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PERFORMANCE OF SYARIAH AND COMPOSITE INDICES: EVIDENCE FROM BURSA MALAYSIA

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ABSTRACT

This study provides new evidence on the risk and return performance of the Kuala Lumpur Syariah Index (KLSI) and the Kuala Lumpur Composite Index (KLCI). An Islamic stock market index such as KLSI selects stocks according to Islamic laws, and thus has a more stringent screening process than its conventional counterpart, KLCI. Our results, however, provide no evidence of significant statistical differences in risk-adjusted returns between Islamic and conventional stock market indices during 1999–2005. We also employ the causality and Johansen cointegration tests to examine their short- and long-run relationships. Besides a significant short-run presence of bidirectional causality, the long-term equilibrium indicates that both indices move in tandem. This suggests that the movement in KLCI gives a good indication as to where KLSI will move in the short-run and long-run. Therefore, prediction of one based on the other is constructive.

Keywords: Islamic compliant stocks, Islamic index, Syariah index

INTRODUCTION

The general perception of ethical investment is that the ethical investor is likely to earn portfolio returns that are below the market portfolio return. It is argued that ethical investing will under-perform over the long term because ethical investment portfolios are subsets of the market portfolio, and lack sufficient diversification (Bauer, Otten & Rad, 2006). However, the results from past studies on the performance gap between ethically screened and unscreened investments are mixed, with several of these studies reporting no statistically significant differences in their returns. For instance, Diltz (1995), Guerard (1997) and Sauer (1997) conclude that there were no statistically significant differences between ethical and non-ethical portfolios in the US. Kreander, Gray, Power and

Sinclair (2005) analyze 40 Socially Responsible Investment (SRI) funds in seven developed countries (Belgium, Germany, Netherlands, Norway, Sweden, Switzerland and the UK), and they conclude that SRI and conventional funds exhibit a very similar performance.

Investment in Islamically compliant stock is based on the Islamic principles of transactions (*Mu'amalat*), and hence, in our view it also falls into the category of ethical investment. Unlike studies on the financial performance of ethical and conventional funds in developed countries, there is little existing empirical literature on the performance of Islamic stock market indices vis-à-vis conventional stock market indices using stock data from developing countries. Thus, this paper examines the financial performance of an investment portfolio comprised of only Islamically compliant stocks, and compares its performance with the conventional stock market index in the Malaysian stock market. The KLSI of Bursa Malaysia Stock Exchange is an average price of Islamic compliant stocks, while the KLCI represents the average price of 100 stocks comprising both Islamic and non-Islamic compliant stocks. The former represents a proxy for ethical/screened investment, while the latter is a proxy for unethical/non-screened investment in this study. The KLSI was launched on 17 April 1999 to "cater for increasing demand by local and foreign investors who seek to invest in securities and instruments which are in line with Syariah principles."[1] Investors seeking to make investments based on Islamic laws now have a benchmark for making superior decisions. KLSI was initially comprised of 279 companies as of 17 April 1999. However, it has grown to 826 companies as of April 2005, comprising 84% of the total listed companies on Bursa Malaysia.[2]

The objective of this paper is twofold. First, we provide evidence of any significant differences between the performance of ethically screened investment and unscreened investment in the case of Malaysia. Following the methods of previous studies, we employ risk-adjusted measurement to compare the performance of KLSI, an Islamic index, to that of KLCI, a conventional stock market index. Our analysis shows that there is no significant difference between the returns for both indices: although the KLSI has lower returns, it also has lower risk exposure than the KLCI. This is in line with the efficient portfolio theory. Our results, however, do not provide clear evidence for the extra cost and lesser diversification benefit associated with screened investments. The second objective is to apply the causality and Johansen cointegration tests to examine their short- and long-run relationships. Our results show that KLCI and KLSI, individually, are non-stationary in the level (i.e. integrated of order 1). On the

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1 http://www.bursamalaysia.com/website/mediacentre/mr/1999/990419.htm/

2 List of Securities Approved by the Syariah Advisory Council of the Securities Commission, 29 April 2005.

other hand, both indices are cointegrated in the long-run (i.e. there is co-movement). The causality test suggests that there is a bidirectional relationship between the two indices.

The remainder of this paper is organized as follows. The next section is literature review and followed by the description of the methodology and data. Later are the results and the conclusion as well as the limitations of the study.

LITERATURE REVIEW

Most of the criticisms facing ethically screened investment (Islamic, ethical, or socially responsible) stem from its contradiction of the principles of the efficient portfolio theory, or modern portfolio theory, of Markowitz (1952). Kettell (2001) defines an efficient portfolio as a portfolio with the smallest risk for a given expected returns or the greatest returns at a given level of risk. This theory is based on rational investors whose goal is to maximize their wealth. The main conclusion of the modern portfolio theory, as argued by D'Antonio, Johnsen and Hutton (1997), is that investors seeking greater expected returns also want to avoid or minimize risk. The minimization of risk is done by holding a group of assets rather than a single one. The process of grouping assets will produce the desired risk-return trade off. This process is known as diversification. Diversification is a "consequence of the imperfect correlations of returns between securities" (Hickman, Teets & Kohls, 1999, p. 73). Hickman et al. (1999) indicate that the lower the correlations of returns between securities, the higher the reduction of risk. Therefore, a well diversified portfolio will only be affected by economy-wide risks or market risks. As a result, traditional investors tend to focus on diversifying their investments to minimize risk and maximize return. The existing empirical literature, however, has not been able to find a significant performance gap between ethically screened and non-ethical screened investment portfolios. The findings of some of these studies are presented below.

Statman (2000) analyzed the performance of the Domini social index (DSI), which is an index of socially responsible companies, and the performance of socially responsible mutual funds against the performance of S&P500 companies in US from May 1990 to September 1998. Using statistical and mathematical techniques such as annualized mean return, standard deviation, Jensen alpha, excess standard deviation adjusted returns, and simple *t*-test for comparing means, he found that the raw returns and risk for DSI were higher than S&P500. However, in terms of returns adjusted to risk, the DSI was lower than S&P500 but not by a statically significant difference. On the other hand, socially responsible funds were found to be less risky and to have lower returns than the S&P500 and the DSI.

In studying the Islamic stock market in Malaysia, Ahmad and Ibrahim (2002) compared the performance of KLSI with that of KLCI over the period from 1999 to 2002. They used various methodologies to investigate the performance, measured by the risk and return of both indexes. Among the techniques used were the adjusted Sharpe ratio (SR), the Treynor Index (TI), the adjusted Jensen Alpha, and the *t*-test for comparing the means. They divided the sample into three periods: the overall sample, the period of growth from April 1999 to February 2000 and the period of decline from March 2000 to January 2002. In comparing the raw returns and risks during 1999–2002, they concluded that for the overall and the declining periods, the return was low for KLSI, while for the growing period the KLSI slightly outperformed the KLCI. In terms of risk, the KLCI was riskier than the KLSI over 1999–2002. When comparing the means, the results were statistically insignificant. In addition, the KLSI reported lower risk-adjusted returns than the KLCI, except during the growing period 1999–2000.

Kreander, Gray, Power, and Sinclair (2005) analyzed 40 SRI funds from seven countries using a matching approach. The countries included were Belgium (1), Germany (4), the Netherlands (2), Norway (2), Sweden (11), Switzerland (2) and the UK (18). The authors applied four criteria for the matching procedure: age, size, country and investment universe of the fund. Similar to the previous studies, they used Jensen's alpha, the Sharpe ratio, and the Treynor ratio as performance measures. They included a measure for market timing in the regression equation for Jensen's alpha. As the market timing of the fund management can significantly bias the calculation of Jensen's alpha, this was an important improvement over to earlier studies. The statistical tests of the differences in the performance measures showed that the Sharpe and Treynor ratios of the conventional funds were slightly higher but not significant, whereas the Jensen's alpha of the SRI funds was higher but only at the 10% significance level. The authors concluded that the SRI and conventional funds exhibit very similar performance.

Hakim and Rashidian (2002) examined the risk and returns of Islamic stock market index in US. They used cointegration analysis and causality analysis to investigate the relationships among the Dow Jones Islamic Market Index (DJIMI), the broad stock market represented by the Wilshire 5000 Index, and the risk-free rate proxies by 3-m T-bill, but found no visible link among them. The results showed that the Islamic index was influenced by factors independent from the broad market or interest rate. This finding provided a different perspective to the claim by Dow Jones Inc. that the index exhibits significant high correlation with the broad market. The new evidence suggested that such correlation was merely temporary and spurious. However, their findings suggested that the Islamic index presents unique risk-return characteristics, which are known as company or unsystematic risk and returns, an observation reflected in a risk profile significantly different from the Wilshire 5000 Index. This result is even more important given the fact that the Wilshire 5000 Index is considerably more diversified than the Islamic index.

Mallin, Saadouni, and Briston (1995) analysed the performance of the ethical and non-ethical funds in the UK using the traditional risk-adjusted measurements such as the Jensen alpha, the Sharpe ratio, and the Treynor ratio. They matched their samples of ethical and non-ethical funds as closely as possible by size and date. Monthly data were collected to investigate the performance of the funds, with the three-month Treasury bill rate as the benchmark risk-free interest rate. The raw returns of 29 matched funds suggest that 12 of the ethical funds outperformed the market while 15 of the non-ethical funds performed better than the market portfolio. The Jensen alpha results show that betas for all the ethical funds are less than unity. However, only five non-ethical funds report beta values of more than unity. Since 21 ethical funds have beta values that are lower than those of the non-ethical funds, they conclude that the ethical funds in general are riskier than non-ethical funds. Their results also show that both funds do not perform better than the market. Between ethical and non-ethical funds, the former report higher returns than the latter.

Hussein and Omran (2005) studied the performance of the Islamic index in the Dow Jones against the Dow Jones index from 1995 until 2003 based on monthly data. The sample was divided into three sub-periods: the entire period, the bull period and the bear period. Their results suggested that the Islamic index outperformed the non-Islamic index both in the entire and bull periods, while the opposite is true for the bear period; however, it was not statistically significant in the bear period. Another study by Hussein (2005) investigated the impact of screening on the performance of FTSE Global Islamic Index and DJIMI in both the short-run and long-run against their counterparts, the Dow Jones World Index and FTSE All-World Index. In general, his study shows that the Islamic index tends to outperform its counterpart during the entire period and the bull period. The Islamic index also earns statistically significant positive returns in the bull period. He therefore concludes that the application of Islamic screening does not have an unfavourable impact on the performance of that index. Another study by Elfakhani, Hasan, and Sidani (2005) investigated the performance of the Islamic mutual funds in several emerging countries (including Malaysia). They find that there is no statistically significant difference between Islamic and conventional funds. Therefore, the screening mechanism does not affect the performance of Islamic investments.

Conclusively, there is no clear evidence that ethically screened investment portfolios tend to under-perform conventional funds. As discussed above, several of the past studies report otherwise. That is, some ethical mutual funds, including Islamic funds, perform as well as, if not better than the conventional investments. It is possible for the socially responsible investors to earn maximum possible investment returns while at the same time being socially concerned about their investment. The argument that there is a financial penalty for being an ethical investor is therefore debatable.

METHODOLOGY

This section is divided into four parts; (1) three separate measurements of risk-adjusted returns, (2) unit root analysis, (3) bivariate Granger causality between KLSI and KLCI, and finally, (4) Vector Autoregression and Impulse Response Analyses. For the data, we compile the daily closing price of the KLSI and the KLCI, as well as the Kuala Lumpur Inter-bank Offer Rate (KLIBOR) representing the risk-free rate over the period from April 1999 to December 2005. These data are compiled from Bank Negara's website, the Perfect Analysis Database and Bloomberg.

Risk Adjusted Performance

Based on the literature review, screened investment is expected to yield lower return than non-screened investment due to its lower level of diversification. Therefore, the first null hypothesis to be tested is

H_1: There is no significant difference in returns between KLSI and KLCI.

The return is measured by the difference of the prices between period t and t–1. In other words, we calculate the returns using the following formula log (P_t /P_{t-1}).[3] Four measurement techniques are used. First, we measure the SR, which is a ratio developed by Nobel Laureate Sharpe to measure risk-adjusted performance. The formula is as follows:

$$SR = \frac{R_i - R_m}{\sigma_i}$$ [4]

[3] Hussein, K., and Omran, M. (2005). Ethical investment revisited: Evidence from Dow Jones Islamic Indexes. *The Journal of Investing, 14*(3), 105–124.

[4] The original model is $S = \frac{\bar{D}}{\sigma D}$ where $\bar{D}$ is the average value of the monthly differences in returns between portfolio and benchmark, and σD is the standard deviation of the portfolio as indicated by Sharpe (1994), pp. 50.

where

R_i : the return on the stock market index (either KLSI or KLCI)
R_m : the return on EMAS index (the benchmark in this study)
σ_i : the standard deviation of the stock market index

Generally, higher SR indicate higher or superior performance, and vice versa. EMAS Index is the abbreviation of Exchange Main Board All-Shares Index. The board is weighted by market capitalization, with a base date of 1 January 1994 and an assigned index value of 100, and 269 companies listed on the base date. As at end of 2005, a total of 646 companies are listed. This index is included to serve as a benchmark in the calculation of the risk performance measures.

Second, the TI performance measure is calculated in this study. It measures returns earned in excess of that which could have been earned on a risk-free investment, per each unit of market risk. The higher the value of the TI, the more return gained per unit of risk. The Treynor ratio is calculated as:

$$TI = \frac{R_i - R_m}{\beta_i}$$

where

R_i : the return on the stock market index (either KLSI or KLCI)
R_m : the return on EMAS Index (the benchmark in this study)
β_i : the beta of the respective stock market index

Third, the Adjusted Jensen's Alpha Index performance (AJAI) is calculated, which represents the average return on a portfolio over and above that predicted by the CAPM, given the portfolio's beta and the average market return. This is the portfolio's alpha, and we compute it using the formula:

$$\alpha = R_i - [R_f + \beta_i(R_m - R_f)]$$

where

R_i : the return on the stock market index (either KLSI or KLCI)
R_m : the return on EMAS index (the benchmark in this study)
β : the beta of the respective stock market index
R_f : the daily three month KLIBOR

The fourth measurement of return is the modified SR formula developed by Statman (1987). This measurement is known as the excess standard deviation-adjusted return, and abbreviated as "eSDAR." It is the excess return of the studied index (Syariah or Composite) over the return of the benchmark (EMAS Index), where the index is leveraged to have the benchmark's standard deviation. The mathematical expression is given as below,

$$eSDAR = R_F + \left(\frac{R_i - R_F}{SD_i} \right) SD_{con} - R_{con}$$

where

R_F : the daily three month KLIBOR
R_i : the return on the stock market index (either KLSI or KLCI)
R_{con} : the return on EMAS index (the benchmark)
SD_i : the standard deviation of the stock market index
SD_{con} : the standard deviation of EMAS index (the benchmark)

Unit Root, Cointegration and Causality

To test the presence of cointegration, we need to perform a unit root test in order to find out whether or not the indices are non-stationary. The Augmented Dickey Fuller test (ADF) is performed to examine the degree of integration between the indices. If the variables are integrated of the same degree (i.e., one or more), then they might have a cointegration relationship. The cointegration test applied here is that of Johansen and Juselius (1990). The purpose of the cointegration test is to investigate the following null hypothesis:

H_2: There is no long-term relationship between screened and non-screened indices.

The existence of a cointegration relationship between two variables implies that there is at least one causal effect running from one variable to the other. However, the direction of the causality is not determined by the cointegration test. To determine the direction of the causation, the Granger causality test is employed. The existence of cointegration between the variables will require the Granger causality to be implemented in the Vector Error Correction Model (VECM); otherwise the bivariate Vector Autoregressive (VAR) model is employed to test causality.

Finally, the Impulse Response Function (IRF) and Variance Decomposition (VD) are used to examine the transmission of innovations between both indices and the degree of endogeneity of each index.

EMPIRICAL RESULTS

Table 1 below shows the growth in the number of companies listed under the KLSI and the total market capitalization of the KLSI from 1999 to 2005. KLSI started with more than 250 companies and increased to 818 at the end of October 2005. The market capitalization increased to represent more than 50% of the total market capitalization of the market.

Figure 1 shows the daily closing prices of both indices. It is apparent from the graph that both indices moved together in the mentioned period. From the graph, the returns of both series seem to move together, suggesting that there is no difference in returns in both indices. Nevertheless, this is only an arbitrary deduction and requires verification.

Table 1
Growth of Syariah Compliant Stocks.

Year	No. of Syariah compliant stocks	Market capitalization (RM billions)
1999	544	270
2000	585	255
2001	636	296
2002	677	289
2003	699	384
2004	778	448
2005*	818	441

Source: Security Commission
Note: *End of October 2005

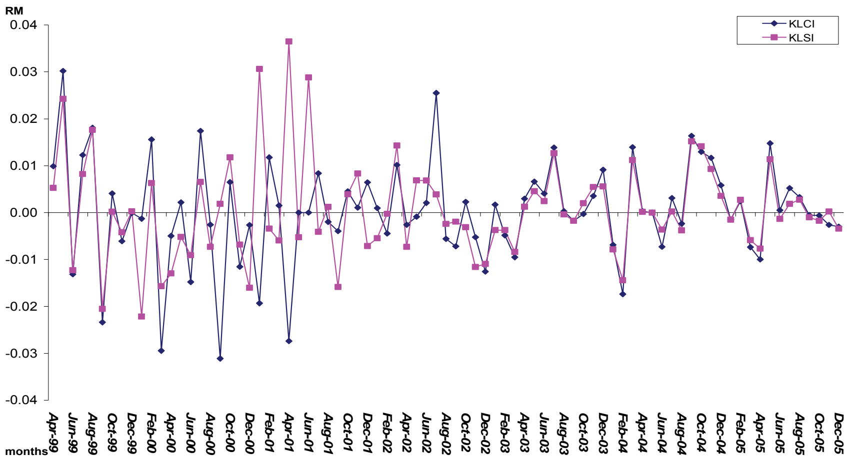

Figure 1. The daily returns for KLCI and KLSI.

Table 2 provides more details on the properties of the daily returns of both indices. The normality test suggests that neither of the returns is normally distributed. The Jarque-Bera (JB) normality test is significant at 1%, suggesting that the null hypothesis of the normality of the data should be rejected, and implying that the series are not normally distributed. Both indices are negatively skewed, in other words skewed to the left and non-symmetric, as reported by Hussein and Omran (2005), Mookerjee and Yu (1999) and Corhay and Tourani (1994), while in terms of kurtosis, they exhibit positive, or platykurtic, values, contrary to the findings reported in most of other studies.

Table 2 also shows descriptive statistics for the returns of both indices. It is clear that the mean return of the KLSI is less than KLCI. This is true for the standard deviation, which is a loose measurement of risk, showing that KLSI is less risky than KLCI. Furthermore, the long-term raw return for both indices, which is measured by the sum of all returns in the period, suggests that KLCI has a superior long-term return than the KLSI.

The simple correlation coefficient is 40%, showing that there is a positive relationship between the indices. However, it is not as strong as reported by Ahmad and Ibrahim (2002) who give a positive value of 96% for the correlation coefficient. This might be because the number of securities listed under KLSI kept increasing, while the securities in KLCI is fixed at 100 since its first

Table 2
Descriptive Statistics of the Daily Returns (1999–2005).

$R_t = LN(P_t) - LN(P_{t-1})$

Property	KLCI (returns)	KLSI (returns)
Mean	0.0002222	0.0001474
Median	0.0105400	0.0098425
Maximum	0.0585049	0.0460604
Minimum	–0.063422	–0.070893
Std. Dev.	0.3726958	0.2472691
Skewness	5.6313127	6.1860376
Kurtosis	–0.1136125	–0.340565
Jarque-Bera	2203.5*	2687.3*
Observations	1677	1677
Correlation between prices	0.405299312*	

Note: *significant at 1%

initiation in 1986. The number of securities incorporated in KLSI has increased from 276[5] in the beginning of the trading period, April 1999, to 826 in April 2005; this might be the cause of the decrease in correlation from 96% to 40.5%.

Difference in Mean

We use a *t*-test to test whether there is a difference between the means of the indices. The result in Table 3 shows that there is no significant difference in mean between the indices. This is consistent with the results of Ahmad and Ibrahim (2002), Statman (2000), and Hussein and Omran (2005) that the returns of ethical investments are not significantly different from those of conventional vehicles. Hence, the screening process in the KLSI does not impose any extra cost on its returns, which is contrary to Rudd (1981).

Risk Adjusted Performance

Table 4 below shows the risk-adjusted returns for each index using four different measurements. The benchmark index is the EMAS Index, which consists of all shares in the Bursa Malaysia's main board. The first measurement is the Sharpe ratio (1994), which takes into consideration the risk in both two types, systematic and unsystematic. As in the results of Ahmad and Ibrahim (2002) and Hussein and Omran (2005), KLSI appears to provide less adjusted returns than KLCI. In addition, market risk (i.e., systematic risk) is used in the second measurement, the TI. The result indicates that KLSI returns are lower than those of KLCI. In the case of AJAI; KLSI is producing lower returns than KLCI. Finally, a look at the risk measured by Beta shows that KLSI is less risky than the KLCI, reflecting the risk-return trade-off.

Table 3
T-test of Mean Differences between Returns of KLCI and KLSI.

Mean difference	t-value	P-value for t-test
0.00008	0.212385494	0.831819215

Table 4
Risk Adjusted Performance and Beta of KLCI and KLSI.

Index	Sharpe ratio	Treynor index	Jensen alpha	Beta	eSDAR
KLSI	0.00301	0.00002972	–0.01245	0.9954	–0.3468278
KLCI	0.00959	0.00010126	–0.00875	0.9968	–0.1434626

[5] http://www.bursamalaysia.com/website/mediacentre/mr/1999/990419.htm/

Finally, the eSDAR confirmed the results found by other measures, where KLSI produced lower returns then the KLCI. This result is in line with previous studies by Cummings (2000), Statman (2000), Hamilton, Jo and Statman (1993) and Hussein and Omran (2005). The fact that KLSI yields lower returns than KLCI could be due to the inclusion of large market capitalization in the KLCI. Claessens, Dasgupta and Glen (1995) report that return on the investment is positively related to size of the investment for developing countries, including Malaysia.

Unit Root and Cointegration

The results in Table 5 indicate that we cannot reject the null hypothesis of unit root, which indicates that both of the indices are not stationary. Subsequently, we performed the same tests on both indices in the first difference. Our unit root test indicates that both series are stationary in the first difference and thus, they are integrated of degree one or I (1). Our results are in line with the literature of financial markets, where stock prices are non-stationary in the level form.

The results for the Johansen cointegration test, which follows the maximum likelihood calculation, are displayed in Table 6. The null hypothesis of no cointegration suggests that the relationship between the series is spurious. Table 6 below shows the results of Johansen cointegration in 24 lags determined by the Akaike information criteria. It is clear that there is only one cointegrating vector, where the null hypothesis that there is no cointegrating vector is rejected based on the maximum eigenvalue and trace statistics. Hence, there is only one cointegration equation in the system, which will be used in estimating the VECM. It can therefore be concluded that there is a long-term relationship between KLSI and KLCI. In other words, there is only one cointegration equation or one equilibrium equation; both series will tend to trend together in the long-term.

Table 5
ADF Unit Root Test for Stationarity.

Index		ADF		
		Intercept	Trend and intercept	None
KLSI	Level (1 lag)	–1.964	–1.95	0.4776
	1st difference (0 lag)	–35.385*	–35.376*	–35.389*
KLCI	Level (2 lags)	–2.047	–2.114	0.6615
	1st difference (1 lag)	–25.17*	–25.163*	–25.164*

*Note:** Significant at 1%

Table 6
The Johansen and Juselius Cointegration Test.

Number of cointegrating vector	Max. eigenvalue	Trace statistics
H_0: r = 0 (no cointegration)	13.5**	16.63*
H_0: r ≤ 1 (at least one cointegrating vector)	3.16	3.16

Note: * and ** significant at 5% and 10%, respectively

In addition, this indicates that the screening mechanism of KLSI might not have any effect on its temporal behaviour as compared with KLCI. In other words, the dropping of companies that are not complying with the selection process will not affect the trend along with the KLCI. This is in contrary to Rudd (1981), who suggested that the selection process would tend to impose more risk and cost on the ethical portfolio. These in return would cause the ethical investment to include fewer and fewer securities.

This result is not in accordance with the results in Hakim and Rashidian (2002), where it was found that DJIMI (Islamic index) is not cointegrated with Wilshire 5000 in a bivariate model. However, they were cointegrated with three months Treasury bill in the trivariate model. Yet again, Reyes and Grieb (1998) have not found any cointegration relationship between socially responsible and non-socially responsible funds.

The long-run equilibrium is depicted below:

$$KLCI = 1.284 - 1.1253KLSI$$
$$KLSI = 1.125 \; - 0.886KLCI$$

The equilibrium relationship suggests that the variables are positively correlated. That is, if KLSI increased by 1% then KLCI will increase by 1.1% in the long run. This is in accordance with the correlation results, cointegration, and Granger causality, all indicating that both indices move together in the same direction.

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Vector Error Correction Model

Table 7 reports the two estimated results for both models. The variables used are the first differences of each index. The lag used in this estimation is 24 lags, based on the Akaike information criteria. Only significant lags are reported in this section.

The first model has an error correcting mechanism of –0.019, which is significant, and with the expected sign. This indicates that if ΔKLCI is out of the equilibrium, it will be adjusted by 0.019% in the long-term. Since the coefficient is negative, positive errors tend to cause ΔKLCI to be negative and hence ΔKLCI to fall. In other words, if the error equilibrium increases by 1%, it will cause ΔKLCI prices to fall by 0.019%, all other factors being constant. This seems to be slow, since the speed of adjustment is only 0.019%. This implies that any shock that changes the ΔKLCI will take a longer time to adjust to their equilibrium values.

When the variables are cointegrated, in the short-run, deviations from the long-term equilibrium will feed back on the changes in the dependent variable and force movement towards long-term equilibrium. That is, if the ΔKLCI, in the first model, has a statistically significant error correcting value, it means it is responding to its feedback loop. If this is not true, then ΔKLCI is responding to short-term shocks in the systems, which are the explanatory variables. It is thus clear that the ΔKLCI is responding to both short-term and long-term feedback, since the error term and the F-value of the model are both significant. However, ΔKLSI is in equilibrium in the long-run, since its error term is insignificant, while any shocks will be adjusted by the short-run dynamics since the F-value is significant.

On the other hand, only seven ΔKLCI lags in the first model are significant, although the sign is not stable. For ΔKLSI in the first model, only six lags are significant and positive except for the first lag. On the other hand, when ΔKLSI was regressed against itself and the ΔKLCI the results in Table 7 suggest that the error coefficient and the speed of adjustment are never statistically significant.

The R^2 and the adjusted R^2 values are 13% and 10% for the first model and 8% and 5% for the second model, respectively. This indicates the proportion of the variation in ΔKLCI that is explained by the explanatory variables. In terms of the causality, or short-run multiplier, the results imply that ΔKLSI causes ΔKLCI based on F-value, which is significant at 5%.

Table 7
VECM for KLCI and KLSI.

	Independent variables in 1st difference form				EC_{t-1}
	Lag	ΔKLCI coefficient	Lag	ΔKLSI coefficient	
Dependent variable ΔKLCI	1	0.10*	1	–0.052***	–0.019*
	2	0.048**	2	0.042	
	3	–0.03	3	0.082*	
	4	–0.063*	4	0.022	
	5	0.03	5	–0.0013	
	6	–0.01	6	0.011	
	7	–0.05**	7	0.12*	
	8	0.011	8	0.024	
	9	–0.029	9	0.013	
	10	0.07*	10	–0.038	
	11	–0.013	11	0.029	
	12	–0.024	12	0.026	
	13	–0.078*	13	–0.019	
	14	–0.038	14	–0.031	
	15	0.012	15	0.023	
	16	–0.029	16	0.031	
	17	–0.009	17	0.029	
	18	–0.018	18	–0.038	
	19	–0.011	19	–0.011	
	20	–0.026	20	0.044	
	21	–0.036	21	0.055**	
	22	–0.003	22	0.038	
	23	–0.071*	23	0.19*	
	24	–0.054	24	0.04	
	R^2 = 0.12 Adjusted R^2 = 0.01 F-statistics = 4.7*				

(continued on next page)

Table 7 *(continued)*

	Independent variables in 1st difference form				EC_{t-1}
	Lag	ΔKLCI coefficient	Lag	ΔKLSI coefficient	
Dependent variable ΔKLSI	1	0.038	1	0.13*	0.003
	2	–0.005	2	0.036	
	3	0.018	3	0.008	
	4	–0.057*	4	0.02	
	5	0.028	5	0.035	
	6	–0.021	6	–0.012	
	7	0.024	7	0.034	
	8	–0.028	8	0.037	
	9	0.010	9	–0.03	
	10	0.027	10	0.04	
	11	–0.057*	11	0.027	
	12	0.053**	12	–0.037	
	13	0.014	13	–0.10	
	14	0.0035	14	–0.014	
	15	–0.010	15	0.027	
	16	–0.025	16	–0.0027	
	17	–0.022	17	0.0043	
	18	–0.006	18	0.026	
	19	–0.036	19	0.016	
	20	0.0006	20	–0.012	
	21	–0.0084	21	0.06*	
	22	0.052**	22	–0.036	
	23	0.046***	23	0.021	
	24	–0.10*	24	0.031	
	$R^2 = 0.08$ Adjusted $R^2 = 0.054$ F-statistics = 2.72*				

Note: *, **, and *** significant at 1%, 5%, and 10%, respectively

Granger Causality Based on VECM

Table 8 summarizes the results of the causality of each variable on the other. The Wald test of restriction indicates that the causality is bidirectional. The significance level of the f-value for KLSI causing KLCI is higher than that of KLCI causing KLSI. In conclusion, the null hypotheses can be rejected in both cases. However, it is apparent that the F-value of the null hypothesis concerning the direction of relationship from KLSI toward KLCI is higher than the opposite.

Table 8
Wald Test for Causality.

Null hypothesis	F-value	Conclusion
ΔKLSI does not cause ΔKLCI	7.94*	Reject H_0
ΔKLCI does not cause ΔKLSI	1.42***	Reject H_0

Note: * and *** significant at 1% and 10%, respectively

Variance Decomposition

Figure 2 displays the result of variance decomposition of both series over ten days. The results shows that, although not statistically significant, the KLCI is the most endogenous, since up to 40 days, only 39% of KLCI is explained by KLSI, so KLSI is influential. On the other hand, KLSI is the most exogenous (i.e., least endogenous) since at the fortieth day 17% of the innovation in KLSI is explained by KLCI, suggesting that KLCI is not influential, although not statistically significant.

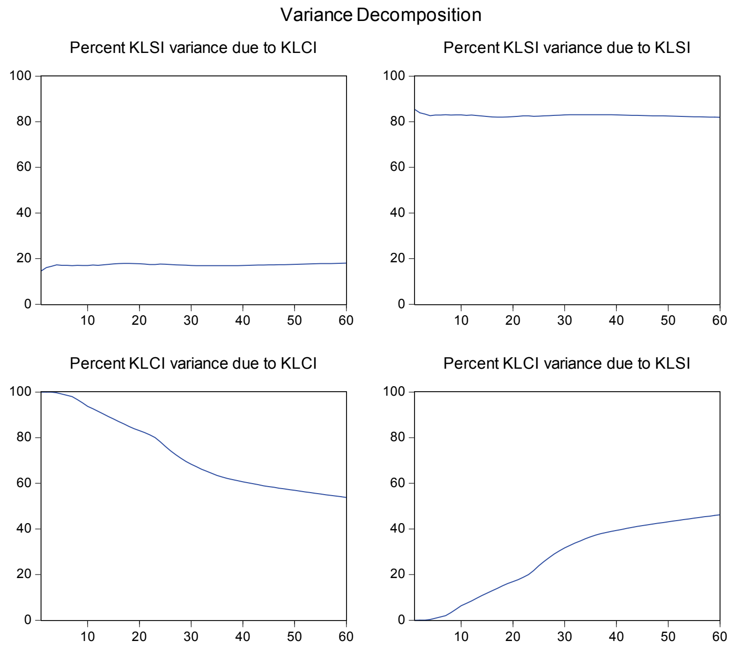

Figure 2. Variance decomposition for both indexes for 60 days.

Impulse Response

In addition, Figure 3, showing the impulse responses for the same period, supports our variance decomposition results, indicating that, although it is not statistically significant, KLCI responds more to shocks in KLSI than vice versa. Again, we can see the strong influence of KLSI on KLCI, suggesting that KLSI dominates the market.

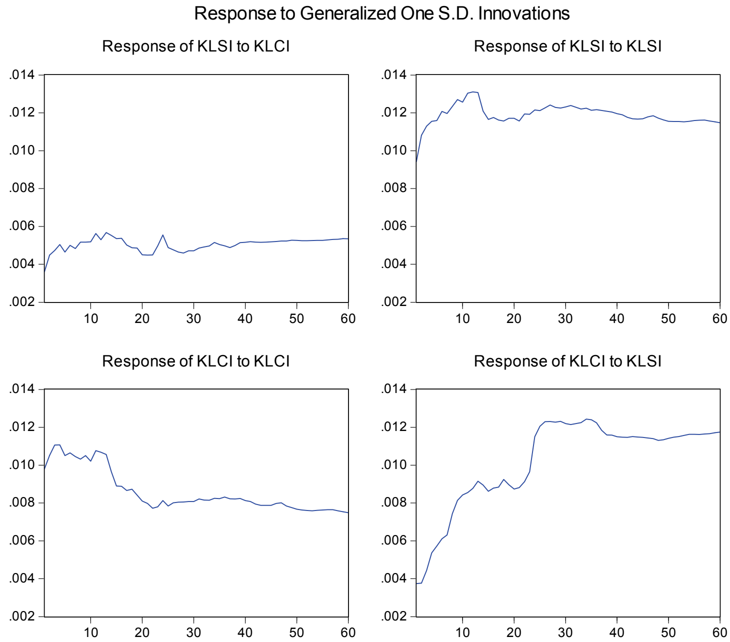

Figure 3. Impulse responses for one standard deviation innovation for 60 days.

CONCLUSIONS

This paper examined the performance of the KLSI against the KLCI using risk-adjusted return measurements and their long-term and short-term relationships. Our statistical results on their risk and returns, measured by the mean and standard deviation, respectively, imply that KLSI is marginally underperforming KLCI. KLCI includes 100 securities of the large market capitalization, while, KLSI include 826 securities. Sixty-eight percent of the KLCI is included in KLSI. The marginal underperformance of the KLSI might be because in developing countries, size and returns are positively related, and it might be due to its newness. Therefore, investors who choose Islamically compliant securities are not substantially worse off than those who choose non-Islamically complaint stocks. The flexibility of the screening criteria for KLSI compared to the DJIMI could have been one factor in our results that indicate no significant difference between the daily return of KLSI and KLCI during the period April 1999 to December 2005. In consequence, there is no harm for investors investing in the Islamically compliant index.

Second, the risk-adjusted returns results for the four measurements indicate that the KLCI has higher returns and higher beta. For KLSI, the opposite is true. It has lower risk-adjusted returns and lower beta. This follows the theory in finance where the higher risk asset will yield higher returns and vice versa. KLSI might have lower risk and returns in the short run. However; such investments also yield another reward. Muslims seek to invest in assets that earn attractive yields as well as peace of mind. The motivation behind investing in Islamic stocks differs greatly from that of conventional investment.

The unit root results show that both series have a unit root problem. This shows that both series are following a random process. Both series are found to be integrated of degree one, i.e., to be stationary in the first difference. Subsequently, cointegration tests suggest that both series are cointegrated i.e., they have a long-term relationship. This indicates that the market in terms of these series is inefficient. The inefficiency arises from the fact that the error of one series can be used to predict the movement of the other. In addition, it indicates that the screening criteria do not affect the temporal behaviour of the KLSI with regard to the movement to its counterpart. In other words, the dropping and inclusion of securities along the way will not influence the KLSI to deviate from the movement of KLCI.

Moreover, the short-run causality, measured by the Granger bivariate test, points to the bidirectional causality between the indices. This implies that in the short-run both prices move in the same direction and they tend to cause each other. One may argue that the causality from KLSI to KLCI is spurious due to the newness of KLSI. Unsurprisingly, the causality from KLSI to KLCI can be explained by the inclusion of 68% of the latter in the former.

The VECM results show that in terms of the relationship between KLCI and KLSI the error term is significant in one model. The error correction indicates the adjustment of KLCI to any deviation from the equilibrium. In other words, KLCI adjusts slowly to the deviation from its long-term equilibrium. In addition, the Granger causality, measured by the overall significance of the model, the F-value, confirms the bivariate bidirectional causality. That is the error correction term measured the long-term relationship indicate that KLCI is adjusting to its long-term equilibrium while KLSI is not. The short-term dynamics is statistically significant in both cases confirming the earlier results of the pair-wise Granger causality test.

VD indicates that over 40 days, KLSI has an effect on KLCI but not vice versa. This indicates that KLSI is dominating KLCI and influencing it. On the other hand, impulse responses for the same time confirm the results of the variance decomposition supporting the influence of KLSI on KLCI but not vice versa. This is true since the responses of KLCI to one standard deviation of KLSI is higher while the opposite is not true. The results imply that there is no difference in returns between both indices, indicating that the extra cost assumed in screened investment such as KLSI is moot. The causality between the series implies that whenever the KLCI moves, it will give a clear indication to where the KLSI will move. Finally, the long-term equilibrium indicates that both indices are moving together and hence, a prediction of one based on the other is constructive.

Overall, these empirical results do not provide evidence of significant differences in performance and movements in those two stock market indices. The two indices seem to behave in a similar manner in both the short-run and long-run. Nonetheless, more needs to be done in this field. Future research should include an examination of the impact of macroeconomic variables, such as inflation and cyclical output, on the performance of the Islamic stock market indices in Malaysia and also other countries.

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