

The Analysis of Optimal Portfolio Establishment and Assessment on Jakarta Islamic Index ST

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Abstract

The purpose of this research is to determine the optimal portfolio of stocks listed on the Jakarta Islamic Index from 2014 to 2016 by using Single Index The model and to determine the optimal level of performance portfolio using Treynor Index on Jakarta Islamic Index stocks optimal portfolio formation from 2014 to 2016. The criteria for sampling in this research are listed on the Jakarta Islamic Index (JII) from 2014 to 2016. Based on these criteria, samples of 21 companies were obtained. The results of this research shows that by the Single Index in 2014 there were nine stocks which established optimal portfolio, namely AALI, TLKM, ICBP, UNVR, KLBF, INDF, BSDE, AKRA, and MPPA with Treynor index value of 0.32416276. In 2015, there were 10 stocks which established the optimal portfolio, namely KLBF, PGAS, ICBP, TLKM, WIKA, UNVR, BSDE, ASRI, INTP and SMRA with Treynor index value of 0.28099925. Meanwhile in 2016, there were 4 stocks which established optimal portfolio, namely AKRA, UNVR, TLKM, and ICBP with Treynor index value of 0.74799645. The study shows that the best performance of the optimal portfolio occurred in 2016, as the 2016 portfolio has the highest Treynor index value compared to those of the portfolio in 2014 and 2015.

Keywords: Optimal Portfolio, Single Index Model, Portfolio Performance

1. INTRODUCTION

A. Research Background

In establishing an optimal portfolio, investors can perform portfolio analysis, which is a field of science that specifically examines the method undertaken by investors to reduce investment risk as low as possible. The optimal portfolio is an investor's chosen portfolio of many investment options. Various methods have been used in determining the optimal portfolio. One of the most widely used model in establishing optimal portfolio is the Single Index Model. Based on the assumption from a single index model, the stock returns movement essentially fluctuates in line with market returns. In particular, it can be observed that most stocks price tends to rise if the stock price index rises. On the other hand, if the stock price index falls, most stocks will experience price declines. It is possible that returns from securities are correlated due to a general reaction to any change in market value.

The portfolio cannot serve as an assurance that investors will gain maximum profit with low risk. The investors should be able to assess how the liquidity and market capitalization of stocks to be included in portfolio, in order to gain returns expected from the portfolio. The optimal portfolio performance may decrease due to poor market conditions. Therefore, it is necessary to analyze portfolio performance in order to keep the portfolio optimal. Portfolio performance measurement can be done by calculating the trade-offs between return and risks. This measurement is called by *risk-adjusted* return. Portfolio performance is calculated by dividing *excess return* with portfolio *volatility*. The Volatility is used to indicate systematic risk (beta). Portfolio performance measurement method is called Treynor Index Method. This method is used as most of the stocks returns are affected by market returns.

The Islamization of capital markets that has been championed by some circles lately has been a major source of sharia capital market growth, in which capital market products and services have been considered to be converted into Sharia capital market products and services. Islamic index or Sharia index takes the process of capital market islamization and becomes the beginning of sharia capital market development. This sharia index has also helped institutions to invest their excess funds in investment in accordance with sharia law. In Indonesia, the most known sharia index is the *Jakarta Islamic Index* (JII). JII is issued by Indonesia Stock Exchange and consists of 30 listed companies which will always be evaluated at any given period. Stocks listed on JII must meet the same elements as other indices in exception of illicit elements in MUI view. For Muslim investors, the fulfillment of sharia aspects in investing is an absolute requirement.

JII stocks have been showing great performance and are able to compete with stocks of other index. JII includes stocks with large market capitalization and high liquidity (Guide to Stock Price Index of Indonesia Stock Exchange 2010 www.idx.co.id). However, although the stocks on JII have large market capitalizations, a portfolio analysis is still needed to shortlist efficient stocks as the optimal portfolio builder. To select stocks from the JII that will serve as optimal portfolio builder by using a single index model, an investor requires stock price information from both JII and Jakarta Composite Index (JCI) as a reflection for optimal portfolio formation. The development data of Jakarta Islamic Index (JII) and JCI returns from 2014 - 2016 is shown on Table 1.1 below:

Table 1.1
Development of Jakarta Islamic Index (JII) and JCI
stocks returns from 2014 - 2016

Year	Jakarta Islamic Index		JCI	
	Closing Price	Return Growth	Closing Price	Return Growth
2014	585.110	-1.65%	4,274.177	-0.98%
2015	691.039	18.10%	5,226.947	22.29%
2016	603.349	-12.69%	4,593.008	-12.13%

Source: IDX annual statistics

Based on table 1.1, it shows that return growth of JII fluctuates in line with JCI return growth. This phenomenon illustrates the optimal portfolio formation that is assumed by a single index model, which is where stock index movements fluctuate in the direction of the market index (JCI). In 2014, JII return decreased by 1.65% and followed by a decline in the JCI returns by 0.98%. In 2015, JII returns jumped quite high, reaching 18.10%, while JCI returns increased up to 22.29%. However, in 2016 JII returns decreased by 12.69% with JCI returns decline by 12.13%. Given the conditions the JII returns which experienced considerable fluctuations over three years, therefore it is necessary to observe the optimal portfolio performance in each year. This observation is conducted to find out the optimal portfolio performance in each year in order to serve as a valuable information for investors in investing their funds into JII.

On that basis, the author seeks to provide a description on the optimal portfolio formation of JII stocks from 2014 to 2016 in this research so that investors can obtain an optimal level of profit and get to know the established portfolio performance as well as to maintain it. A previous research was done by Umanto Eko (University of Indonesia, 2010) with the title of "Optimal Portfolio Performance Analysis and Assessment of LQ45 Stocks with Single Index Model and Constanta Correlation Model. The research result indicates that investors should allocate the largest funds in TLKM (PT Telekomunikasi Indonesia Tbk) stocks. Meanwhile, the optimal portfolio performance formed by using constant correlation method has a decent performance.

Based on the background that has been described above, the author is motivated to conduct research with the title of "THE ANALYSIS OF OPTIMAL PORTFOLIO ESTABLISHMENT AND ASSESSMENT OF JAKARTA ISLAMIC INDEX STOCKS FROM 2014 TO 2016".

B. Problem Statement

Based on the discussion of problems described in the background, the researcher formulates the problem as follows:

1. Which JII stocks from 2014 to 2016 that establish the optimal portfolio formed by the Single Index Model?
2. How is the optimal portfolio performance of JII stocks from 2014 to 2016 as measured by the Treynor Index method?

C. Research Objectives

Based on the formulation of the problems described above, the objectives of this research are as follows:

1. To determine the optimal portfolio of JII stocks from 2014 to 2016 which is formed with the Single Index Model.
2. To determine the optimal portfolio performance of JII stocks from 2014 to 2016 as measured by the Treynor Index method.

D. Research Contribution

This research is expected to be useful for the parties concerned, namely:

- a. Practical Contribution: This research is expected to serve as a feedback for analysts and investors as a guide in conducting stock analysis and determining optimal portfolio with single index model, or as a policy in investing, as well as an overview for the assessment of optimal portfolio performance by using the Treynor Index method. Therefore, the optimal portfolio establishment on stocks conducted by investors can gain *return* which correspond to a certain level of risk.
- b. Academic Contribution: This research is expected to be used as one of the methods to develop and apply science related to optimal portfolio establishment with single index model and optimal portfolio performance assessment by Treynor Index method. Academics can take advantage of this research as a factual case that can be used in financial management research and complement other research as well as develop further research.

2. LITERATURE REVIEW

A. Portfolio Definition

Husnan (2015:4) defines portfolio as a set of assets selected by investors in allocating funds owned or a set of investments. Meanwhile, according to Aziz (2010:28) securities portfolio is a collection of securities owned jointly by the investors in mutual funds.

B. Single Index Model Definition

Single Index Model is a technique to measure the return and risk of a stock or a portfolio (Zubir, 2011:97). A single index model was developed by William Sharpe. This model can be used to simplify Markowitz model calculations. In addition, a single index model can also be used to calculate expected returns as well as portfolio risk (Hartono, 2010:231).

C. Treynor Index Definition

The Treynor Index is the method that was first introduced by Jack L. Treynor in 1966. The portfolio performance is calculated by dividing excess return with portfolio volatility. The volatility is used to indicate systematic risk (beta). The risk can be minimized by diversifying stocks by way of forming a stock portfolio.

3. RESEARCH METHOD

A. Time and Place of Research

This research was conducted from March 2016 until December 2016 in Jakarta. The period used in this research is from 2014 to 2016. This research used secondary data that takes data through the official website of Indonesia Stock Exchange (www.idx.co.id) and SBI data from the official website of Bank Indonesia (www.bi.go.id) on the index listed on the Indonesia Stock Exchange, the Jakarta Islamic Index (JII). The research was conducted at Mercubuana University, Jakarta.

B. Research Design

The research design used in this research is descriptive quantitative, which aims to establish the description systematically, factually and accurately about the facts and properties of the research population. In this research, the design provides an overview of the object under study, namely on the establishment of a portfolio determined by a single index model and portfolio performance assessment as measured using Treynor Index.

C. Research Population and Sample

1. Research Population

The population is the whole individual or object taken or the size obtained from all individuals or related objects (Wathen 2013:8). The population in this study are all companies whose stocks are registered in the Jakarta Islamic Index (JII) from 2014 to 2016. There are 30 companies listed on Jakarta Islamic Index (JII) which are renewed every 6 months.

2. Sample

The sample is a portion or part of a similar population (Wathen, 2013: 8). The sample for this study is determined using non-probability sampling with purposive sampling method, which is a sampling technique performed on the population based on certain criteria determined by the researcher. This type of sampling technique is used when every member of the population does not have the same possibilities to be used as a sample.

The samples taken in this study are companies that meet the criteria based on researcher's consideration, namely companies which are consistently listed on JII from 2014 until 2016. Based on the criteria, sample of 21 companies was taken. The list of companies whose stocks are consistently listed on Jakarta Islamic Index (JII) from 2014 to 2016 can be seen in table 3.2 below:

Table 3.2 Stocks on Jakarta Islamic Index (JII)
 From 2014 to 2016

No	Stock Ticker	Company Name
1	AALI	Astra Agro Lestari Tbk.
2	ADRO	Adaro Energy Tbk.
3	AKRA	AKR Corporindo Tbk.
4	ASII	Astra International Tbk.
5	ASRI	Alam Sutera Realty Tbk.
6	BSDE	Bumi Serpong Damai Tbk.
7	ICBP	Indofood CBP Sukses Makmur Tbk.
8	INDF	Indofood Sukses Makmur Tbk.
9	INTP	Indocement Tunggul Prakarsa Tbk.
10	ITMG	Indo Tambang Raya Megah Tbk.
11	KLBF	Kalbe Farma
12	LPKR	Lippo Karawaci Tbk.
13	LSIP	PP London Sumatra Indonesia Tbk.
14	MPPA	Matahari Putra Prima Tbk.
15	PGAS	Perusahaan Gas Negara (Persero) Tbk.
16	SMGR	Semen Indonesia Tbk.
17	SMRA	Summarecon Agung Tbk.
18	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
19	UNTR	United Tractors Tbk.
20	UNVR	Unilever Indonesia Tbk.
21	WIKA	Wijaya Karya Tbk.

D. Data Collection Technique

The data for this research was collected by literature study, which is by studying the literature related to the research theme as well as record or copy the data listed on www.idx.co.id for the research results.

The data used in this study is secondary data, in which the research data is taken from www.idx.co.id website, which has already been published. The source of data obtained in this research is from Indonesia Stock Exchange (IDX), SBI (Bank Indonesia Certificates) rate, research-related literature, and prior research related to this research.

E. Data Analysis Method

The data in this research was analyzed using Single Index Model to determine optimal portfolio builder and Treynor Index to measure optimal portfolio performance. Meanwhile, the researched used Microsoft Excel software for aiding the calculations. The procedures in the data analysis methods are as follow:

1. Initial Stocks Selection
 - a. Enlisting the stocks which are consistently listed on JII from 2014 to 2016.
 - b. Shortlisting the stocks that will be candidates as the optimal portfolio builder which are consistently listed on JII from 2014 to 2016.
2. Establishing Optimal Portfolio
 Calculating returns of each stock, using equation 3.1 as follows:

$$R_i = \frac{P_t - P_{t-1}}{P_{t-1}} \quad (3.1)$$

Where:

- R_i = Stock returns
- P_t = Stock price at time =t
- P_{t-1} = Stock price in the past period

Calculating expected return of stocks or expected profit of each individual stocks by using equation 3.2 as follows:

$$E(R_i) = \frac{\sum R_i}{n} \quad (3.2)$$

Where:

- $E(R_i)$ = expected return from stock i
- R_i = Realized return of stock i

n = Total realized return of stock i

Calculating the risk level of each stock assumed by the variance and standard deviation. This was done to find out how much risk owned by each stock that will serve as the optimal portfolio builder. To calculate the variance and standard deviation of each stock, the equation 3.3 below is used

$$\sigma_i^2 = \frac{\sum[(R_i - E(R_i))^2]}{n} \rightarrow \sigma_i = \sqrt{\sigma_i^2} \quad (3.3)$$

Where:

- R_i = Stock i Return
- $E(R_i)$ = Expected return of stock i
- n = Number of observations
- σ_i^2 = Variant of stock i
- σ_i = Standard deviation of stock i

Calculating JCI return, JCI expected return, and JCI risks with equations 3.4, 3.5, and 3.6 as follows:

$$R_m = \frac{IHSG_t - IHSG_{t-1}}{IHSG_{t-1}} \quad (3.4)$$

Where:

- R_m = JCI Return
- $IHSG_t$ = JCI Level during time t
- $IHSG_{t-1}$ = JCI Level in the previous period

As for JCI expected return is calculated by:

$$E(R_m) = \frac{\sum R_m}{n} \quad (3.5)$$

Where:

- $E(R_m)$ = JCI Expected return
- R_m = JCI Return
- n = Number of observations

The JCI risks are calculated by:

$$\sigma_m^2 = \frac{\sum[(R_m - E(R_m))^2]}{n} \rightarrow \sigma_m = \sqrt{\sigma_m^2} \quad (3.6)$$

Where:

- σ_m^2 = IHSG Variance
- R_m = JCI Return
- $E(R_m)$ = JCI Expected return
- n = Number of observations
- σ_m = JCI Standard deviation

The covariance of stock i with market covariance is calculated using equation 3.7 as follows:

$$Cov(R_i, R_m) = \frac{\sum[R_i - E(R_i)][R_m - E(R_m)]}{n} \quad (3.7)$$

Where:

- $Cov(R_i, R_m)$ = Relationship of R_i with R_m
- R_i = Return of stock i
- $E(R_i)$ = Expected return of stock i
- R_m = JCI Return
- $E(R_m)$ = JCI Expected return
- n = Number of observations

The beta stock is calculated using the equation 3.8 as follows:

$$\beta_i = \frac{Cov(R_i, R_m)}{\sigma_m^2} \quad (3.8)$$

Where:

- β_i = Beta stock i
- σ_m^2 = Market variant
- $Cov(R_i, R_m)$ = Relationship between R_i and R_m

Alpha stock is calculated using the equation 3.9 as follows:

$$\alpha_i = E(R_i) - \beta_i * E(R_m) \quad (3.9)$$

Where:

- α_i = Alpha stock i
- β_i = Beta stock i

$E(R_m)$ = Market expected return
 $E(R_i)$ = Expected return of stock i

The variance from residual errors or error variant is calculated using the equation 3.10 as follows:

$$\sigma_{ei}^2 = \sigma_i^2 - (\sigma_m^2 * (\alpha_i)^2) \quad (3.10)$$

Where:

σ_{ei}^2 = Variant ei of stock i
 σ_i^2 = Variant of stock i
 σ_m^2 = Market variant
 α_i = Alpha stock i

R_f (free-asset return) is calculated using equation 3.11 as follows:

$$R_f = \frac{\sum SBI * (1 - T)}{n} \quad (3.11)$$

Where:

R_f = Free-asset return
 SBI = Average benchmark rate (BI Rate)
 T = Deposits tax
 n = Number of observations

Calculating Excess return to beta (ERB)

To determine the stocks fir candidates of optimal portfolio builder is by sorting stocks from the highest ERB value to the lowest. Stocks with the highest ERB value are eligible to be candidates for optimal portfolio builder. ERB is calculated using the following equation 3.12:

$$ERB_i = \frac{E(R_i) - R_f}{\beta_i} \quad (3.12)$$

Where :

ERB_i = Excess return to beta stock i
 $E(R_i)$ = Expected return of stock i
 R_f = Risk-free assets return
 β_i = Beta stock i

The values of A_i and B_i for each of i^{th} stock are calculated with the following equations 3.13 and 3.14 as follow:

$$A_i = \frac{[E(R_i) - R_f] \beta_i}{\sigma_{ei}^2} \quad (3.13)$$

Where :

A_i = Scale from balance to A on each stock
 $E(R_i)$ = Expected return of stock i
 R_f = Risk-free assets return
 β_i = Beta stock i
 σ_{ei}^2 = ei variant of stock i

$$B_i = \frac{\beta_i^2}{\sigma_{ei}^2} \quad (3.14)$$

Where :

B_i = Scale from balance to B on each stock
 β_i^2 = Beta stock i
 σ_{ei}^2 = ei variant of stock i

The A_j and B_j value for each j^{th} stock are calculated with the following equations 3:15 and 3:16:

$$A_j = \sum_{j=1}^n \frac{(\bar{R}_j - R_f) \beta_j}{\sigma_{ej}^2} \quad (3.15)$$

Where :

A_j = Scale from balance to A of j^{th} future result
 \bar{R}_j = Average return of j^{th} future results
 R_f = Risk-free return
 β_j = Beta stock of j^{th} future result

$$B_j = \frac{\sum_{j=1}^n \beta_j^2}{\sum_{j=1}^n \sigma_{\epsilon_j}^2} \quad (3.16)$$

Where :

B_j = Scale from balance to B of j^{th} future result

β_j^2 = Beta stock of j^{th} future result

$\sigma_{\epsilon_j}^2$ = Residual error variant of j^{th} future results

The C_i value is calculated using the following equation 3.17:

$$C_i = \frac{\sigma_m^2 \sum_{j=1}^n \frac{[E(R_j) - R_f] \beta_j}{\sigma_{\epsilon_j}^2}}{1 + \sigma_m^2 \sum_{j=1}^n \left[\frac{\beta_j^2}{\sigma_{\epsilon_j}^2} \right]} \quad (3.17)$$

Where :

C_i = Cut - off point

σ_m^2 = Market Variants

$E(R_j)$ = Average return of j^{th} future results

R_f = Risk-free return

β_j = Beta stock of j^{th} future result

$\sigma_{\epsilon_j}^2$ = Residual error variant of j^{th} future results

Specifying C^* (cut-off point).

The amount of cut-off point is the C_i value when the last ERB is still higher than the C_i value (represents the largest C_i value). Stocks that establish the optimal portfolio are any stock that has ERB value higher than or equal to C^* . Meanwhile, stocks that have ERB value lower or equal to C^* are not included in stocks that establish the optimal portfolio. It can be written as follows:

$ERB \geq C^*$ the stock goes into the optimal portfolio.

$ERB \leq C^*$ the stock does not go into the optimal portfolio.

3. Implementing Investment in Optimal Portfolio

Calculating the proportion of funds for each stock that establish the optimal portfolio. The investment proportion can be calculated using equations 3.18 and 3.19 as follows:

$$W_i = \frac{Z_i}{\sum_{j=1}^k Z_j} \quad (3.18)$$

Where :

W_i = Proportion of funds invested in stock i

k = Number of stocks in optimal portfolio

Z_j = Total balance scale over each stock

Z_i = Relative investment for each stock

With Z_i is:

$$Z_i = \frac{\beta_i}{\sigma_{\epsilon_i}^2} (ERB_i - C^*) \quad (3.19)$$

Where :

Z_i = Relative investment for each stock

β_i = Beta stock i

ERB_i = Excess return to beta stock i

C^* = The cut-off point which is the largest C_i value

4. Optimal Portfolio Performance Assessment

Portfolio performance can be measured by calculating the Treynor index value in the optimal portfolio.

The portfolio that has the largest Treynor index value is the portfolio that has the best performance. The

Treynor index can be calculated using the following equation 3.25:

$$TP_i = \frac{(RP_i - R_f)}{\beta P_i} \quad (3.25)$$

Where :

TP_i = Treynor Index on portfolio i

RP_i = Portfolio i return

R_f = Risk-free return

βP_i = Beta ortfolio i

4. RESULTS AND DISCUSSION

Stocks that are listed into optimal portfolio are those that have excess return to beta (ERB) value greater or equal to cut-off point (C^*). The table 4:15 below shows that result of stocks listed into optimal portfolio with ERB value greater or equal to C^* .

Table 4.15
 JII Stocks for Optimal Portfolio from 2014 to 2016

Portfolio	No	Ticker	Company Name
2014	1	AALI	Astra Agro Lestari Tbk.
	2	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
	3	ICBP	Indofood CBP Sukses Makmur Tbk.
	4	UNVR	Unilever Indonesia Tbk.
	5	KLBF	Kalbe Farma
	6	INDF	Indofood Sukses Makmur Tbk.
	7	BSDE	Bumi Serpong Damai Tbk.
	8	AKRA	AKR Corporindo Tbk.
	9	MPPA	Matahari Putra Prima Tbk.
2015	1	KLBF	Kalbe Farma
	2	PGAS	Perusahaan Gas Negara (Persero) Tbk.
	3	ICBP	Indofood CBP Sukses Makmur Tbk.
	4	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
	5	WIKA	Wijaya Karya Tbk.
	6	UNVR	Unilever Indonesia Tbk.
	7	BSDE	Bumi Serpong Damai Tbk.
	8	ASRI	Alam Sutera Realty Tbk.
	9	IT	Indocement Tunggul Prakarsa Tbk.
	10	SMRA	Summarecon Agung Tbk.
2016	1	AKRA	AKR Corporindo Tbk.
	2	UNVR	Unilever Indonesia Tbk.
	3	TLKM	Telekomunikasi Indonesia (Persero) Tbk.
	4	ICBP	Indofood CBP Sukses Makmur Tbk.

Source: data, processed

Table 4:15 shows that in 2014 the stocks in portfolio are 9 stocks namely: AALI, TLKM, ICBP, UNVR, KLBF, INDF, BSDE, AKRA, and MPPA. These stocks definitely have ERB values greater than or equal to C^* .

In 2015, the portfolio consists of 10 stocks with ERB values greater or equal to C^* . These stocks are KLBF, PGAS, ICBP, TLKM, WIKA, UNVR, BSDE, ASRI, INTP, and SMRA.

Meanwhile, in 2016, the portfolio consists of 4 stocks with ERB values greater than or equal to C^* . These stocks are AKRA, UNVR, TLKM, and ICBP.

Portfolio performance assessment is measured by using Treynor Index method. The optimal portfolio performance assessment is seen from the Treynor Index calculation which shows positive and higher value compared to other portfolio(s). If the Treynor Index value is positive and greater, the portfolio performance will be better. To find out the treynor index value in the portfolio, equation 3.25 can be used in the calculation. The table 4.20 below shows treynor index value calculation on the portfolio.

Table 4.20 Result of Treynor Index Value Calculation on Optimal Portfolio of JII Index for 2014 to 2016

Year	Tp_i
2014	0.32416276
2015	0.28099925
2016	0.74799645

Source: Data, processed

From table 4.20 above, the portfolio that has the best performance is in 2016 with the Treynor index value of 0.74799645, consisting of stocks: AKRA, UNVR, TLKM, and ICBP. Meanwhile, the second best portfolio

performance is in 2014 with the Treynor index value of 0.324164276, consisting of stocks: AALI, TLKM, ICBP, UNVR, KLBF, INDF, BSDE, AKRA, and MPPA. Lastly, the portfolio with least optimal performance is in 2015 which has the lowest Treynor index value between the portfolio, equal to 0.28099925, consisting of stocks: KLBF, PGAS, ICBP, TLKM, WIKA, UNVR, BSDE, ASRI, INTP, and SMRA.

5. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

Based on the research objectives and results, the conclusions can be drawn out as follows:

From the calculation results using a single index model of 21 stocks listed on JII during 2014 to 2016; it shows that in 2014, 9 stocks formed optimal portfolio. In 2015 there are 10 stocks formed the optimal portfolio. Lastly, 4 stocks formed optimal portfolio in 2016.

The details of the stocks are as follows:

- 1) In 2014, the stocks forming optimal portfolio are: AALI, TLKM, ICBP, UNVR, KLBF, INDF, BSDE, AKRA, and MPPA. The largest capital investment is in AALI stocks which reaches 20.72%.
- 2) For 2015, the stocks forming optimal portfolio are: KLBF, PGAS, ICBP, TLKM, WIKA, UNVR, BSDE, ASRI, INTP, and SMRA. The largest capital investment is in TLKM stocks which reaches 40.79%.
- 3) In 2016, the stocks that formed the optimal portfolio are: AKRA, UNVR, TLKM, and ICBP. The largest capital investment is in AKRA, equal to 65.34%.

In a single index model, the above optimal-portfolio-forming stocks have the excess return to beta (ERB) value greater than or equal to the cut-off point value (C*). Portfolio performance is measured using the Treynor index, the results show that the best performing portfolio is the 2016 portfolio as it has the highest Treynor index value among other portfolios (0.74799645) with the combination of AKRA, UNVR, TLKM and ICBP stocks. The second position is the 2014 portfolio which has the second highest Treynor index value (0.32416276) with the combination of AALI, TLKM, ICBP, UNVR, KLBF, INDF, BSDE, AKRA, and MPPA stocks. Lastly, the 2015 portfolio has the lowest Treynor index value, consisting of KLBF, PGAS, ICBP, TLKM, WIKA, UNVR, BSDE, ASRI, INTP, and SMRA stocks.

B. Suggestion

1. For investors or potential investors who will invest into JII, it is advisable to invest in a combination of stocks that provide high returns and high performance results as well as stocks in the 2016 portfolio which has the best portfolio performance among those of in 2014 and 2015 and as well as having high portfolio expected return. The combination of stocks in the 2013 portfolio includes AKRA, UNVR, TLKM, and ICBP, with the largest investment portion were in AKRA (65.34%).
2. The next researcher is expected to continue this research different research period, in order to adapt to the changing market conditions and anticipate earlier the worst losses that may occur. With this research, the researchers and investors in the stock market are advised to use the Single Index Model method when establishing a portfolio in order to optimally select the stocks, as well as use the Treynor Index assessing portfolio performance if several stocks are influenced by market changes.

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