tool in portfolio analysis. It is calculated by comparing the market index price changes to individual stock price changes over a specific period. A beta greater than 1 indicates higher volatility than the market, while a beta lower than 1 indicates lower volatility. $$\beta i = \frac{cov\ (Ri, Rm)}{var\ (Rm)}$$ Details: βi : beta coefficient of stock i

	Var(Rm) : variance of market return Rm : market return
Risk Free Rate	It is used to determine the minimum expected return for an investor. Using the risk-free rate, investors can estimate their minimum potential return. In this study, the risk-free rate for CAPM is the interest rate, while for SCAPM, it is the return on mudharabah profit-sharing.
Expected Return	Expected return is the average of historical returns that have occurred in the past. $$E(Ri) = \frac{\sum Ri}{n}$$ Details: E(Ri) : expected return of stock i ∑Ri : total return of stock i n : number of returns of stock i

b. Dependent Variable

Table 2. Operational Definition of Dependent Variables

Variable	Definition
Capital Asset Pricing Model (CAPM)	CAPM is an equilibrium model that simplifies the relationship between risk and return, using a single variable (beta) to represent risk. $$E(Ri) = Rf + \beta\ (E(Rm) - Rf)$$ Details: E(Ri) : Expected return of the stock at time i Rf : risk-free rate β : beta value E(Rm) : expected market return E(Rm) – Rf : risk premium
Sharia Compliance Asset Pricing Model (SCAPM)	SCAPM is an extension of CAPM that evaluates risk and return within a Sharia framework. Faisol et al. (2020) propose replacing the Rf variable with mudharabah profit-sharing return (RMD) in the SCAPM model. $$E(Ri) = RMDt + \beta\ (E(Rm) - RMD)$$ Details: E(Ri) : Expected return of the stock RMD : Mudharabah return E(Rm) : Expected market return β : beta or systematic risk Rm – RMD : Risk premium

3. Data Analysis Method

This study uses a two-step regression method. The first step involves forming an optimal portfolio from the JII stocks in the sample. A time series regression is performed for each stock to obtain the regression coefficient (beta). Using these betas, the optimal portfolio is constructed using the Capital Asset Pricing Model (CAPM) and Sharia Compliance Asset Pricing Model (SCAPM). The second step is testing the significance of the betas through cross-sectional regression on the optimal portfolio.

4. Hyphotheses Test

Hypothesis testing is conducted using cross-sectional regression on the beta values of the optimal portfolio stocks previously calculated. The steps in this regression test include: 1) calculating the dependent variable (Y) using SCAPM and CAPM; 2) calculating the independent variable, which is the regression coefficient (beta) from the optimal portfolio stock formation; and 3) testing the first hypothesis (H1) using partial significance testing (t-test) at a 95% confidence level (α = 5%). The criteria are: H10 is accepted if t-value is positive and significance is less than 5%, while H11 is rejected if t-value is not positive or significance is above 5%. Additionally, a paired sample t-test is used to test the second hypothesis (H2) to compare the returns of the CAPM and SCAPM portfolios. The criteria for H2 are: H20 is rejected if sig. (2-tailed) > 0.05, meaning no significant difference between CAPM and SCAPM returns, and H21 is accepted if sig. (2-tailed) < 0.05, indicating a significant difference between the portfolio performances of CAPM and SCAPM.

4. RESULTS

Capital Asset Pricing Model (CAPM) model, the significance test results for this model is shown in Table 3. According to the data, the regression coefficient beta is -0.000948, and the significance level between the independent and dependent variables is 0.000. This indicates that beta is negative and significant at the 95% level (α = 5%). Additionally, the R-squared value is 1.000, meaning that 100% of the expected return is influenced by the beta variable, with no impact from other factors outside this model.

Table 3. CAPM Model Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003868	4.36E-18	8.86E+14	0.0000
BETA	-0.000948	2.98E-18	-3.18E+14	0.0000
R-squared	1.000000	Mean dependent var		0.002615
Adjusted R-squared	1.000000	S.D. dependent var		0.000651
S.E. of regression	4.58E-18	Sum squared resid		8.39E-35
F-statistic	1.01E+29	Durbin-Watson stat		1.939759
Prob(F-statistic)	0.000000			

Source: Eviews, 2024

Sharia Compliance Asset Pricing Model (SCAPM) model, the significance test results for this model is shown in Table 4. Based on the data in Table 4. the regression coefficient beta is -0.000506, and the significance level between the independent and dependent variables is 0.000, indicating a negative and significant beta at the 95% level (α = 5%). The R-squared value of 1.000 means that 100% of the expected return is influenced by the beta variable, with no impact from other factors outside the model.

Table 4. SCAPM Model Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003426	2.35E-18	1.46E+15	0.0000
BETA	-0.000506	1.69E-18	-3.00E+14	0.0000
R-squared	1.000000	Mean dependent var		0.002789
Adjusted R-squared	1.000000	S.D. dependent var		0.000326
S.E. of regression	2.67E-18	Sum squared resid		3.56E-35
F-statistic	8.97E+28	Durbin-Watson stat		1.876836
Prob(F-statistic)	0.000000			

Source: Eviews, 2024

After analyzing the results, the next step is to summarize the findings regarding the validity of the SCAPM and CAPM models on the risk and return of the optimal JII stock portfolio, as well as the significant difference between the SCAPM and CAPM models in predicting JII portfolio returns. The following is a summary table of the research results:

Table 5. Recapitulation of Research Results

No	Hyphotheses	Results	Criteria	Interpretation	Conclusions
1.	The SCAPM and CAPM models are valid for portfolio risk and return optimum JII	*Coefficient Beta* = -0,00948 dan -0,000506 Sig = 0,000	Coefficient Beta (β) > 0 > α (0,05)	H1 is rejected	The SCAPM and CAPM models are valid for portfolio risk and return optimum JII
2.	The SCAPM model is significantly different from the CAPM model in predicting returns JII portfolio	H1 is rejected, so there is no need to carry out a different test	sig. (2-tailed) < 0,05	H2 is rejected	Because H1 was rejected, H2 was no longer tested

Source: Developed by Researchers, 2024

4. DISCUSSION

The CAPM and SCAPM models are valid for risk and expected return JII optimum stock portfolio

Based on the t-statistic test results for both the Capital Asset Pricing Model (CAPM) and Sharia Compliance Asset Pricing Model (SCAPM), the beta (β) as the risk variable has negative coefficients of -0.000948 and -0.000506, respectively, with the same significant probability value of 0.0000, well below 5% at a 5% significance level. This indicates a significant negative correlation between the risk variable (beta) and the expected return of the optimal JII stock portfolio from 2019 to 2023, meaning that as risk decreases, return increases. Therefore, the first hypothesis (H1), stating that both SCAPM and CAPM models are positively significant for risk and expected return, is rejected. This finding contradicts Black (1972), Lintner (1965), and Sharpe (1964), who stated that beta is the only relevant risk measure for

investment and there should be a positive trade-off between beta and expected return (Tang & Shum, 2003).

This study's results align with those of Fletcher (2000), who found a significant positive relationship between beta and return during rising market months, and a significant negative relationship during falling market months. Similarly, Tang & Shum (2003) observed a positive relationship during market upturns and a negative one during downturns. Additionally, Faisol et al. (2023) tested beta's validity on the JII index and concluded that beta was invalid, as the Covid-19 pandemic increased global economic risks and stock volatility, making beta unpredictable and invalidating the SCAPM model. During the study period, the market experienced a downturn due to the Covid-19 pandemic from 2020 to 2022, leading to a lack of validity in the risk-return relationship. Typically, the relationship is positive, meaning higher risk leads to higher return and vice versa. However, this study found a significant negative relationship, where a decrease in risk resulted in an increase in return. This suggests Indonesian investors are risk-averse, preferring low-risk investments like deposits, bonds when risk levels rise.

The CAPM model is significantly different from the SCAPM model in predicting JII optimum portfolio return

At this stage, no paired sample t-test is conducted to compare the CAPM and SCAPM models in predicting the optimal portfolio return of JII. This step aims to determine which model better predicts the return, but hypothesis H1 must first be accepted. Therefore, in hypothesis H2, both the Capital Asset Pricing Model (CAPM) and Sharia Compliance Asset Pricing Model (SCAPM) are found invalid in predicting the future return of the JII optimal portfolio.

5. CONCLUSION

This study aims to examine the validity of the Sharia Compliance Asset Pricing Model (SCAPM) mudharabah and the Capital Asset Pricing Model (CAPM) on the optimal portfolio of sharia stocks on the Indonesia Stock Exchange during 2019-2023. Key conclusions include:

1. No validity was found for either the CAPM or SCAPM models on the optimal sharia stock portfolio, as both models' beta coefficients were negative and significant.
2. In the sharia stock market, the relationship between beta and return is inversely correlated—when risk increases, return decreases, and vice versa.

3. The CAPM theory, which posits a positive trade-off between beta (systematic risk) and expected return, is refuted by this study.

LIMITATION

This study has several limitations, including the use of a limited data period (2019-2023), which may not capture long-term trends. The impact of market disruptions, such as the COVID-19 pandemic, may have influenced the results, affecting the generalizability of the findings. Additionally, the study relies on assumptions in the CAPM and SCAPM models, which may not fully reflect real-world conditions. The data used comes from secondary sources, which could be incomplete or inaccurate, and the study only considers beta as a measure of risk, ignoring other factors like unsystematic risk. Finally, investor behavior and external economic factors, such as global events, are not accounted for, which could also affect the validity of the models.

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