Islamic Versus Conventional Stock Market Indices Performance: Empirical Evidence from Turkey

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Abstract

Rapid growth of Islamic finance in general and Sharī`ah compliant stocks in particular arises the question whether Islamic funds/stocks have a better performance or there is no significant difference with the performance of their conventional counterparts. This study has twofold objectives, firstly to compare the performance of Islamic and conventional stock market indices in Turkey, namely KATILIM 50 and BIST100 by using Two-Sample Test of Hypothesis over the period of 15 May 2015 to 31 December 2016. Secondly, to examine the causal relationship between both stocks markets indices in the short-run using Granger (1969) Causality Test. The findings of parametric Z-test reveal that there is no statistically significant difference between the performance of both indices namely KATILIM 50 Index and BIST 100 Index during the time frame of the study. Further, the Granger Causality findings indicate the absence of causal relationship between the two stock markets indices in the short-run. This suggests that stock market in Turkey is informational efficient and non-violated with the Efficient Market Hypothesis with respect to the available information of both indices. The findings of this study therefore will provide useful channel for Muslim investors to fully participate in the Turkish capital market that is Shariah complaint and fulfil their religious belief without sacrificing any financial performance. The findings of this study therefore provide relevant inputs for both the investors and the policy makers to further support the development of Islamic stock market as an alternative investment choice.

Keywords:
Turkish stock exchange, KATILIM 50, BIST 100, Return, Performance, Causality.

INTRODUCTION

A rapid growth of Islamic finance in the past few decades and the concern of Muslim investors in investing in Sharī`ah compliant assets motivated many investors to focus on and shift their funds to Shariah compliant stocks markets investment including Turkish stock market. The Shariah compliant stock market in Turkey has experienced a rapid growth in the past few years and currently continues to grow at a fast pace.

In the dual capital market system, typical of the Turkish stock market, where the Islamic and the conventional stocks are operated and traded, investors have flexibility in investment choices. Participation 30 Index (Index Code: KATLM) and Participation 50 Index (Index Code: KAT50) are Stock Indexes comprised of shares of subsequently Top 30 and Top 50 companies with the biggest public market capitalization traded at Borsa Istanbul National Market and compliant to Shariah principles. Selection of shares is based on Shariah compliant Index Rules and lists companies which are not active in the fields of interest-based activities, alcohol, gambling, pork, entertainment etc. Moreover, companies are required to achieve some financial ratios to achieve some financial ratios in order take part in the index. The rate of total interest-bearing debt of companies to market capitalization shall be lower than 30%; the rate of interest-bearing cash and securities to market capitalization shall be less than 30%; and the rate of income from abovementioned fields to total income shall be lower than 5%.

On the other hand, BIST Stock Indices have been created to measure the price and the return performances of group of stocks traded on Borsa İstanbul. BIST 100 Index (Index Code: XU100) is a capitalization-weighted index composed of National Market companies except investment trusts. The constituents of the BIST National 100 Index are selected on the basis of pre-determined criteria directed for the companies to be included in the indices.

Existence of Shariah compliant stock market gives the Muslim investors a choice of an alternative investment which is in line with the Sharī`ah rules and principles. Hence, the Islamic stock market investment in Turkey is considered as an alternative investment window through which Muslim investors can participate in the stock market with a religious conscience. However, there still exists an argument among investors whether the performance of Sharī`ah compliant stocks are better compared to their conventional counterparts (Reddy and Fu, 2014).

In this study we compare the performance of Participation 50 Index which represents top 50 companies with the biggest public market capitalization and do business in compliance with Shariah rules and therefore aims to compare the performance of Shariah compliant stocks versus to conventional stock market indices represented by BIST 100, to assist investors in making the investment decision and creating an optimal portfolio diversification investment strategy in the Turkish stock market. In other words, the study aims to examine the application of portfolio theory in the context of Turkish stock market.

LITERATURE REVIEW

The performance of both Islamic and conventional indexes for equity investment purposes was studied by number of researchers. For example, research conducted by Reddy and Fu (2014), analysed the performance dissimilarities between Islamic and conventional stocks which are listed on the Australian Stock Exchange (ASX). The study investigates the performance of both indices from 2001 to 2013. Their results find a statistically significant change, in terms of risk, between Shariah compliant and conventional stocks listed on ASX. Statistically significant similarity was found in terms of the returns from both indices.

Hakim and Rashidian (2002) studied US Islamic stock index in terms of risk and returns. The authors applied co-integration and causality analyses to examine the correlation between Dow Jones Islamic Market Index, Wilshire 5000 Index, and the risk-free investment represented by 3-m T-bill. The study found significant link between variables. On the other hand, findings suggest that Dow Jones Islamic Market Index is affected by dynamics detached from the risk free interest rates and broad market. The study also claims that there are unique risk-return features attached to Dow Jones Islamic Market Index such as company risk or unsystematic risk. The findings on a risk profile are significantly different from the Wilshire 5000 Index.

Hussein and Omran (2005) studied the performance of Dow Jones Islamic Market Index versus Dow Jones Index for the period from 1995 – 2003. The research studied three sub-periods namely, the whole period, the bear period and the bull period. The findings suggest that during the bull period and the entire period Dow Jones Islamic Market Index outperforms the Dow Jones Index, meanwhile during the bear period a non-significant outperformance of the Dow Jones Index was detected.

Elfakhani, Hasan, and Sidani (2005) analysed the performance of the Islamic mutual funds in some emerging economies. Their findings claim no statistically significant difference between two funds. Thus, the authors suggest that the screening mechanism has no effect on the performance of Islamic investments.

This study contributes to the existing literature twofold. Firstly it compares the performance of Islamic and Conventional stock market indices in Turkey, represented by KATILIM50 and BIST 100 using Two-Sample Test of Hypothesis over the period of 15 May 2015 to 31 December 2016. Secondly, it examines the causal relationship between both stocks markets indices in the short-run using Granger (1969) Causality Test.

This study uses daily stock market return indices of both Islamic and conventional stock markets in Turkey namely, KATILIM50 and BIST 100 to investigate their performance over the period of 15 May 2015 to 31 December 2016. This represented for 410 observations. The daily returns data for both indices were collected from secondary sources; specifically from the DataStream database.   The returns were calculated using the following formula:

$$Return = \frac{Ending\ Price - Beginning\ Price}{Beginning\ Price} \times 100$$

$$(1)$$

METHOD

This section of analysis provides a brief statistical background for the variables (KATILIM 50 and BIST 100) behaviour and its prior inferences. This includes the graphical analysis, the descriptive statistics and the correlation matrix results.

The Pairwise Granger (1969) Test

The study applied Granger (1969) causality test to examine whether predictability is existed among the Islamic and conventional stock market indices in Turkish Capital Market. Formally, the X Granger causes Y if the past values of X in the model can help to forecast Y value rather than using only past information of Y (Asteriou and Hall, 2006). The Granger Causality test for the case of two variables Y_t and X_t can mathematically presented using the following equations:

$$Y_t = \alpha_1 + \sum_{i=1}^{n} \beta_i X_{t-i} + \sum_{i=1}^{m} \gamma_j Y_{t-1} + \varepsilon_{1t} \qquad (2)$$

$$X_t = \alpha_2 + \sum_{i=1}^{n} \theta_i X_{t-i} + \sum_{i=1}^{m} \delta_j Y_{t-1} + \varepsilon_{2t} \qquad (3)$$

Where Y_t and X_t represent the variables under the investigation, α_1 and α_2 are constant terms and ε_{1t} and ε_{2t} are white noise error terms. The subscripts t and m represent time periods and the number of lags respectively for the applied model, while n represents the number of observations. The set of the null and alternative hypotheses is expressed in the following equation:

H_o: $\sum_{i=1}^{n} \beta_i = 0$ (X_t does not cause Y_t)

H_1: $\sum_{i=1}^{n} \beta_i \neq 0$ (X_t does cause Y_t)

In order to determine the direction of the relationship between X and Y, there are four different null hypotheses to be examined based on the OLS coefficient estimations, which are:

i-If $\sum_{i=1}^{m} \gamma_j$ and $\sum_{i=1}^{m} \delta_j$ = 0, it can be established that X and Y do not help to predict one another or both variables are independents.

ii- If $\sum_{i=1}^{m} \gamma_j$ and $\sum_{i=1}^{m} \delta_j$ ≠ 0 we conclude that X_t and Y_t have bi-directional causality.

iii-If $\sum_{i=1}^{m} \gamma_j \neq$ 0 and $\sum_{i=1}^{m} \delta_j$ = 0, the conclusion will be changes in Y can aid to predict future values of X then again not the other way around.

iv-Finally, if $\sum_{i=1}^{m} \gamma_j =$ 0 and $\sum_{i=1}^{m} \delta_j$ ≠ 0, the decision will be unidirectional Granger causality exists from X to Y. In other words, changes in X help to predict future values of Y but not vice versa.

These null hypotheses will be examined using an F-test given by the following formula as reported by Asteriou and Hall (2006):

$$F = \frac{(RSSr - RSSur)/m}{RSSur/(n-k)}$$
(4)

Where, m represents the number of lagged terms, n is denoted for the number of observations, k indicates the parameters' number estimated in the unrestricted model and $RSSr$ and $RSSur$ stated for residual sum of squares of both the restricted and unrestricted models respectively. The null hypotheses will be rejected if the F-statistic is more than the critical value for a selected level of significance (Brandt and Williams, 2006).

Two-Sample Test of Hypothesis

The study adopted the two-sample test of hypothesis to examine the performance of both the population means of (KATILIM 50 and BIST 100) stock market indices' returns as recommended by ATA and BUĞAN, (2015). There are five steps that have been pursued for conducting the two-sample test of hypothesis which are summarized as follows:

Step 1: State the null hypothesis and alternative hypothesis

H_o: $\mu_1 = \mu_2$

H_a: $\mu_1 \neq \mu_2$

Where, the μ_1 represents the capital gain for the Islamic stock market index (KATILIM 50), μ_2 represents the capital gain for the Conventional stock market index (BIST 100). H_o is the null hypothesis which states that; there is no difference between Islamic stock market return and the conventional stock market return in Turkey capital market. H_a is the alternative hypothesis which states that there is statistical significant different between Islamic and conventional stock markets returns in Turkey stock market. ***Step 2***: Select the level of significance, in which the current study chose the 0.01 level of significance to reject the null hypothesis when it is actually true. ***Step 3***: Determine the test statistics, where the study utilized the (Z) distribution test statistics, since the samples utilized in the study are large (n>30), which account of 410 observations and the population standard deviation is unknown. The Z statistic value is mathematically presented by the following formula:

$$z = \frac{(\overline{x}_1 - \overline{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}}$$

(5)

Where, $\overline{x}_1$ and $\overline{x}_2$ are the sample means, n_1, n_2 are the sample size and σ_1^2 and σ_2^2 are the variance of the population value. ***Step 4***: Formulate decision rule which is based on the null and the alternative hypothesis. In this test, H_o is rejected if the value computed from the test statistic (Z) distribution exceeds the critical value of the Z at 99% of confidence interval. Only then shall we accept the alternative hypothesis. ***Step 5***: Make the decision regarding H_o and interpret the result. All these steps have been performed by using the SPSS.23, statistical software.

ANALYSIS AND DISCUSSION

This section presents the findings of the study analysis including the graphical analysis findings, the descriptive statistics, the correlation matrix findings, the Granger (1969) causality test findings, and Two-Sample Test of Hypothesis findings.

The purpose of conducting graphical analysis in this study is to figure out and understand the behaviours and movements of both indices namely, KATILIM 50 and BIST 100 whether positively or negatively associated during the time frame of current study analysis. Furthermore, it is important to have deep understanding for the behaviours of stock market indices because stock index can provide investors with a good idea of how the overall stock market or a certain portion of the stock market is performing. Understanding the market index behaviour can also be useful for measuring the performance of our own portfolio against specific benchmark.

Figure 1 displays the movement and the performance of both indices in Borsa Istanbul, which indicate that the overall performance of both indices were negative during the time frame of this study. Where, KATILIM 50 and BIST 100 indices are sharply dropped by almost 15,000 points between May 2015 and November 2016. As KATILIM 50 and BIST 100 indices were traded at 35,000 points in 15 May 2015 to almost 20,000 points by the end of November 2016.
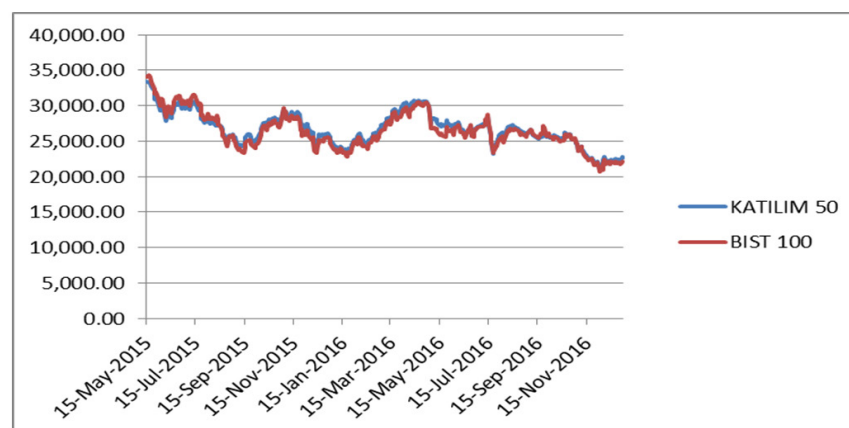

Figure 1: Price Movements of Both Indices KATILIM 50 and BIST 100 over the Period 15 May to December 2016.

This might be attributed to the challenges such internal and external political crisis. These challenges might give negative effect on the country's local stability and the investment environment as a whole, including stock market.

In addition, Figure 2 displays the dynamic volatility of both stock market indices' returns, which indicates that the return of BIST 100 index was more volatile compared to returns from KATILIM 50 Index. In other words, KATILIM 50 index proves to be more stable than BIST 100 index. The highest increase in the dynamic negative volatilities was marked during

the period of July 2016, which might be due to the domestic political crisis that created lack of trust among investors, resulting in return decline and more volatile and unpredictable behaviour for future stock market returns in Turkish Stock Market.
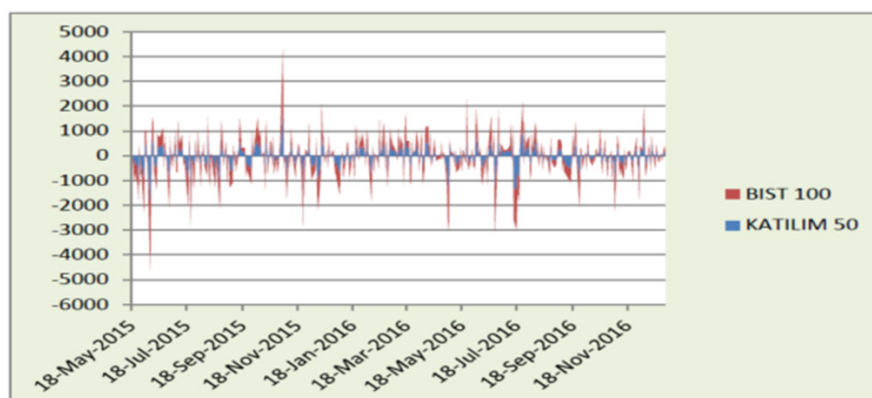

Figure 2: Return Movements of KATILIM 50 and BIST 100 over the Period of 15 May 2015 to December 2016.

Table 1 shows the descriptive statistics tests for the variables under study. These include the sample mean, the maximum, the minimum, the standard deviations, as well as the Skewness and the Kurtosis test to examine the variables' data normality of distribution. KATILIM50 Index has a mean of TRY -25.7511 and a standard deviation of 440.58598 with a minimum and a maximum value of TRY -2140.95 and TRY 1887.86, respectively. While, The BIST100 index has a mean of TRY -28.9423 and a standard deviation of 498.29160 with a minimum and a maximum value of TRY -2482.69 and TRY 2398.17, respectively. Moreover, the standard deviation value of 440.58598 and 498.29160 for the KATILIM50 and BIST100 are represented about -1710%, and -1721% respectively of their mean showing that the stock market prices are unstable, giving a signal of price uncertainty in the both Islamic and Conventional stock market in Turkish capital market.

Table 1: Descriptive Statistics		
Particulars	KATILIM50	BIST100
Minimum	-2140.95	-2482.69
Maximum	1887.86	2398.17
Mean	-25.7511	-28.9423
Std. Deviation	440.58598	498.29160
Skewness Statistic	-.549	-.341
Skewness Std. Error	.121	.121

| Kurtosis | Statistic | 2.510 | 2.879 |
| | Std. Error | .240 | .240 |

Furthermore, Table 1 shows that the skewness and the Kurtosis values for the both indices are normally distributed. In particular, the skewness values for both indices (KATILIM50 and BIST100) are range between -.549 and -.341, which is less than the rule of thumb that states data are normally distributed if its skewness values range between -1 and +1 (Hair et al., 2010).The negative skewness values indicate to a greater possibility of a large decrease in each index than growth in the short-term future. Further, the Kurtosis values for both indices are less than the rule of thumb of +3 that recommended by Stock and Watson (2006). The overall findings of the normality tests confirmed that that data are normally and randomly distributed around their means, which indicates that there is no chance for speculation practices in the Turkey stock market.

Table 2 exposes that there is a strong positive correlation of 96% between the KATILIM50 and the BIST100 at statistically significant level of .01.

Tabel 2: Paired Correlation matrix result

	Variables	N	Correlation	Sig.
Pair 1	KATILIM 50 &	41	.960	.00
	BIST 100	0		0

However, the high correlation between these two indices does not mean they are representing each other, or have Multicollinearity problem, because both indices are considered by many previous studies as leading indicators variables. This high correlation may be due to both indices are effect by the same degree of macroeconomic policies in Turkey industry. Further, the high correlation among the variables does not have anything to do without measuring "cause-and effect" (Seiler, 2004) thus, we need to conduct the Granger (1969) causality test to check whether both indices are predicting each other in the short-run, and then prevent the Turkey stock market from any speculative practices.

Table 3 presents the findings of the Pairwise Granger causality test between KATILIM50 index and BIST100 index in Turkey Stock Market Exchange for different level of lags such as daily, weekly, monthly, quarterly and so on.

Table 3: Pairwise Granger causality Test Results

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
BIST100 does not Granger Cause KATILIM50	409	0.29803	0.5854
KATILIM50 does not Granger Cause BIST100		1.72570	0.1897

Lags: 5

Null Hypothesis:	Obs	F-Statistic	Prob.
BIST100 does not Granger Cause KATILIM50	405	1.19370	0.3115
KATILIM50 does not Granger Cause BIST100		1.42896	0.2128

Lags: 30

Null Hypothesis:	Obs	F-Statistic	Prob.
BIST100 does not Granger Cause KATILIM50	380	0.91805	0.5938
KATILIM50 does not Granger Cause BIST100		0.94317	0.5555

Lags: 120

Null Hypothesis:	Obs	F-Statistic	Prob.
BIST100 does not Granger Cause KATILIM50	290	0.93873	0.6170
KATILIM50 does not Granger Cause BIST100		0.90446	0.6751

The findings indicate that the KATILIM50 index and BIST100 index does not Granger cause one another in the short-run during the study time frame. This mean KATILIM50 index and BIST100 index are independent in the perspective of prediction in Turkey capital market. The non-existence of a relationship between the KATILIM50 index and BIST100 index in the short-run is perhaps due to companies that are listed in Islamic KATILIM50 index operate their business based on the Islamic law (Sharī`ah Principals) that barred and prohibited them to involve in conventional business that are interest based which are mainly experienced and operated by companies that listed in BIST100 index.

One possible concept that can be drawn from this finding is that the stock market in Turkey is informationally efficient and showing the proof on the Efficient Market Hypothesis with respect to predictable behaviours between the Islamic and conventional stock indices. In other words, the share prices of both indices (KATILIM50 index and BIST100 index) cannot

be predicted using the available information of both indices in the short-run. This means that speculators cannot exercise the available information of both indices in the short-term to predict each other for creating abnormal profit in Turkey stock market.

Despite the study have investigated the behaviour and relationship between the KATILIM50 index and BIST100 index in Turkey stock market, investors still need such information about the performance of both indices in order to make the right investment choice and decision, resulting in creating an optimal portfolio investment. To this end the study conducted the Two-Sample Test of Hypothesis to compare the performance of both indices (the KATILIM50 index and BIST100 index).

Table 4 presents the Z-statistic test findings, which has a value of 0.097146156 that is less than the critical value of the two tails, which is 0.922610327. Therefore, the study can not reject the null hypothesis that advocates there is no different between Islamic stock market return (KATILIM 50) and the conventional stock market return (BIST 100) in Turkey capital market at significant level of .01.

Table 4: Z-Test: Two Sample for Means

	KATILIM 50	BIST 100
Mean	-25.751117	-28.94226
Known Variance	194116	248294.5
Observations	410	410
Hypothesized Mean Difference	0	
z	0.097146156	
P(Z<=z) one-tail	0.461305163	
z Critical one-tail	1.644853627	
P(Z<=z) two-tail	0.922610327	
z Critical two-tail	1.959963985	

The findings of the Z-statistic of Two-Sample means in Table 4 suggest that there is sufficient evidence that both Islamic and conventional stock market indices have the same capital gain and degree of performance in Turkey capital market. This finding therefore, will offer Muslim investors with alternative channel to participate in Turkey capital market using Islamic investment instrument such Islamic KATILIM 50 index that is in line with

Sharī`ah Principals to fulfil their religious faith and achieve the same return that offer by conventional counter-party.

CONCLUSION

This study utilized Two-Sample Test of Hypothesis to compare and investigate the performance of both Islamic KATILIM 50 index and conventional BIST100 index in Turkey stock exchange market over the period of 15 May 2015 to 31 December 2016 using daily frequency data. Further the study was also examined whether both indices have cause and effect relationship during the same time frame of the study using the Pairwise Granger (1969) Test.

The overall findings show that both Islamic KATILIM 50 index and conventional BIST100 index have no differences in their return and the level of performance. This finding suggests that investors can invest in both stock markets however, for Muslim Investor is difficult to participate in conventional market that is interest base, which is prohibited by Islamic law. Thus, this finding suggests that Muslim investors to invest their wealth in Islamic stock market that is Shariah complaint to satisfy their religious beliefs and achieve the same level of returns with Conventional counterpart. Besides, the result of Granger (1969) Test showed the absence of causality between both indices. This suggested that stock markets in Turkey are informationally efficient and non-violated with the Efficient Market Hypothesis with respect to the available information of both indices.

The policy implications that can draw from the findings of the study could be twofold. Firstly, the evidence of absences of causal association between both market indices may have significant impact for investors' portfolio diversification investment opportunities. Secondly, the evidence of equality in terms of capital gain and degree of performance for both indices would provide relevant inputs to further support the development of a vibrant Islamic stock market as potential alternative to the current conventional counterparty.

The current study could be expanded in future by exploring and determining the potential factors that may have influence on the performance of both Islamic and conventional stock markets indices in Turkey. Further extension could be made for this study by comparing the performance of stock market in Turkey and other countries to provide investor with better diversification investment strategy for their portfolio investment.

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