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CAPITAL MARKET REVIEW

Conventional and Islamic Indices in Indonesia: A Comparison on Performance, Volatility, and The Determinants

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The purpose of this study is to evaluate performance and volatility of Islamic and conventional stock indices along with their determinant factor variables in Indonesia. The study adopts: (1) Capital Asset Pricing Model (CAPM) to compare the performance of the Jakarta Islamic Index (JII) to represent Islamic index and LQ45 to represent the conventional, (2) beta calculation to measure volatility, and (3) Autoregressive Distributed Lag (ARDL) to capture the determinants and the reason behind the outperformance. The data coverage is from January 2006 to November 2015. The study finds that: (1) There is no significant difference on performance between JII and LQ45, (2) JII is less volatile than LQ45, except in 2010, and (3) JII performance is less affected by external factors except for crude oil price. Moreover, the result implies challenge for the authorities to educate society, particularly whom concern to shari'ah principles, with information that Islamic index performance is not much difference from conventional index and less volatile.

Keywords: *Islamic index, performance comparison, volatility, determinants*

Introduction

Stocks under Islamic laws, i.e. shari'ah, has shaped world financial system in less than two decades in response to a strong demand from muslim community worldwide to have an alternative financial system that much more resistant to moral hazard. Shari'ah principles, risk-sharing and asset-based financing, prove more resilient than its conventional ones during financial crisis years, even though profitability remains lower (Asutay & Hendranastiti, 2015; Listyaningsih & Krishnamurti, 2014).

Indonesia as one of largest growing Muslim population, thus, offers potent prospect to develop Islamic financial industries. Meanwhile

there have been limited studies when it comes to the Islamic stock markets. Besides, most of studies conducted in the field with varied methods revealed conflicting results. Rahmayanti (2003) examines portfolio of Jakarta Islamic Index (JII) and conventional index (LQ45) during period of 2001-2002, based on daily index using Capital Asset Pricing Model (CAPM). The result shows that Islamic portfolio performs better than conventional ones in terms of risk that is lower than its peer. In addition, the result also showing shari'ah screening process positively affects Islamic portfolio performance. Hartono, Soekarno, and Damayanti (2014) evaluate monthly net asset value for each mutual fund between Jakarta Composite Index (JCI)

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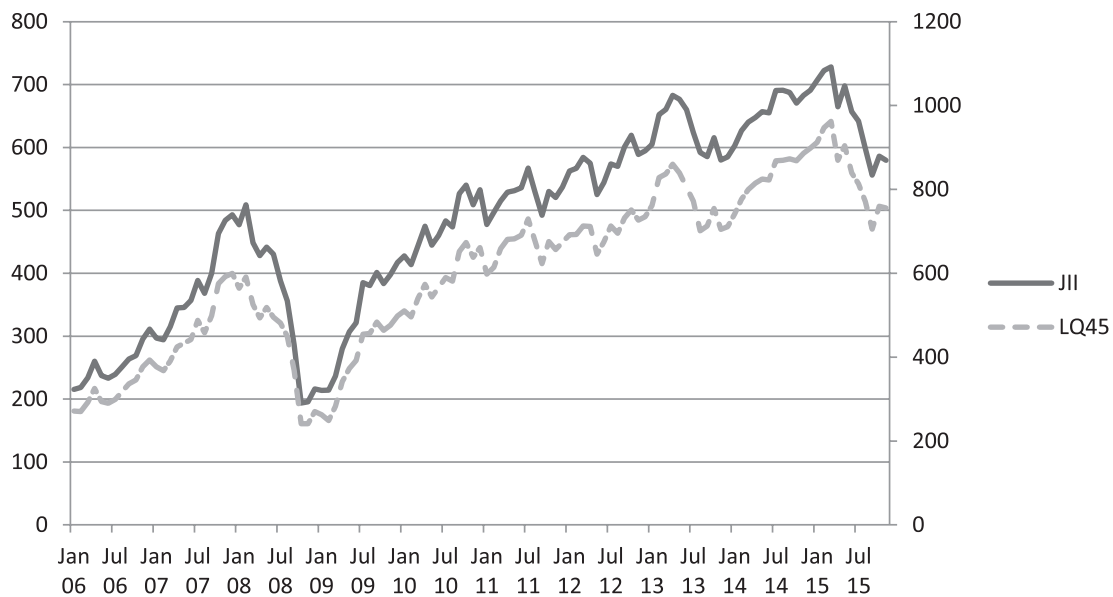


Figure 1. Jakarta Islamic Index (JII) and LQ45 Performance (January 2006 – November 2015)

Note: This figure is created manually using data from IDX

and JII, covering period of January 2008-December 2012. They apply Sharpe ratio, modified snail trail, and morningstar as measurement tool to capture rating performance based on return. The result shows that none of the return and risk adjusted returns performance of Islamic or conventional equity funds outperform the market. Setiawan and Oktariza (2013) also provide result indicating there is no significant difference on performance between Islamic and conventional indices by utilizing data from 30 shari'ah and 30 conventional companies listed on IDX over the period of 2009-2011. Whilst Sukmana and Kholid (2012) find that Islamic stock index is less risky than its conventional index. They apply the ARCH and GARCH method to measure the magnitude of financial crisis towards Islamic and conventional indices volatility.

It is interesting to note that a great care is necessary in applying and analyzing performance stocks ratios. Considering a different dataset and methodology as well as conflicting evidence resulted, this paper therefore is motivated to contribute to the existing literatures by providing new evidence and comprehensive analysis from performance comparison, volatility comparison, to the determinants of conventional and Islamic indices.

In order to do so, we compare the Jakarta Islamic Index (JII) portfolio performance to represent Islamic index with one of conventional portfolios, LQ45, which have similar characteristic, over the period January 2006 to November 2015. We employ Sharpe and Treynor ratios to measure performance of indices and portfolios and beta calculation is used to measure volatility. In addition, we use Autoregressive Distributed Lag (ARDL) as the model that allows for capturing the outperformance of either JII or LQ45.

Moreover, the structure of this paper is organized as follows: section 2 will briefly summarize the literature review. The econometric methodology and data description is presented in Section 3. Section 4 will discuss the main empirical results. Our concluding remarks and recommendations are summed up in the last section.

Overview of Jakarta Islamic Index (JII) and LQ45

JII is the first Indonesian Islamic index, launched in July 2000 in collaboration with PT. Danareksa Investment Management as the first mutual fund shari'ah, created in July 2007. Since its establishment, investment in Islamic

stocks has experienced a significant growth. Madyan, Salim, Anshori, and Solimun (2013) reported stocks included in calculation of JII were having biggest average market capitalization and high liquidity over period 2006-2010. Even though during period of financial crisis (2007-2008) JII stocks declined significantly at 300 points, performance of JII stock index was at the peak level (Listyaningsih & Krishnamurti, 2014; Sakti & Harun, 2013). We use JII as the proxy of Islamic index instead of Indonesia Shari'ah Stock Index (ISSI) considering that ISSI has only started from 2012 whereas JII has been published since 2000, therefore, JII provides longer dataset than ISSI does.

Furthermore, a fundamental difference between JII and other conventional stock index lies in the criteria of the issuer's shares that must meet the basic principles of shari'ah. In order to be classified in the JII, Issuers/Public Companies shall meet two types of criteria, qualitative and quantitative criteria. Qualitative criteria means that business activities should not be involved in *riba* (interest), *gharar* (speculation), and *maisyir* (gambling). Quantitative criteria requires that stock included in JII must not have debt ratio exceeding 45%, accounts receivables to total assets must remain below 55% and interest income should represent less than 10% of total revenue. Compared to quantitative criteria required by DJII (the US), JII's is less restrictive (Listyaningsih & Krishnamurti, 2014).

For its counterpart conventional index, LQ45 is used because of having similarity with JII that do not include all stocks listed in IDX. JII only counts 30 top biggest market capitalization shari'ah stocks, whereas LQ45 only measures 45 top biggest market capitalization stocks since its launch in February 1997. Furthermore, to be classified in the LQ45, firms must have the following four criteria that: are listed in IDX for at least 3 months, incorporated in the top 60 companies with the highest market capitalization in the last 12 months, incorporated in the top 60 companies with the highest transaction value in regular market in the last 12 months, and having good financial performance, prospect of growth, and high transaction value and frequency.

Literature Review

It has been a trend to shift investment preferences from conventional to shari'ah stocks since financial downturn, that were Asian financial crisis in 1997-1998 and the global financial crisis in 2006-2009 (Hussin, Yusof, Muhammad, Razak, Hasyim, & Marwan, 2013). Recently, not only have capital markets based shari'ah developed in Muslim countries, but also begun to call attention in non-majority Muslim countries. Because of the importance of capital market development in economy, numerous studies related to evaluating portfolio performance of Islamic and conventional indices have been conducted in developed and emerging countries as follows.

Jawadi, Jawadi, and Louhichi (2014) find that Islamic indices outperformed their conventional peers during financial crisis period. They extend utilizing CAPM-GARCH to correct the bias while it captures volatility dynamics. Dataset used are over the period 2000-2011, covering three major regions: Europe, the USA, and the world.

Al-Khazali, Lean, and Samet (2014) also test stock indices from Asia Pacific, Canadian, Developed Country, Emerging Markets, European, Global, Japanese, UK, and US over the period 1996-2012. Using non-parametric approach, which is Stochastic Dominance (SD), the result is consistent. Islamic indices dominated their counterparts during turbulent period, 2007-2012. To extent, they employ SD method for the returns that are not normally distributed.

As done by Habib and Islam (2014), performance of Islamic index in India and Malaysia also outperformed their conventional counterpart during crisis period. They use a monthly dataset covering period 2003-2013. Following other previous studies, they employ risk-adjusted monthly returns, calculated using time series data of daily closing prices.

Furthermore, using the dataset from 101 companies listed in London Stock Exchange and included in FTSE 100, Asutay and Hendranastiti (2015) also confirm that Islamic portfolio performed better than their conventional peers mainly in the global financial crisis years,

2008-2010. To extent, the less exposure for some Islamic indices during the crisis can be due to low leverage effect and the exclusion of conventional financial stocks (Dewandaru, Alaoui, Bacha, & Masih, 2014).

A mixed result is found in case of Australian Stock Exchange (ASX) over the period 2001-2013. The author, Reddy and Fu (2014), fail to prove that performance of Islamic stocks listed on ASX outperform its conventional counterpart, even though there is a significant difference in terms of risk.

Compared to Malaysia as counterpart, Dewi and Ferdian (2012) find that Indonesian Islamic mutual funds slightly outperform in terms of asset allocation funds and debt funds during period January 2006 - April 2009. In order to compare the performance, they are using 5 measurement tools, namely Sharpe, Treynor, and Jensen ratios, as well as Snail Trail Methodology and Market Timing. The Malaysian asset allocation funds were relatively better diversified than Indonesia's. The result also showing conventional investment instruments still dominate Indonesian capital market even though Islamic mutual funds have relatively low risk with relatively high return. A thing to note, returns in both countries are continuously increasing after the global financial crisis.

Related to the effect of the determinants of Islamic index performance, Antonio, Hafidhoh, and Fauzi (2013) find that Federal Fund rate (Fed rate), oil price, interest rate, exchange rate and inflation significantly affect both Indonesia (JII) and Malaysia (FHSI) Islamic index in the long-term. Albaity (2011) also provide results that interest rate affects Islamic stocks in Malaysia and the US. To extent, basically, lower stock price might be caused by an increase the Fed rate due to the Fed attempts to lower money supply by making goods more expensive as domestic interest rates increase. In other words, money supply positively influence stock price, included Islamic stock price (Mustafa, Ramlee, & Kassim, 2015; Tian & Ma, 2010).

To be more specifically using ARDL method, Mustafa et al. (2015) confirm that Islamic stock in Malaysia show a positive relation to domestic macroeconomics, such as industrial

activities, money supply, unemployment rate, and real effective exchange rate, whereas it reacts negatively to the Fed rate. Inflation also has a negative relationship on stock price performance because it triggers to functioning money as a store of value. Another finding done by Antonio et al. (2013) is that in the short-term, only inflation, exchange rate, and oil price variables significantly affect JII, while there are no any selected macroeconomic variables significantly affecting FHSI. In terms of exchange rates, a firm's profits depend on a change in the exchange rates, which leads to affect its stock prices (Agrawal, Srivastav, & Srivastava, 2010).

In line with Kamarudin and Masih (2015) who further examine the relationship between crude oil and Malaysian Islamic and conventional stock markets using daily data from January 2007 to December 2014, they find that the relationship of the oil price and stock market is naturally not the same through all time scales. The result indicates that Malaysia stock markets will positively correlated as crude oil markets become volatile. Therefore, for long term forecast it is suggested to adjust and beware with their portfolio strategy although crude oil prices do not have co-movement to the stock markets for short and medium term. Meanwhile Sakti and Harun (2013) analyze whether or not co-integration does exist between JII and some selected macroeconomic variables using VAR method. Utilizing monthly dataset from January 2000 - December 2010, it is shown that Indonesian Islamic stock market is not driven by global factors.

Findings about whether or not Shari'ah stock index outperform conventional stock index from both developed and emerging countries are still unsettled. Khalichi, Humayun, Arouri, and Teulon (2014) supported the reason that, Islamic indices could be as attractive as conventional ones since potent diversification exist in both indices, offering similar opportunities for long run benefit. Besides, Islamic indices have the same level of (in)efficiency as conventional indices, investors thus regardless what they believe in order to maximize risk-adjusted returns. The former reason is also confirmed by

Abbes and Trichili (2015), who investigate the long and short run integration dynamic among a large set of developed and emerging Islamic stock markets from different regions. They concluded that both indices have a tendency to move together towards the same direction in the long-run. All in all, those findings have important implications in designing investment strategies for investors who desiring to diversify their portfolios across Islamic stocks, especially during financial crisis period.

Research Methods

This study implements three methodologies: (1) Capital Asset Pricing Model (CAPM) using Sharpe Ratio and Treynor Ratio to compare the performance of Islamic index measured by JII, and conventional index measured by LQ45, (2) Beta calculation to measure volatility of each index, and (3) Autoregressive Distributed Lag (ARDL) to capture the determinants and the reason behind the outperformance. In addition, as the proxy for risk free interest rate, we use 3-month time deposit rate determined by Bank Indonesia, it is adopted as some similar researches conducting in US use 3-month Treasury bill rate as the proxy for risk free interest rate.

Capital Asset Pricing Model (CAPM)

Sharpe Ratio and Treynor Ratio have become the standard to measure performance of indices and portfolios as it does not only calculate return of the indices as the performance measurement, but it also weights its risk to the calculation. These two models are also used by many studies comparing indices performance measurement (Al-Khalazi et al., 2014; Dewi & Ferdian, 2012; Habib & Islam, 2014; Jawadi et al., 2014; Reddy & Fu, 2014).

Moreover, below are the formulas of Sharpe (1966) and Treynor (1965) Ratio:

$$\text{Sharpe Ratio} = \frac{(R_{i,t} - R_{f,t})}{\sigma(R_{i,t})} \quad (1)$$

$$\text{Treynor Ratio} = \frac{(R_{i,t} - R_{f,t})}{\beta_i} \quad (2)$$

where $R_{i,t}$ denotes average stock return of index i in specific period of time, $R_{f,t}$ denotes return of risk free rate in specific period of time, $\sigma(R_{i,t})$ denotes standard deviation of average stock return of index i , $R_{M,t}$ denotes average return of benchmark index, which in this case is JCI, in specific period of time, and β_i denotes beta of market index, which reflects its volatility towards benchmark index.

These two ratios draw marginal return of each index weighted with its risk that represented by the index's return volatility, the higher the ratios the better the better its portfolio performance.

Beta Calculation

To compare the volatility of JII and LQ45, we use a simple calculation to measure both indices volatility towards benchmark index, which in this case is JCI. Furthermore, its calculation is as follows:

$$\beta_i = \frac{\text{cov}(R_{i,t} - R_{M,t})}{\sigma^2(R_{M,t})} \quad (3)$$

where $R_{i,t}$ denotes average stock return of index i in specific period of time, $R_{f,t}$ denotes return of risk free rate in specific period of time, $\sigma(R_{i,t})$ denotes standard deviation of average stock return of index i , $R_{M,t}$ denotes average return of benchmark index, which in this case is JCI, in specific period of time, and β_i denotes beta of market index

Autoregressive Distributed Lag (ARDL)

Prior to determining the appropriate methodology to compare the determinants effect of JII and LQ45 Index and considering the data set is time series we apply unit root test to identify the stationary level of each variable. To check the stationary level of variables, instead of using conventional unit root test we apply Unit Root with Break Test as Perron (1989) stated that the failure to capturing a structural break may lead to a bias that will decrease the ability to reject a false unit root null hypothesis. Moreover, below are results of Unit Root with Break Test.

Table 1. Unit Root with Break Test

Variables	t-statistic	
	Level	First Difference
LnJII	-4.014(3)	-11.531(0)***
LnLQ45	-3.888(3)	-12.375(0)***
LnUSD	-3.459(1)	-9.165(1)***
LnOil	-4.498(2)	-9.093(0)***
LnBI_Rate	-5.376(3)**	-6.524(0)***
LnFed_Rate	-7.151(1)***	-9.375(0)***
LnNet_Foreign	-17.194(0)***	-14.766(4)***
LnCPI	-4.003(1)	-10.167(1)***
LnProd_Index	-7.896(0)***	-16.468(0)***
LnM2	-4.363(0)	-6.600(7)***

Notes: (i) Minimize Dicky-Fuller t-statistic with trend and intercept is used to select the break, (ii) critical values with trend and intercept at 1%, 5%, and 10% are -5.719, -5.176, and -4.894 respectively, and t-statistic that exceed critical values indicates the variable is stationer (iii) automatic lag selection box is set to maximum of 12 lags, and figure in () indicates optimum lag length by using Schwarz information criterion, (iv) ** indicates it is significant at 5 % level, *** indicates it is significant at 1% level.

From the above result, we can see that not all of variables are stationer at level. Therefore, we cannot use Ordinary Least Square (OLS) as the methodology since it will lead to spurious regression. However, since none of variables are stationer at second difference, we can apply Autoregressive Distributed Lag (ARDL) as the methodology to compare the determinants' effect of JII and LQ45. There are several advantages of ARDL model: 1) ARDL can be used for set of variables with different order of stationary as long as it does not exceed first difference level of stationary, whereas Johansen's cointegration only allows same difference order (Pesaran, 2001); (2) ARDL is able to determine cointegration of small sample cases (Tang, 2003); and (3) ARDL captures both short run and long run coefficients through its bound test and conditional unrestricted error correction model (UECM).

Pesaran and Pesaran (1997) and Pesaran and Shin (2001) cited in Hoque and Yusop (2010) the form of ARDL methodology as expressed in the following term:

$$\mathcal{O}(L, p)y_t = c_0 + \sum_{i=1}^k \beta(L, q_i)x_{it} + \partial w_t + u_t; t=1, \dots, n \quad (4)$$

Where y_t is the independent variable, c_0 is the constant, x_{it} are the independent variables, L is lag operator, and w_t is the $s \times 1$ vector of deterministic variables including intercept, trend, dummy variables, and other exogenous variables. Furthermore, equation 4 can be rewrite into this following form to represent unconditional restriction error correction model by

including lag levels and first difference of the variables:

$$Dy_t = c_0 + c_1 t + \lambda_{yxx} x_{t-1} + \sum_{i=1}^p Dy_{t-i} + \sum_{i=1}^p Dx_{t-i} + \partial w_t + u_t \quad (5)$$

where D is first difference operator, t is trends, and the coefficient of y_t is representing the short run dynamic effects.

According to Hoque and Yusop (2010), ARDL model is performed in three steps: first is performing ARDL Bound Test to determine the presence of long run cointegrating relationships among the variables in the estimation models by using ARDL Bounds Test with the null hypothesis of there is no cointegration among the joint variables in the estimation. Second, it is required to estimate the elasticity of long run coefficients. Finally, the short run effect of the coefficients is estimated by doing conditional unrestricted error correction model.

Before determining the ARDL estimation model, we include a structural break dummy variable into the estimation as Zivot and Andrews (1992) stated that a dummy variable consists a break point might be needed to be included in time series model to reduce the possibility of false identification of cointegration existence. In order to determine the break period, we run OLS regression with JII and LQ45 index price as the dependent variable whereas the rest variables in Table 1 as the independent variables, the residual of the OLS regression is used to perform a Bai-Perron Test of $L+1$ vs L sequentially determined breaks on the residual to determine the break period. The Bai-Perron

Table 2. Variable Description

No	Variables	Description
1	JII Index and LQ45 Index Price	This variable measures the aggregate performance of stocks listed in each indices (JII and LQ45)
2	USD Rate	This variable is a proxy for global factors, it measures the effect of global currency fluctuation to index performance
3	Oil Price	This variable is a proxy for commodities' price and external factors, it measures the effect of oil price to index performance
4	BI Rate	This variable is a proxy for macroeconomic variables, it measures the effect of BI rate to index performance
5	Fed Rate	This variable is a proxy for external factor, it measures the effect of US Federal Fund Rate to index performance
6	Net Foreign Flow	This variable measures foreign transaction value effect to index performance, it is also considered as external factor
7	Consumer Price Index (CPI)	This variable is a proxy for macroeconomics variables especially inflation, it measures CPI inflation effect to index performance
8	Production Index	This variable indicates the real production output, it measures the effect of production index to stock market index performance
9	Money Supply (M2)	This variable is a proxy for macroeconomics variables, it measures the effect of money supply to index performance

Test result indicates there is a break in December 2007 with F-statistic 38.45 with and critical value of 23.70 meaning that it is significant at 5% level. Therefore, we create a structural break dummy variable (monthly) containing 0 (zero) value for period before December 2007, and 1 for December 2007 onwards.

After adding structural break variable, we run an ARDL regression to estimate the optimum model for determining the lag number using Akaike info Criterion (AIC) with maximum lag number of 4; below is the estimation model result:

$$\begin{aligned}
 \text{LnIndexPrice}_t = & \lambda_0 + \lambda_1 \text{LnIndexPrice}_{t-1} + \lambda_2 \text{LnUSDRate}_t \\
 & + \lambda_3 \text{LnUSDRate}_{t-1} + \lambda_4 \text{LnUSDRate}_{t-2} \\
 & + \lambda_5 \text{LnOilPrice}_t + \lambda_6 \text{LnOilPrice}_{t-1} \\
 & + \lambda_7 \text{BIRate}_t + \lambda_8 \text{FEDRate}_t \\
 & + \lambda_9 \text{LnNetForeignFlow}_t \\
 & + \lambda_{10} \text{LnNetForeignFlow}_{t-1} + \lambda_{11} \text{LnCPI}_t \\
 & + \lambda_{12} \text{LnLnCPI}_{t-1} + \lambda_{13} \text{LnLnCPI}_{t-2} \\
 & + \lambda_{14} \text{LnLnCPI}_{t-3} + \lambda_{15} \text{LnProdIndex}_t \\
 & + \lambda_{16} \text{LnM2}_t + \lambda_{17} \text{BreakDummy}_t + u_t \quad (6)
 \end{aligned}$$

Notes: (i) *Ln* is natural logarithm form (ii) *IndexPrice* is JII index or LQ45 Index; *USDRate* is 1 USD rate per rupiah; *OilPrice* is West Texas Intermediate (WTI) crude oil price; *BIRate* is Bank Indonesia reference rate; *FedRate* is Federal Fund Reserve Rate; *NetForeignFlow* is net buying stocks value done by foreign account; *CPI* is consumer price index; *ProdIndex* is pro-

duction index; *M2* is a measurement of money supply including cash, checking deposits, money market mutual funds, and other time deposits; *BreakDummy* is dummy variable with value of 0 for period before December 2007, and 1 for December 2007 onwards, (iii) λ is coefficient of each independent variables;

The next step is formulating the unconditional restricted error correction model from above equation as follows:

$$\begin{aligned}
 \text{DLnIndexPrice}_t = & \rho_0 + \rho_1 \text{DLnUSDRate}_t + \rho_2 \text{DLnOilPrice}_t \\
 & + \rho_3 \text{DBIRate}_t + \rho_4 \text{DFEDRate}_t \\
 & + \rho_5 \text{DLnNetForeignFlow}_t + \rho_6 \text{DLnCPI}_t \\
 & + \rho_7 \text{DLnCPI}_{t-1} + \rho_8 \text{DLnCPI}_{t-2} + \rho_9 \text{DLnProIndex}_t \\
 & + \rho_{10} \text{DLnM2}_t + \rho_{11} \text{BreakDummy}_t + u_t \quad (7)
 \end{aligned}$$

Notes: (i) *D* is first difference form, (ii) ρ is coefficient of each independent variables.

Data

The primary analysis of this paper emphasizes on comparing the performance and determinant factors of Islamic index and conventional index. The analysis uses monthly data from January 2006 – November 2015 which are the complete and the latest monthly dataset available in IDX website, Central Bank of Indonesia (BI), and US Central Bank (The Federal Reserve). In addition, a full summary of variables used in the model appears in in Table 2.

Table 3. Portfolio Performance and Volatility of JII and LQ45 Comparison

No	Year	JII				LQ45				JII Outperform LQ45?	JII Less Volatile than LQ45?
		Sharpe ratio	Treynor ratio	Beta	Annual Return	Sharpe ratio	Treynor ratio	Beta	Annual Return		
1	2006	0.468	0.027	0.97	44.54%	0.452	0.025	1.03	44.72%	Yes	Yes
2	2007	0.713	0.041	1.03	66.02%	0.621	0.034	1.12	59.06%	Yes	Yes
3	2008	-0.557	-0.065	1.06	-54.67%	-0.502	-0.056	1.12	-52.11%	No	Yes
4	2009	0.757	0.060	0.96	95.28%	0.680	0.052	1.06	89.78%	Yes	Yes
5	2010	0.276	0.016	1.00	24.60%	0.344	0.020	0.98	29.57%	No	No
6	2011	0.127	0.007	0.92	12.46%	0.119	0.006	1.08	12.65%	Yes	Yes
7	2012	0.023	0.001	1.08	5.73%	0.032	0.001	1.13	6.20%	No	Yes
8	2013	-0.163	-0.009	0.80	3.23%	-0.187	-0.010	1.02	-6.58%	Yes	Yes
9	2014	0.250	0.005	1.05	14.62%	0.530	0.010	1.06	21.14%	No	Yes
10	2015	-0.550	-0.034	0.77	-17.95%	-0.404	-0.019	1.25	-17.17%	No	Yes

Table 4. ARDL Bounds Test

Independent Variable	F-Statistic
JII	4.815954
LQ45	4.250915

Notes: (i) critical values of lower bound at 1%, 5%, and 10% are 2.26, 2.55, and 3.15 respectively, (ii) critical values of upper bound at 1%, 5%, and 10% are 3.34, 3.68, and 4.43 respectively, (iii) F-statistic that exceed critical values of upper bound indicates that there is a cointegration.

This study considers those eight variables consisting of macroeconomic indicators and external factors that may influence indices performance as also done by some similar previous studies (see Agrawal et al., 2010; Antonio et al., 2013; Mustafa et al., 2015; Talla, 2013; Tian & Ma, 2010). Those independent variables reflect expectations of the future performance of corporate profit/loss as stock prices are fundamentally determined by net profit/loss of company (Kuwornu, 2012). The stocks' price movement of JII or LQ45 constituents will automatically be calculated in their belonging indices, which affect JII price and LQ45 price.

Results and Discussions

Portfolio Performance

By calculating Sharpe ratio and Treynor ratio as the methodology to measure and to compare the performance of JII and LQ45 using the complete and the latest dataset available in IDX, from January 2006 to November 2015, the result shows that neither JII nor LQ45 has better performance. In a range of ten years, JII outperform LQ45 in 5 years: 2006, 2007, 2009, 2011, and 2013, whereas LQ45 outperform JII also in 5 years: 2008, 2010, 2012, 2014, and 2015. In addition, we could not justify whether or not

JII outperform LQ45 in economic crisis period because within the period of study it only covers one period of economic crisis (2008). Regarding the reason behind the outperformance of either JII or LQ45 in certain years will be discussed in the part of interpretation of ARDL regression result. In addition, the result can be seen in Table 3.

Volatility

To measure the index volatility, we use beta (β) coefficient by using JCI as a benchmark. It is obtained by dividing covariance of excess return of JII or LQ45 towards JCI to standard deviation of JCI. Simply say, it is comparing the volatility of JII or LQ45 to its benchmark, which is in this case is JCI. The greater the beta, the more volatile the index towards its benchmark. A beta equals 1 indicates that the JII or LQ45 move along with the market (same volatility). Furthermore, beta less than 1 indicates that JII or LQ45 is less volatile than JCI, whereas beta greater than 1 indicates that JII or LQ45 is more volatile than JCI.

Based on Table 3 we can see that, almost every year JII is less volatile than LQ45, except in 2010. Compared to JCI the volatility result is mixed, therefore we should not compare JII's volatility to JCI's volatility since JCI consists

Table 5. Regression result showing short run coefficients

Independent Variable	Dependent Variable	
	(1) JII	(2) LQ45
D(LNUSD)	-0.580**	-0.850***
D(LNUSD(-1))	0.438**	0.523**
D(LNOIL_PRICE)	0.196***	0.194***
D(BI_RATE)	-2.202**	-1.950**
D(FED_RATE)	-0.022	-0.020
D(LNNET_FOREIGN)	0.032**	0.034**
D(LNCPI)	0.625	0.571
D(LNCPI(-1))	-2.196	-2.523*
D(LNCPI(-2))	2.280**	2.454**
D(LNPROD_INDEX)	0.054	0.196
D(LNM2)	-0.188	-0.175
D(BREAK)	-0.067	-0.0819
D(@TREND())	0.012***	0.011***
CointEq(-1)	-0.163**	-0.167**
Observations	116	116

Notes: (i) highlighted coefficients showing that its effect is larger than its counterpart

(ii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

of all stocks. JCI can only be compared, as a proxy of conventional index, to ISSI (Indonesia Shari'ah Stock Index) for ISSI also consists of all shari'ah stocks. Hence, we can say that Islamic index is less volatile than conventional index.

Determinants of the Index Performance

The first step in ARDL is to investigate the cointegration of the joint variables by looking to ARDL Bounds Test. From the Table 4 we can see that both F-statistics are more than critical value of upper bound at 5% level of significance. Hence, we can reject the null hypothesis, meaning that there is a cointegration among the joint variables. In other words, there is a long-run relationship among the joint variables.

By running equation (7) using ARDL Cointegration and Long Run Form, we can get the estimated coefficients of short run and long run effects of the models as shown in Table 5 and Table 7 respectively.

As can be seen in Table 5, in the short run ,USD rate, oil price, BI rate, net foreign flow, and CPI are significant for JII and LQ45. This finding is consistent with previous research examining the determinants of Islamic index in emerging markets. Antonio et al. (2013) also found that oil price, exchange rate, and inflation

have significant effect to JII and FTSE Bursa Malaysia Hijrah Shariah Index (FHSI), whereas Federal Fund Rate does not have significant effect to both stock markets. As for oil price, it is significant because majority stocks belong to JII portfolio are commodity companies (Table 6), this argument is also supported by Lenny and Handoyo (2008) which stating that mining sector is dominating trading transaction in IDX. Regarding USD rate, it is negatively significant to both indices as also explained by Ajayi and Mougoue (1996) that exchange rate depreciation drives higher inflation in the future, which makes investors unsure about the future performance of companies. Granger, Huang, and Yang (2000) also stated that currency depreciation may decrease stock prices, if the companies are net importers. In terms of BI Rate, it is negatively significant to both indices due to interest rate is one of indicators for people decision regarding asset substitution, lower interest rate may encourage people to diversify their investment portfolio stock market and *vice versa*. In respect of net foreign flow, it is significant considering foreign investors play an important role for IDX development, data shows that 43.41% trading transaction in IDX from Q1-Q3 2015 is done by foreign investors¹. In addition, inflation (which in this study measured by CPI) is likely to affect stock prices since investing

¹ IDX Statistics 3rd Quarter 2015

Table 6. JII's constituent occurrence per sectors January 2006 – November 2015

No	Sectors	Frequency of stocks' occurrence	Occurrence percentage
1	Commodity	215	35.8%
2	Property	96	16.0%
3	Infrastructure	70	11.7%
4	Basic industry	69	11.5%
5	Trade and services	69	11.5%
6	Consumer goods	62	10.3%
7	Miscellaneous industry	19	3.2%
	Total	600	100%

Source: authors' calculation using data from IDX

in stock is one way to hedge inflation which means that if the prices decrease people tend to invest in stocks and *vice versa* (Chen, Roll, & Izednomi, 1986).

To be more detailed, the result shows that compared to LQ45, JII performance is more affected by BI rate and crude oil price. On the other hand, LQ45 is more affected by exchange rate (USD), net foreign flow, and consumer price index.

Regarding exchange rate, from the regression result we can see that the coefficient of *LnUSD* variable is -0.58% for JII and -0.85% for *Ln_LQ45*. It means that 1% increase (appreciation) in USD is likely to decrease LQ45 price by 0.85% whereas for JII price is 0.58%. In short, USD rate fluctuation will have bigger effect to LQ45 than JII. In contrast, BI rate change has a greater impact to JII than LQ45, 1% increase of BI Rate is expected to decrease JII by -2.2% and LQ45 by 2.5%. In addition, Federal Reserve Fund Rate does not have significant effect to both indices.

Furthermore, foreign transaction is affecting LQ45 more than JII, 1% increase in net foreign value is likely to raise LQ45 by 0.034%, whereas for JII is 0.032%. The same condition also happens in CPI coefficient, 1% increase in CPI the month before is expected to decrease current LQ45 by 2.45%, whereas for JII is 2.28%. In addition, money supply does not have significant effect to JII and LQ45.

Regarding crude oil price, measured by West Texas Intermediate (WTI) price, its movement has more impact to JII than LQ45, 1% increase in oil price is expected to raise JII by 0.196% whereas the figure for LQ45 is 0.194%. It is not surprising that oil price and BI rate have greater influence to JII than LQ45, if we look

at Table 6 we can clearly see that, within the period of January 2006 – November 2015 JII constituent is dominated by commodity stocks (35.8%) which consists of palm oil and mining companies, consecutively followed by property (16.0%), infrastructure (11.7%), basic industry (11.5%), trade and services (11.5%), consumer goods (10.3%), and miscellaneous industry (3.2%).

The oil price movement commonly affects other commodity prices such as palm oil, coal, nickel, and other commodities considering some of them are the alternative source of energy besides oil. Therefore, considering JII's major constituent is commodity stocks (in fact Astra Agro Lestari within the period of study is always become a member of JII except in second semester of 2006), it is plausible that JII is affected more by oil price than LQ45. The same reason applies to BI rate, since the second major constituent of JII is property which is affected by BI rate. Low BI rate will lower the cost of borrowing that it would encourage people to borrow from the bank to buy houses, apartments, and other properties which are directly contribute to the profit of companies. Thus, it is also reasonable that BI rate has more impact to JII than LQ45. Furthermore, production index and money supply do not have significant impact to JII.

Referring back to Table 3 that compares the performance measurement between JII and LQ45, now we proceed to analyze the reason behind the outperformance of either JII or LQ45 in certain years as regression and interpretation have been done. Considering crude oil price, USD rate, and BI rate (in graph BI rate will be multiplied by 1000 due to scaling adjustment for better understanding) are three main fac-

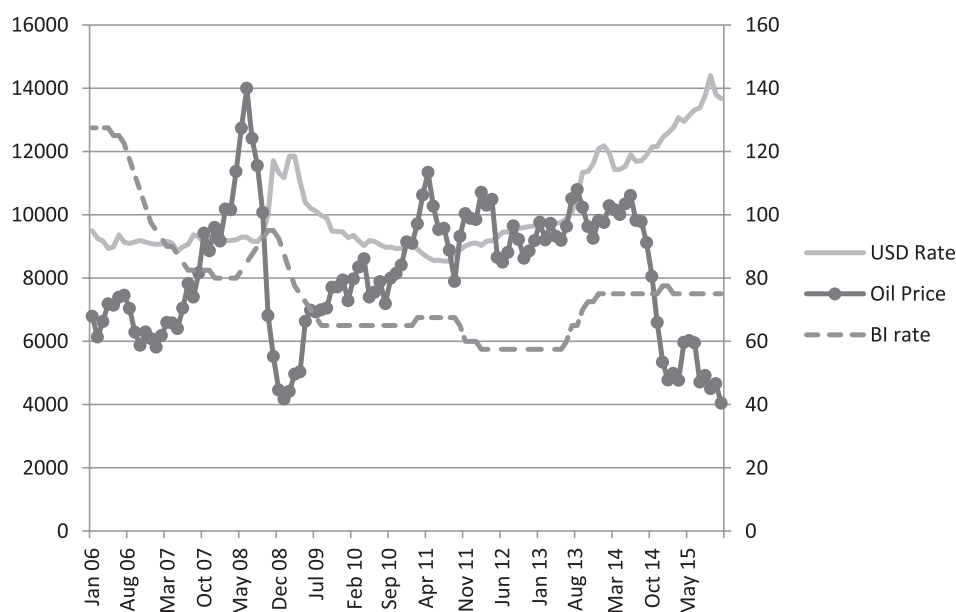


Figure 2. USD Rate, Crude Oil WTI Price, and BI Rate Movement January 2006 – November 2015

Note: This figure is created manually using data from Bank Indonesia and The Federal Reserve

tors affecting JII and LQ45 price, hence, we use Figure 2 consisting the movement of those determinants.

Between 2006 and 2007, JII's outperformance is caused by the significant increase of oil price that was triggered by the high demand from china to fuel their massive production in supporting rapid economic growth; that period is well known as commodity boom. The same determinant also explains why in 2008 JII underperform LQ45, to extent, from the mid 2008 price of oil slipped drastically. JII outperform LQ45 again in 2009 because of the oil price hike as can be seen in the figure. Furthermore, in 2010 LQ45 outperformed JII it is likely because USD rate trend is declining in that year. As we have discussed in previous part, USD rate change has bigger impact to LQ45 than JII.

Moreover, the reason behind the outperformance of JII in 2011 is because the declining trend of BI rate, as BI rate has bigger impact on JII considering that JII second major constituent is stocks in property sector. For the next year (2012), JII performance is under LQ45 because of the decrease of oil price in that year in aggregate. Then, in 2013 JII is able to perform better again than LQ45 before it becomes underperform in 2014 and 2015 that is caused by the oil price movement in those three years (oil

price trend is increasing in 2013, whereas in 2014 and 2015 its trend is decreasing). In terms of long run effect, the only significant variables are BI Rate, net foreign value, and CPI. In fact, all of these variables give a greater impact to JII than to LQ45.

Conclusions

In summary, the empirical result, using capital asset pricing model (CAPM), found that within the period of January 2006 – November 2015, neither Islamic index (measured by JII) nor conventional index (measured by LQ45) has better performance. In addition, in terms of volatility, this study shows that Islamic index is less risky than LQ45. It is shown from the calculation of beta that almost in each year of dataset except 2010, beta of JII are less than beta of LQ45, meaning that Islamic index is less volatile than conventional index. However, it may not last long, considering the price of oil is, nowadays, very fluctuated while highest constituent of JII index is commodity stocks which their performance is influenced by oil price movement. This condition could be dangerous for the JII volatility. Therefore, it might be needed for the authorities, OJK and IDX, to reconsider the sector diversification of JII con-

Table 7. Regression result showing long run coefficients

Independent Variables	Dependent Variable	
	(1) JII	(2) LQ45
LNUSD	1.127	0.7260
LNOIL_PRICE	0.100	0.1050
BI_RATE	-13.539**	-11.7260**
FED_RATE	-0.135	-0.1210
LNNET_FOREIGN	0.376**	0.3620**
LNCPI	-12.304**	-9.8700
LNPROD_INDEX	0.331	1.1800
LNM2	-1.157	-1.0548
BREAK	-0.411	-0.4850
C	64.422**	51.1790**
@TREND	0.075**	0.0610**
Observations	116	116

Notes: (i) highlighted coefficients showing that its effect is larger than its counterpart
(ii) ***p<0.01, ** p<0.05, * p<0.1

stituent or JII portfolio e.g. by adding the number of JII stocks instead of 30 stocks, or establishing new formula and requirement for stocks to be listed in JII index so that JII constituent is not only dominated mostly by one certain sector.

We also implement model, represented by Autoregressive Distributed Lag (ARDL), consisting some variables that may influence the performance of JII index and LQ45 index. It is also applied to investigate the reason of the outperformance of either JII index or LQ45 index in certain years. The result show that in the short run JII performance is more driven by BI rate and crude oil price, whereas LQ45 performance is more affected by exchange rate (USD), net foreign flow, and consumer price index. It is in line with the study of Sakti and Harun (2013) which stated that, interestingly, external factors are less affecting Islamic index than conventional index.

It is a challenge for the authorities, mainly OJK and IDX, to promote Islamic index, also to inform and to educate people, particularly

whom concern of sha'riah principles, that there is no significant difference on performance between Islamic index and conventional index, and that Islamic index is less volatile than conventional index. In fact, it is less influenced by external factors and sentiments e.g. exchange rate and net foreign flow, compared to conventional index. Some specific actions could be applied by OJK and IDX to promote Islamic index such as: (1) reducing transaction fee for shari'ah account and Shari'ah ETF (*Reksadana Syariah*), (2) educating society and promoting Islamic index through several events held in universities, schools, communities, and institutions, (3) tightening the control and supervision of trading involving shari'ah stocks to prevent illegal acts, especially pumping and dumping stock price², harming investors so that shari'ah account investor feel more secure and safer, and importantly it also prevents the violation of shari'ah principles such as *gharar* (speculating) and *maisyir* (gambling). The feeling of secure and safe may encourage potential investors to open a shari'ah account or to buy shari'ah ETF.

² The pumping process involves the price jump of a stock often lures investors to buy the shares without knowing that it is a trap to get money from unaware investors, when it comes to the dumping process, the price of the stock will go down suddenly and drastically, and the late buyer investors, likely new investors, will suffer because of this tricky act.

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