

## Conference Paper

# Optimizing Financing Sharia Bank Through the Formation of Optimal Portfolio with Single Index Model

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## Abstract

This study was conducted to determine the optimal portfolio combination and its proportion for Sharia bank financing which is divided into several contracts (*murabahah, mudharabah, musyarakah, ijarah, dan qardh*). This research is quantitative because it involves a number of mathematical calculation techniques to determine the optimal portfolio composition with Single Index Model (SIM) as its method of analysis. The SIM enables precise calculation of the composition of each asset (financing) by identifying the value of Excess Return to Beta (ERB) as well as the cut-off point based on the acquisition of equivalent rate of profit sharing for each financing. The result of data processing shows that the biggest financing composition is *istishna* financing (46.7%), *murabahah* financing (23.1%), *musyarakah* financing (19.98%), *mudharabah* (6.4%), *Qardh* (2.37%) and *ijarah* (1.5%). The portfolio return was 357.42 percent with portfolio risk of 3.91 percent. This proves that the establishment of an optimal portfolio can not only increase the profitability of Sharia banks but also reduce the existing level of risk, so that Sharia bank profits can also increase along with the assets of the Sharia bank itself.

**Keywords:** optimal portfolio, single index model (SIM)

## 1. Introduction

Financing is one of the main activities undertaken by Bank Syariah as a unit inter-mediation institution between surplus and deficit of units. For the acquisition of funding from the community, Sharia bank is required to allocate depositor funds appropriately in order to be able to provide income to Sharia bank and its customers. The allocation of fund placement is also adjusted to various conditions, including liquidity factor which has become an important issue for Sharia banks. However, in accordance with Bank Indonesia Regulation (PBI No. 13/5/2011), banks as financial institutions are required

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to distribute 80 percent of total Third-party Funds (DPK) that have been collected into productive financing.

Financing is one of the productive assets of Sharia banks that are able to generate profits. Financing is also part of investment activities undertaken by Sharia banks, especially in the real sector. Theoretically, the more finance is distributed, the more the profit/profit of Islamic banks that can be generated. There are many studies that have proven empirically that the more research is channeled, the more income can be generated. Table 1 shows the empirical data on the development of financing composition in each financing contract.

TABLE 1: Table on composition of Sharia bank financing distribution.

Year	Average Financing Composition						TOTAL
	Mudharabah	Musyarakah	Murabahah	Istishna	Ijarah	Qardh	FINANCING
2012	10.882	22.531	70.221	335	5.459	11.277	120.704
2013	12.843	34.500	101.979	493	9.346	10.614	169.775
2014	14.006	44.893	112.967	587	10.533	7.473	190.457
2015	14.660	49.848	111.826	695	9.246	4.735	191.009
<b>Average</b>	<b>13.098</b>	<b>37.943</b>	<b>99.248</b>	<b>527</b>	<b>8.646</b>	<b>8.525</b>	<b>167.986</b>
Financing proportion	0.078	0.226	0.591	0.003	0.051	0.051	
	7.80%	22.59%	59.08%	0.31%	5.15%	5.07%	

Source: Sharia Banking Statistics (SPS), Bank Indonesia

If we look at the statistics of Sharia banking, the amount of Sharia bank financing continues to increase from the beginning of 2012 until the end of 2015, whether through profit-sharing financing (mudharabah and musyarakah), sale and purchase-based financing and lease (murabaha, istishna and ijara) as well as other types of financing (qardh). However, based on the proportion, murabaha financing has the largest proportion of financing compared to others. The second largest proportion is musyarakah financing, followed by mudharabah, ijara, qardh and istishna.

The allocation of this proportion is deemed inadequate as the true function of a Sharia bank is a unit intermediary institution that adopts the principle of profit and loss sharing (PLS) on profit-sharing financing.

This encourages Sharia banks to be able to precisely allocate their financing composition. Sharia banks distribute financing with various covenants that are tailored to the form/contract made. The financing under such contracts is the financing of

mudharabah, musyarakah, murabaha, istishna, ijara and qardh. Where each contract has the potential for various benefits and losses due to the characteristics of each contract being different. This can be seen from the acquisition of the equivalent rate of return (RoR) of each contract that varies between one contract and another.

The amount of composition of Islamic bank financing disbursed is also not based on the acquisition of profits and losses obtained. If a Sharia bank is able to allocate exactly how much optimal financing composition should be channeled based on profit gains, it will be able to easily increase profits that could eventually increase the value of Islamic banking assets themselves. Table 2 illustrates the average equivalent rate (yield) of Bank Syariah’s financing products.

TABLE 2: Table on average yield of Sharia bank financing.

Year	Equivalent Rate of Yield (in percentage)					
	Mudharabah	Musyarakah	Murabahah	Istishna	Ijarah	Qardh
2012	15.85	13.72	14.17	14.38	0.23	4.40
2013	15.35	13.16	13.80	13.90	0.66	6.69
2014	18.07	13.11	14.18	12.90	6.48	4.42
2015	12.23	11.72	13.68	13.23	10.32	11.70
Average	15.37	12.93	13.96	13.60	4.42	6.80

Source: Sharia Banking Statistics (SPS), Bank Indonesia

Based on the data given in Table 2, the acquisition of data equivalent rate for profit sharing in various contracts, financing type with the largest return rate is mudharabah with an average value of 15.37 percent from 2012 to 2015, followed by murabaha financing with average value of 13.96 percent, istishna financing with equivalent rate of 13.60 percent, musyarakah financing with equivalent rate for the average yield of 12.93 percent, and qardh (6.8%) and ijarah (4.42%).

If the Sharia bank is able to allocate appropriately the composition or proportion of the distribution of financing products adjusted to the amount or the appropriate RoR, it is not impossible if the Sharia bank would be able to provide greater income potential.

Therefore, there is a need to study the optimal portfolio composition of Sharia bank’s financing products in Indonesia. The optimal portfolio composition of Sharia bank financing can be calculated using single index model (SIM) that can provide a model for sharia banking in Indonesia to be able to allocate precisely the amount of financing composition of Sharia banks that is divided into several contracts such as murabaha, mudharabah, musharaka, ijarah and qardh.

SIM is one of the most accurate measuring tools to measure a low-risk portfolio. It was developed by Sharpe (1963) that is called single index market model. This model can be used to simplify calculations in the Markowitz model by providing the input parameters required to calculate the Markowitz model. In addition, a SIM can also be used to calculate the expected return and portfolio risk.

Diversification of Islamic banking financing products into financing portfolios (a combination of more than one financing instrument) is essential to increase the return rate of Sharia banks, in order to increase Sharia banking growth in Indonesia and the market share of Sharia banks is no longer far behind conventional banks.

However, the obstacle in establishing this financing portfolio is the need to assess the return behavior of each Sharia financing instrument, that is, the return expectation of each instrument when combined with other instruments (combination of two, three, four or five financing instruments). Is the expected return of the established financing portfolio showing good behavior or not, or whether it's likely to be profitable or not.

However, it is not only the financing return that becomes an obstacle in this case, but also the risk that is the measure of the uncertainty between the expected rate of return (expected RoR) and future return from the financing portfolio. Sharia banking will certainly avoid high risk of entering financing contracts with investors. This is one of the importance of making a financing portfolio because it can minimize risks that may arise in the future.

Based on this consideration, the risk behavior of a financing instrument should be observed, that is, how a financing instrument is combined with other Islamic financing instruments, whether it tends to minimize or actually increase risk. Do not stop here just because it is also important to consider the volatility of the gap between the actual rate of return (actual RoR) and the expected RoR of the Sharia financing instruments, given the monthly time series data in the financial sector or the financial RoR with very high volatility levels. This gap is called an abnormal RoR. Thus, the abnormal volatility RoR of these Sharia financing instruments is also a measure of uncertainty as an additional consideration for establishing a financing portfolio.

As a financial institution, Sharia banks arrange financing allocations on a portfolio of financial instruments taking into account the risk factors and accompanying gains. Therefore, before forming an optimal portfolio, this research tries to analyze risk behavior and return of individual and Sharia bank's financing portfolio. Volatility is calculated from the abnormal RoR, where the abnormal RoR is the difference between the actual rate of return (actual RoR) with the expected rate of return (expected RoR).

Therefore, out of both approaches, the financing portfolio can finally be determined, being comprised of more than one instruments/combination of the best Sharia bank financing.

Next, Excess Return to Beta (ERB) value and cut-off point value are calculated in order to determine the optimal portfolio combination and the proportion of the shares to be formed. Performance will also be measured using Risk-adjusted Performance. The discovery of the most ideal composition/financing combination is expected as a financing portfolio that will provide maximum benefits for Sharia banks. This research does not involve the growth indicator variable of Sharia banking (Assets, Third-party Funds), but it is also expected that the diversification of Sharia banking-financing products into this portfolio will increase the growth of Sharia banking (Assets, Third-party Funds and Financing) in Indonesian market share.

Diversification of financing in various cooperation contracts is one of the advantages of Sharia banks when compared with conventional banks. The number of contracts used in particular adjusted to the form of contract of cooperation made. The forms of contracts/cooperation have different characteristics that make each contract as highly varied potential advantages and disadvantages. It is therefore necessary to prepare the composition of the portfolio of Sharia banks financing is optimally based on the amount of expected return that can be generated on each contract. It is expected that with such optimal portfolio composition, the Sharia bank can increase profit or profitability which in turn can increase the assets of Sharia banks.

## 2. Literature Review

### 2.1. Optimum portfolio

In the formation of a portfolio, investors always want to maximize the expected return with a certain level of risk they are willing to bear or look for a portfolio that offers the lowest risk and a certain amount of RoR. This particular portfolio is called an efficient portfolio. (Eduardus Tandelilin, *Portofolio dan Investasi: Teori dan Aplikasi*, (Yogyakarta: Kanisius, 2014), h. 157)

To establish an efficient portfolio, we must assume the behavior of investors in making investment decisions. One of the most important assumptions is that no investor likes excessive risk (risk aversion). Meanwhile, the optimal portfolio is what an investor chooses from the many options that exist in an efficient portfolio set.

## 2.2. Single index model (SIM)

Markowitz's portfolio model with complex covariance calculations was further developed by William Sharpe by creating a SIM. This model relates the calculation of return of each asset to the market index return. Mathematically, the SIM is as follows:

$$R_i = \alpha_i + \beta_i R_M + e_i$$

In this case,  $R_i$  = Return of securities i

$\alpha_i$  = Part of securities i return that is not influenced by market performance

$\beta_i$  = Measure of sensitivity of return of securities i to the changes in market return

$R_M$  = Market index return

$e_i$  = Residual error

The calculation of the securities return in a SIM involves two main components: (Eduardus Tandelilin, *Portofolio dan Investasi: Teori dan Aplikasi*, (Yogyakarta: Kanisius, 2014), h. 132)

1. Return component which is denoted by  $\alpha_i$
2. Market-related return components; denoted by  $\beta_i$ .

The components of the company's uniqueness are related to micro events that only affect the company. Meanwhile, the components associated with the market concern macro events that affect the entire company.

## 3. Research Methodology

This research uses a descriptive quantitative approach using data equivalent rate (yield) of financing contracts/products financed by Bank Syariah and returns from Bank Indonesia Sharia Certificates (SBIS) as complementary data used as a comparison of market portfolio.

The data used in this research is the type of secondary data. Secondary data that was obtained is time series data in monthly form, and the data used in research are as follows:

1. Data on equivalent rate (yield) of all financing channeled by Sharia banks listed in the Sharia Banking Statistics (SPS) for the period of January 2012 to December 2015. Data was obtained from the websites [www.bi.go.id](http://www.bi.go.id) and [www.ojk.go.id](http://www.ojk.go.id)

2. Data on the yield of Bank Indonesia Sharia's Certificates (SBIS) for the period of January 2012 to December 2015. Data was obtained from the websites [www.bi.go.id](http://www.bi.go.id) and [www.ojk.go.id](http://www.ojk.go.id)

### 3.1. Data analysis method

In the formation of optimal portfolio using SIM method. SIM is based on the observation that the price of the securities fluctuates in the direction of the stock price index, and this method is representative in a combination of portfolio formation compared to other methods.

Next is the creation of optimal portfolio of Bank Syariah financing. Bank Syariah financing portfolio is prepared using the optimal portfolio of SIM, that is, assuming that the consideration of portfolio formation is only based on ERB ratio.

After all the data has been collected and verified as true and complete, the next step is:

1. Calculating the monthly return of each Sharia bank financing
2. Calculating market return
3. Calculating beta financing using Capital Asset Pricing Model (CAPM) or formula
4. Developing an optimal portfolio of SIMs that begin by creating a financing sequence based on the highest excess return
5. The next procedure is to calculate the  $C_i$  ratio of each stock in order to determine the cut-off ratio ( $C^*$ ).  $C^*$  is the maximum value of the  $C_i$  value of each financing that has been previously ranked based on the excess return value from the highest to the lowest. The cut-off point value is used as a benchmark to accept or reject a share from being included to a portfolio candidate. Shares with the highest  $C_i$  value up to the cut-off point value are eligible to be included as portfolio-building stocks.
6. Once the financing that forms the portfolio has been determined, the next step is to determine the proportion or percentage of investment allocation from each selected financing in the portfolio.
7. After the data is processed, a portfolio of shares from each of the Sharia bank products is formed. After the proportion of each share in each portfolio is known, the next step is to evaluate the performance of each portfolio formed.

## 4. Result of Research and Discussion

### 4.1. Analysis process

#### 4.1.1. Comparison of expected return, standard deviation and variants of Sharia bank financing

Realized return is obtained from the percentage change equivalent rate of financing  $i$  in month  $t$  minus equivalent rate  $i$  in month  $t-1$ , then the result is divided by equivalent rate  $i$  in month  $t-1$ . Expected return is calculated with the help of Microsoft excel software using the average formula.

But in the measurement of the risk of securities, we also need to calculate the relative risk of a security. This relative risk indicates the risk per unit of return expected. This is necessary because risk information that is only a variance and standard deviation will be problematic, especially when we want to compare risk levels among assets, each of which has an unequal expected return. Relative risk size that can be used is the coefficient of variation. The formula for calculating the coefficient of variation can be from the standard deviation value divided by the expected return value.

The results of the calculation of the expected return, risks (standard deviation) and variants of each individual financing have been given in Table 3.

TABLE 3: E (Ri), Standard Deviation and Variants of Bank Syariah Financing.

No	Code	E(R)	$\sigma$ (standard deviation)	$\sigma^2$ (Variant)	Variety Coefficient
1	Mudharabah	15.37	2.80	7.84	0.182
2	Musyarakah	12.93	0.93	0.86	0.072
3	Murabahah	13.96	0.71	0.50	0.051
4	Istishna	13.60	0.67	0.45	0.049
5	Ijarah	4.44	4.74	22.48	1.067
6	Qardh	6.80	3.63	13.18	0.533

Source: Result of data processing

Based on Table 3, all financing including mudharabah (15.37%), musharaka (12.93%), murabaha (13.96%), istishna (13.60%), ijara (4.44%) to qardh (6.80%) have a positive RoR. Financing that has a positive expected return of E (Ri) indicates that it is feasible as an alternative in investing.



Standard deviation ( $\sigma$ ) is used to measure the risk of realized return of financing for individual samples. The highest standard deviation ( $\sigma$ ) exists in Ijarah financing (4.74%). Meanwhile, the lowest standard deviation is found in murabaha (0.67%) financing.

However, to compare the level of risk between financing where each financing has an unequal expected return, it is necessary to calculate the relative risk of financing. The measure of relative risk that can be used is the coefficient of variation. The highest variation coefficient exists in Ijarah financing (1.067%). This shows that Ijarah financing is the riskiest compared to other financing, while the lowest variation coefficient is in Istishna financing (0.049%). This shows that Istishna financing is the least risky type of financing compared to others.

#### 4.1.2. Calculating alpha, beta and variance error of Sharia bank financing

To calculate alpha, beta and variance error using spss 16 program. The calculation results of alpha, beta and variance errors are described in Table 4. Meanwhile, the output of the SPSS result to be given is attached hereto.

TABLE 4: Alpha Table, Beta and Financing Error Variance.

No	Code	Ai	$\beta_i$	ei
1	Mudharabah	17.114	-0.287	2.101
2	Musarakah	15.626	-0.446	0.570
3	Murabahah	14.229	-0.045	0.533
4	Istishna	16.497	-0.478	0.257
5	Ijarah	-11.525	2.635	2.680
6	Qardh	-0.346	1.182	2.525

Source: Result of data processing

Table 4 shows that the regression yields the value of alpha ( $\alpha_i$ ) which is the measure of return of securities I, in this case, the financing i which is not influenced by the market performance. Or a value that indicates the expectation of the financing rate section i that is not influenced by market changes. The alpha value in the formation of a portfolio with a SIM is an intercept. Positive alpha values illustrate that investment performance is better than the expected investment returns. Based on the calculation, there are four financing whose alpha value is positive, such as mudharabah (17.114), musarakah (15.626), murabahah (14.229) and istishna (16.497) financing. And the

remaining Ijarah and Qardh financing produce an alpha negative value that illustrates that the performance of Ijarah and Qardh financing is no better than the expected return on investment.

The beta value indicates the amount of slope indicating an increase in expected return on securities  $i$  for each 1 percent market return increase or systemic gauge of securities or portfolio relative to market risk. We can therefore conclude that the beta value of the results of this study indicate the size of sensitivity of return of a financing with market return in the study period. Beta value can be positive or negative. If the value of the beta is positive, the increase in market return will result in an increase in the return on financing. If the value of the beta is negative, the increase in market return will result in a decrease in the return on financing.

Based on the calculation of Table 4, there are four financings that have negative beta and two financings with a positive beta. Financings with negative beta are mudharabah (-0.287), musharaka (-0.446), murabaha (-0.045) and istishna (-0.478). A negative beta indicates that any increase of 1 unit or 1 percent in market return, it will decrease the financing return by the coefficient value listed on the beta value. This is in accordance with the logic stating that if the Central Bank increases the yield on SBIS, the Sharia bank will tend to place more funds in SBIS than to finance, this is because the placement on SBIS has a lower-risk level when compared to placement of financing. The low distribution of financing would also reduce the amount of returns obtained from the financing.

Meanwhile, the types of financing with recorded positive beta are Ijarah (2.635) and Qardh (1.182). This means that a 1 percent increase in return on market returns (SBIS) will continue to increase the return rate for Ijarah and Qardh financing. This is due to the principle of financing that is very different from SBIS, so that the rise and fall of yield on SBIS does not significantly affect the lease-based Ijarah and qardh-based financing that is tabarru.

The magnitude of the beta coefficient is normal if  $\beta = 1$ . If the value of  $\beta < 1$ , the financing is weak, meaning that if there is an increase of market return of  $n$  percent, then the return of financing will increase by less than  $n$  percent. Conversely, if the value of  $\beta > 1$ , then the financing includes aggressive financing, meaning that if market returns increase by  $n$  percent, the return of financing will rise by more than  $n$  percent. From the calculation in Table 4, there are two types of financings that are deemed aggressive, namely, Ijarah (2.635) and Qardh (1.182). Meanwhile, mudharabah financing

(0.287), musharaka (0.446), murabahah (0.045) and istishna (0.478) are deemed as weak financing.

The value of the variance error is a variant of the residual error of the *i*-th security. The value of this variance error is used to obtain the cut-off point value to determine the portfolio financing candidate.

### 4.1.3. Calculating excess return to beta (ERB)

Here are the expected return, beta and ERB six financing portfolio candidates for optimal portfolio financing. The value of ERB is used to obtain financing in the optimal portfolio combination, which will be compared with the cut-off point value. The result of calculating the value of ERB for optimal portfolio is presented in Table 5.

TABLE 5: Table on Composition of Expected Return, Beta, and ERB in Bank Syariah Financing.

No	Code	E(R)	Rf	Beta	ERB
1	Mudharabah	15.37	0	-0.287	53.5674
2	Musyarakah	12.93	0	-0.446	28.9841
3	Murabahah	13.96	0	-0.045	310.1818
4	Istishna	13.60	0	-0.478	28.4595
5	Ijarah	4.44	0	2.635	1.6857
6	Qardh	6.80	0	1.182	5.7564

Source: Result of data processing

The value of this ERB determines whether all of the candidates' shares of the portfolio listed in Table 5 would be included to the optimal portfolio. The selected ERB values for entry into the optimal portfolio are those with positive ERBs. Shares with negative ERBs are not eligible to form an optimal portfolio. This is because ERB is the excess return of securities. If the ERB value of a negative security, there is no excess return of the securities.

Table 6 shows that no financing has a negative ERB value. Therefore, the existing six financings are included in the portfolio candidate because it fulfills the optimal portfolio requirement, that is, having a positive ERB value. Financing that has a positive ERB value is likely to be the part of the optimal portfolio. To determine which financing will be part of the optimal portfolio, comparison must first be made between ERB and cut-off point ( $C^*$ ).

#### 4.1.4. Calculating and determining the value of cut-off point (C\*)

The cut-off point value is the maximum Ci value of a series of Ci financing values. The cut-off point value (C\*) is used as a limiting point to determine whether or not the financing goes into the optimal portfolio member.

TABLE 6: Cut Off Point Table

No	Code	E(R)	Rf	Beta	Variance	ERB	Ai	Bi	Ci
1	Mudharabah	15.37	0	-0.287	2.101	-53.5674	-0.99957	0.01866	-0.042747
2	Musyarakah	12.93	0	-0.446	0.570	-28.9841	-17.74515	0.61224	-0.740099
3	Murabahah	13.96	0	-0.045	0.533	-310.1818	-2.21099	0.00713	-0.094602
4	Istishna	13.60	0	-0.478	0.257	-28.4595	-98.45008	3.45931	-3.670252
5	Ijarah	4.44	0	2.635	2.680	1.6857	1.62956	0.96670	0.066974
6	Qardh	6.80	0	1.182	2.525	5.7564	1.26143	0.21914	0.053488
	Variance Market				0.04280		Cut-off Point (C*)		0.066974

Source: Result of data processing

Based on Table 6, the value of C\* obtained from the largest Ci value is 3.670252 on istishna financing. The cut-off point value shows the dividing boundary between acceptance and rejection of financing for creating an efficient portfolio. After the cut-off point value is determined, the positive ERB value is compared with the cut-off point value. If the ERB value is less than the C\* value, the financing does not meet the optimal portfolio criteria. If the financing has an ERB value greater than the value of C\*, then it is deemed to have met the optimal portfolio criteria. Table 7 illustrates the comparison between ERB and C\* values.

TABLE 7: Table on Comparison between ERB and C\*.

No	Code	ERB	Desc.	C*
1	Mudharabah	53.56739	>	0.066974
2	Musyarakah	28.98409	>	0.066974
3	Murabahah	310.18178	>	0.066974
4	Istishna	28.45945	>	0.066974
5	Ijarah	1.68569	>	0.066974
6	Qardh	5.75641	>	0.066974

Source: Result of data processing

Table 7 explains that six financings have ERB value  $> C^*$ . Thus, it can be concluded that the financing of mudharabah, musyarakah, murabaha and istishna, ijarah and qardh have been qualified to enter into the optimal portfolio, so it can proceed to the next stage.

#### 4.1.5. Determine the optimal portfolio and the proportion of funds of each portfolio-building share

Once the selected financing comes into the optimal portfolio, the next step is to calculate the proportion of each selected financing. Table 8 illustrates the calculation of the proportion of funds to be combined and formed into an optimal portfolio.

TABLE 8: Table on Proportion of Optimal Portfolio Fund.

No	Code	( $\beta_i$ )	$e_i$	ERB	$X_i$	$W_i$
1	Mudharabah	0.287	2.1010	53.567	7.3082	0.064
2	Musyarakah	0.446	0.5700	28.984	22.6788	0.199
3	Murabahah	0.045	0.5330	310.182	26.1880	0.231
4	Istishna	0.478	0.2570	28.459	52.9324	0.467
5	Ijarah	2.635	2.6800	1.686	1.6574	0.015
6	Qardh	1.182	2.5250	5.756	2.6947	0.024
Total					113.4594	1.000

Source: Result of data processing

Table 8 shows the respective proportions of mudharabah (0.064), musyarakah (0.200), murabahah (0.231), istishna (0.467), ijara (0.015) and qardh (0.024) proportion. In the aforementioned optimal portfolio, the financing istishna has the largest proportion of financing than murabaha and mudharabah. This is not in line with the initial conditions for allocating more financing to murabahah and mudharabah financing. The determination of the number of proportions with SIM is based on the amount of ERB that shows the magnitude or excess return of securities (financing) on the beta of securities. The high ERB indicates that the financing is able to provide a greater profit advantage than the reference market index. Meanwhile, the lowest proportion is in ijarah financing of only 0.015 or 1.5 percent of the total proportion of financing disbursed. This makes sense given that the financing of ijara is quite rare in demand by some of the customers who submit applications.

#### 4.1.6. Calculating portfolio return and risk

The expected return of the portfolio can be estimated by calculating the expected number of returns of each portfolio-forming financing with the proportion of funds of each forming financing. Table 9 shows the calculation of risk based on the portfolio formed.

TABLE 9: Table on Calculations of Portfolio Return.

No	Code	E(R)	Wi	E(R)
1	Mudharabah	15.3738	0.0644	0.9903
2	Musyarakah	12.9269	0.1999	2.5839
3	Murabahah	13.9582	0.2308	3.2217
4	Istishna	13.6036	0.4665	6.3465
5	Ijarah	4.4418	0.0146	0.0649
6	Qardh	6.8041	0.0238	0.1616
E(Rp)				3.5742

Source: Result of data processing

Based on Table 9, the expected return of the portfolio generated from the six financings formed into the portfolio is 3.5742. The portfolio return is greater than the SBIS market RoR of 2.07 (207%). Therefore, the objective of Sharia bank to form optimal portfolio is achieved. Meanwhile, to look for risks from an established portfolio, the risk value of the portfolio can be calculated by first looking for the value of the squared portfolio beta. After that, the portfolio variant is sought and scaled to get the value of portfolio risk. Table 10 shows the calculation of risk based on the portfolio formed.

The risks of a portfolio can be seen from the standard deviation of the root variant portfolio. The level of risk on the optimal portfolio is smaller than the risk level of individual financing. It can therefore be concluded that investment risk can be minimized by forming an optimal portfolio.

According to Table 10, the level of risk formed by the optimal portfolio is 0.0391 (3.91%). This portfolio risk value is smaller than the value of individual financing risks such as mudharabah (0.287), musharaka (0.446), murabaha (0.045), istishna (0.478), ijarah (2.635) and qardh (1.182). Therefore, it can be concluded that with the optimal portfolio formation, in addition to increasing return rate, one can also lower the level of risk.

TABLE 10: Table on Calculations of Portfolio Risk.

No	Code	$\beta_i$ (Beta)	$e_i$ (Variance Error)	$W_i$	$\beta_i \cdot W_i$	$e_i \cdot W_i$
1	Mudharabah	0.287	2.101	0.0644	0.0185	0.1353
2	Musyarakah	0.446	0.570	0.1999	0.0891	0.1139
3	Murabahah	0.045	0.533	0.2308	0.0104	0.1230
4	Istishna	0.478	0.257	0.4665	0.2230	0.1199
5	Ijarah	2.635	2.680	0.0146	0.0385	0.0391
6	Qardh	1.182	2.525	0.0238	0.0281	0.0600
Variance Market			0.0428			0.5913
Portfolio Variant						0.0015
Portfolio Risk						0.0391

Source: Result of data processing

## 5. Conclusion

Based on the research, it can be concluded that:

1. The potential of Risk and Return on each financing product of Bank Syariah, including mudharabah (15.37%), musyarakah (12.93%), murabaha (13.96%), istishna (13.60%), ijarah (4.44%) to qardh (6.80%) had a positive overall RoR. Financing that has a positive expected return of  $E(R_i)$  indicates that it is feasible as an alternative investment. However, based on financing ratings, mudharabah is able to provide the largest average return of 15.37% and ijarah financing provides the lowest average return of 4.44%, while the highest risk of realized return exists in ijarah financing (4.74%). The lowest standard deviation is found in murabaha (0.67%) financing.
2. Based on the research flow that has been done with SIM, the composition of optimal portfolio formation is mudharabah (6.4%), musyarakah (19.98%), murabahah (23.1%) istishna (46.65%), ijarah (14.6%) and qardh (2.38%). The results show that the largest composition of financing is on istishna financing (46.65%) and the lowest on qardh financing (2.38%). This couldn't be further from reality. At the beginning of composition, the largest financing is actually murabahah (59.08%) and the lowest is istishna financing (0.31%).
3. The establishment of an optimal portfolio formed with a SIM yields a portfolio return of 3.5742 or 357.42% with a risk rate of 0.0391 (3.91%). This is a proof

that with the diversification in various financing contracts not only increases the profits of Sharia bank, it can also reduce the level of risk at hand. In the end, Sharia bank will be able to increase its own profit and asset.

## 6. Implications

The implication of this research is that the diversification of financing contracts or products by Bank Syariah must be implemented, considering that each financing contract has a distinct characteristic. Differences of these characteristics are assessed from the principle and also the allocation of financing used. The differences of these characteristics also have impact on the acquisition of the results.

Profit sharing-based financing cannot be replaced with sale and purchase-based financing and vice versa. So far, the distribution of financing by Bank Syariah is based solely on customer demand for such financing products, and the Sharia bank cannot predict how much profit and loss is derived from the distribution of existing financing products.

With the establishment of this optimal portfolio, Bank Syariah has guidance in the division of proportion or composition of financing, making it easier in achieving certain targets. Customer demand for a particular financing product must be balanced with the Sharia bank's policy to focus on specific financing. Do not let the Sharia bank's function as an intermediary institution reduced to a financial institution based on sale financing only, because so far the largest proportion of financing goes to murabahah. Ideally, Sharia bank is able to focus on the financing of working capital or investment using mudharabah or musyarakah contracts in order to drive the public economy.

The establishment of an optimal portfolio with SIM has been widely used and applied to all financial products, both financial and nonfinancial assets, and has proven its validity in forming an optimal portfolio, which is a portfolio capable of providing maximum profit with minimal risk. The optimal portfolio of SIM forms a portfolio by calculating the ERB quantity or calculating the excess profits from each return or equivalent rate of financing compared to the amount of market risk. Financing with a positive ERB is said to be eligible for candidate portfolio, while the negative ERB is eliminated from the portfolio.

From the results of data processing performed, all financing products are able to record a positive ERB value so that all financing would be eligible as candidate portfolio. This ERB value is then compared with the cut-off point value which is the dividing



boundary between acceptance and rejection of financing for efficient portfolio establishment. The result of portfolio composition is the final result of the model that can be used as a guide for Sharia bank to determine the limitation of financing distribution for each contract.

The end result of optimal portfolio composition is different from reality, but it is not mandatory to Sharia banks. Scientific research is conducted to help formulate policies in decision-making. And the distribution of financing provided can also be submitted to the applicable trading mechanism, depending on the supply and demand of the market. If it turns out that the market is more in need of profit-sharing financing, then the demand for profit-sharing financing also increases. However, with the establishment of this optimal portfolio, Sharia banks can determine the target achievement of existing financing disbursement.

## 7. Recommendations

The recommendations of this study are as follows:

1. Sharia bank must be able to determine the main priority in the distribution of financing. Not only will the market demand for a particular financing product, Sharia banks should also refer to the acquisition of risk and return that can be obtained. A good priority setting should refer to the acquisition of potential benefits and losses obtained, so that it can ultimately increase the profits of Sharia bank.
2. The establishment of an optimal portfolio can be used as a reference or guidance for Sharia bank to determine the target of financing disbursement, considering that the financing is also the core business of Sharia bank and the allocation of productive assets must be improved by the Sharia bank to achieve its objectives.
3. As a good intermediary institution, Sharia bank should focus more on productive financing based on working capital or investment which generally use mudharabah, musyarakah or istishna contracts to enable Sharia bank to contribute in moving the wheels of economy and development of the country. However, it is possible for Sharia bank to provide consumptive financing, considering that until now people still need consumptive financing and seek solutions from the Sharia bank.

4. The determination of market return can be changed with other macroeconomic indicators, so it can compare the level of sensitivity or beta in each financing which is more appropriate in certain economic conditions.
5. The establishment of a good portfolio should be done every year in order to facilitate Sharia bank in determining the direction of achievement policy in the coming operational year.

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