

# Is Reasonable to Use Mudharabah in Sharia Pricing Assets ?

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**Abstract.** This study aims to test whether several variations of mudharabah can be used as a substitute for the risk free rate in developing the Sharia CAPM model, as evidenced by the absence of differences in test results between the CAPM and Sharia CAPM models. The method used in this study is the average difference test using the Mann-Whitney test. The test results show that there is no significant difference between the average CAPM and SCAPM values. This means that using various variations of mudharabah in the calculation of pricing assets as a substitute for the risk free rate is a reasonable step, especially for sharia economic activists.

**Keywords:** Sharia CAPM, Mudharabah, Zakat

## 1 Introduction

One of the analytical tools used in terms of estimating the return value of a security is Capital Assets Pricing Model (CAPM) proposed by Sharpe [1]. By using a single index model, CAPM explains that the expected return of a security is a linear function of the security's risk-free rate and systematic risk against its market return with beta coefficient ( $\beta$ ). The use of beta coefficient as a measurement tool of systematic risk is considered relevant in describing the true risk because it cannot be minimized or eliminated by carrying out a portfolio, therefore it remains in every security or portfolio. Mathematically, CAPM can be represented in the following equation:

$$[E(R_p) = R_{Fr} + \beta (R_{mr} - R_{Fr}) + e]$$

The use of the interest component as the risk-free rate ( $R_{fr}$ ) has created a distinctive polemic among the performers of the sharia economic because it is classified as prohibited usury (*riba*). Therefore, an alternative asset pricing model which complies with sharia values or with Sharia Compliant Asset Pricing Model (SCAPM) is needed.

Some researchers have offered the alternative substitute of  $R_f$  or *interest rate*, such as Tomkin and Karim [2] who proposed eliminating the interest component in all Islamic economic practices, so that each contract or transaction is based solely on the principle of buying and selling (*ba'i*), leasing (*ijarah*), lending and borrowing (*qard*), philanthropy (*shodaqoh*), and cooperation (*musyarakah*). The models that can developed from Tomkin and Karim's proposals are:

$$[E(R) = \beta R_{mr}]. \quad (1)$$

El-Ashker [3] developed the theory of CAPM by using Zakat rate of 2.5% as the minimum rate. The model developed based on the proposal of Askher becomes:

$$[E(R) = Zkh + \beta ((R_{mr} - 2,5\%) + e)]. \quad (2)$$

Later, this model developed by Derbali et al [4] with several modifications, in the form of using sukuk rate or Islamic bonds as the substitute for the risk-free rate by imposing zakat on sukuk returns and market returns as costs intended to clean the assets as required in sharia. The model developed by Derbali et al is mentioned as follows:

$$E(R) = R_s + \beta \left( R_m - \frac{RS}{1 - \partial M_1} \right). \quad (3)$$

The equation for the purification of market return by zakat (market purification) is:

$$\partial_M = 1 - \frac{\theta' \sigma_M + (1 - 2.5\%) R_s}{(1 - 2.5\%) R_m} \quad (4)$$

details :  
 $R_s$  : Return sukuk  
 $\partial_M$  : Market purification  
 $\theta'$  : Observed market price of risk on the capital market line  
 $\sigma_m$  : market standard deviation

Furthermore, Shaikh [5] proposed the use of the growth of Gross Domestic Product ( $\Sigma PP$ ) as a substitute for the risk-free rate, with the argument that every investment made must generate the income above GDP growth as the average productivity value of the society in an area. This is because Islam advocates someone to work productively and produce better value over time. The CAPM modification model developed based on the Sheikh's proposal is illustrated as follows:

$$[E(R) = \Sigma PP + \beta (R_{mr} - \Sigma PP) + e]. \quad (5)$$

Hanif [6] more specifically proposed using the inflation rate as a substitute for  $R_f$  in CAPM. This model is considered the most relevant model and approaches the classic CAPM model because the  $R_f$  component is formed by calculating the inflation in its determination. The model developed by Hanif is described as follows:

$$[E(R) = Inf + \beta (R_{mr} - Inf) + e]. \quad (6)$$

Although the efforts have been made to provide the alternative models, the models that have been previously stated have several issues to be discussed. For example, model proposed by El-Askher about the use of 2.5% of zakat cannot be used because Zakat is a function of obligations or expenses while  $R_f$  a function of income. Because the difference in function, therefore zakat cannot replace  $R_f$ . Besides, in Islamic jurisprudence, zakat can only be issued on non-productive fixed assets that have reached a certain amount or *nisab* and the possession has reached at least one year or *haul*. Empirically, the terms of *nisab* and *haul* can make it difficult for investors to determine their investment, because it can be an illogical choice when investors reject an investment that offers returns below the *nisab* and *haul* but can cover the cost of investment capital.

Likewise, the model developed by Derbali which used the sukuk rate is irrelevant because of its constant nature during the sukuk period so that it cannot anticipate changes in economic and market conditions that occur during the sukuk issuance period which results in not dynamic and difficult to predict changes in asset prices as a result of changes in economic conditions and markets.

Furthermore, the model developed by Shaikh is also inappropriate because the use of interest is different from PP in its function as an instrument of monetary control. When the government wants the economy to move more productively, interest will be lowered and vice versa, so that between interest and society's production value (PP) will have the opposite direction. The use of  $\Sigma GDP$  is irrelevant in describing the actual market conditions.

Next, the model using inflation developed by Hanif has several weaknesses, due to the fact that inflation is only one component in the formation of Rfr besides the cost of capital and the level of business risk, so if it is used only inflation as a substitute for Rfr, the E(R) value of Islamic CAPM will always be smaller than the classic E(R) of CAPM.

Based on the criticism of the Islamic or Sharia CAPM models that have been developed previously, this study offers another approach, namely the value of profit sharing or *mudharabah* from an industrial business in an area, which in this study uses the equivalent value of 12 months *mudharabah* deposits in the industry of Islamic banking because it is a type of profit sharing that has been popular and published regularly so it is easy to use as a risk benchmark.

## 2 Literature Review

### A. Sharia principles in Sharia CAPM

Sharia CAPM is an alternative model developed from CAPM but using the assumption of adherence to Islamic Sharia principles. These sharia principles include:

1. No cost of interest.
2. Imposing zakat for income.

### B. The Development of the SCAPM model

This study offers an alternative substitute for Rfr in the SCAPM model, namely the *mudharabah* equivalent. The formulation of the model is carried out by following the principles in the Islamic economy.

The first rule in model development is that there is no risk-free rate in the Islamic economic system. It means that all investments must be considered risky so that the Rfr component of the CAPM must also be replaced with another yield value that describes the principles of Islamic economics, in this case, the average value set. Return *mudharabah* (Rmd). The risk level at Rmd is calculated using the Standard Deviation (SD), and the model formed must take into account the Rmd level with the Standard Deviation (Rmd ± SD).

The second principle in Islamic economics is the obligation to pay zakat on the value of return received. Researchers have different opinions about the obligation to fulfill the Haul period and the nisab of the assets subject to the responsibility of zakat, so a model is formed to accommodate these differences of opinion.

Furthermore, the SCAPM model is described based on the different approaches to determining the standard deviation (SD) and the difference in the challenge of zakat collection, with the following model variations:

1. The SCAPM model, without SD and subject to zakat, is only used for investors who believe that zakat is collected directly without waiting for the haul and nisab, are as follows:

$$SCAPMR_{mdz} = (1 - Z) Rmd + \beta (Rm - ((1 - Z) Rmd)) \quad (9)$$

2. The SCAPM model with SD above the equivalent of *mudharabah* and subject to zakat of 2.5%, for investors who believe that zakat is collected directly without waiting for the haul and nisab, are as follows:

$$SCAPM_{((Rmd + SD)Z)} = (1 - Z) (Rmd + SD) + \beta (Rm - ((1 - Z) (Rmd + SD))) \quad (10)$$

3. The SCAPM model with SD is below the mudharabah equivalent and is subject to zakat of 2.5%, for investors who believe that zakat is collected directly without waiting for haul and nisab, are as follows:

$$SCAPM_{((Rmd-SD)Z)} = (1-Z)(Rmd-SD) + \beta(Rm - ((1-Z)(Rmd-SD))). \quad (11)$$

4. The SCAPM model without SD and without being subject to zakat, for investors who believe that the imposition of zakat must reach the haul and nisab, are as follows:

$$SCAPM_{Rmd} = Rmd + \beta(Rm - Rmd). \quad (12)$$

5. The SCAPM model with SD above is equivalent to mudharabah without the imposition of zakat, for investors who believe that zakat imposition must reach haul and nisab, are as follows:

$$SCAPM_{(Rmd+SD)} = (Rmd+SD) + \beta(Rm - (Rmd+SD)). \quad (13)$$

6. The SCAPM model with SD under the mudharabah equivalent and without being subject to zakat for investors who believe that the imposition of zakat must reach the haul and nisab is as follows:

$$SCAPM_{(Rmd-SD)} = (Rmd-SD) + \beta(Rm - (Rmd-SD)). \quad (14)$$

### 3 Methodology and Data Analysis

#### A. Methodology

The research will be done as a quantitative descriptive study, using the theory of pricing model, particularly the Capital Asset Pricing Model (CAPM) and various variations of the Sharia Compliant Asset Pricing Model (SCAPM). The data used in this research are daily data from stock returns contained in the Jakarta Islamic Index ( $\hat{JKII}$ ), daily market return of Jakarta Composite Index ( $\hat{JKSE}$ ), risk-free rate using BI rate or BI 7-days Repo Rate, and the equivalent return mudharabah using return mudharabah of Islamic Banking in Indonesia during period from January 2014 to December 2018.

The model used in this research is linear regression. The testing toward the strength of the mudharabah equivalent variable was carried out by using partial significance test. On the other hand, to find out whether SCAPM model could be used as the alternative of CAPM conventional, then the average difference test between SCAPM and CAPM is carried out.

#### B. Data and Analysis

This research is designed with some stages to achieve the purpose of the research. The stages of completion are written as follows:

1. Calculating daily return of individual shares of each company that meets the criteria in  $\hat{JKII}$ ,
2. Calculating return value of daily market ( $Rm$ ) from JKSE,
3. Calculating beta ( $\beta$ ) risk value,
4. Calculating the value of daily risk-free rate ( $Rf$ )
5. Calculating the value of daily *equivalent mudharabah* ( $Rmd$ ),
6. Calculating the estimated daily return for  $\hat{JKII}$  index using CAPM with the following equation (1), and calculating the estimated daily return for  $\hat{JKII}$  index of each variation of SCAPM *mudharabah* by using general equation (9) to (14).
7. Testing the significance of the linier regresion model from each variation of SCAPM *mudharabah*, by using the partial significance test (t-test), applying significance criteria of 95% ( $\alpha = 5\%$ ),

8. Testing the average difference test between CAPM and each mudharabah SCAPM variations using the Mann-Whitney test, under the condition:
  - a. If the significance value of Mann-Whitney (Asymp. Sig) < 0,05, then there is a significant difference of the average between CAPM and the variation of SCAPM *Mudharabah*.
  - b. If the significance value of Mann-Whitney (Asymp. sig) > 0,05, then there is no significant difference between CAPM and the variation of SCAPM *Mudharabah*.

#### 4 Research Result and Discussion

Data of linear regression from the variation of SCAPM mudharabah model that passes the classical assumption calculations, is then tested for the significance of each variable with the following results:

**Table 1.** Significant Test Result to Variant Model of SCAPM *Mudharabah*

No.	MODEL	Dependent Variable	Independent Variable	Result
1	SCAPM <sub>RmdZ</sub>	$Ri - ((1 - Z)Rmd)$	$Rm - ((1 - Z)Rmd)$	Significant
2	SCAPM <sub>(Rmd+SD)Z</sub>	$Ri - ((1 - Z)(Rmd + SD))$	$Rm - ((1 - Z)(Rmd + SD))$	Significant
3	SCAPM <sub>(Rmd -SD)Z</sub>	$Ri - ((1 - Z)(Rmd - SD))$	$Rm - ((1 - Z)(Rmd - SD))$	Significant
4	SCAPM <sub>Rmd</sub>	$Ri - Rmd$	$Rm - (Rmd)$	Significant
5	SCAPM <sub>(Rmd+SD)</sub>	$Ri - (Rmd + SD)$	$Rm - (Rmd + SD)$	Significant
6	SCAPM <sub>(Rmd -SD)</sub>	$Ri - (Rmd - SD)$	$Rm - (Rmd - SD)$	Significant

Source : processed data with spss

Based on the results of the calculations in Table 1, it is found that in all variations of the SCAPM mudharabah model, the independent variable which contains all variations of mudharabah return is significant. Therefore, it can be concluded that all mudharabah variables with all their variations can serve as an alternative to the risk-free rate.

After testing the significance of the mudharabah variable, the next step is comparing the CAPM model with all variations of the mudharabah SCAPM model using the Mann-Whitney average difference test with the following results:

**Table 2.** Mann-Whitney test Result

No.	MODEL	Significant Value of Mann-Whitney	Result
1	SCAPM <sub>RmdZ</sub>	0,981	There is no significant difference between CAPM dan SCAPM <sub>RmdZ</sub>
2	SCAPM <sub>(Rmd+SD)Z</sub>	0,978	There is no significant difference between CAPM dan SCAPM <sub>(Rmd+SD)Z</sub>
3	SCAPM <sub>(Rmd -SD)Z</sub>	0,948	There is no significant difference between CAPM dan SCAPM <sub>(Rmd-SD)Z</sub>
4	SCAPM <sub>Rmd</sub>	0,988	There is no significant difference between CAPM dan SCAPM <sub>Rmd</sub>
5	SCAPM <sub>(Rmd+SD)</sub>	0,961	There is no significant difference between CAPM dan SCAPM <sub>(Rmd+SD)</sub>
6	SCAPM <sub>(Rmd -SD)</sub>	0,961	There is no significant difference between CAPM dan SCAPM <sub>(Rmd-SD)</sub>

Source: processed data with spss

The results of the two different average tests of Mann-Whitney show that there is no significant average difference between CAPM and all variations of the SCAPM *mudharabah*. Thus, it can be stated that the expected return of all variations of the SCAPM *mudharabah* is relatively similar to the expected return of CAPM, so that the *mudharabah* SCAPM model can be used as an alternative to CAPM.

The findings generated in this study are mentioned as follows:

1. *Mudharabah* return variable has a significant effect on the dependent variable, so it is concluded that this variable can replace the risk-free rate variable as in the CAPM model.
2. The results of the two-average difference test between the CAPM model and all the *mudharabah* SCAPM variations show that there is no significant average difference between both of them, so it can be stated that all variations of the *mudharabah* SCAPM model can be used as an alternative to the classic CAPM model. And therefore, the use of variation *mudharabah* is a reasonable step for the sharia economics stakeholders.

## 5 Implication and Suggestion for Future Research

The existence of the *mudharabah* variable with all of its variations that have proven to be significant and capable of being a substitute for the risk-free rate or interest, has implications for carrying out similar researches in the formation of non-interest-based financial models, which in turn can be the beginning for the realization of usury-free economic practices.

Although in this study the value of *mudharabah* return is proxied in the average return in *mudharabah* contract in Islamic banking, ideally, what is used as a proxy for *mudharabah* return is the average profit sharing in certain industrial sectors according to the type of asset sector to be invested.

The *mudharabah* SCAPM model needs to be tested for the accuracy in empirical practice. Therefore, it is necessary to carry out further research that examines the strength of the *mudharabah* SCAPM model in various market conditions, such as when anomalies occur, in the conditional market, or when other variables are present. In addition, it is also necessary to test the use of the return *mudharabah* variable by using proxies for other industrial sectors, apart from the Islamic banking industry.

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