

Comparative study between the performances of two Islamic indices

Study on FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI)

Rama Gardika¹, Ade Banani², Sulistyandari³

Faculty of Economics and Business, Universitas Jenderal Soedirman, Indonesia

Abstract

This study aims to analyze the differences in the performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) in Malaysia and Indonesia Sharia Stock Index (ISSI) in Indonesia by using Sharpe, Treynor, and Jensen ratio. Type of this study is quantitative research by using hypothesis testing and purposive sampling technique. Population in this study is all sharia indices listed on Indonesia Stock Exchange (IDX) and Bursa Malaysia (BM). From the sampling process obtained two indices. These indices are FTSE Bursa Malaysia EMAS Syariah (FBMS) and Indonesia Sharia Stock Index (ISSI). Objects of this study are monthly index returns during the period of July 2012 to June 2012 which amounted to 60 data. Hypothesis testing is intended to determine whether there is significant difference between the performance of FBMS and ISSI on the measurement of Sharpe, Treynor, and Jensen ratio. Test was conducted by using Two Independent Samples t-test. Results showed that there is no significant difference between the performance of FBMS and ISSI on the Sharpe, Treynor, and Jensen ratio. Implication of this study is that the results of this study can be used as a reference for companies in selecting which Islamic index prefer to issue the stock in based on the performance measured using Sharpe, Treynor, and Jensen ratio. Results of this study also can be used as a reference for investors who are interested in investing funds in sharia stocks in Indonesia and Malaysia.

Keywords

Index; Sharia; Sharpe ratio; Treynor ratio; Jensen ratio

INTRODUCTION

Background

Investing is one of controlled strategies to gain wealth that is very effective for everyone. According to Morgan (2013), investing is the act of committing money or capital to an endeavor (a business, project, real estate, etc.) with the expectation of obtaining an additional income or profit. Investing includes the amount of time of the investors put into the study of a prospective company, especially since time is money.

There are many ways to make financial investments. One of them is investing in accordance with the principles of Islamic sharia. Sharia investment avoids investors from practices forbidden by Islam. However, the transactions and facilities of sharia investment are limited right now. Investment can be done on various business activities related to the activity of producing a product or service that is not forbidden by Islam such as liquor, pork, gambling, fraud, etc. One of sharia investments is buying sharia securities including sharia stock, sharia bond, sharia mutual fund, and other securities in accordance with the principles of sharia.

In the past decade, the demand for sharia-compliant financial products had increased. According to Dharani and Natarajan (2011), sharia investment had grown significantly in developed and developing countries post 1990 through the introduction of broad macroeconomic and structural reformations in the financial system, the implementation of trade liberalization policies, capital movement, privatization, and global integration of financial markets. These conditions paved the way for the Muslim community to participate in stock market operations.

Sharia capital markets are relatively more resilient to crises compared to conventional capital markets. It was stated by Ahmad and Albaity (2008), as the sharia capital market has a better ability to adapt to changes from external crisis disturbances. Sharia capital markets offer a more secure investment medium for the crisis. Thus, the Indonesian capital and financial market institutions are expected to give their attention and commitment in the development of sharia capital market as an advantageous investment alternative.

In the Southeast Asian region, there are two countries with the largest Muslim population. Both countries are Indonesia and Malaysia. Muslim

✉ Correspondence to:

¹Universitas Jenderal Soedirman, Indonesia. E-mail: ramagardika@gmail.com

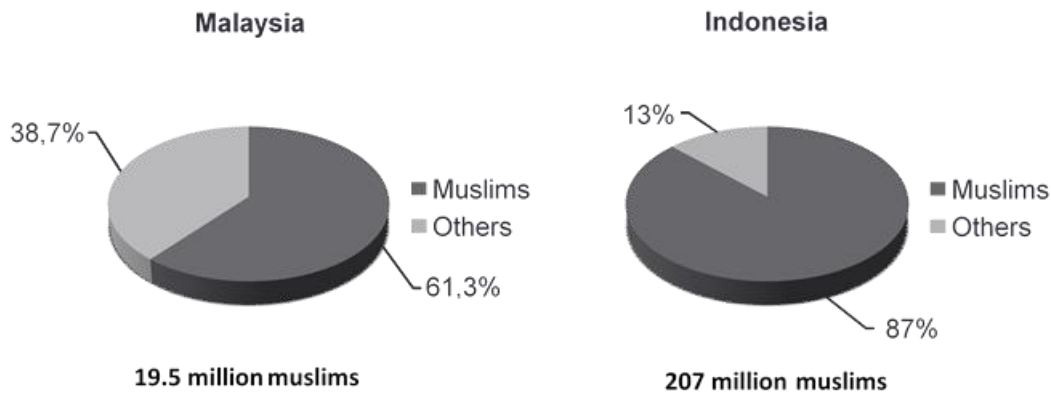
²Universitas Jenderal Soedirman, Indonesia. E-mail: a.banani@yahoo.com

³Universitas Jenderal Soedirman, Indonesia. E-mail: sulistyandari.yan@gmail.com

population comparison between both countries can be seen in figure 1. Large number of Muslim residents in both countries led to a demand for a sharia financial system or sharia capitalization system that could keep Muslims not worried for being able to make a transaction in the economy

without violating the teachings of their religion. It encourages the two countries to issue sharia-based stock index, Malaysia issued the Financial Times Stock Exchange (FTSE) Bursa Malaysia EMAS Sharia or FBMS and Indonesia issued Indonesia Sharia Stock Index (ISSI).

Figure 1
Muslim population comparison between Malaysia and Indonesia (2014)



Source: wikipedia.org

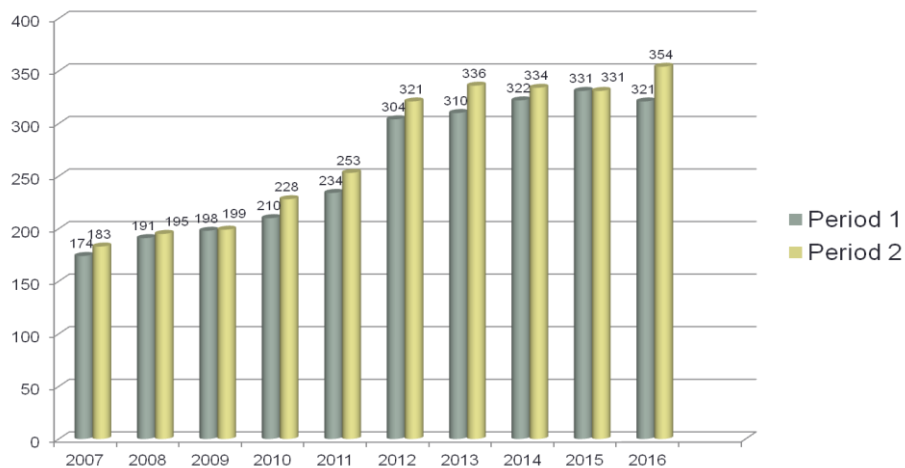
Malaysia and Indonesia are countries with the majority of Muslim population and have launched Islamic indices. Both countries also have the same economic characteristics. Although Malaysia economic condition is not identically the same with Indonesia, but both economic conditions are almost the same and both countries are still the developing countries. Trend of sharia stock growth in Indonesia and Malaysia also showed similar characteristics. It can be seen in the growth of ISSI capitalization that grew IDR 1,200,689.06 million and FBMS capitalization that grew IDR 1,123,123.93 million from 2011 until 2016 (www.investing.com). It makes both countries leading the Muslim-majority countries in the economic sector in the Southeastern Asia. These reasons led the author to be comparing the Islamic indices of both countries in purpose to find out whether there is significant difference in performance between the indices from two different countries that have the same economic characteristics and the majority of Muslim population.

Bursa Malaysia has launched three indices to track the performance of sharia-compliant securities. These indices are FTSE Bursa Malaysia EMAS Shariah Index (FBM EMAS Shariah), FTSE Bursa Malaysia Hijrah Shariah Index (FBM Hijrah Shariah), and FTSE Bursa Malaysia Small Cap

Shariah (FBM Small Cap Shariah). These indices are designed for the creation of structured products, index tracking funds, and Exchange Traded Funds or as performance benchmarks. The constituents are screened and tested on their market capitalization, free-float, and liquidity. The review is conducted semi-annually in June and December. The launch of the FTSE Bursa Malaysia Hijrah Shariah Index and FTSE Bursa Malaysia GOLD Shariah Index was in response to increase interest in sharia-compliant investment. Both index were the joint initiative between FTSE, Bursa Malaysia, and the global leading sharia consultancy, Yasaar Ltd.

FTSE Bursa Malaysia EMAS Sharia (FBMS) consists of sharia-compliant constituents of the FTSE Bursa Malaysia EMAS that meet the screening requirement of the Shariah Advisory Council (SAC). FTSE Bursa Malaysia Hijrah Shariah (FBMHS) index consists of 30 largest sharia-compliant companies in FBMEMAS screened by Yasaar Ltd and the Securities Commission's Shariah Advisory Council (SAC). And the FTSE Bursa Malaysia Small Cap Shariah (FBMSCAP) comprises the constituents of the FTSE Bursa Malaysia Small Cap Index that are sharia-compliant according to the SAC Screening methodology.

Figure 2
Sharia stock constituents growth in Indonesia (2007-2016)

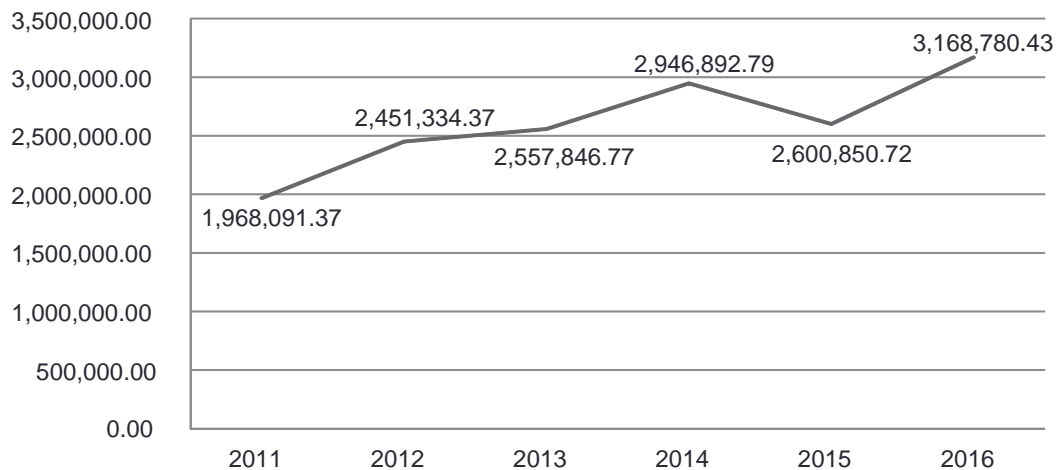


Source: Financial Services Authority (OJK)

Demand of sharia stock in Indonesia increases year to year. It is showed by the growth of sharia stock constituents in Indonesia (figure 2). It made Indonesia Stock Exchange launched Islamic indices. Indonesia has two Islamic indices. Both indices are Indonesia Sharia Stock Index (ISSI) and Jakarta Islamic Index (JII). Indonesia Sharia Stock Index (ISSI) is a stock index that reflects the total sharia stocks listed on the Indonesia Stock Exchange (IDX). Indonesia Sharia Stock Index

(ISSI) constituents are all sharia stocks listed on IDX and listed in the List of Sharia Securities (DES). Growth of ISSI capitalization can be seen in figure 3. Jakarta Islamic Index (JII) is more specific than ISSI. It may be said that JII's position against ISSI is like LQ45 to IHSG. Each period, the shares that enter JII amounted to 30 (thirty) shares considered not to violate the principles of sharia. JII uses the base day of January 1, 1995 with a base value of 100.

Figure 3
Indonesia Sharia Stock Index (ISSI) capitalization in billion rupiah (2011-2016)



Source: Financial Services Authority (OJK)

This study aims to measure the performance of two biggest Islamic indices in South Asia countries, FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) using Sharpe, Treynor, and Jensen ratio. These methods were selected instead of the other methods because Sharpe, Treynor, and Jensen ratio can be found in variety of financial and investment management literature books at both basic and advanced levels.

The methods have been accepted and valid as the standard in the measurement of mutual fund performance (Rudiyanto, 2011). These methods were also consistently used by the previous research to measure the index performance.

Problem formulation

Research results of Shofiyullah (2014) showed that the performances of two Islamic indices, JII and FBMHS, are not significantly different. Type of the research is hypothesis testing by using purposive sampling technique. Population in the study was all listed Islamic Indices in Indonesia Stock Exchange and Bursa Malaysia. Two indices are obtained from the sampling process, namely Jakarta Islamic Index (JII) and the FTSE Bursa Malaysia Hijrah Shariah Index (FBMHS). Object of this study is the monthly index return for the period of January 2009 to December 2011, amounting to 36 data. The researcher used the method of Sharpe, Treynor, and Jensen index test to get the results and found out that there was no significant difference between the performance of JII and FBMHS.

Author adapted the method of Sharpe, Treynor, and Jensen ratio used in Shofiyullah's research to measure the index performance. Previous research took the sample of JII and FBMHS index that only consist of 30 sharia stock constituents with the highest liquidity. Difference between previous research and this research are that this research took the sample of ISSI and FBMS index that cover all sharia stock constituents in Malaysia and Indonesia, and this research expands the sampling period taken in the previous research from 3 years to 5 years.

From the research gap above, the questions can be drawn as follow: (1) Is there difference in performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) measured by Sharpe ratio? (2) Is there difference in performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) measured by Treynor ratio? (3) Is there difference in performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) measured by Jensen ratio?

LITERATURE REVIEW

Sharia stock

Conceptually, stocks are securities and also the proof of capital participation to the company and with that proof the shareholders are entitled to get the proceeds of the company's business (Bodie, *et al.*, 2012). Concept of capital participation with the right to get the part of the results of the business is a concept that is not contrary to the principles of sharia. Sharia principles recognize this concept as a *musyarakah* or *syirkah* activity. Based on the analogy, then conceptually, the stock is a security that is not contrary to the principles of sharia.

However, not all stocks issued by public companies may be referred to as sharia stocks. A stock may be categorized as sharia stock if the stock is issued by: (1) Issuers / public companies that clearly state in their articles of association that the business activities of the issuers / public

companies are in accordance with sharia principles (sharia issuers / public companies); or (2) Issuers / public companies that do not state in their articles of association that the business activities of the issuers / public companies are not contradict with the principles of sharia in the capital market, but meet the following criteria: (a) Not conducting business as follows: gambling; trading prohibited by sharia (for example: trade not accompanied by delivery of goods / services and trade with false supply / demand); *ribawi* financial services (for example: interest-based banks and interest-based financing companies); buying and selling risks that contain elements of uncertainty and / or gambling (for example: conventional insurance); producing, distributing, trading and / or providing: illegitimate goods or services because of the substance; illegitimate goods or services not because of the substance; and / or goods or services that undermine morality and / or harm; and conducting transactions containing bribery elements. (b) Meet the following financial ratios: total interest-based debt compared to total assets of not more than 45%, for example Bank Muamalat Indonesia, Bank Panin Syariah, and Sofyan Hotel; or total interest income and other unlawful income compared to total business income and other income not more than 10%, for example stocks of issuers / public companies listed in the Sharia Securities List.

Indonesia sharia indices

Sharia capital market in Indonesia already has two stock indices which are the reference for investors in measuring the performance of their portfolio. Both indices include the Jakarta Islamic Index (JII) that has been published on July 3, 2000 and the Indonesian Sharia Stock Index (ISSI) which was launched simultaneously with the fatwa of DSN-MUI on May 12, 2011. Sharia capital market in Indonesia already has the main instrument of composite index which takes into account the performance of all sharia stocks listed on the Indonesia Stock Exchange. That index is called ISSI (Indonesia Sharia Stock Index).

Indonesia Sharia Stock Index (ISSI) constituents consist of stocks listed in the Sharia Securities List as set out in the Regulation of Bapepam and LK Number II.K.1 on Criteria and Issuance of Sharia Securities List (see the explanation about sharia stocks). In addition, the sharia capital market also has a performance-based index called Jakarta Islamic Index (JII) whose constituents consist of 30 stocks that have the highest liquidity in the Indonesia Stock Exchange. To become a constituent of the Jakarta Islamic Index (JII), a stock must first be included as a stock listed in the Sharia Securities List, after that, the stocks incorporated in the ISSI constituency will be selected into 60 stocks with the highest market capitalization. Market capitalization is obtained from

the multiplication of the number of stocks outstanding multiplied by the prevailing price. Thirty of sixty stocks that have the largest transaction value will be taken.

Sharia stock index plays an important role in the development of sharia capital market in Indonesia. It is not only a benchmark for investors, but also the basis for measuring the performance of an Islamic mutual fund even the foundation of an Exchange Traded Fund (ETF) product. In addition, ISSI publication ends a misunderstanding of the public regarding the number of sharia stocks, where many people think that the number is only 30 stocks.

Malaysia sharia indices

Bursa Malaysia as an integrated exchange offers a good breadth of quality sharia-compliant stocks. Development of the Securities Screening Methodology by the Shariah Advisory Council (SAC) of Malaysia Securities Commission (SC) determines the sharia compliance of securities listed and traded on Bursa Malaysia. The sharia compliance review is undertaken for securities of companies listed on the exchange and during pre-initial public offering companies. Each public listed company is reviewed based on the latest annual audited financial statements. The list of sharia-compliant securities is updated and published every May and November.

Bursa Malaysia has launched three indices to track the performance of Shariah-compliant securities, the FTSE Bursa Malaysia EMAS Shariah Index (FBM EMAS Shariah), the FTSE Bursa Malaysia Hijrah Shariah Index (FBM Hijrah Shariah) and the FTSE Bursa Malaysia Small Cap Shariah (FBM Small Cap Shariah). These indices are designed for the creation of structured products, index tracking funds and Exchange Traded Funds or as performance benchmarks. Constituents are screened and tested on market capitalization, free-float and liquidity. The review is done semi-annually in June and December.

FBMS (FTSE Bursa Malaysia EMAS Shariah) is the index that consists of sharia-compliant constituents of the FBMEMAS that meet the screening requirement of the Shariah Advisory Council (SAC). FBMHS (FTSE Bursa Malaysia Hijrah Shariah Index) consists of 30 largest sharia-compliant companies in FBMEMAS screened by Yasaar Ltd and the Securities Commission's Shariah Advisory Council (SAC). FBMSCAP (FTSE Bursa Malaysia Small Cap Shariah) comprises the constituents of the FTSE Bursa Malaysia Small Cap Index that are Shariah-compliant according to the SAC Screening methodology.

FTSE Bursa Malaysia EMAS Shariah (FBMS) is a benchmark index that applies the principles set out by the SAC of the SC. These sharia-compliant companies are further filtered for FBM Hijrah Shariah which consists of the 30 largest sharia

compliant companies in FBM EMAS Shariah screened by Yasaar Ltd., a leading global Shariah consultancy, to meet the requirements of international sharia investors. FTSE Bursa Malaysia EMAS Shariah (FBMS) has been designed to provide investors with a broad benchmark for sharia-compliant investment. Constituents are screened according to the Malaysian Securities Commission's Shariah Advisory Council (SAC) screening methodology. FTSE Bursa Malaysia EMAS Shariah (FBMS) applies the principles set out by the SAC in the design of this index.

General criteria stipulate that sharia-compliant companies must not be involved in any of the following core activities: financial services based on *riba* (interest); gambling; manufacture or sale of non-*halal* products or related products; conventional insurance; entertainment activities that are non-permissible according to sharia; manufacture or sale of tobacco-based products or related products; stockbroking or share trading in sharia non-compliant securities; and, other activities deemed non-permissible according to sharia. FTSE Bursa Malaysia EMAS Shariah (FBMS) is chosen as the object of this study because it covers all the sharia stock constituents in Malaysia (Bursa Malaysia, 2017).

Sharpe ratio

Sharpe's performance measurement method was first introduced in 1966 by William Sharpe. Sharpe's measurement is based on an excess return on risk or known as a reward-to-variability ratio. The excess return is derived from the difference between the rate of return of the investment portfolio and the risk-free investment (Indiastuti, 2008). In this study, portfolio investment is an investment in each of ISSI and FBMS issuers and riskless investment is assumed as the average interest rate of Bank Indonesia Certificates (SBI) and overnight rate of Bank Negara Malaysia. And the standard deviation portfolio used is a total risk value that combines the risk that can be diversified (unsystematic risk) and the risk that cannot be diversified (systematic risk).

Treynor ratio

Measurement with the Treynor method are also based on excess return ($R_p - R_f$), as does Sharpe. However, Treynor method uses beta (β) as denominator which is a systematic risk or also called market risk (Indiastuti, 2008).

Jensen ratio

Jensen's measurement method is based on Capital Asset Pricing Model (CAPM). This model states whether the investment manager can outperform the market in a predictable and statistically significant way, by indicating a positive alpha. A

good investment manager will produce significant positive alpha and vice versa. This method was developed by Michael C. Jensen in 1968. Jensen ratio measures performance by calculating the difference in returns earned from a portfolio (actual return) with expected returns based on systematic risk levels.

HYPOTHESIS DEVELOPMENT AND RESEARCH MODEL

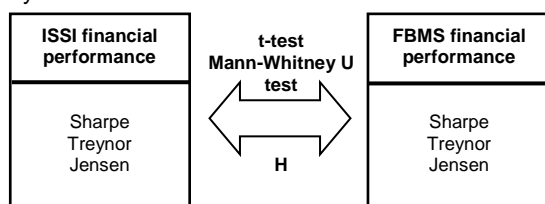
Many investors mistakenly base the success of their portfolios on returns alone. Few investors consider the risk that they took to achieve those returns. Since the 1960s, investors had known how to quantify and measure risk with the variability of returns, but no single measure actually looked at both risk and return together (Pareto, 2017). Today, investors have three sets of performance measurement tools for assisting with the portfolio evaluations. Sharpe, Treynor, and Jensen ratio combine risk and return performance into a single value, but each model is slightly different.

In measuring the index performance, this research used three methods. These methods are Sharpe, Treynor, and Jensen ratio. These methods were selected instead of the other methods because Sharpe, Treynor, and Jensen Index can be found in variety of financial and investment management literature books at both basic and advanced levels. The methods have been accepted and valid as the standard in the measurement of mutual fund performance (Rudiyanto, 2011). Those methods are also used as a reference in assessing the performance of mutual funds and consistently used by the previous researches to measure the index performance.

Hypothesis in this research can be formulated as follows:

- H1: There are differences in the performance of ISSI and FBMS measured by the Sharpe ratio.
- H2: There are differences in the performance of ISSI and FBMS measured by the Treynor ratio.
- H3: There are differences in the performance of ISSI and FBMS measured by the Jensen Alpha ratio.

Figure 4
Analysis framework



RESEARCH METHOD

This research is an empirical study; the study of empirical facts based on observation of the FTSE Bursa Malaysia EMAS Shariah (FMBS) on Bursa Malaysia and Indonesia Sharia Stock Index (ISSI) on Indonesia Stock Exchange (IDX) on the period of 2012-2017. Observation periods in this study were taken during 2012 to 2017. Required data are the monthly index return for the period of July 2012 to June 2017 amounting to 60 data. Data of this study were historical data collected from Bursa Malaysia and Indonesia Stock Exchange (IDX). Both data were obtained from the website of www.investing.com. Populations in this study are all Islamic indices in Indonesia Stock Exchange and Bursa Malaysia. Sampling was taken by using purposive sampling method. Samples were chosen based on characteristic suitability with the criteria that has been determined to get the representative sample. These criteria are: (1) Islamic indices operating on the Indonesia Stock Exchange and Bursa Malaysia in the period of 2012 to 2017. (2) Islamic indices covering all sharia stocks listed on the stock index of each country. From these criteria, samples of this study were Indonesian Sharia Stock Index (ISSI) on Indonesia Stock Exchange (IDX) and FTSE Bursa Malaysia EMAS Syariah Index (FBMS) on Bursa Malaysia.

ANALYSIS TOOLS

Sharpe ratio (S_p)

Sharpe ratio is a method used to compare portfolio performance by using the concept of Capital Market Line (CML) or better known as Reward to Variability Ratio (RVAR). Sharpe states the portfolio performance series by calculating the net result of the portfolio with a risk-free rate per risk unit with the symbol of S_p . Sharpe's performance index is calculated by the following formula:

$$S_p = \frac{R_p - R_f}{\sigma_p}$$

Where:

S_p = Sharpe performance ratio

R_p = portfolio return or market rate of return

R_f = risk-free return or risk-free interest rate

σ_p = standard deviation of the portfolio return p during the time of the study

Treynor ratio (T_p)

Treynor is the ratio used to measure portfolio performance. Treynor assumes that the highly diversified portfolio is known as Reward to Volatility Ratio (RVOR). The Treynor index, therefore, states that the portfolio performance series that is calculated as the net result of the portfolio with the risk-free interest rate per unit of market risk of the portfolio with the symbol of T_p . Treynor's

performance ratio is calculated by the following formula:

$$Tp = \frac{Rp - Rf}{\beta p}$$

Where:

- Tp = Treynor performance ratio
- Rp = portfolio return or market rate of return
- Rf = risk-free return or risk-free interest rate
- βp = market risk of portfolio or systematic risk of portfolio (beta)

Jensen ratio (ap)

Jensen ratio or Jensen alpha ratio is one of measurement methods of portfolio performance. Jensen is very concerned about CAPM in measuring the performance of the portfolio which is often called Jensen alpha (differential return measure). Jensen alpha is an absolute measure that estimates the constant rate of return during the investment period in which the level of Jensen alpha returns are above (below) the buy-hold strategy with the same systematic risk. The Jensen Alpha formula as follows:

$$ap = Rp - [Rf + \beta p (Rm - Rf)]$$

Higher the positive ap, better the portfolio performance. Jensen ratio can be calculated in another way by simplifying the above equation into the equation below:

$$Rp - Rf = ap + \beta p (Rm - Rf)$$

Where:

- $Rp - Rf$ = excess return (the difference between portfolio return with risk free rate)
- $Rm - Rf$ = market premium (the difference between market return with risk free rate)
- ap = Jensen ratio
- βp = beta coefficient from the portfolio

Index return (Rp)

Return is calculated by reducing the index value at the end of the unit of a certain period (t) with the end of the unit of previous period (t-1), then divided by the index value at the end of the unit of previous period (t-1). The equation form as follows:

$$Rp = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where:

- P_t = index value in period t (end of period)
- P_{t-1} = index value in period t-1 (beginning of period)

Standard deviation (σ)

Standard deviation (σ) gives a description of the magnitude of the risk of fluctuations in the change in returns per unit of a sub-period into subsequent sub-period, and is referred to as total risk. The greater the σ value, the higher the risk of change in return per unit that occurs. Calculation of standard deviation in this study is conducted on the return rate of all Islamic indices and market return. In Microsoft Excel program, this calculation can be done with the formula "STDEV (...)". So can for standard deviation calculations. In the application of STDEV, the calculation of standard deviation can be done manually using the following formula:

$$\sigma = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$$

Where:

- x = n-th data
- \bar{x} = x mean = mean value of the sample
- n = amount of data

Risk-free rate (Rf)

Risk free asset defined as definite return, this type of asset must be a fixed-interest security that has no default possibility. Since all corporate securities are principally defaulted, risk-free assets cannot be issued by the company, but must be government-issued securities. In this study, riskless investment is assumed to be the Indonesia Government Securities (SUN) series FR0061 issued on July 3, 2012 with the maturity period of 9.8 years obtained from the website of www.bi.go.id and the coupon rate of Malaysian Government Security (MGS) series ZI120012 which was issued on July 12, 2012 with the maturity period of 5 years obtained from the website of www.bondinfo.bnm.gov.my. The SUN and MGS bonus levels are already in percentage form so that the returns can be calculated by dividing the bonus rate of SUN and MGS respectively by the number of months until maturity to reflect the rate of return on a monthly basis.

Market return (Rm)

Market return used in this research as a benchmark for ISSI is Jakarta Composite Index (JCI). JCI is an index that shows the movement of stock prices in general listed on the stock exchange which became a reference about the development of activities in the capital market. JCI can be used to assess the general market situation or measure whether stock prices increase or decrease. JCI also involves all stock prices listed on the exchange. In addition to inflation and deposit rates, stock returns will be influenced by market indices used as indicators for market conditions and market returns. Capital

market performance can be seen through the JCI. While, market return as a benchmark for FBMS is Kuala Lumpur Composite Index (KLCI).

Beta (β)

Beta (β) is a market risk that provides an overview of the relationship between the excess return of portfolio and the excess return from the market. Index with $\beta = 1$ has the same risk with market risk (JCI), so it is expected to get the same return with that produced by Jakarta Composite Index (JCI). The portfolio with $\beta < 1$ has a lower risk than market risk, so the potential return is generally below the return generated by the JCI. An index with $\beta > 1$ has a greater risk than market risk, so it is expected to have a return above the JCI return. Calculation of beta in this study is the beta of ISSI and FBMS, and the market beta is not calculated because the value is 1 (one). The calculation of beta in this research uses linear regression of $Y = a + bX$ in Microsoft Excel application with the function of "SLOPE (...)" with the condition of return of ISSI and FBMS as Y axis and return market as X axis (JCI as a benchmark of Indonesian index and FBMKLCI as a benchmark of Malaysian index).

In formula form, beta can be calculated using:

$$\beta_{iI} = \frac{\sigma_{iI}}{\sigma_{2I}}$$

Where:

β_{iI} = beta of portfolio

σ_{iI} = covariance of portfolio return of i with market portfolio

σ_{2I} = variance of the market portfolio

Two independent samples t-test

After conducting the normality test mentioned above, to test whether there are differences in the performance of ISSI and FBMS, conducted an independent sample t-test. Independent sample t-test is a type of statistical test that aims to compare the average of two groups that are not paired or unrelated. Unpaired can be interpreted that the study was conducted for two different sample subjects. Independent sample t-test is used to determine whether two unrelated samples have different mean values. Principle of this testing is to see the differences in the variances of the two groups of data, so before the test, must first know whether the variances are equal (equal variance) or different variances (unequal variance). The homogeneity of the variances is tested based on the formula:

$$F = \frac{S_1^2}{S_2^2}$$

Where:

F = value of F count

S_1^2 = biggest variance value

S_2^2 = smallest variance value

Data is determined to have the same variance when F count < F table, and vice versa. Data variance is not equal (unequal variance) when F count > F table. Form of variance of both groups of data will affect the standard error value that will eventually differentiate the test formula.

Testing of t-test for the same variance (equal variance) is using the formula of pooled variance:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

Testing of t-test for different variance (unequal variance) is using the formula of separated variance:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

Where:

\bar{x}_1 = mean of sample 1

\bar{x}_2 = mean of sample 2

S_1^2 = variance of sample 1

S_2^2 = variance of sample 2

n_1 = number of sample 1

n_2 = number of sample 2

Purpose of independent sample t-test is to compare the average of two groups that are not related to each other. Whether the two groups have the same mean or the mean is significantly different.

Mann-Whitney U test

In statistics, Mann-Whitney U test, or also called the Mann-Whitney-Wilcoxon (MWW), Wilcoxon rank-sum test, or Wilcoxon-Mann-Whitney test, is a nonparametric test of the null hypothesis that it is equally likely that a randomly selected value from one sample will be less than or greater than a randomly selected value from a second sample.

Unlike the t-test it does not require the assumption of normal distributions. It is nearly as efficient as the t-test on normal distributions. This test can be used to determine whether two independent samples were selected from populations having the same distribution; a similar nonparametric test used on dependent samples is the Wilcoxon signed-rank test.

Test involves the calculation of a statistic, usually called U, whose distribution under the null

hypothesis is known. In the case of small samples, the distribution is tabulated, but for sample sizes above 20, approximation using the normal distribution is fairly good. Some books tabulate statistics equivalent to U, such as the sum of ranks in one of the samples, rather than U itself. Mann-Whitney U test is included in most modern statistical packages. It is also easily calculated by hand, especially for small samples.

RESULT

Descriptive statistics

Table 1

Descriptive statistics for FBMS and ISSI monthly returns (July 2012 - June 2017)

	FBMS	ISSI
Mean	0.002882	0.00631
Standard error	0.003358	0.004484
Median	0.00715	0.01255
Mode	N/A	0.0475
Standard deviation	0.02601	0.034735
Sample variance	0.000677	0.001206
Kurtosis	0.45981	0.054002
Skewness	-0.46592	-0.71055
Range	0.1387	0.1476
Minimum	-0.0752	-0.0789
Maximum	0.0635	0.0687
Sum	0.1729	0.3786
Count	60	60

Source: Microsoft Excel

Based on table 1, resulted statistic data as follows: (1) Index returns of FBMS with 60 samples of data has minimum value of -0.0752, maximum value of 0.0635, mean / average value of 0.002882, and standard deviation of 0.02601. (2) Index returns of ISSI with 60 samples of data has minimum value of -0.0789, maximum value of 0.0687, mean / average value of 0.00631, and standard deviation of 0.034735. It means that the average return of the Indonesia Sharia Stock Index (ISSI) is higher than the FTSE Bursa Malaysia EMAS Shariah (FBMS) in the period of July 2012 - June 2017. From the range, it can be concluded that the return of ISSI (0.1476) is more fluctuated than the FBMS (0.1387).

Table 2

Descriptive statistics for ISSI performance measured by Sharpe ratio (July 2012 - June 2017)

	FBMS	ISSI
Mean	-0.3621	-0.1709
Standard error	0.129099	0.127571
Median	-0.198	0.023034
Mode	N/A	N/A
Standard deviation	1	0.988161
Sample variance	1	0.976462
Kurtosis	0.45981	0.118362
Skewness	-0.46592	-0.71419
Range	5.332477	4.249365
Minimum	-3.36404	-2.60739
Maximum	1.968442	1.641974
Sum	-21.7259	-10.2539
Count	60	60

Source: Microsoft Excel

Based on table 2, resulted statistic data as follows: (1) Index performance of FBMS with 60 samples of data has minimum value of -3.36404, maximum value of 1.968442, mean / average value of -0.3621, and standard deviation of 1. (2) Index performance of ISSI with 60 samples of data has minimum value of -2.60739, maximum value of 1.641974, mean / average value of -0.1709, and standard deviation of 0.988161. It means that the average performance of the Indonesia Sharia Stock Index (ISSI) measured by Sharpe ratio is higher than the FTSE Bursa Malaysia EMAS Shariah (FBMS) in the period of July 2012 - June 2017. Both indices performances ratio are negative which means that the excess returns of both indices are below the expected returns.

Table 3

Descriptive statistics for ISSI performance measured by Treynor ratio (July 2012 - June 2017)

	FBMS	ISSI
Mean	-0.01194	-0.00552
Standard error	0.004258	0.004619
Median	-0.00653	0.00091
Mode	N/A	0.036911
Standard deviation	0.032981	0.03578
Sample variance	0.001088	0.00128
Kurtosis	0.45981	0.054002
Skewness	-0.46592	-0.71055
Range	0.175872	0.15204
Minimum	-0.11095	-0.09329
Maximum	0.064922	0.058749
Sum	-0.71655	-0.33107
Count	60	60

Source: Microsoft Excel

Based on table 3, resulted statistic data as follows: (1) Index performance of FBMS with 60 samples of data has minimum value of -0.11095, maximum value of 0.064922, mean / average value of -0.01194, and standard deviation of 0.032981. (2) Index performance of ISSI with 60 samples of data has minimum value of -0.09329, maximum value of 0.058749, mean / average value of -0.00552, and standard deviation of 0.03578. It means that the average performance of the Indonesia Sharia Stock Index (ISSI) measured by Treynor ratio is higher than the FTSE Bursa Malaysia EMAS Shariah (FBMS) in the period of July 2012 - June 2017. Both indices performances ratio are negative which means that the excess returns of both indices are below the expected returns.

Table 4
Descriptive statistics for ISSI performance measured by Jensen ratio (July 2012 - June 2017)

	FBMS	ISSI
Mean	-0.0012	-0.00092
Standard error	0.001507	0.001208
Median	-0.00104	3.86E-05
Mode	N/A	N/A
Standard deviation	0.011671	0.009354
Sample variance	0.000136	8.75E-05
Kurtosis	1.716452	-0.2413
Skewness	0.730388	-0.14842
Range	0.064489	0.04045
Minimum	-0.02725	-0.02002
Maximum	0.037241	0.020428
Sum	-0.07196	-0.05511
Count	60	60

Source: Microsoft Excel

Based on table 4, resulted statistic data as follows: (1) Index performance of FBMS with 60 samples of data has minimum value of -0.02725, maximum value of 0.037241, mean / average value of -0.0012, and standard deviation of 0.011671. (2)

Index performance of ISSI with 60 samples of data has minimum value of -0.02002, maximum value of 0.020428, mean / average value of -0.00092, and standard deviation of 0.009354. It means that the average performance of the Indonesia Sharia Stock Index (ISSI) measured by Sharpe ratio is higher than the FTSE Bursa Malaysia EMAS Shariah (FBMS) in the period of July 2012 - June 2017. Both indices performances ratio are negative which means that the excess returns of both indices are below the expected returns.

Normality testing

Before applying the hypothesis testing, Normality testing needs to be conducted. Normality testing determines whether the data is normally distributed or not. This study used two-sample Kolmogorov-Smirnov test for the normality testing. Two sample Kolmogorov-Smirnov test was applied to identify whether the data of FBMS and ISSI are normally distributed or not.

Table 5
One sample Kolmogorov-Smirnov test for FBMS and ISSI monthly returns data (July 2012 - June 2017)

		FBMS	ISSI
N		60	60
Normal parameters	Mean	0.002882	0.006310
	Std. deviation	0.0260104	0.0347346
Most extreme differences	Absolute	0.083	0.133
	Positive	0.071	0.085
	Negative	-0.083	-0.133
Test statistic		0.083	0.133
Asymp. Sig. (2-tailed)		0.200	0.010

Source: SPSS

Based on table 5, resulted statistic data as follows: (1) Kolmogorov-Smirnov test for the data of FBMS monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) > alpha (α) or 0.200 > 0.05. It means that the data is normally

distributed. (2) Kolmogorov-Smirnov test for the data of ISSI monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) < alpha (α) or 0.010 < 0.05. It means that the data is not normally distributed.

Table 6
One sample Kolmogorov-Smirnov test for FBMS and ISSI performance data (July 2012 - June 2017)

		FBMS	ISSI
N		60	60
Normal parameters	Mean	-0.3620973	-0.1708996
	Std. deviation	1.00000053	0.098816108
Most extreme differences	Absolute	0.083	0.140
	Positive	0.071	0.085
	Negative	-0.083	-0.140
Test statistic		0.083	0.140
Asymp. Sig. (2-tailed)		0.200	0.005

Source: SPSS

Based on table 6, resulted statistic data as follows: (1) Kolmogorov-Smirnov test for the data of FBMS monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) > alpha (α) or 0.200 > 0.05. It means that the data is normally

distributed. (2) Kolmogorov-Smirnov test for the data of ISSI monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) < alpha (α) or 0.005 < 0.05. It means that the data is not normally distributed.

Table 7

One sample Kolmogorov-Smirnov test for FBMS and ISSI performance data (July 2012 - June 2017)

		FBMS	ISSI
N		60	60
Normal parameters	Mean	-0.0119425	-.00055175
	Std. deviation	0.03298108	0.03577907
Most extreme differences	Absolute	0.083	0.133
	Positive	0.071	0.085
	Negative	-0.083	-0.133
Test statistic		0.083	0.133
Asymp. Sig. (2-tailed)		0.200	0.010

Source: SPSS

Based on table 7, resulted statistic data as follows: (1) Kolmogorov-Smirnov test for the data of FBMS monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) > alpha (α) or 0.200 > 0.05. It means that the data is normally

distributed. (2) Kolmogorov-Smirnov test for the data of ISSI monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) < alpha (α) or 0.010 < 0.05. It means that the data is not normally distributed.

Table 8

One sample Kolmogorov-Smirnov test for FBMS and ISSI performance data (July 2012 - June 2017)

		FBMS	ISSI
N		60	60
Normal parameters	Mean	-0.0011997	-0.0009188
	Std. deviation	0.01167119	0.00935425
Most extreme differences	Absolute	0.083	0.072
	Positive	0.083	0.060
	Negative	-0.049	-0.072
Test statistic		0.083	0.072
Asymp. Sig. (2-tailed)		0.200	0.200

Source: SPSS

Based on table 8, resulted statistic data as follows: (1) Kolmogorov-Smirnov test for the data of FBMS monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) > alpha (α) or 0.200 > 0.05. It means that the data is normally distributed. (2) Kolmogorov-Smirnov test for the data of ISSI monthly returns during July 2012 - June 2017 shows that Asymp. Sig. (2-tailed) < alpha (α) or 0.200 < 0.05. It means that the data is normally distributed.

Hypothesis testing

H1: There are significant differences in the performance of FBMS and ISSI measured by the Sharpe ratio.

Because the data of ISSI performances measured by Sharpe ratio is not normally distributed, hypothesis testing will be conducted by using Mann-Whitney U test which is one of non-parametric methods used in statistics to measure the differences between the means of two groups of data. Mann-Whitney U test doesn't require the data normally distributed.

Table 9

Mann-Whitney U test for FBMS and ISSI performances measured by Sharpe ratio (July 2012 - June 2017)

Mann-Whitney U	1566.500
Wilcoxon W	3396.500
Z	-1.226
Asymp. Sig. (2-tailed)	0.220

Source: SPSS

Based on table 9, showed that the value of Asymp. Sig. (2-tailed) > alpha (α) or 0.220 > 0.05. So, Ho is accepted and Ha is rejected. It means there is no significant difference in the performance of ISSI and FBMS measured by the Sharpe ratio.

H2: There are significant differences in the performance of FBMS and ISSI measured by the Treynor ratio.

Because the data of ISSI performances measured by Treynor ratio is not normally distributed, hypothesis testing will be conducted by using Mann-Whitney U test which is one of non-parametric methods used in statistics to measure the differences between the means of two groups of data. Mann-Whitney U test doesn't require the data normally distributed.

Table 10

Mann-Whitney U test for FBMS and ISSI performances measured by Treynor ratio (July 2012 - June 2017)

Mann-Whitney U	1563.000
Wilcoxon W	3393.000
Z	-1.244
Asymp. Sig. (2-tailed)	.214

Source: SPSS

Based on table 10, showed that the value of Asymp. Sig. (2-tailed) > alpha (α) or $0.214 > 0.05$. So, H_0 is accepted and H_a is rejected. It means there is no significant difference in the performance of ISSI and FBMS measured by the Treynor ratio.

H3: There are significant differences in the performance of FBMS and ISSI measured by the Jensen ratio.

Because the data of FBMS and ISSI performances measured by Jensen ratio is normally distributed, hypothesis testing will be conducted by using two independent samples t-test. Before conducting Two Independent Samples t-test, two samples F-test must be conducted first to find out whether two groups of data have the equal or unequal variances.

Table 11

Two samples F-test for FBMS and ISSI performances measured by Jensen ratio (July 2012 - June 2017)

	FBMS	ISSI
Mean	-0.0012	-0.00092
Variance	0.000136	0.000088
Observations	60	60
df	59	59
F	1.556802	
P(F<=f) one-tail	0.0459	
F critical one-tail	1.539957	

Source: SPSS

Based the table 11, it is showed that F statistic ($1.556802 > F$ table (1.539957)). It means that two groups of data have the unequal variances. So, kind of Two Independent Samples t-test that will be conducted is t-test for unequal variances.

Table 12

Two independent samples t-test for FBMS and ISSI performances (July 2012 - June 2017)

	FBMS	ISSI
Mean	-0.0012	-0.000919
Variance	0.000136	0.0000875
Observations	60	60
Hypothesized mean Difference	0	
df	113	
t stat	-0.14545	
P(T<=t) one-tail	0.442309	
t critical one-tail	1.65845	
P(T<=t) two-tail	0.884618	
t critical two-tail	1.98118	

Source: SPSS

Based on table 12, it is showed that the value of t statistic ($-0.14545 > t$ table (1.98118)). So, H_0 is accepted and H_a is rejected. It means there is no significant difference in the performance of ISSI and FBMS measured by the Jensen ratio.

DISCUSSION

Performance differences of FBMS and ISSI measured by Sharpe ratio

Statistic test shows that there is no significant difference between the performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) in the period of July 2012 - June 2012 measured by Sharpe ratio, so the H_0 is accepted and the H_a is rejected. It means that there is no significant difference between the performances of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) ($\alpha = 0.05$) with the ISSI Sharpe value which outperformed the FBMS. Sharpe performance ratio measures how much excess return generated from each portfolio for each unit of total risk. Greater Sharpe performance value shows better portfolio performance.

By looking at the results on negative Sharpe performance measurements on both indices, can be seen that FBMS and ISSI are not able to give positive excess return for each unit of total risk. ISSI has a greater Sharpe value when compared to FBMS, so the excess return of ISSI is greater than FBMS for each unit of total risk. It means that the benefits of investing in FBMS and ISSI stocks are lower than the benefits of investing in risk-free assets (SUN and MGS), but the investment return on FBMS is greater than ISSI profit when viewed from the total risk of each index. However, there is no significant difference in the Sharpe ratio values of both indices.

Performance differences of FBMS and ISSI measured by Treynor ratio

Statistic test shows that there is no significant difference between the performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) in the period of July 2012 - June 2012 measured by Treynor ratio, so the H_0 is accepted and the H_a is rejected. It means that there is no significant difference between the performances of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) ($\alpha = 0.05$) with the ISSI Treynor value that outperformed the FBMS. FBMS and ISSI have negative Treynor index. These negative values are due to FBMS and ISSI return rates which were lower than risk-free asset return (SUN and MGS).

ISSI has a higher Treynor performance ratio than FBMS, it shows that the excess return generated by investment in ISSI is greater than FBMS for each unit of systematic risk (index risk that is affected by market risk) arising on each

index. However, there is no significant difference in the Treynor ratio values of both indices.

Performance differences of FBMS and ISSI measured by Jensen ratio

Statistic test shows that there is no significant difference between the performance of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) in the period of July 2012 - June 2012 measured by Jensen ratio, so the H_0 is accepted and the H_a is rejected. It means that there is no significant difference between the performances of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Index (ISSI) ($\alpha = 0.05$) with the ISSI Jensen value that outperformed the FBMS. Jensen or Alpha ratio performance measurement is based on the Capital Asset Pricing Model (CAPM) theory, which is comparing the excess return with the required return predicted from CAPM. FBMS and ISSI have negative Jensen values. It shows that the performances of FBMS and ISSI are under the expected return. However, there is no significant difference in Jensen ratios of both indices.

CONCLUSION

Based on the description on data analysis and discussion, can be concluded things as follows: (1) There is no significant difference between the performances of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Indices (ISSI) in Sharpe ratio. (2) There is no significant difference between the performances of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Indices (ISSI) in Treynor ratio. (3) There is no significant difference between the performances of FTSE Bursa Malaysia EMAS Shariah (FBMS) and Indonesia Sharia Stock Indices (ISSI) in Jensen ratio.

Although there is no significant difference in the performances of both indices, calculations showed that the performance of ISSI in period of July 2012 - June 2017 outperformed the FBMS in all the three measurements (Sharpe, Treynor, and Jensen ratio). It differs to the results of the research of Shofiyullah (2014) where although there was no significant difference between the performances of FBMHS and JII in the period of 2009-2011 measured by the same methods, performance of FBMHS in Malaysia outperformed the JII in Indonesia. It might be due to the increasing of ISSI constituents in the period taken in this study compared to the previous period (see figure 2).

All of the three hypothesis in this research are rejected. It is the same with the research conducted by Shofiyullah (2014) where the research investigated the differences between the performances of Jakarta Islamic Index (JII) and FTSE Bursa Malaysia Hijrah Shariah (FBMHS) with the same methods with this study, that are Sharpe,

Treynor, and Jensen ratio. All of the hypothesis of the Shofiyullah was rejected which means that there was no significant difference in the performances of JII and FBMHS measured by Sharpe, Treynor, and Jensen ratio. Shofiyullah argued that it due to the similarity of excess returns of both indices. JII and FBMHS.

In the descriptive statistics in Table 1, it can be seen that the average return of ISSI (0.00631) is higher than FBMS (0.002882) although the return of ISSI (range = 0.1476) is more fluctuated than FBMS (range = 0.1387). These reasons might cause the ISSI outperformed the FBMS although the difference of the performances of both indices is not significant.

IMPLICATION

Based on the conclusions of the research results, there are some suggestions that may be useful for the investors. Results of this study can be used as a reference for investors who are interested to invest funds in sharia stocks in Indonesia and Malaysia. Although there are differences in the results of Sharpe, Treynor, and Jensen ratio calculations, where ISSI is superior to FBMS on the Sharpe ratio indicating that excess return on ISSI issuers' shares is greater than FBMS issuers for each total index risk.

ISSI outperformed FBMS in Treynor and Jensen ratio. It means that for the ISSI Treynor excess return is greater than the FBMS for each unit of systematic risk. And for Jensen ratio, return of ISSI is greater than FBMS although both ratio values are under the expected return, but there is no significant difference between both indices on the three ratios. Therefore, investment decisions are still adjusting to the tendency of investment managers. Besides using the results of this study, investors should be still monitoring the performance of each stock issuer of FBMS and ISSI which will be used as an investment instrument to see the performances of these stocks individually.

LIMITATION OF STUDY

This study only examines the performances of sharia stock indices, so it cannot be generalized to the conventional stock indices listed on Indonesia Stock Exchange and Bursa Malaysia. Suggestions for further research as follows: (1) Due to the limitations of index data owned by the author, the author recommend that the findings from this study to be tested on the next year's index return achievement to find out whether the findings are still relevant or not. (2) Further research on the index performance will be better if it uses other ratios besides the ratios used by the author in order to increase the accuracy of the research, especially the ratios related to the portfolio assessment.

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Appendix 1

FTSE Bursa Malaysia EMAS Shariah (FBMS) historical data (July 2012 - June 2017)

Number of data	Date	Price	Open	High	Low	Return (%)
1	Jul 12	11,278.60	11,016.30	11,436.66	11,016.30	2.5
2	Aug 12	11,377.70	11,248.70	11,501.73	11,244.68	0.88
3	Sep 12	11,341.75	11,402.18	11,470.60	11,040.69	-0.32
4	Oct 12	11,488.38	11,352.54	11,575.89	11,318.06	1.29
5	Nov 12	10,957.26	11,513.81	11,526.41	10,775.67	-4.62
6	Dec 12	11,520.73	10,937.97	11,520.73	10,907.05	5.14
7	Jan 13	11,112.97	11,492.50	11,629.01	10,963.86	-3.54
8	Feb 13	11,105.74	11,147.75	11,178.13	10,838.73	-0.07
9	Mar 13	11,357.06	11,105.88	11,399.94	10,986.71	2.26
10	Apr 13	11,663.19	11,355.18	11,730.36	11,157.04	2.7
11	May 13	12,403.80	11,656.32	12,531.23	11,464.26	6.35
12	Jun 13	12,294.50	12,387.24	12,541.42	11,934.08	-0.88
13	Jul 13	12,373.68	12,290.23	12,640.60	12,255.78	0.64
14	Aug 13	12,046.89	12,415.43	12,591.30	11,485.88	-2.64
15	Sep 13	12,364.88	12,027.67	12,533.72	11,908.09	2.64
16	Oct 13	12,742.22	12,360.51	12,805.02	12,335.38	3.05
17	Nov 13	12,734.18	12,715.92	12,836.30	12,565.62	-0.06
18	Dec 13	13,051.60	12,729.33	13,124.78	12,721.88	2.49
19	Jan 14	12,604.02	13,046.11	13,048.59	12,389.31	-3.43
20	Feb 14	12,895.61	12,426.57	12,945.38	12,372.65	2.31
21	Mar 14	13,146.18	12,893.58	13,151.50	12,751.65	1.94
22	Apr 14	13,214.50	13,119.57	13,224.69	13,032.83	0.52
23	May 14	13,136.04	13,211.51	13,395.88	13,134.49	-0.59
24	Jun 14	13,387.34	13,121.39	13,418.80	13,075.53	1.91
25	Jul 14	13,383.98	13,362.31	13,536.80	13,314.81	-0.03
26	Aug 14	13,219.74	13,330.66	13,453.44	13,166.90	-1.23
27	Sep 14	13,185.85	13,220.12	13,335.38	13,086.12	-0.26
28	Oct 14	13,346.37	13,190.83	13,346.37	12,505.67	1.22
29	Nov 14	13,036.26	13,357.46	13,393.64	12,924.09	-2.32
30	Dec 14	12,507.03	13,028.55	13,028.55	11,804.03	-4.06
31	Jan 15	12,851.97	12,470.56	13,041.52	12,201.59	2.76
32	Feb 15	13,120.63	13,161.15	13,161.15	12,745.85	2.09
33	Mar 15	13,122.15	13,144.92	13,146.07	12,833.51	0.01
34	Apr 15	13,073.91	13,103.66	13,388.93	13,062.08	-0.37
35	May 15	12,576.45	13,122.38	13,133.74	12,548.20	-3.8
36	Jun 15	12,208.85	12,609.68	12,685.78	12,138.77	-2.92
37	Jul 15	12,373.72	12,270.45	12,477.22	12,033.14	1.35
38	Aug 15	11,443.34	12,323.04	12,539.35	10,705.63	-7.52
39	Sep 15	11,889.05	11,693.70	12,143.94	11,265.24	3.89
40	Oct 15	12,392.83	11,895.74	12,682.58	11,866.12	4.24
41	Nov 15	12,506.87	12,395.43	12,695.19	12,359.39	0.92
42	Dec 15	12,800.65	12,529.44	12,894.94	12,180.94	2.35
43	Jan 16	12,420.82	12,771.78	12,777.66	12,105.60	-2.97
44	Feb 16	12,249.24	12,421.29	12,575.25	12,168.12	-1.38
45	Mar 16	12,498.31	12,274.95	12,586.45	12,261.76	2.03
46	Apr 16	12,208.99	12,482.39	12,559.51	12,131.99	-2.31
47	May 16	11,922.64	12,187.04	12,210.50	11,775.69	-2.35
48	Jun 16	12,102.94	11,901.80	12,185.94	11,799.29	1.51
49	Jul 16	12,198.77	12,089.77	12,283.49	12,000.22	0.79
50	Aug 16	12,430.50	12,231.63	12,596.80	12,197.98	1.9
51	Sep 16	12,348.18	12,421.72	12,530.61	12,231.59	-0.66
52	Oct 16	12,384.01	12,398.66	12,477.95	12,368.19	0.29
53	Nov 16	11,901.19	12,384.53	12,398.68	11,845.46	-3.9
54	Dec 16	12,014.42	11,896.48	12,075.11	11,891.57	0.95
55	Jan 17	12,227.59	11,998.95	12,372.47	11,966.63	1.77
56	Feb 17	12,387.75	12,202.80	12,591.01	12,202.80	1.31
57	Mar 17	12,811.34	12,387.80	12,880.42	12,370.91	3.42
58	Apr 17	12,972.49	12,834.05	12,989.88	12,750.09	1.26
59	May 17	12,804.02	12,980.88	13,126.04	12,782.04	-1.3
60	Jun 17	12,822.15	12,795.63	13,019.98	12,740.17	0.14

Source: www.investing.com

Appendix 2

Indonesia Sharia Stock Index (ISSI) historical data (July 2012 - June 2017)

Number of data	Date	Price	Open	High	Low	Return (%)
1	Jul 12	137.86	132.34	138.14	132.07	4.75
2	Aug 12	135.96	137.54	139.56	133.23	-1.38
3	Sep 12	143.96	135.54	144.46	135.34	5.88
4	Oct 12	147.78	143.47	147.94	142.00	2.65
5	Nov 12	143.89	147.04	147.69	142.76	-2.63
6	Dec 12	145.00	143.77	145.77	141.66	0.77
7	Jan 13	147.51	145.23	149.45	143.64	1.73
8	Feb 13	157.64	147.55	157.93	147.37	6.87
9	Mar 13	162.64	158.16	163.56	156.15	3.17
10	Apr 13	166.91	162.36	166.91	160.28	2.63
11	May 13	169.81	166.27	175.07	162.46	1.74
12	Jun 13	164.24	169.10	169.73	146.43	-3.28
13	Jul 13	154.20	161.15	163.56	149.03	-6.11
14	Aug 13	143.92	154.91	158.06	129.47	-6.67
15	Sep 13	145.16	143.84	159.93	136.66	0.86
16	Oct 13	151.31	145.29	156.30	145.24	4.24
17	Nov 13	143.03	150.10	151.78	141.43	-5.47
18	Dec 13	143.71	143.38	145.87	137.95	0.48
19	Jan 14	146.86	142.76	149.96	139.62	2.19
20	Feb 14	152.88	146.12	153.32	143.27	4.10
21	Mar 14	157.35	151.63	162.20	150.78	2.92
22	Apr 14	158.83	158.18	162.72	155.53	0.94
23	May 14	161.08	158.59	167.33	158.42	1.42
24	Jun 14	159.75	160.87	163.68	158.59	-0.83
25	Jul 14	167.34	159.86	169.64	159.25	4.75
26	Aug 14	168.98	166.34	171.86	166.04	0.98
27	Sep 14	166.76	169.34	172.71	165.07	-1.31
28	Oct 14	163.41	166.57	167.06	157.67	-2.01
29	Nov 14	166.10	163.80	166.40	158.82	1.65
30	Dec 14	168.64	166.02	168.64	161.26	1.53
31	Jan 15	171.50	169.06	173.52	165.27	1.70
32	Feb 15	174.32	170.97	175.41	169.30	1.64
33	Mar 15	174.10	174.46	175.79	168.43	-0.13
34	Apr 15	161.71	173.86	174.46	159.94	-7.12
35	May 15	167.07	162.22	171.92	162.05	3.31
36	Jun 15	157.92	167.21	167.56	155.49	-5.48
37	Jul 15	154.50	158.47	160.47	151.71	-2.17
38	Aug 15	142.31	153.57	154.79	129.84	-7.89
39	Sep 15	134.39	141.58	141.63	128.4	-5.57
40	Oct 15	140.96	134.54	148.07	134.27	4.89
41	Nov 15	139.80	140.65	145.73	138.53	-0.82
42	Dec 15	145.06	141.59	145.18	134.45	3.76
43	Jan 16	144.88	144.64	146.91	138.86	-0.12
44	Feb 16	151.15	144.98	151.67	142.26	4.33
45	Mar 16	155.91	151.02	158.76	150.98	3.15
46	Apr 16	157.46	156.12	162.43	154.79	0.99
47	May 16	156.35	156.78	158.34	152.61	-0.70
48	Jun 16	165.94	156.65	166.36	156.61	6.13
49	Jul 16	173.75	166.29	177.58	164.28	4.71
50	Aug 16	178.66	175.52	181.52	174.68	2.83
51	Sep 16	176.93	177.72	180.78	168.81	-0.97
52	Oct 16	179.22	178.41	181.14	176.19	1.29
53	Nov 16	170.00	179.37	181.21	166.31	-5.14
54	Dec 16	172.08	171.14	174.71	163.00	1.22
55	Jan 17	172.48	171.66	174.14	169.87	0.23
56	Feb 17	174.75	173.25	176.09	173.01	1.32
57	Mar 17	180.49	174.90	181.52	173.46	3.28
58	Apr 17	184.69	181.02	186.46	180.71	2.33
59	May 17	183.12	185.25	187.29	179.01	-0.85
60	Jun 17	185.22	183.33	185.35	180.47	1.15

Source: www.investing.com

Appendix 3**Kuala Lumpur Composite Index (KLCI) historical data (July 2012 - June 2017)**

Number of data	Date	Price	Open	High	Low	Return (%)
1	Jul 12	1,631.60	1,599.87	1,647.94	1,599.67	2.03
2	Aug 12	1,646.11	1,628.07	1,655.39	1,626.68	0.89
3	Sep 12	1,636.66	1,649.48	1,655.49	1,595.85	-0.57
4	Oct 12	1,673.07	1,635.38	1,679.37	1,633.39	2.22
5	Nov 12	1,610.83	1,675.85	1,678.57	1,590.67	-3.72
6	Dec 12	1,688.95	1,608.31	1,688.95	1,601.71	4.85
7	Jan 13	1,627.55	1,685.15	1,699.68	1,602.12	-3.64
8	Feb 13	1,637.63	1,634.54	1,639.58	1,597.00	0.62
9	Mar 13	1,671.63	1,636.47	1,681.03	1,613.94	2.08
10	Apr 13	1,717.65	1,671.88	1,718.44	1,632.28	2.75
11	May 13	1,769.22	1,715.01	1,826.22	1,685.28	3.00
12	Jun 13	1,773.54	1,771.55	1,792.67	1,723.74	0.24
13	Jul 13	1,772.62	1,771.98	1,811.65	1,762.87	-0.05
14	Aug 13	1,727.58	1,775.71	1,801.26	1,660.39	-2.54
15	Sep 13	1,768.62	1,723.77	1,805.15	1,702.57	2.38
16	Oct 13	1,806.85	1,766.37	1,822.17	1,759.66	2.16
17	Nov 13	1,812.72	1,803.68	1,814.73	1,780.54	0.32
18	Dec 13	1,866.96	1,812.75	1,882.20	1,811.67	2.99
19	Jan 14	1,804.03	1,865.73	1,868.29	1,777.62	-3.37
20	Feb 14	1,835.66	1,795.89	1,836.14	1,769.80	1.75
21	Mar 14	1,849.21	1,834.44	1,852.29	1,802.88	0.74
22	Apr 14	1,871.52	1,846.10	1,871.52	1,842.06	1.21
23	May 14	1,873.38	1,869.50	1,889.47	1,853.31	0.10
24	Jun 14	1,882.71	1,867.80	1,892.33	1,860.20	0.50
25	Jul 14	1,871.36	1,879.24	1,896.23	1,866.47	-0.60
26	Aug 14	1,866.11	1,866.11	1,879.62	1,837.28	-0.28
27	Sep 14	1,846.31	1,865.46	1,876.21	1,829.24	-1.06
28	Oct 14	1,855.15	1,847.00	1,855.15	1,766.22	0.48
29	Nov 14	1,820.89	1,856.82	1,858.09	1,805.35	-1.85
30	Dec 14	1,761.25	1,821.52	1,821.52	1,671.82	-3.28
31	Jan 15	1,781.26	1,757.15	1,810.21	1,706.18	1.14
32	Feb 15	1,821.21	1,814.72	1,831.41	1,780.21	2.24
33	Mar 15	1,830.78	1,822.91	1,832.85	1,774.30	0.53
34	Apr 15	1,818.27	1,831.35	1,867.53	1,818.27	-0.68
35	May 15	1,747.52	1,830.32	1,830.90	1,746.06	-3.89
36	Jun 15	1,706.64	1,751.82	1,752.08	1,688.44	-2.34
37	Jul 15	1,723.14	1,709.77	1,738.67	1,685.03	0.97
38	Aug 15	1,612.74	1,716.99	1,744.19	1,503.68	-6.41
39	Sep 15	1,621.04	1,655.47	1,691.93	1,567.91	0.51
40	Oct 15	1,665.71	1,622.61	1,727.41	1,617.42	2.76
41	Nov 15	1,672.16	1,665.30	1,696.99	1,644.29	0.39
42	Dec 15	1,692.51	1,670.29	1,706.25	1,622.84	1.22
43	Jan 16	1,667.80	1,686.82	1,687.89	1,600.92	-1.46
44	Feb 16	1,654.75	1,663.99	1,685.88	1,631.11	-0.78
45	Mar 16	1,717.58	1,658.42	1,726.55	1,655.47	3.80
46	Apr 16	1,672.72	1,715.36	1,729.13	1,660.92	-2.61
47	May 16	1,626.00	1,674.51	1,676.03	1,611.91	-2.79
48	Jun 16	1,654.08	1,623.33	1,664.04	1,611.88	1.73
49	Jul 16	1,653.26	1,653.16	1,674.58	1,640.68	-0.05
50	Aug 16	1,678.06	1,657.18	1,700.71	1,648.45	1.50
51	Sep 16	1,652.55	1,682.35	1,692.12	1,645.18	-1.52
52	Oct 16	1,672.46	1,658.36	1,679.11	1,652.63	1.20
53	Nov 16	1,619.12	1,673.56	1,673.90	1,614.11	-3.19
54	Dec 16	1,641.73	1,621.10	1,651.45	1,616.54	1.40
55	Jan 17	1,671.54	1,636.94	1,695.72	1,630.67	1.82
56	Feb 17	1,693.77	1,670.40	1,719.76	1,667.68	1.33
57	Mar 17	1,740.09	1,694.64	1,759.76	1,692.33	2.73
58	Apr 17	1,768.06	1,742.38	1,772.21	1,729.13	1.61
59	May 17	1,765.87	1,769.16	1,787.54	1,754.23	-0.12
60	Jun 17	1,763.67	1,764.57	1,796.75	1,755.65	-0.12

Source: www.investing.com

Appendix 4

Jakarta Composite Index (JCI) historical data (July 2012 - June 2017)

Number of data	Date	Price	Open	High	Low	Return (%)
1	Jul 12	4,142.34	3,976.71	4,149.71	3,963.47	4.72
2	Aug 12	4,060.33	4,129.81	4,183.03	3,978.08	-1.98
3	Sep 12	4,262.56	4,052.89	4,272.83	4,047.28	4.98
4	Oct 12	4,350.29	4,249.69	4,366.86	4,214.52	2.06
5	Nov 12	4,276.14	4,331.75	4,381.75	4,255.27	-1.70
6	Dec 12	4,316.69	4,277.19	4,340.26	4,222.13	0.95
7	Jan 13	4,453.70	4,322.58	4,472.11	4,298.61	3.17
8	Feb 13	4,795.79	4,458.60	4,795.79	4,457.45	7.68
9	Mar 13	4,940.99	4,798.49	4,940.99	4,721.32	3.03
10	Apr 13	5,034.07	4,927.12	5,034.07	4,856.30	1.88
11	May 13	5,068.63	5,020.20	5,251.30	4,907.60	0.69
12	Jun 13	4,818.90	5,053.54	5,055.83	4,373.38	-4.93
13	Jul 13	4,610.38	4,757.18	4,815.73	4,403.80	-4.33
14	Aug 13	4,195.09	4,618.96	4,699.73	3,837.74	-9.01
15	Sep 13	4,316.18	4,196.72	4,791.77	4,012.68	2.89
16	Oct 13	4,510.63	4,314.96	4,611.26	4,314.96	4.51
17	Nov 13	4,256.44	4,473.73	4,518.65	4,202.92	-5.64
18	Dec 13	4,274.18	4,269.08	4,331.59	4,109.31	0.42
19	Jan 14	4,418.76	4,240.39	4,510.22	4,161.19	3.38
20	Feb 14	4,620.22	4,407.00	4,665.27	4,320.78	4.56
21	Mar 14	4,768.28	4,589.62	4,903.50	4,567.76	3.20
22	Apr 14	4,840.15	4,796.16	4,933.11	4,721.60	1.51
23	May 14	4,893.91	4,845.34	5,091.32	4,828.22	1.11
24	Jun 14	4,878.58	4,900.97	4,971.95	4,835.04	-0.31
25	Jul 14	5,088.80	4,877.65	5,165.42	4,862.42	4.31
26	Aug 14	5,136.86	5,076.23	5,223.98	5,043.52	0.94
27	Sep 14	5,137.58	5,159.94	5,262.57	5,082.73	0.01
28	Oct 14	5,089.55	5,148.57	5,165.39	4,900.72	-0.93
29	Nov 14	5,149.89	5,102.54	5,157.08	4,965.39	1.19
30	Dec 14	5,226.95	5,150.38	5,226.95	5,005.27	1.50
31	Jan 15	5,289.40	5,233.80	5,325.04	5,121.81	1.19
32	Feb 15	5,450.29	5,277.15	5,464.22	5,254.04	3.04
33	Mar 15	5,518.67	5,452.83	5,518.67	5,350.47	1.25
34	Apr 15	5,086.42	5,516.80	5,524.04	5,015.01	-7.83
35	May 15	5,216.38	5,093.33	5,347.13	5,089.42	2.55
36	Jun 15	4,910.66	5,212.13	5,215.55	4,826.13	-5.86
37	Jul 15	4,802.53	4,924.07	4,982.91	4,711.49	-2.20
38	Aug 15	4,509.61	4,778.04	4,868.07	4,111.11	-6.10
39	Sep 15	4,223.91	4,484.20	4,484.79	4,033.59	-6.34
40	Oct 15	4,455.18	4,231.41	4,696.16	4,207.80	5.48
41	Nov 15	4,446.46	4,442.42	4,621.26	4,395.97	-0.20
42	Dec 15	4,593.01	4,504.22	4,595.51	4,330.76	3.30
43	Jan 16	4,615.16	4,580.17	4,639.24	4,408.80	0.48
44	Feb 16	4,770.96	4,620.15	4,803.61	4,545.14	3.38
45	Mar 16	4,845.37	4,760.24	4,908.26	4,757.80	1.56
46	Apr 16	4,838.58	4,843.39	4,920.40	4,766.81	-0.14
47	May 16	4,796.87	4,828.96	4,845.12	4,690.56	-0.86
48	Jun 16	5,016.65	4,801.85	5,033.24	4,754.36	4.58
49	Jul 16	5,215.99	5,027.62	5,334.12	4,971.58	3.97
50	Aug 16	5,386.08	5,280.21	5,476.22	5,279.59	3.26
51	Sep 16	5,364.80	5,368.52	5,474.31	5,128.17	-0.40
52	Oct 16	5,422.54	5,403.86	5,482.84	5,332.08	1.08
53	Nov 16	5,148.91	5,430.75	5,491.70	5,043.35	-5.05
54	Dec 17	5,296.71	5,168.63	5,334.79	5,022.85	2.87
55	Jan 17	5,294.10	5,290.39	5,360.06	5,228.29	-0.05
56	Feb 17	5,386.69	5,319.94	5,418.38	5,317.49	1.75
57	Mar 17	5,568.11	5,389.17	5,606.02	5,350.91	3.37
58	Apr 17	5,685.30	5,583.35	5,726.53	5,577.49	2.10
59	May 17	5,738.15	5,703.87	5,874.44	5,577.52	0.93
60	Jun 17	5,829.71	5,749.42	5,831.34	5,668.72	1.60

Source: www.investing.com

Appendix 5

Sharpe ratio calculation for FBMS and ISSI monthly returns (July 2012 - June 2017)

Number of data	Date	Index return (Rp)		Risk-free rate (Rf)		Rp-Rf		Std. deviation (σp)		Sharpe ratio (Sp)	
		FBMS	ISSI	ZI120012	SPN12130704	FBMS	ISSI	FBMS	ISSI	FBMS	ISSI
1	Jul 12	0.0250	0.0475	0.0123	0.01167	0.01270	0.03583	0.03473	0.02601	0.48827	0.03071
2	Aug 12	0.0088	-0.0138	0.0123	0.01167	-0.00350	-0.02547	0.03473	0.02601	-0.13456	-0.73318
3	Sep 12	-0.0032	0.0588	0.0123	0.01167	-0.01550	0.04713	0.03473	0.02601	-0.59591	1.35696
4	Oct 12	0.0129	0.0265	0.0123	0.01167	0.00060	0.01483	0.03473	0.02601	0.02307	0.42705
5	Nov 12	-0.0462	-0.0263	0.0123	0.01167	-0.05850	-0.03797	0.03473	0.02601	-2.24910	-1.09305
6	Dec 12	0.0514	0.0077	0.0123	0.01167	0.03910	-0.00397	0.03473	0.02601	1.50324	-0.11420
7	Jan 13	-0.0354	0.0173	0.0123	0.01167	-0.04770	0.00563	0.03473	0.02601	-1.83388	0.16218
8	Feb 13	-0.0007	0.0687	0.0123	0.01167	-0.01300	0.05703	0.03473	0.02601	-0.4998	1.64197
9	Mar 13	0.0226	0.0317	0.0123	0.01167	0.01030	0.02003	0.03473	0.02601	0.39600	0.57675
10	Apr 13	0.0270	0.0263	0.0123	0.01167	0.01470	0.01463	0.03473	0.02601	0.56516	0.42129
11	May 13	0.0635	0.0174	0.0123	0.01167	0.05120	0.00573	0.03473	0.02601	1.96844	0.16506
12	Jun 13	-0.0088	-0.0328	0.0123	0.01167	-0.02110	-0.04447	0.03473	0.02601	-0.81121	-1.28018
13	Jul 13	0.0064	-0.0611	0.0123	0.01167	-0.00590	-0.07277	0.03473	0.02601	-0.22683	-2.09493
14	Aug 13	-0.0264	-0.0667	0.0123	0.01167	-0.03870	-0.07837	0.03473	0.02601	-1.48786	-2.25616
15	Sep 13	0.0264	0.0086	0.0123	0.01167	0.01410	-0.00307	0.03473	0.02601	0.54209	-0.08829
16	Oct 13	0.0305	0.0424	0.0123	0.01167	0.01820	0.03073	0.03473	0.02601	0.69972	0.88480
17	Nov 13	-0.0006	-0.0547	0.0123	0.01167	-0.01290	-0.06637	0.03473	0.02601	-0.49595	-1.91068
18	Dec 13	0.0249	0.0048	0.0123	0.01167	0.01260	-0.00687	0.03473	0.02601	0.48442	-0.19769
19	Jan 14	-0.0343	0.0219	0.0123	0.01167	-0.04660	0.01023	0.03473	0.02601	-1.79159	0.29461
20	Feb 14	0.0231	0.0410	0.0123	0.01167	0.01080	0.02933	0.03473	0.02601	0.41522	0.84450
21	Mar 14	0.0194	0.0292	0.0123	0.01167	0.00710	0.01753	0.03473	0.02601	0.27297	0.50478
22	Apr 14	0.0052	0.0094	0.0123	0.01167	-0.00710	-0.00227	0.03473	0.02601	-0.27297	-0.06526
23	May 14	-0.0059	0.0142	0.0123	0.01167	-0.01820	0.00253	0.03473	0.02601	-0.69972	0.07293
24	Jun 14	0.0191	-0.0083	0.0123	0.01167	0.00680	-0.01997	0.03473	0.02601	0.26143	-0.57484
25	Jul 14	-0.0003	0.0475	0.0123	0.01167	-0.01260	0.03583	0.03473	0.02601	-0.48442	1.03163
26	Aug 14	-0.0123	0.0098	0.0123	0.01167	-0.02460	-0.00187	0.03473	0.02601	-0.94577	-0.05374
27	Sep 14	-0.0026	-0.0131	0.0123	0.01167	-0.01490	-0.02477	0.03473	0.02601	-0.57285	-0.71303
28	Oct 14	0.0122	-0.0201	0.0123	0.01167	-0.00010	-0.03177	0.03473	0.02601	-0.00384	-0.91455
29	Nov 14	-0.0232	0.0165	0.0123	0.01167	-0.03550	0.00483	0.03473	0.02601	-1.36484	0.13915
30	Dec 14	-0.0406	0.0153	0.0123	0.01167	-0.05290	0.00363	0.03473	0.02601	-2.03380	0.10460
31	Jan 15	0.0276	0.0170	0.0123	0.01167	0.01530	0.00533	0.03473	0.02601	0.58823	0.15355
32	Feb 15	0.0209	0.0164	0.0123	0.01167	0.00860	0.00473	0.03473	0.02601	0.33064	0.13627
33	Mar 15	0.0001	-0.0013	0.0123	0.01167	-0.01220	-0.01297	0.03473	0.02601	-0.46904	-0.37331
34	Apr 15	-0.0037	-0.0712	0.0123	0.01167	-0.01600	-0.08287	0.03473	0.02601	-0.61514	-2.38571
35	May 15	-0.0380	0.0331	0.0123	0.01167	-0.05030	0.02143	0.03473	0.02601	-1.93384	0.61706
36	Jun 15	-0.0292	-0.0548	0.0123	0.01167	-0.04150	-0.06647	0.03473	0.02601	-1.59551	-1.91356
37	Jul 15	0.0135	-0.0217	0.0123	0.01167	0.00120	-0.03337	0.03473	0.02601	0.04614	-0.96062
38	Aug 15	-0.0752	-0.0789	0.0123	0.01167	-0.08750	-0.09057	0.03473	0.02601	-3.36404	-2.60739
39	Sep 15	0.0389	-0.0557	0.0123	0.01167	0.02660	-0.06737	0.03473	0.02601	1.02267	-1.93947
40	Oct 15	0.0424	0.0489	0.0123	0.01167	0.03010	0.03723	0.03473	0.02601	1.15723	1.07194
41	Nov 15	0.0092	-0.0082	0.0123	0.01167	-0.00310	-0.01987	0.03473	0.02601	-0.11918	-0.57196
42	Dec 15	0.0235	0.0376	0.0123	0.01167	0.01120	0.02593	0.03473	0.02601	0.43060	0.74661
43	Jan 16	-0.0297	-0.0012	0.0123	0.01167	-0.04200	-0.01287	0.03473	0.02601	-1.61474	-0.37043
44	Feb 16	-0.0138	0.0433	0.0123	0.01167	-0.02610	0.03163	0.03473	0.02601	-1.00344	0.91072
45	Mar 16	0.0203	0.0315	0.0123	0.01167	0.00800	0.01983	0.03473	0.02601	0.30757	0.57100
46	Apr 16	-0.0231	0.0099	0.0123	0.01167	-0.03540	-0.00177	0.03473	0.02601	-1.36099	-0.05086
47	May 16	-0.0235	-0.0070	0.0123	0.01167	-0.03580	-0.01867	0.03473	0.02601	-1.37637	-0.53741
48	Jun 16	0.0151	0.0613	0.0123	0.01167	0.00280	0.04963	0.03473	0.02601	0.10765	1.42893
49	Jul 16	0.0079	0.0471	0.0123	0.01167	-0.00440	0.03543	0.03473	0.02601	-0.16916	1.02012
50	Aug 16	0.0190	0.0283	0.0123	0.01167	0.00670	0.01663	0.03473	0.02601	0.25759	0.47887
51	Sep 16	-0.0066	-0.0097	0.0123	0.01167	-0.01890	-0.02137	0.03473	0.02601	-0.72663	-0.61514
52	Oct 16	0.0029	0.0129	0.0123	0.01167	-0.00940	0.00123	0.03473	0.02601	-0.36139	0.03551
53	Nov 16	-0.0390	-0.0514	0.0123	0.01167	-0.05130	-0.06307	0.03473	0.02601	-1.97229	-1.81567
54	Dec 17	0.0095	0.0122	0.0123	0.01167	-0.00280	0.00053	0.03473	0.02601	-0.10765	0.01535
55	Jan 17	0.0177	0.0023	0.0123	0.01167	0.00540	-0.00937	0.03473	0.02601	0.20761	-0.26966
56	Feb 17	0.0131	0.0132	0.0123	0.01167	0.00080	0.00153	0.03473	0.02601	0.03076	0.04414
57	Mar 17	0.0342	0.0328	0.0123	0.01167	0.02190	0.02113	0.03473	0.02601	0.84197	0.60842
58	Apr 17	0.0126	0.0233	0.0123	0.01167	0.00030	0.01163	0.03473	0.02601	0.01153	0.33492
59	May 17	-0.0130	-0.0085	0.0123	0.01167	-0.02530	-0.02017	0.03473	0.02601	-0.97269	-0.58059
60	Jun 17	0.0014	0.0115	0.0123	0.01167	-0.01090	-0.00017	0.03473	0.02601	-0.41906	-0.00480
Mean		0.00288	0.00631	0.0123	0.01167	-0.00942	-0.00536	0.03473	0.02601	-0.36210	-0.17090

Source: Microsoft Excel

Appendix 6

Treynor ratio calculation for FBMS and ISSI monthly returns (July 2012 - June 2017)

Number of data	Date	Index return (Rp)		Risk-free rate (Rf)		Rp-Rf		Index beta (βp)		Treynor ratio (Tp)	
		FBMS	ISSI	Z1120012	SPN12130704	FBMS	ISSI	FBMS	ISSI	FBMS	ISSI
1	Jul 12	0.0250	0.0475	0.0123	0.01167	0.01270	0.03583	0.78864	0.9708	0.01610	0.03691
2	Aug 12	0.0088	-0.0138	0.0123	0.01167	-0.00350	-0.02547	0.78864	0.9708	-0.00444	-0.02623
3	Sep 12	-0.0032	0.0588	0.0123	0.01167	-0.01550	0.04713	0.78864	0.9708	-0.01965	0.04855
4	Oct 12	0.0129	0.0265	0.0123	0.01167	0.00060	0.01483	0.78864	0.9708	0.00076	0.01528
5	Nov 12	-0.0462	-0.0263	0.0123	0.01167	-0.05850	-0.03797	0.78864	0.9708	-0.07418	-0.03911
6	Dec 12	0.0514	0.0077	0.0123	0.01167	0.03910	-0.00397	0.78864	0.9708	0.04958	-0.00409
7	Jan 13	-0.0354	0.0173	0.0123	0.01167	-0.04770	0.00563	0.78864	0.9708	-0.06048	0.00580
8	Feb 13	-0.0007	0.0687	0.0123	0.01167	-0.01300	0.05703	0.78864	0.9708	-0.0165	0.05875
9	Mar 13	0.0226	0.0317	0.0123	0.01167	0.01030	0.02003	0.78864	0.9708	0.01306	0.02064
10	Apr 13	0.0270	0.0263	0.0123	0.01167	0.01470	0.01463	0.78864	0.9708	0.01864	0.01507
11	May 13	0.0635	0.0174	0.0123	0.01167	0.05120	0.00573	0.78864	0.9708	0.06492	0.00591
12	Jun 13	-0.0088	-0.0328	0.0123	0.01167	-0.02110	-0.04447	0.78864	0.9708	-0.02675	-0.04580
13	Jul 13	0.0064	-0.0611	0.0123	0.01167	-0.00590	-0.07277	0.78864	0.9708	-0.00748	-0.07496
14	Aug 13	-0.0264	-0.0667	0.0123	0.01167	-0.03870	-0.07837	0.78864	0.9708	-0.04907	-0.08072
15	Sep 13	0.0264	0.0086	0.0123	0.01167	0.01410	-0.00307	0.78864	0.9708	0.01788	-0.00316
16	Oct 13	0.0305	0.0424	0.0123	0.01167	0.01820	0.03073	0.78864	0.9708	0.02308	0.03166
17	Nov 13	-0.0006	-0.0547	0.0123	0.01167	-0.01290	-0.06637	0.78864	0.9708	-0.01636	-0.06836
18	Dec 13	0.0249	0.0048	0.0123	0.01167	0.01260	-0.00687	0.78864	0.9708	0.01598	-0.00707
19	Jan 14	-0.0343	0.0219	0.0123	0.01167	-0.04660	0.01023	0.78864	0.9708	-0.05909	0.01054
20	Feb 14	0.0231	0.0410	0.0123	0.01167	0.01080	0.02933	0.78864	0.9708	0.01369	0.03022
21	Mar 14	0.0194	0.0292	0.0123	0.01167	0.00710	0.01753	0.78864	0.9708	0.00900	0.01806
22	Apr 14	0.0052	0.0094	0.0123	0.01167	-0.00710	-0.00227	0.78864	0.9708	-0.00900	-0.00233
23	May 14	-0.0059	0.0142	0.0123	0.01167	-0.01820	0.00253	0.78864	0.9708	-0.02308	0.00261
24	Jun 14	0.0191	-0.0083	0.0123	0.01167	0.00680	-0.01997	0.78864	0.9708	0.00862	-0.02057
25	Jul 14	-0.0003	0.0475	0.0123	0.01167	-0.01260	0.03583	0.78864	0.9708	-0.01598	0.03691
26	Aug 14	-0.0123	0.0098	0.0123	0.01167	-0.02460	-0.00187	0.78864	0.9708	-0.03119	-0.00192
27	Sep 14	-0.0026	-0.0131	0.0123	0.01167	-0.01490	-0.02477	0.78864	0.9708	-0.01889	-0.02551
28	Oct 14	0.0122	-0.0201	0.0123	0.01167	-0.00010	-0.03177	0.78864	0.9708	-0.00013	-0.03272
29	Nov 14	-0.0232	0.0165	0.0123	0.01167	-0.03550	0.00483	0.78864	0.9708	-0.04501	0.00498
30	Dec 14	-0.0406	0.0153	0.0123	0.01167	-0.05290	0.00363	0.78864	0.9708	-0.06708	0.00374
31	Jan 15	0.0276	0.0170	0.0123	0.01167	0.01530	0.00533	0.78864	0.9708	0.01940	0.00549
32	Feb 15	0.0209	0.0164	0.0123	0.01167	0.00860	0.00473	0.78864	0.9708	0.01090	0.00488
33	Mar 15	0.0001	-0.0013	0.0123	0.01167	-0.01220	-0.01297	0.78864	0.9708	-0.01547	-0.01336
34	Apr 15	-0.0037	-0.0712	0.0123	0.01167	-0.01600	-0.08287	0.78864	0.9708	-0.02029	-0.08536
35	May 15	-0.0380	0.0331	0.0123	0.01167	-0.05030	0.02143	0.78864	0.9708	-0.06378	0.02208
36	Jun 15	-0.0292	-0.0548	0.0123	0.01167	-0.04150	-0.06647	0.78864	0.9708	-0.05262	-0.06847
37	Jul 15	0.0135	-0.0217	0.0123	0.01167	0.00120	-0.03337	0.78864	0.9708	0.00152	-0.03437
38	Aug 15	-0.0752	-0.0789	0.0123	0.01167	-0.08750	-0.09057	0.78864	0.9708	-0.11095	-0.09329
39	Sep 15	0.0389	-0.0557	0.0123	0.01167	0.02660	-0.06737	0.78864	0.9708	0.03373	-0.06939
40	Oct 15	0.0424	0.0489	0.0123	0.01167	0.03010	0.03723	0.78864	0.9708	0.03817	0.03835
41	Nov 15	0.0092	-0.0082	0.0123	0.01167	-0.00310	-0.01987	0.78864	0.9708	-0.00393	-0.02046
42	Dec 15	0.0235	0.0376	0.0123	0.01167	0.01120	0.02593	0.78864	0.9708	0.01420	0.02671
43	Jan 16	-0.0297	-0.0012	0.0123	0.01167	-0.04200	-0.01287	0.78864	0.9708	-0.05326	-0.01325
44	Feb 16	-0.0138	0.0433	0.0123	0.01167	-0.02610	0.03163	0.78864	0.9708	-0.03309	0.03258
45	Mar 16	0.0203	0.0315	0.0123	0.01167	0.00800	0.01983	0.78864	0.9708	0.01014	0.02043
46	Apr 16	-0.0231	0.0099	0.0123	0.01167	-0.03540	-0.00177	0.78864	0.9708	-0.04489	-0.00182
47	May 16	-0.0235	-0.0070	0.0123	0.01167	-0.03580	-0.01867	0.78864	0.9708	-0.04539	-0.01923
48	Jun 16	0.0151	0.0613	0.0123	0.01167	0.00280	0.04963	0.78864	0.9708	0.00355	0.05113
49	Jul 16	0.0079	0.0471	0.0123	0.01167	-0.00440	0.03543	0.78864	0.9708	-0.00558	0.03650
50	Aug 16	0.0190	0.0283	0.0123	0.01167	0.00670	0.01663	0.78864	0.9708	0.00850	0.01713
51	Sep 16	-0.0066	-0.0097	0.0123	0.01167	-0.01890	-0.02137	0.78864	0.9708	-0.02397	-0.02201
52	Oct 16	0.0029	0.0129	0.0123	0.01167	-0.00940	0.00123	0.78864	0.9708	-0.01192	0.00127
53	Nov 16	-0.0390	-0.0514	0.0123	0.01167	-0.05130	-0.06307	0.78864	0.9708	-0.06505	-0.06496
54	Dec 17	0.0095	0.0122	0.0123	0.01167	-0.00280	0.00053	0.78864	0.9708	-0.00355	0.00055
55	Jan 17	0.0177	0.0023	0.0123	0.01167	0.00540	-0.00937	0.78864	0.9708	0.00685	-0.00965
56	Feb 17	0.0131	0.0132	0.0123	0.01167	0.00080	0.00153	0.78864	0.9708	0.00101	0.00158
57	Mar 17	0.0342	0.0328	0.0123	0.01167	0.02190	0.02113	0.78864	0.9708	0.02777	0.02177
58	Apr 17	0.0126	0.0233	0.0123	0.01167	0.00030	0.01163	0.78864	0.9708	0.00038	0.01198
59	May 17	-0.0130	-0.0085	0.0123	0.01167	-0.02530	-0.02017	0.78864	0.9708	-0.03208	-0.02077
60	Jun 17	0.0014	0.0115	0.0123	0.01167	-0.01090	-0.00017	0.78864	0.9708	-0.01382	-0.00017
Mean		0.00288	0.00631	0.0123	0.01167	-0.00942	-0.00536	0.78864	0.9708	-0.01194	-0.00552

Source: Microsoft Excel

Appendix 7

Jensen ratio calculation for FBMS and ISSI monthly returns (July 2012 - June 2017)

Number of data	Date	Index return (Rp)		Market return (Rm)		Risk-free rate (Rf)		Rm-Rf		Index beta (β)		Jensen ratio (ap)	
		FBMS	ISSI	KLCI	JCI	Z1120012	SPN12130704	FBMS	ISSI	FBMS	ISSI	FBMS	ISSI
1	Jul 12	0.0250	0.0475	0.0203	0.0472	0.0123	0.01167	0.00800	0.03553	0.78864	0.9708	0.00639	0.00134
2	Aug 12	0.0088	-0.0138	0.0089	-0.0198	0.0123	0.01167	-0.00340	-0.03147	0.78864	0.9708	-0.00082	0.00508
3	Sep 12	-0.0032	0.0588	-0.0057	0.0498	0.0123	0.01167	-0.01800	0.03813	0.78864	0.9708	-0.00130	0.01011
4	Oct 12	0.0129	0.0265	0.0222	0.0206	0.0123	0.01167	0.00990	0.00893	0.78864	0.9708	-0.00721	0.00616
5	Nov 12	-0.0462	-0.0263	-0.0372	-0.0170	0.0123	0.01167	-0.04950	-0.02867	0.78864	0.9708	-0.01946	-0.01014
6	Dec 12	0.0514	0.0077	0.0485	0.0095	0.0123	0.01167	0.03620	-0.00217	0.78864	0.9708	0.01055	-0.00186
7	Jan 13	-0.0354	0.0173	-0.0364	0.0317	0.0123	0.01167	-0.04870	0.02003	0.78864	0.9708	-0.00929	-0.01381
8	Feb 13	-0.0007	0.0687	0.0062	0.0768	0.0123	0.01167	-0.00610	0.06513	0.78864	0.9708	-0.0082	-0.00620
9	Mar 13	0.0226	0.0317	0.0208	0.0303	0.0123	0.01167	0.00850	0.01863	0.78864	0.9708	0.00360	0.00194
10	Apr 13	0.0270	0.0263	0.0275	0.0188	0.0123	0.01167	0.01520	0.00713	0.78864	0.9708	0.00271	0.00771
11	May 13	0.0635	0.0174	0.0300	0.0069	0.0123	0.01167	0.01770	-0.00477	0.78864	0.9708	0.03724	0.01036
12	Jun 13	-0.0088	-0.0328	0.0024	-0.0493	0.0123	0.01167	-0.00990	-0.06097	0.78864	0.9708	-0.01329	0.01472
13	Jul 13	0.0064	-0.0611	-0.0005	-0.0433	0.0123	0.01167	-0.01280	-0.05497	0.78864	0.9708	0.00419	-0.01941
14	Aug 13	-0.0264	-0.0667	-0.0254	-0.0901	0.0123	0.01167	-0.03770	-0.10177	0.78864	0.9708	-0.00897	0.02043
15	Sep 13	0.0264	0.0086	0.0238	0.0289	0.0123	0.01167	0.01150	0.01723	0.78864	0.9708	0.00503	-0.01980
16	Oct 13	0.0305	0.0424	0.0216	0.0451	0.0123	0.01167	0.00930	0.03343	0.78864	0.9708	0.01087	-0.00172
17	Nov 13	-0.0006	-0.0547	0.0032	-0.0564	0.0123	0.01167	-0.00910	-0.06807	0.78864	0.9708	-0.00572	-0.00029
18	Dec 13	0.0249	0.0048	0.0299	0.0042	0.0123	0.01167	0.01760	-0.00747	0.78864	0.9708	-0.00128	0.00038
19	Jan 14	-0.0343	0.0219	-0.0337	0.0338	0.0123	0.01167	-0.04600	0.02213	0.78864	0.9708	-0.01032	-0.01125
20	Feb 14	0.0231	0.0410	0.0175	0.0456	0.0123	0.01167	0.00520	0.03393	0.78864	0.9708	0.00670	-0.00361
21	Mar 14	0.0194	0.0292	0.0074	0.0320	0.0123	0.01167	-0.00490	0.02033	0.78864	0.9708	0.01096	-0.00221
22	Apr 14	0.0052	0.0094	0.0121	0.0151	0.0123	0.01167	-0.00020	0.00343	0.78864	0.9708	-0.00694	-0.00560
23	May 14	-0.0059	0.0142	0.0010	0.0111	0.0123	0.01167	-0.01130	-0.00057	0.78864	0.9708	-0.00929	0.00308
24	Jun 14	0.0191	-0.0083	0.0050	-0.0031	0.0123	0.01167	-0.00730	-0.01477	0.78864	0.9708	0.01256	-0.00563
25	Jul 14	-0.0003	0.0475	-0.0060	0.0431	0.0123	0.01167	-0.01830	0.03143	0.78864	0.9708	0.00183	0.00532
26	Aug 14	-0.0123	0.0098	-0.0028	0.0094	0.0123	0.01167	-0.01510	-0.00227	0.78864	0.9708	-0.01269	0.00033
27	Sep 14	-0.0026	-0.0131	-0.0106	0.0001	0.0123	0.01167	-0.02290	-0.01157	0.78864	0.9708	0.00316	-0.01354
28	Oct 14	0.0122	-0.0201	0.0048	-0.0093	0.0123	0.01167	-0.00750	-0.02097	0.78864	0.9708	0.00581	-0.01141
29	Nov 14	-0.0232	0.0165	-0.0185	0.0119	0.0123	0.01167	-0.03080	0.00023	0.78864	0.9708	-0.01121	0.00461
30	Dec 14	-0.0406	0.0153	-0.0328	0.0150	0.0123	0.01167	-0.04510	0.00333	0.78864	0.9708	-0.01733	0.00040
31	Jan 15	0.0276	0.0170	0.0114	0.0119	0.0123	0.01167	-0.00090	0.00023	0.78864	0.9708	0.01601	0.00511
32	Feb 15	0.0209	0.0164	0.0224	0.0304	0.0123	0.01167	0.01010	0.01873	0.78864	0.9708	0.00063	-0.01345
33	Mar 15	0.0001	-0.0013	0.0053	0.0125	0.0123	0.01167	-0.00700	0.00083	0.78864	0.9708	-0.00668	-0.01378
34	Apr 15	-0.0037	-0.0712	-0.0068	-0.0783	0.0123	0.01167	-0.01910	-0.08997	0.78864	0.9708	-0.00094	0.00447
35	May 15	-0.0380	0.0331	-0.0389	0.0255	0.0123	0.01167	-0.05120	0.01383	0.78864	0.9708	-0.00992	0.00800
36	Jun 15	-0.0292	-0.0548	-0.0234	-0.0586	0.0123	0.01167	-0.03570	-0.07027	0.78864	0.9708	-0.01335	0.00175
37	Jul 15	0.0135	-0.0217	0.0097	-0.0220	0.0123	0.01167	-0.00260	-0.03367	0.78864	0.9708	0.00325	-0.00068
38	Aug 15	-0.0752	-0.0789	-0.0641	-0.0610	0.0123	0.01167	-0.07640	-0.07267	0.78864	0.9708	-0.02725	-0.02002
39	Sep 15	0.0389	-0.0557	0.0051	-0.0634	0.0123	0.01167	-0.00720	-0.07507	0.78864	0.9708	0.03228	0.00551
40	Oct 15	0.0424	0.0489	0.0276	0.0548	0.0123	0.01167	0.01530	0.04313	0.78864	0.9708	0.01803	-0.00464
41	Nov 15	0.0092	-0.0082	0.0039	-0.0020	0.0123	0.01167	-0.00840	-0.01367	0.78864	0.9708	0.00352	-0.00660
42	Dec 15	0.0235	0.0376	0.0122	0.0330	0.0123	0.01167	-0.00010	0.02133	0.78864	0.9708	0.01128	0.00522
43	Jan 16	-0.0297	-0.0012	-0.0146	0.0048	0.0123	0.01167	-0.02690	-0.00687	0.78864	0.9708	-0.02079	-0.00620
44	Feb 16	-0.0138	0.0433	-0.0078	0.0338	0.0123	0.01167	-0.02010	0.02213	0.78864	0.9708	-0.01025	0.01015
45	Mar 16	0.0203	0.0315	0.0380	0.0156	0.0123	0.01167	0.02570	0.00393	0.78864	0.9708	-0.01227	0.01601
46	Apr 16	-0.0231	0.0099	-0.0261	-0.0014	0.0123	0.01167	-0.03840	-0.01307	0.78864	0.9708	-0.00512	0.01092
47	May 16	-0.0235	-0.0070	-0.0279	-0.0086	0.0123	0.01167	-0.04020	-0.02027	0.78864	0.9708	-0.00410	0.00101
48	Jun 16	0.0151	0.0613	0.0173	0.0458	0.0123	0.01167	0.00500	0.03413	0.78864	0.9708	-0.00114	0.01650
49	Jul 16	0.0079	0.0471	-0.0005	0.0397	0.0123	0.01167	-0.01280	0.02803	0.78864	0.9708	0.00569	0.00822
50	Aug 16	0.0190	0.0283	0.0150	0.0326	0.0123	0.01167	0.00270	0.02093	0.78864	0.9708	0.00457	-0.00369
51	Sep 16	-0.0066	-0.0097	-0.0152	-0.0040	0.0123	0.01167	-0.02750	-0.01567	0.78864	0.9708	0.00279	-0.00616
52	Oct 16	0.0029	0.0129	0.0120	0.0108	0.0123	0.01167	-0.00030	-0.00087	0.78864	0.9708	-0.00916	0.00207
53	Nov 16	-0.0390	-0.0514	-0.0319	-0.0505	0.0123	0.01167	-0.04420	-0.06217	0.78864	0.9708	-0.01644	-0.00272
54	Dec 16	0.0095	0.0122	0.0140	0.0287	0.0123	0.01167	0.00170	0.01703	0.78864	0.9708	-0.00414	-0.01600
55	Jan 17	0.0177	0.0023	0.0182	-0.0005	0.0123	0.01167	0.00590	-0.01217	0.78864	0.9708	0.00075	0.00244
56	Feb 17	0.0131	0.0132	0.0133	0.0175	0.0123	0.01167	0.00100	0.00583	0.78864	0.9708	0.00001	-0.00413
57	Mar 17	0.0342	0.0328	0.0273	0.0337	0.0123	0.01167	0.01500	0.02203	0.78864	0.9708	0.01007	-0.00026
58	Apr 17	0.0126	0.0233	0.0161	0.0210	0.0123	0.01167	0.00380	0.00933	0.78864	0.9708	-0.00270	0.00257
59	May 17	-0.0130	-0.0085	-0.0012	0.0093	0.0123	0.01167	-0.01350	-0.00237	0.78864	0.9708	-0.01465	-0.01787
60	Jun 17	0.0014	0.0115	-0.0012	0.0160	0.0123	0.01167	-0.01350	0.00433	0.78864	0.9708	-0.00025	-0.00437
Mean		0.00288	0.00631	0.00188	0.00710	0.0123	0.01167	-0.01042	-0.00457	0.78864	0.9708	-0.00120	-0.00092

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