

The Cost of Sharia Investing: Comparative Empirical Study in Indonesian Stock Market

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Abstract

This study attempts to investigate the financial performance of Jakarta Islamic Index (JII) in comparison with more widely known Jakarta Composite Index (JCI). Using historical data from January 2004 to May 2015, we comprehensively measure returns and risk properties of the indices using mean returns, standard deviation, Sharpe ratio, Treynor ratio, Jensen Alpha, and Value-at-Risk, and evaluate their results. We also perform portfolio simulation to assess the diversification capability of JII from strategic asset allocation perspective. Our findings indicate that despite JII outperforms JCI during pre-crisis in terms of raw and risk-adjusted returns, it underperforms JCI in all other sub-periods. Meanwhile, in terms of risk characteristics, we find that JII is a clear inferior to JCI. Thus, in overall we argue that there is a substantial cost associated with Sharia investing in Indonesian Stock Market. Nevertheless, simulation results indicate that JII could serve as a valuable portfolio diversification tool, in which it succeeds in lowering the risk of the whole portfolio.

Keywords: Islamic finance; Islamic stock index; Indonesian stock market; Sharia investing

1. Introduction

Islamic finance has been constantly gaining attention during the last decade due to its massive potential and currently not-so-exploited nature. The main feature that distinguish Islamic finance to its conventional counterpart is the way it is being carried out, in which it has to comply with Islamic law (Sharia). In order to comply with such law, there is a strict prohibition of interest in any financial transaction. This very nature makes the need for equity-based financial instruments considerably higher in Islamic finance (Iqbal, 2001). Thus, many investors who would like to comply with Islamic law tend to turn to equity markets as the source for their profits. Unfortunately, not all stocks listed in the stock markets are representing the ethical value of Islamic law. Many of the listed companies exhibit considerable elements of prohibited activities in their businesses. In order to help Islamic investors screen their potential

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investments, Islamic indices are constructed. These indices screen stocks and sort out the companies with unethical activities (from the perspective of Islamic law).

The first Islamic indices made their debuts in late 1990s, with the first index being the DMI 150 (Dar al Mal al-Islami), which was jointly launched on April 1998 by Swiss-based Faisal Finance and Bank Vontobel. The index tracks the performance of 150 selected largest global public companies. Since this debut, the awareness of the potential of Islamic finance spread around the globe, influencing main financial market institutions to launch their own Islamic indices to tap the Islamic financial market. In 1999, two of the world's largest stock markets launched their versions of Islamic index, in which Dow Jones constructed Dow Jones Islamic Market Index (DJIMI) on February and FTSE created Global Islamic Index Series (GIIS) in October. This trend was halted by the dotcom bubble during early 2000s, but regained its momentum in mid 2000s, with Standard & Poor's launching of its Islamic index family in 2006 and MSCI published its version in 2007.

The emerging markets, especially those with significant portion of Islamic population also went on with the trend. In Malaysia, Kuala Lumpur Stock Exchange (KLSE) launched Kuala Lumpur Stock Exchange Sharia Index (KLSI) on April 1999 as the main indicator for Islamic equities in KLSE. In Indonesia, the Jakarta Stock Exchange (now Indonesia Stock Exchange) introduced Jakarta Islamic Index (JII) on July 2000. Bombay Stock Exchange (BSE) in India joined the trend in 2010 by publishing its first Islamic index which tracks 50 largest and most liquid stocks. Other emerging markets such as Egypt, Saudi Arabia, Pakistan, Turkey, Bahrain, and even Taiwan have also introduced their own versions of Islamic index in each stock market.

In order to be included in the Islamic indices, a particular stock must go through a set of selection criteria. While there may be discrepancies in the criteria used among the countries, the screening process typically consists of two steps: 1) screening of companies' business activities; and 2) screening of companies' financial ratios. In the first step, the main purpose is to exclude companies which engage in prohibited activities, such as pornography, arms dealing, gambling, and pork and alcohol trading. In the second step, the main purpose is to exclude the companies which engage too much in interest and unlawful income, typically by screening their debt ratio (El Gamal, 2006).

Given considerable restriction placed on the portfolio, we develop an interest on how this particular Sharia law-based restriction affects the portfolio performance. Thus, in this study, we perform a comprehensive comparison analysis between a Sharia-restricted Jakarta Islamic Index (JII) and non-restricted Jakarta Composite Index (JCI) using a set of measures, including Sharpe (1994) and Treynor (1965) ratios, Jensen (1968) alpha, and Value-at-risk (VaR) methodologies. Furthermore, we also simulate portfolio returns and risk properties to explore the capability of JII as a tool of diversification from JCI. We find that the JII exhibit a fairly inferior performance in terms of risk-adjusted returns compared to JCI except during pre-crisis sub-period. Meanwhile, in all risk measures, JII is associated with persistently higher risk compared to its conventional peer. On the other hand, the study also suggests the possibility of JII being a potential tool for investors to reduce their strategic portfolio risk.

The remainder of this paper is organized as follows. Section 2 reviews previous studies and issues raised. Section 3 discusses about the data and methodology used in the study. Section 4 analyzes the empirical results, and section 5 concludes.

2. Literature review

A number of studies have analyzed the performance comparison between Islamic indices and their conventional counterparts. Several studies focus on the return performance of the indices, while others discuss the indices' risk properties. One of the earliest studies on the return performance comparison is Hakim and Rashidian (2004). They compare the Dow Jones Islamic Market Index (DJIMI) with Dow Jones World Index (DJW) and another socially-responsible index, the Dow Jones Sustainability Index (DJS) between 2000 and 2004. The study finds that the DJIMI considerably underperforms DJS, but has lower risk than broad market (DJW). They also provide evidence against the argument that investors are harmed by using DJI as benchmark instead of DJW.

Hassan et al (2005) investigate the performance characteristics between DJIMI and Dow Jones Index – Americas (DJI-Americas). Utilizing comprehensive measuring tools such as Jensen alpha, Fama and French (1993) 3-factor models, and Carhart (1997) 4-factor model, they find that the expected returns for sharia-screened portfolios are higher than their conventional peers. Also, investors are not exposed to adverse effects on using Islamic indices, and can expect as much return as they would gain from a conventional fund.

Hussein (2004) compares the performance of FTSE Global Islamic Index (GII) and FTSE All-world index between 1996 and 2003. He finds that GII performs as well as the All-world Index, and possess no adverse effect on investment performance. He also finds that the alpha of GII is positive during bull, but negative during bear market. Hussein (2007) further extends the study to include DJIMI and DJW and achieves similar conclusion. However, in this further study, he also finds that both Islamic indices (GII and DJIMI) are riskier than their counterparts, measured by their betas.

Interestingly, even though similar data and indices are used, but some researchers reported different results, as we witness in the discussion of indices performances with regards to financial crisis. For example, Al-Khazali et al (2013) report that Dow Jones Islamic indices outperform their conventional peers during global financial crisis (2008) and also in meltdown economy afterwards. A year later, Ho et al (2014) provide supporting results to that argument, i.e. they analyze the performance of a group of Islamic indices (12 indices from 8 countries) and match them with conventional peers and find (under Sharpe, Treynor, and Jensen measures) that Islamic indices outperform conventional ones during two crises (dotcom crisis in 2002 and global financial crisis in 2008), while being inconclusive during post-crisis period. Meanwhile, using similar measures (Sharpe, Treynor, and Jensen), Jawadi et al (2014) compares the performance of Dow Jones Islamic indices and MSCI indices in three separate geographical regions (the World, US, and EU). They find that Islamic indices have slightly better performance during run-up to the crisis, but are inferior to their conventional counterparts during crisis. Then, Islamic indices outperform their peers again in post-crisis period, suggesting that investors take shelters in Islamic stocks.

On the other side, taking the focus on risk properties of the index, one of the earliest literatures is Hakim and Rashidian (2002), in which they used Engle and Granger (1987) cointegration technique to evaluate the relationship between DJIMI, Wilshire 5000 index, and Treasury Bills from 1999-2002. They find the absence of cointegration between DJIMI and Wilshire 5000 index. Using Vector Error-Correction Model (VECM), they also conclude that both Wilshire 5000 and T-Bills do not cause changes in DJIMI, suggesting that there is another factor influencing DJIMI, raising a possibility for DJIMI to serve as a potential diversification tool.

Al Zoubi and Maghreyeh (2007) produce one of the most notable studies on this topic, in which they compare the risk of DJIMI and Dow Jones World (DJW) during 1996-2005. Using RiskMetrics and two

student-t APARCH methodologies to estimate the Value-at-Risk, they find that the DJIMI is less risky than DJW. They also conclude that the sharia filtering process results in a set of unique companies and did not adversely affect the index performance.

Another study that investigates the cointegration between Islamic and conventional index is Khamlichi et al (2014), in which they evaluate whether a cointegration is apparent between the pair of indices in 4 index families. As Hakim and Rashidian (2002) do, this study also uses Engle and Granger (1987) cointegration technique. While they find no cointegration between Islamic and conventional peers in the Dow Jones and S&P index families, they find existing cointegration in FTSE and MSCI families. They also perform random-walk test on the index pairs and find that the Islamic and conventional indices possess similar level of efficiency.

As for Indonesian market, to the best of our knowledge, there has not been sufficient scrutiny over the Islamic indices in Indonesia conducted by financial researchers. One of the most known studies is Sukmana and Kholid (2012), which examine the risk performance of Jakarta Islamic Index (JII) compared to Jakarta Composite Index (JCI) during 2008 crisis. Utilizing ARCH and GARCH methodologies, they find that the JII is less risky than JCI. They also conclude that during the crisis, JII is proven to be more resilient than JCI.

Previous studies on this topic manage to yield varying results on how the performance of Islamic indices compares to its conventional peers. A considerable majority seems to support the argument that Islamic indices perform better (either in terms of returns or risks) than conventional indices. This leads us to investigate and provide empirical evidence on whether similar phenomenon also applies in Indonesian stock market.

3. Data and methodology

Jakarta Islamic Index (JII) was introduced on July 3rd, 2000 by Jakarta Stock Exchange (now Indonesia Stock Exchange), in cooperation with PT Danareksa Investment Management. It is one of two known Islamic indices in Indonesian equity market (another being the ISSI, the Indonesian Sharia Stock Index which was recently launched in 2011). In order to attain more reliability in its calculation, the historical data for JII calculation reached as far as 1995. The methodology for JII calculation is identical to that of Jakarta Composite Index (JCI), i.e. market-value weighted average index with Laspeyres formula using 1995 as the base year, at the original index value of 100. JII consists of 30 member stocks, and is being re-evaluated every 6 months. The selection process in determining the members is based on following criteria:

1. Eligible stocks are screened and selected sharia-compliant stocks included in “Sharia Emittent List” published by Indonesian Financial Services Authority (the “OJK”). The eligible stocks are screened on the basis of their business operations and financial ratios to exclude the companies that engage in a substantial amount of prohibited activities.
2. 60 stocks with highest capitalization values in the last 12 months are picked from the list.
3. Among them, 30 stocks with highest liquidity level (as defined by transaction values) in the last 12 months are selected as JII member stocks.

This study uses monthly data of JII and JCI from January 2004 to May 2015. In order to construct a more robust analysis, the period of study is divided into 3 groups: pre-crisis (2004-2007), crisis (2008-2009), and post-crisis (2010-2015). It is worth noting that we also performed undocumented analysis under similar method using weekly data and yield similar results.

This study compares the performance of JII and JCI in order to determine whether there is any opportunity cost associated with following (taking as a benchmark) JII instead of the broader JCI. The comparison is performed on the basis of various measures, both return (raw and risk-adjusted) and risk. For the raw return, the study uses mean monthly index return and Holding Period Return (HPR) of the index over horizon period. The Sharpe ratio, Treynor ratio, and Jensen alpha are used as proxies for risk-adjusted return measures. The risk measures uses standard deviation (σ) as a measure of total risk and Value-at-Risk (VaR), both historical and analytical methodologies. As needed by some of the measures, the 1-year Indonesian Government Bond (IGB) yield is used as the risk-free rate (R_f).

This study defines current period index return as the logarithm of current level of the index divided by the level in the previous period. The formula is used to measure both monthly index return and HPR. Mathematically speaking, the index return is:

$$R_{it} = \log(p_{it} / p_{it-1}) \quad (1)$$

where p_t = value of index at time t

One would not be able to grasp the full picture by independently analyzing returns and risk of the portfolio without considering the joint effect of both properties. In this case, the study employs three risk-adjusted return measures to more effectively analyze the return of the index. Firstly, the Sharpe (1994) ratio is defined as the excess return of the index over risk-free rate per unit of total risk. Higher Sharpe ratio translates into better the performance of the index. To calculate Sharpe ratio, the following formula is used:

$$\text{Sharpe} = (R_{it} - R_f) / \sigma_{it} \quad (2)$$

where R_{it} = return on index i at time t ; R_f = risk-free rate; σ_{it} = standard deviation of index i over period t

Secondly, the Treynor (1965) ratio measures the excess return of the index over risk-free rate per unit of systematic risk. It is important to note that the only difference between Treynor ratio and Sharpe ratio is the measure of risk used, in which Treynor ratio uses only systematic risk (represented by β), while Sharpe ratio uses total risk (as represented by standard deviation). As in Sharpe ratio, the higher the

Treynor ratio, the better the index performance is concluded. The Treynor ratio is calculated using the following formula:

$$\text{Treynor} = (R_{it} - R_f) / \beta_{it} \quad (3)$$

where R_{it} = return on index i at time t ; R_f = risk-free rate; β_{it} = beta of index i over period t

Finally, Jensen (1968) alpha measures the excess return exhibited by the index over the benchmark chosen (R_m) over a period of time. In order to calculate the alpha, a regression analysis is performed on the JII excess returns over JCI excess returns. The regression analysis evaluates the alpha by estimating the Capital Asset Pricing Model (CAPM), which is defined as:

$$R_{it} - R_f = \alpha + \beta (R_m - R_f) + \varepsilon_{it} \quad (4)$$

where R_i = return on index i ; R_f = risk-free rate; R_m = return on benchmark

The study also employs Value-at-Risk (VaR) methodologies to measure the index risks. VaR is defined as the minimum loss an index is expected to bear at certain percentage of probability over particular investment horizon. There are two types of VaR calculation that will be used in this study: historical and analytical VaR. Historical VaR is evaluated by plotting the historical returns of the index into a return distribution and evaluate a certain percentage's percentile value. For example, 5% historical VaR is the value at 5th percentile of the distribution. Meanwhile, analytical VaR is calculated based on the following formula:

$$\text{VaR at } x\% = R_i - (z_x \times \sigma_i) \quad (5)$$

where R_i = return on index i ; z_x = z-value of $x\%$ probability; σ_i = standard deviation of index i

Furthermore, the study also simulates portfolio in order to explore the possibility of utilizing JII as a mean of strategic portfolio diversification. This may sound unreasonable idea due to the fact that all of JII member stocks are also the members of a more complete JCI, but as several studies suggests (Hakim and Rashidian, 2002; Khamliche et al, 2014; Jawadi, et al, 2014), there exists the potential of using a sharia-based index to diversify an investor's portfolio, which results in lower overall portfolio risk.

4. Results and discussions

Table 1 presents the descriptive statistics of both JII and JCI. From the table, it can be inferred that in terms of mean monthly returns, JII is inferior to JCI in the entire period and sub-periods except in pre-crisis sub-period (2004-2007). During the pre-crisis period, JII outperforms JCI by posting in average 1.286% of monthly returns, compared to JCI's 1.196%. However, during the crisis the JII suddenly underperforms JCI (an average loss of 0.348% compared to 0.145% of JCI) and is not able to subsequently return to superiority after the crisis has passed. This result suggests that investors tend to consider JII to be a riskier index than JCI, in which the investors are comfortable with holding it during the time of high confidence, and run from it during time of panic. During the time of panic, investors shifted their holdings back to their main benchmark, i.e. the JCI which they consider as having lower risk.

This notion is backed by another finding that can be inferred from the table, i.e. the fact that JII has persistently higher standard deviation during all periods in consideration. Since the standard deviation is the widely accepted measure of total risk, this fact could be the reason why investors consider JII as having higher risk than JCI.

This trend continues with the Holding Period Returns (HPR), in which the HPR of JII is lower than JCI in entire period and sub-periods except during pre-crisis. The HPR can be considered as the total cumulative return an investor could obtain if she buys a unit of security (or index) and holds it for a particular period. In this case, the HPR for JII is superior to JCI during pre-crisis, but suddenly underperforms the JCI during crisis and post-crisis, resulting in the entire period HPR for JII being 11.34% lower than JCI (JII's 74.533% compared to JCI's 84.061%).

Next, the study tests the properties of the data to determine normality and identify heteroskedasticity problem within the dataset. The distribution of the dataset during all periods and sub-periods seems to be negatively skewed, as shown by the negative values of skewness measure in all sub-periods. The distribution's kurtosis is consistently higher than the common kurtosis level of a normal distribution, i.e. 3. Thus, in order to more accurately determine the normality of the data, we perform Jarque-Bera (skewness-kurtosis) normality test. According to the result, the Jarque-Bera probability value for both JII and JCI distributions are zero, thus leading us to reject the null hypothesis of the data being normally distributed. As for heteroskedasticity test, we perform Breusch-Pagan test and obtain a chi-square value of 14.53, which is significant at 5%, implying that the dataset exhibits a heteroskedasticity problem. Consequently, in order to construct a reliable regression model, the study needs to resort to using Generalized Least Square (GLS) method instead of Ordinary Least Square (OLS) method when estimating CAPM. The detail of descriptive statistics and data properties test is presented in table 1.

4.1. Risk-adjusted returns

The next step is to analyze and compare the risk-adjusted returns of JII and JCI. Firstly, the study analyzes the Sharpe and Treynor ratios of both JII and JCI. Table 2 shows the Sharpe and Treynor ratios of both indices under periods in consideration. Under Sharpe and Treynor measures, similar phenomenon is also visible, in which JII is inferior (i.e. having lower ratio) to JCI except during pre-crisis. Under both measures, JII outperforms JCI during pre-crisis by scoring 0.415 in Sharpe ratio and 0.213 in Treynor, both are higher than JCI's 0.358 and 0.008, respectively. But that condition is reversed during crisis, in which JII suffers higher losses than JCI, making their Sharpe and Treynor ratios look worse than JCI (-0.212 and -0.016 compared to -0.190 and -0.009 respectively). In the end, JII fails to retake superiority in the period after crisis by again posting lower ratios than JCI. The detail of Sharpe and Treynor ratios is presented in table 2.

Table 1. Descriptive statistics of the dataset

Measure	All		Pre-crisis		Crisis		Post-crisis	
	JCI	JII	JCI	JII	JCI	JII	JCI	JII
Mean Returns	0.618%	0.548%	1.196%	1.286%	-0.145%	-0.349%	0.482%	0.346%
St Deviation	2.790%	3.088%	2.246%	2.485%	4.796%	5.261%	1.915%	2.128%
Skewness	-1.774	-1.096	-.690	-.374	-1.384	-.658	-.554	-.791
Kurtosis	12.124	7.645	3.495	3.756	6.279	3.823	3.417	4.012
Jarque-Bera	54.53**	32.13**						
Probability	0.000	0.000						
Breusch-Pagan		14.53**						
Probability		0.0001						
HPR	84.061%	74.533%	56.192%	60.457%	-1.563%	-8.447%	30.060%	20.522%

Note: ** = significant at 5%; HPR is calculated using the same return formula, i.e. $R_{it} = \log(p_{it} / p_{it-1})$

Table 2. Sharpe and Treynor ratios

Ratio	All		Pre-crisis		Crisis		Post-crisis	
	JCI	JII	JCI	JII	JCI	JII	JCI	JII
Sharpe	-0.010	-0.035	0.358	0.415	-0.190	-0.212	-0.003	-0.067
Treynor	0.000	-0.002	0.008	0.213	-0.009	-0.016	0.000	-0.049

Besides Sharpe and Treynor ratios, Jensen alpha is also a widely used measure for risk-adjusted returns. In order to evaluate the alpha of the indices, this study performs GLS regressions using Capital Asset Pricing Model (CAPM) as its basis. Table 3 shows the result of the GLS estimation. From the table, we can see that the alpha of JII is 0.009, which is positive and significant (at 10%) during pre-crisis sub-period. This finding means that JII is able to achieve higher risk-adjusted returns over JCI (as the benchmark) during this sub-period. However, when the crisis ensues, JII's alpha turns negative, despite not being significant. The negative-but-not-significant alpha persists even after the crisis is resolved. We might not be able to conclude significance of the alpha from the result, but at least the result suggests that during crisis and post-crisis, JII achieved slightly lower returns than JCI. This result is in line with several previous findings (Hussein, 2004 and Jawadi et al, 2014), in which JII outperforms JCI in pre-crisis sub-period but underperforms afterwards.

We can also infer another interesting finding from table 3 with regards to JII's beta. Despite the results for entire period show statistically significant beta, but the beta value is still relatively low (0.475). Moreover, we can also infer from the table that the main source of the beta value and its significance comes from the crisis period. During the pre-crisis period, the beta value of JII is very low (0.046) and insignificant. This suggests that the JII does not move in tandem with JCI as its benchmark. This also raises the possibility of JII being considered a tool for portfolio diversification, due to the notion that a good diversification tool must not move in similar fashion with the benchmark, thus having a low beta. However, during crisis period, the beta of JII skyrocketed up to 0.708 level, and is statistically significant (at 5% level). Then,

when the crisis is resolved, the beta value drops back to 0.029 level and back at being statistically insignificant.

The findings on the beta are also supported by the calculation of Pearson correlation between JII and JCI. In overall period, the correlation between the two indices is 0.371, which is still considerably low. However, when we break down the analysis into sub-periods, we observe similar behavior as in beta. The correlation between JII and JCI in both pre- and post-crisis are very low (both are lower than 0.1), while during crisis the correlation escalates very significantly to 0.629 level. Proven by beta and Pearson correlation analysis, one possible explanation for this phenomenon is that during crisis, all securities in one market (and even between markets) are more cointegrated with each other, and thus more likely to move in tandem. Schiller (2000) explains this phenomenon in his “irrational exuberance” theory, which states that during crisis, investors are exhibiting irrational behavior, i.e. herding behavior. Under this situation, investors ignore their rationally considered decisions and tend to go along with the crowd, thus resulting in massive selloff during crisis without any sound investment basis.

The detail of GLS estimation and Pearson correlation table is presented in table 3.

Table 3. GLS estimation results

Model: $R_{it} - R_f = \alpha + \beta(R_m - R_f) + \varepsilon_{it}$; where R_{it} = return on index i at time t ; R_f = risk-free rate; R_m = return on benchmark. z-values are presented in parentheses

Measure	All	Pre-crisis	Crisis	Post-crisis
α (Jensen's α)	-0.001 (-0.36)	0.009* (1.76)	-0.005 (-0.53)	-0.001 (-0.53)
β	0.475 (5.04)	0.046 (0.2)	0.708** (3.95)	0.029 (0.21)
Pearson Correlation between JII and JCI	0.371	0.045	0.629	0.014

Note: * = significant at 10%; ** = significant at 5%;

4.2. Value-at-risk (VaR)

The results from previous section shows that in terms of standard deviation (a measure of total risk), JII is a clear inferior to JCI in all periods in question. In this section, we evaluate the index risks by applying Value-at-Risk (VaR) methodology. VaR is defined as the minimum loss that an index is expected to bear at certain level of probability. We employ two types of VaR methodology, i.e. historical and analytical and apply 5% probability in our calculation. Table 4 presents the VaR of both indices. From the table, it is clear that JII persistently has bigger negative value than JCI in all periods in consideration. Both analytical and historical VaR methodologies yield similar results. This means that at 5% probability, JII is more likely to suffer from bigger losses than JCI. This is in line with previous findings with regards to the risk properties of both indices, in which JII is inferior to JCI. In other words, JII is riskier than JCI. The detail of the results of VaR calculation is presented in table 4.

Table 4. Value-at-risk at 5% probability using historical and analytical methods

VaR	All		Pre-crisis		Crisis		Post-crisis	
	Method	JCI	JII	JCI	JII	JCI	JII	JCI
Historical		-3.641%	-4.714%	-2.942%	-3.510%	-6.864%	-8.200%	-3.522%
Analytical		-3.985%	-4.546%	-2.510%	-2.813%	-8.059%	-9.030%	-2.677%

4.3. Portfolio simulation

Hakim and Rashidian (2002), Al Zoubi and Maghreyeh (2007), Khamlich et al (2014) and Jawadi, et al (2014) studies suggest the notion of utilizing Islamic index in a market portfolio as a tool for diversification. One of the needed characteristics for a good diversification tool is that it has lower systematic risk (measured by beta) to the benchmark. In our study, we find that the beta of JII (with JCI as benchmark) is very low during non-crisis sub-periods, i.e. both pre- and post-crisis, meaning that JII is less likely to move in tandem with JCI. Even during crisis sub-period where the beta rises significantly, it only reaches a 0.708 at maximum, which is considerably low. This result also implies that JCI is not a significant factor of explaining the returns of JII. Thus, for investors who base their benchmark on JCI, they might be able to obtain diversification benefit by investing in JII as well. In order to better assess this possibility, we perform portfolio simulation, in which we compare between two portfolios: one with 100% invested in JCI, and others with a certain percentage also invested in JII. Then, the portfolios are evaluated on the basis of their returns and risk characteristics. Table 5 presents the results of this portfolio simulation.

Based on table 5, we can see that by diversifying the market portfolio (JCI) into JII, the portfolio's risk gradually decreases. All risk measures in consideration (standard deviation and VaR methodologies) exhibit downward trend in its values as we increase the allocation to JII. However, it seems that the reduction in risk, especially the total risk (measured by standard deviation), is slower than the decrease in mean return. As we observe the effect of diversification in Sharpe ratio, the ratio gradually declines, suggesting that the return drops faster than the reduction in total risk. Thus, although we are able to achieve decreased risk by diversifying into JII, but the portfolio's risk-adjusted return actually worsens. This finding might be an impediment for the investment managers whose performances are measured on the basis of risk-adjusted returns not to diversify its market portfolio to JII. The detail of the results is shown in table 5.

Table 5. Portfolio simulation results

Measure	100% JCI	90% JCI + 10% JII	70% JCI + 30% JII	50% JCI + 50% JII
Mean Returns	0.577%	0.569%	0.552%	0.535%
Standard Deviation (σ)	2.891%	2.750%	2.573%	2.558%
Historical VaR @5%	-3.641%	-3.288%	-3.097%	-2.796%
Analytical VaR @5%	-4.194%	-3.969%	-3.693%	-3.685%
HPR	62.665%	61.654%	59.632%	57.610%
Sharpe	-0.010	-0.013	-0.021	-0.027
Treynor	0.000	0.000	-0.001	-0.001

4.4. Discussion

A considerable majority of previous literatures seem to support the argument that Islamic indices tend to have better return performance and risk properties than their conventional peers. However, in overall, this particular study is particularly interesting in the sense that it lends support to the opposite side. The findings in this study contradicts previous results, mainly Sukmana and Kholid (2012) which use similar sample in Indonesian capital market, in which they suggest that JII has better risk properties than JCI. Moreover, our findings also contradict several previous studies which analyze various indexes in various countries, such as Hakim and Rashidian (2002), Hassan et al (2005), and Ho et al (2014) which mainly conclude that Islamic indices have higher risk-adjusted returns than their conventional peers, and with Al Zoubi and Maghreyeh (2007) which indicates that Islamic indices have better VaR characteristics. Nevertheless, our results share an interesting “partial” similarities with Hussein (2004) and Jawadi et al (2014), in which they also indicate that Islamic indices outperform conventional ones during run-up to the crisis but underperform afterwards.

Our proposed explanation of the opposite argument this study has taken is due to the fact that JII is inherently less diversified than JCI, thus fundamentally possesses larger risk. As we know, JII contains only 30 stocks, a number which lies on the edge between fully diversified and not fully diversified according to Markowitz's rule of thumb. This less-diversified status of JII may explain its greater risks compared to fully-diversified JCI, in the sense that there is still some degree of company-specific risks left in the index. In other words, the leftover company-specific risks in JII might be responsible for its greater risk measures. The status of Indonesian capital market, which is still not efficient, might also worsen the situation, so that a greater number of stocks are needed in an index or portfolio in order to eliminate all possible unsystematic risks. All in all, this phenomenon warrants further studies in order to investigate whether the underperformance of JII continues to occur in extended period, and also to explore the factors responsible for explaining the returns of each index.

5. Conclusion

This study investigates the financial performance of Jakarta Islamic Index (JII) compared to its better-known conventional counterpart, the Jakarta Composite Index (JCI) over three sub-periods: pre-crisis, crisis, and post-crisis. This study also attempts to assess JII's potential as a possible diversification alternative. In order to arrive at the conclusion, we evaluate the performance using a set of returns and risk measures, including the Sharpe, Treynor, Jensen Alpha, and Value-at-Risk (VaR), and we perform a portfolio simulation to demonstrate and analyze the diversification capability. Our results suggest that JII has lower raw and risk-adjusted returns in all sub-periods except during pre-crisis, as shown by the mean returns, HPR, Sharpe and Treynor ratios, and Jensen Alpha. JII is even more inferior in terms of risk, in which this study finds that the JII has greater number in all evaluated risk measures (standard deviation, and analytical and historical VaRs). All our results converge to indicate a considerable inferiority of JII in term of financial performance to JCI, thus we conclude that there is a considerable cost associated with investing in Sharia way, in this case by using JII as investment benchmark instead of JCI. Nevertheless, from our analysis of JII's capability of diversification, the results confirm that very possibility. Our portfolio simulation results indicate that portfolio diversified by using JII has lower risk measures than those are not.

Our results have implication for both individuals and institutions in establishing their investment portfolio allocation. The higher risk characteristics of JII may not be a wise choice for risk-averse investors who

seek lower absolute risk in a stand-alone asset class. Also, during a crisis, it is also unwise to invest in JII since it is proven to underperform JCI. Nevertheless, taking a perspective of strategic asset allocation, investing in JII may prove to be a possible way to reduce one's overall investment portfolio risk, despite on the price of faster decline of returns. Future research on this study should incorporate a wider range of indices in its analysis, and it is also advisable to employ more sophisticated analysis tools, especially in order to assess the risk properties of the index more accurately. Further analysis on identifying the factors responsible for the return and risk properties for JII is also warranted.

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