RESEARCH PAPER

Do Islamic Stocks reinforce Real Economic Activity? Evidence from an Emerging Islamic Capital Market

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Abstract
The principles of the Islamic moral economy encourage actual economic activity and an asset-driven financing model. Accordingly, the study examines the dynamic association between Islamic stocks and actual economic activity in an emerging Islamic capital market. The study employs various robust time series methods to unveil the relationship between Islamic stocks and real economic activity. Moreover, in the presence of other well-known predictors of economic activity like conventional stock index, interest rate, and exchange rate, the study finds a bidirectional causal relationship between the Islamic Shariah-compliant stock index and real economic activity on Pakistan Stock Exchange (PSX). The study's findings reinforce the notion that the development of the Islamic capital market leads to an augmented level of real economic activity.
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Introduction

In the last two decades the Islamic financial industry has accelerated and grown to produce remarkable variations and a wide variety of financial products. Islamic financial investment products have remarkably grown and an attained new height in terms of trading volumes because of their specific features different from conventional financial products. Researchers and practitioners around the globe have taken a keen interest in Islamic modes of financing due to the rapid expansion of the Islamic financial service industry. The latest statistics reveal that the Islamic finance industry consists of 1389 financial institutions. Islamic banking is the largest contributor to the Islamic financial service industry with total worth around USD 1.7 trillion (Reuters, 2018). Islamic capital markets represent the fastest growing product portfolio among the Islamic financial service industry at the end of 2018. Islamic financing is based on major beliefs and principles which include a ban on interest (Riba), the prohibition of excessive ambiguity and uncertainty (Gharar), ban on speculation (Maysir) and prevention of participating in unethical industries. The primary feature of Shariah-compliant products is to offer investors the opportunity to invest in financial products that comply with Islamic moral laws. However, Islamic investment products also differ from their conventional counterparts in terms of quality and characteristics of risk and return. Notably, post-financial crisis 2007-08, the search for alternative financial paradigm has provided Islamic financial markets the opportunity to be recognized in international financial markets.

A plethora of financial literature has covered the impact of financial development on

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economic growth. It is a well-known fact that an efficient financial system contributes to economic growth by eliminating information asymmetries, offering risk diversification opportunities, diminishing liquidity risk, promoting allocative efficiency, observing corporate controls and supporting funds mobilization (Stiglitz, 1985; King and Levine, 1993; Levine and Zervos, 1998; Beck and Levine, 2004; Enisan and Olufisayo, 2009; Peia and Roszbach, 2015; Pradhan, 2018).The overall financial system is an intricate structure. Broadly, the financial system could be bisected into two major parts financial intermediaries and markets. The financial intermediation function is offered by banks, insurance and companies and pension funds and financial markets consist of stock, bond, commodity and derivative markets. An efficient financial system fuels long term economic growth through capital accumulation and channeling saving towards productive investments. A large thread in financial literature has focused on the relationship between financial development and economic growth from the banking perspective. The role of capital markets in the growth stimulating process has received less attention as compared to the banking sector (King and Levine, 1993; Harris, 1997; Levine et al., 2000; Beck et al., 2000; Rousseau and Wachtel, 2000; Arestis et al., 2001; Naceur and Ghazouani, 2007; Ngare et al., 2014; Peia and Roszbach, 2015). However, a large number of studies have recognized the role of capital markets in the economic growth process.

Contemporary finance theories such as the stock valuation model and the wealth effect argue functional role of stock markets to predict future economic activity. The theory of stock valuation shows that the existing stock values represent the future earnings prospects of businesses and adjustments in stock prices which further contribute to the economic development. Moreover, the current level of stock prices will reflect the future expectations about the economy. In case the economy is expected to grow, stock market will respond by building up the stock prices and vice versa in the other scenario. Thus, if the expectations of market participants are useful then the stock market will lead in the direction of real economic activity. Fama (1990) asserts economic activity is positively associated with firm cash flows and hence linked to stock prices. The findings of the mentioned study showed that in US economy, stock prices predicted real economic activity for the duration of 1953 to 1987.

A large number of studies after the recent emergence of Islamic finance have attempted to estimate the nexus between Islamic financial markets and economic growth. However, there is a dearth of literature investigating the link between Shariah-compliant stocks and real economic activity. This study seeks to explore the dynamic relationship between the real economic activity and Shariah-compliant stocks in an emerging economy. Since Islamic law (Shariah) principles and objectives support and encourage real economic activity and asset driven financing model, we hypothesize a strong link between Shariah-compliant stocks and real economic activity. Nevertheless, the empirical confirmation of the theoretical percept remains to be verified. To verify the study employs a variety of time series techniques to estimate the underlying relationship. We also include conventional stock market index and few well known economic predictors (interest rate and exchange rate) of real economic activity as control variables in our empirical framework. This study contributes to the literature by examining the long term and short term association between Shariah compliant stocks and real economic activity in the emerging Islamic capital market. The Islamic financial service industry of Pakistan is among the top growing Islamic financing markets in Asia. Lately, a line of studies has examined the relationship between stock market development and economic growth process (Sharif and Afshan, 2016; Haider and Tariq, 2018; Sattar et al., 2018; Sulong et al., 2018; Naseem et al., 2019), while the linkages between Shariah compliant stocks and economic activity remains to be explored. The results of this study will assist investors and policy makers in understanding the exact relationship of Islamic stocks with real economic activity in other similar Islamic equity markets. The

findings will also help reflect the true impact of financial inclusion of Shariah products in conventional markets. Moreover, this will also highlight the contribution of the contemporary Islamic financial model to Shariah objectives and ethical financing.

The rest of the paper is structured in the following way; the section 2 of the paper discusses the relevant literature. The section 3 of the study narrates the brief history of the Islamic index in Pakistan. The section 4 of the study describes the data and methodology used for empirical analysis. The section 5 outlines the results and findings of the study and section 6 will conclude the paper.

Literature Review

Stock Market and Economic Growth Nexus

The impact of stock market development on economic growth is one of the most widely researched areas in financial economics. A large number of studies have theoretically and empirically have investigated the role of the stock market in economic growth process (Garcia and Liu, 1999; Zhu et al., 2004; Beck and Levine, 2004; Dritsaki and Dritsaki-Bargiota, 2005; Claessens et al., 2006; Naceur et al., 2007; Rousseau and Xiao, 2007; Marques et al., 2013; Korczak and Korczak, 2013; Peia and Roszbach, 2015). Similar to other financial services stock market is recognized as a pivotal component of the overall development of the financial sector where more focus is assigned to internal activities of the stock market (de la Torre et al., 2007; Ngare et al., 2014). The earlier literature on the subject has identified various channels through which stock market development contributes to economic growth. Firstly, the development of the stock market provides the opportunity to growing companies to acquire financing at a lower cost. Secondly, it reduces the reliance of firms on banking and debt-based financing model, which helps in times of credit crunch. Thirdly, the stock market offers long term financing opportunities through individual funds that may or may not be available for a long period. Most importantly, it assists in boosting savings and enhancing the quantity and quality investments in an economy.

Similar to other major components of the financial sector like banking the link between economic growth and stock market development can be explained using four hypotheses. The first hypothesis supply lending hypothesis stipulates that stock market development causes economic growth. A large number of studies support functional role of the stock market in stimulating higher economic growth through capital formation (Leigh, 1997; Levine and Zervos, 1998; Van Nieuwerburgh et al., 2006; Argrawalla and Tuteja, 2007; Deb and Mukherjee, 2008; Nowbutsing and Odit, 2009; Enisan and Olufisayo, 2009; Akinlo and Akinlo, 2009; Zivengwa et al., 2011; Pradhan et al., 2013; Peia and Roszbach, 2015). The second hypothesis demand following hypothesis states economic growth causes stock market development. The idea asserts that economic growth leads to the development of the stock market due to higher demand for financial services (Dritsaki and Dritsaki-Bargiota, 2005; Odhiambo, 2008; Kar et al., 2011; Pradhan et al., 2014; Peia and Roszbach, 2015). The third hypothesis feedback hypothesis suggests a bi-directional relationship between stock market development and economic growth. The proponents of the hypothesis support the inevitable association between economic growth and financial development (Nishat and Saghir, 1991; Huang et al., 2000; Caporale et al., 2004; Hou and Cheng, 2010; Marques et al., 2013; Pradhan et al., 2014; Peia and Roszbach, 2015). Finally, the neutrality hypothesis maintains there is no relationship between stock market development and economic growth and both are independent of each other (Lucas, 1988; Pradhan et al., 2013; Vo et al., 2016). Considering the local context Shahbaz et al. (2008) found bi-directional long term causal relationships between stock market development and economic growth in Pakistan.

Islamic Equity Styled Indices and Economic Growth

A large number of studies have studied the relationship between the development of Islamic financial markets and economic growth focusing on Islamic banking (Furqani and Mulyany, 2009; Abduh and Azmi, 2012; Imam and Kpodar, 2013; Kassim, 2016; Rafay and Saqib, 2017). Despite its popularity largely literature is silent on the relationship between Islamic stocks and real economic activity. However, academic research on Islamic portfolios and Shariah compliant instruments has gradually grown. At present they are two conflicting views about the performance of Islamic equities and their influence on investors and financial markets. Firstly, a strand of literature advocates the dichotomy hypothesis for Islamic equity indexes maintaining that Islamic capital markets were less affected by financial crisis 2007-08 compared to conventional counterparts (Chapra, 2009; Dridi and Hassan, 2011; Arouri et al., 2013). This idea follows that Shariah compliant investments forbid excessive risk and ignore highly leveraged risky companies (Ghoul and Karam, 2007). Also, they provide risk diversification opportunities for investors against unstable market conditions (Jawadi et al., 2014; Al-Khazali et al., 2014). In this way Islamic financial instruments contribute in enhancing economic value, social welfare, eliminating inequity and maintaining necessary distance from social and ecological emergencies (Merdad et al., 2015). On the other side, others argue that Islamic Shariah screening costs reduce the returns on Islamic portfolios. Moreover, considering the Markowitz (1952) portfolio optimization model and modern portfolio theory selecting subset of unrestricted portfolio adversely affects the portfolio performance. This notion is supported by studies that show low returns of Islamic portfolio compared to conventional counterparts (Derigs and Marzban, 2009; Donia and Marzban, 2010; Saqib et al., 2020). However, overall the evidence illustrates divergent results for different Islamic financial instruments and sizeable evidence also reinforces superior performance of Islamic equities in terms of risk and return (see e.g., Dharani et al., 2019).

Islamic Equity Index of Pakistan

Shariah-compliant index of Pakistan Stock Exchange (PSX) is known as Karachi Meezan Index (KMI) and consists of thetop30 Islamic compliant stocks. KMI-30 was inaugurated in September 2008. The primary objective of KMI-30 is to provide investors the opportunity to attain investment goals in compliance with their religious beliefs and values. To be part of the index, each company has to fulfill Shariah screening criteria. A company is eligible to be part of KMI-30 when: (I) the principal business of the company must be not against Islamic financial and moral principles. (II)The debt to asset ratio of the company should be less than 37 %, since like Islamic finance principles prohibit interest-bearing securities and encourages equities. (III)Non-Shariah-compliant investments like debt styled securities, derivatives, conventional mutual funds and money market instruments are less than 33 %. (IV)The non-compliant income to the total revenue of the company should be less than 5 %. (V)The fixed to total asset ratio of the company should be greater than 25 %.

Data & Methodology

Data

To research the relationship between ISSH and Pakistan's real economic activity, the study uses Islamic Karachi Meezan Index (KMI-30) and large scale manufacturing index (LSMI) as proxies. Additionally, the model also includes conventional stock index (KSE-100), Interest rate (KIBOR) and real exchange rate are used as control variables. Monthly data set is

acquired from the Statistical Bulletin of State Bank of Pakistan (SBP) and Pakistan Stock Exchange (PSX) data portal. The study sample covers the period from September 2008 to December 2018.

Methodology

VAR Model

Earlier studies used a variety of econometric methodologies to estimate the relationship between Islamic indices and economic growth. Following the previous literature this study employs a variety of robust time series models. Under Vector Auto Regression (VAR) environment, we use the JJ-Cointegration test, Granger causality test, Impulse Response Functions (IRF), and Variance decomposition Analysis (VDC) to explore the link between Islamic index and real economic activity in Pakistan. The equation (1) shows the basic functional form of our model.

LSMI= f (KMI30, KSE100, IR, EXG)   (1)

In the model, LSMI is taken as a proxy of real economic activity in Pakistan. It is the only available production index in Pakistan. KMI-30 is taken as the proxy of the Shariah-compliant index. The model also contains three control variables. KSE-100 is taken as the proxy of the conventional index to discern the behavior of both conventional and Islamic indices to changes in economic activity in the economy. Additionally, interest rate and real exchange rate, two major drivers of macroeconomic activity are also included as control variables in the model. Following VAR equation are used to explore the underlying link.

$$LSMI= \alpha_1+\beta_1KMI30+\beta_2KSE100+\beta_3IR+\beta_4EXG+e_1 \qquad (2)$$

$$KMI30 = \alpha_2+\beta_5LSMI+\beta_6KSE100+\beta_7IR+\beta8EXG+e_2 \qquad (3)$$

$$KSE100= \alpha_3+\beta_9LSMI\beta_{10}+KMI+\beta_{11}IR+\beta_{12}EXG+e_3 \qquad (4)$$

$$IR= \alpha_4+\beta_{13}LSMI+\beta_{14}KMI30+\beta_{15}KSE100+\beta_{16}EXG+e_3 \qquad (5)$$

$$EXG= \alpha_5+\beta_{17} LSMI+\beta_{18}KMI30+\beta_{19}KSE100+ \beta_{20}IR+e_5 \qquad (6)$$

Unit Root Test and Cointegration

In order to prevent false results, variables stationary in time series analyses is established. We employ Dickey and Fuller's (1981) unit root test to check the stationarity of variables in our model. It is commonly referred to as Augmented Dickey-Fuller (ADF) test. To determine the long term relationship between the variables under study, we use the multivariate-cointegration test introduced by Johansen (1988) and Johansen and Juselius (1990). It is commonly known as the JJ-cointegration test. The test uses two statistics termed as trace statistics and max eigenvalue statistics for estimating the number of cointegration vectors. Furthermore, the optimal lag length for the VAR model is derived from famous lag length criteria including Hannan Quinn criterion (HQ), Statistic, Schwarz criterion (SIC), Akaike Information Criterion (AIC), Sequential Modified LR Test and Final Prediction Error (FPR).

Causal Association

The cointegration analysis unveils the long term association between the variables. However, in order to estimate the causal direction of the long term association between variables, the

study uses the model introduced by Granger (1969). Considering, two variables Xt and Yt Granger (1969) states that if Xt causes Yt, then the time serious values of Xt contain function information to predict Yt. We use the Granger causality test to check the causal relationship between the variables in our model. The optimal lag length for the test is calculated using Schwarz criterion (SIC) and Akaike Information Criterion (AIC).

Innovation Accounting

Among the major issues of VAR model is the interpretation of regression coefficients. Since VAR estimates multiple equations and produces a large number of coefficients, the meaningful interpretation of VAR coefficients is a daunting task. For useful analysis, the study uses IRF and VDC analysis. IRF depicts the response of each variable in the VAR model to one standard deviation shock in itself and other variables. The approach is particularly useful in evaluating the impact of innovations on the current and future values of the underlying variable. Additionally, the study also uses VDC to account for the changes in a particular variable due to its innovations and changes in other variables. The approach will assist in evaluating the short term and long term variations in variables under study.

Results

ADF Test Results

Table 1 shows the results of unit root tests. The results of ADF tests show that all the variables in the model are stationary at first order. The results are estimated for the constant model. Table 1 shows that trace statistic is less than the critical value at 1 % significance level for all variables.

Table 1. ADF Results

Variables	Critical Value	T-Statistic	Stationary
LSMI	(-3.497029)	(-8.577273)*	(First order)
KSE100	(-3.490772)	(-10.65251)*	(First order)
KMI30	(-3.490772)	(-11.27451)*	(First order)
EXG	(-3.490772)	(-12.95093)*	(First order)
KIBOR	(-3.490772)	(-10.95747)*	(First order)

Source: Research finding.
Note: * Significant at 1% level

JJ Co-integration Test Results

We estimate cointegration results using constant and trend model. The results of cointegration test using linear trend model show at 5 % significance level, the value of trace statistic is greater than the critical value (76.22020>69.81889). The findings unveil long term association between the variables in our model. The results are further confirmed by the second criterion, as the Max Eigen value is larger than the critical value at 5 % significance level (40.55357>33.87687). The results obtained from constant model are also same and confirm long term association between the underlying variables. These findings imply strong long term linkages between the development of Shariah-compliant index and economic activity in Pakistan. Finally, the results of constant model are reported in the table 2.

Table 2. Cointegration Results

Dependent Variables	Constant Model		Linear Trend Model	
	Critical Value	t-statistic	Critical Value	t-statistic
LSMI	(47.8561)	(35.6666)**	(76.2202)	(69.8188)**

Source: Research finding.

Granger Causality Test Results

The earlier results revealed the long term association between KMI-30 and LSMI. However, to find the nature of the association, the study employs Granger causality test. Table 2 reports the Granger causality results. The results confirm the casual relationship between KMI-30 and LSMI. The results show the nature of the association is bi-directional. This implies that the development of Shariah compliant index contributes to augmented economic activity in the economy and vice versa. Moreover, a higher level of real economic activity also causes KMI-30 expansion. The findings support that presence of Islamic capital index provides alternative investment opportunities for investors. This development of a new market leads to higher economic activity and growth. Similar findings are also obtained for conventional KSE-100 index. This highlights the crucial importance of the capital market as a whole for economic activity in Pakistan. The similar findings are also explained by this fact that the similar composition of KMI-30 and KSE-100. However, the results also show that there is no causal relationship between KMI-30 and KSE-100 indices. The findings highlight that the existence of conventional and Islamic indexes provides an investor with portfolio diversification opportunities. Additionally, the results also reveal a bi-directional relationship between the Shariah-compliant index and KIBOR. This implies that the Islamic mode of investments is also influenced by interest rate, contrary to the theoretical supposition.

Table 3. Causality Tests

Null Hypothesis	F- Statistic	P-Value
LSMI does not Granger Cause KSE100	5.25981	0.0238*
LSMI does not Granger Cause KMI30	5.28620	0.0234*
LSMI does not Granger Cause EXG	0.41271	0.5220
LSMI does not Granger Cause KIBOR	0.19521	0.6595
KMI30 does not Granger Cause LSMI	13.2519	0.0004*
KMI30 does not Granger Cause KSE100	1.08232	0.3005
KMI30 does not Granger Cause EXG	1.94518	0.1660
KMI30 does not Granger Cause KIBOR	5.24770	0.0239*
KSE100 does not Granger Cause LSMI	12.8726	0.0005*
KSE100 does not Granger Cause KMI30	0.09324	0.7607
KSE100 does not Granger Cause EXG	1.41017	0.2376
KSE100 does not Granger Cause KIBOR	5.37758	0.0223*
EXG does not Granger Cause LSMI	16.9415	0.0001*
EXG does not Granger Cause KSE100	7.51631	0.0072*
EXG does not Granger Cause KMI30	5.24351	0.0240*
EXG does not Granger Cause KIBOR	1.98026	0.1622
KIBOR does not Granger Cause LSMI	13.4762	0.0004*
KIBOR does not Granger Cause KSE100	4.10485	0.0452*
KIBOR does not Granger Cause KMI30	3.95243	0.0493*
KIBOR does not Granger Cause EXG	3.29993	0.0721

Source: Research finding.
Note: Significant at 5% level and the null hypothesis is rejected.

IRF Results

IRF results provide the time profile effect of the shocks in the system. IRF of KMI-30 shows

a positive response to one standard deviation shock in LSMI. This implies as the economic activity gears up, the Shariah-compliant index grows. Further, KMI-30 also shows a positive response to one standard deviation shock in KSE-100. This shows the overall growth in Pakistan Stock Exchange (PSX) attracts investors to invest in both Islamic and conventional indexes. Additionally, like the conventional counterpart finding KMI-30 also shows a negative response to an increase in interest rate. The IRF results of LMSI show the negative response of LSMI to one standard deviation shock in KMI-30 and KSE-100. These results highlight the fact during the short-run: the development of the capital market hardly affects the economic activity in Pakistan. Moreover, the real economic activity is more fueled by other exogenous economic determinants not necessarily included in the model. We skip the details of the rest of IRFs for the sake of brevity, as reported figures are sufficient to answering our relevant research questions.
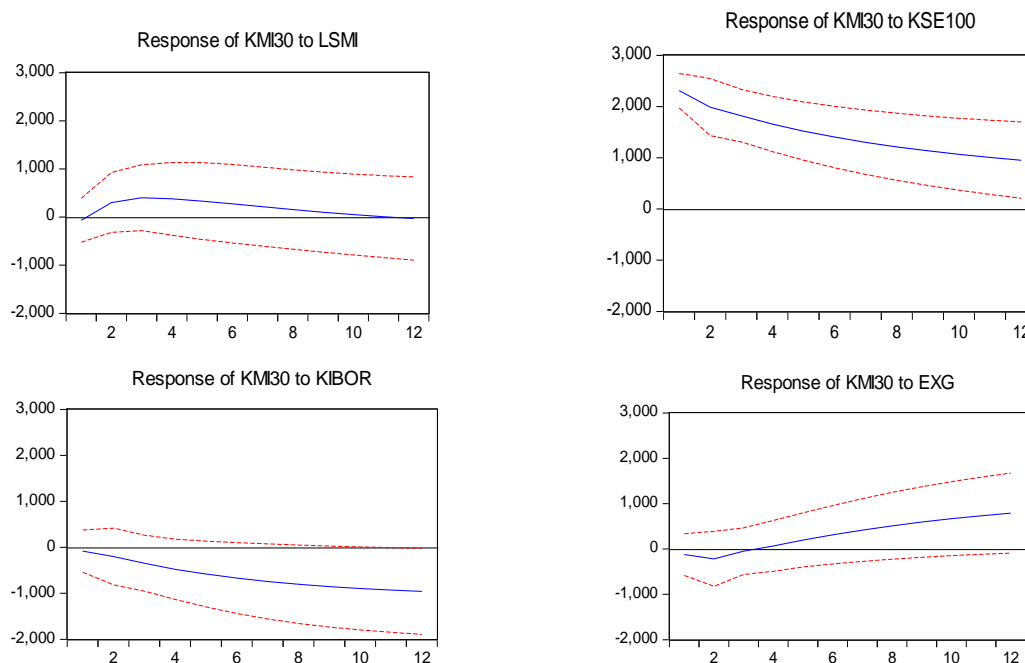

Figure 1. Impulse Response Functions of KMI-30
Source: Research finding.
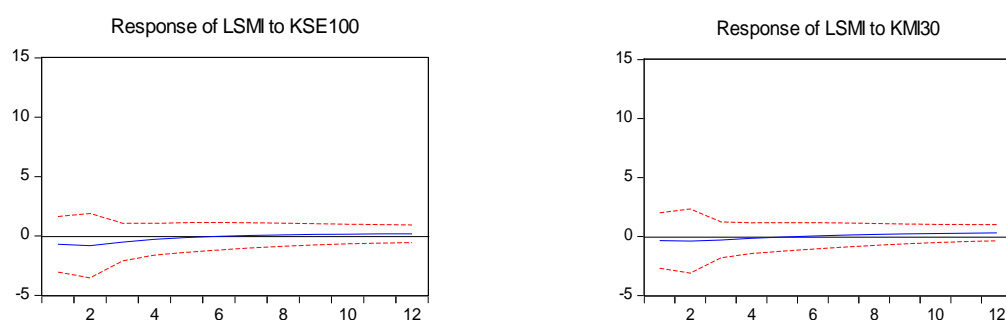
Figure 2. Impulse Response Functions of LSMI
Source: Research finding.

VDC Results

The Table 4 reports the VDC results of LSMI. The results illustrate in the short run (1 month period) none of the variables in the model explain variance of forecast errors of LSMI. The results are not surprising because pass through of different economic variables on economic activity transpires with a time lag. Further, even in the long run KMI-30 and KSE-100 hardly explain any change in variance of forecast errors of LSMI. This reflects the development of

capital market plays a little role in explaining change in real economic activity in shorter time horizon. The major share of the share is explained by other exogenous economic variables which are not included in the model. Furthermore, the results also depict that in the long run major change in KMI-30 and KSE-100 Indices is explained by the endogenous capital market variables. Moreover, LSMI explains very little of the variation in forecasted errors in KMI-30 and KSE-100. These findings support the anecdotal evidence that PSX does not truly reflect the economic conditions of the country. The criticism is not without merit as market inefficiencies in emerging capital markets create this common disparity. The findings also show important role of KIBOR in explaining the change in both indices. The findings are in line with theoretical capital asset pricing theory.

Table 4. Variance Decomposition of LSMI

Period	S.E	LSMI	KSE100	KMI30	EXG	KIBOR
1	12.29038	100.0000	0.000000	0.000000	0.000000	0.000000
2	13.78924	99.41483	0.116318	0.393793	0.001354	0.073704
3	14.22092	98.92424	0.162966	0.462445	0.298627	0.151725
4	14.38559	98.31000	0.173755	0.488032	0.705493	0.322718
5	14.46574	97.56569	0.175336	0.509926	1.229640	0.519407
6	14.52766	96.76210	0.173969	0.534331	1.803739	0.725857
7	14.58990	95.94555	0.173111	0.567192	2.386484	0.927664
8	14.65510	95.14326	0.174261	0.613408	2.950141	1.118928
9	14.72185	94.36704	0.177835	0.676530	3.480613	1.297983
10	14.78841	93.62031	0.183730	0.758486	3.971888	1.465592
11	14.85356	92.90246	0.191626	0.859626	4.422886	1.623406
12	14.91669	92.21145	0.201157	0.978987	4.835132	1.773269

Source: Research finding.

Table 5. Variance Decomposition of KSE100

Period	S.E	LSMI	KSE100	KMI30	EXG	KIBOR
1	1355.154	0.324284	99.67572	0.000000	0.000000	0.000000
2	1834.188	0.890547	98.24949	0.645629	0.000498	0.213832
3	2161.960	1.134821	97.49881	0.539793	0.185075	0.641499
4	2409.583	1.123841	96.54793	0.434747	0.585289	1.308194
5	2612.572	1.038967	95.14911	0.420702	1.246752	2.144467
6	2788.267	0.936436	93.29429	0.524896	2.120958	3.123424
7	2946.741	0.840813	91.03555	0.753399	3.173120	4.197116
8	3094.211	0.763867	88.45208	1.100596	4.357150	5.326304
9	3234.563	0.709528	85.63134	1.554508	5.628814	6.475814
10	3370.233	0.677306	82.65847	2.099520	6.947466	7.617243
11	3502.716	0.664431	79.60972	2.718512	8.278473	8.728866
12	3632.901	0.667197	76.54925	3.394376	9.593925	9.795247

Source: Research finding.

Table 6. Variance Decomposition of KMI30

Period	S.E	LSMI	KSE100	KMI30	EXG	KIBOR
1	2403.623	0.077157	92.42070	7.502142	0.000000	0.000000
2	3166.904	0.960404	93.45010	5.377541	0.018935	0.193016
3	3721.762	1.859054	92.28002	5.083623	0.116477	0.660830
4	4150.997	2.322738	90.57816	5.290084	0.362961	1.446054
5	4506.914	2.511520	88.53119	5.689911	0.831632	2.435746
6	4816.900	2.527330	86.20307	6.184632	1.491165	3.593800
7	5096.919	2.437063	83.65438	6.731932	2.322392	4.854233
8	5357.101	2.292137	80.94432	7.307372	3.291105	6.165069
9	5603.910	2.127778	78.13197	7.896725	4.361865	7.481656
10	5841.471	1.966132	75.27332	8.490956	5.499843	8.769747
11	6072.373	1.819606	72.41777	9.084101	6.673780	10.00474
12	6298.203	1.693892	69.60625	9.672087	7.857162	11.17061

Source: Research finding.

Table 7. Variance Decomposition of EXG

Period	S.E	LSMI	KSE100	KMI30	EXG	KIBOR
1	1.457669	1.448558	0.749658	1.071029	96.73076	0.000000
2	1.841197	3.295467	0.757897	3.976282	89.24522	2.725136
3	2.213470	6.168838	0.723219	6.039282	83.94404	3.124624
4	2.515350	7.966297	0.648077	7.779362	79.92395	3.682309
5	2.774316	9.034682	0.578614	9.460305	76.77099	4.155412
6	2.998213	9.600887	0.518926	11.09764	74.16659	4.615955
7	3.194363	9.823872	0.468538	12.68229	71.95766	5.067640
8	3.368023	9.824225	0.426239	14.19794	70.03421	5.517386
9	3.523305	9.686980	0.390908	15.62850	68.32734	5.966264
10	3.663350	9.470158	0.361697	16.96198	66.79204	6.414128
11	3.790588	9.212293	0.338015	18.19122	65.39864	6.859830
12	3.906914	8.938260	0.319456	19.31361	64.12683	7.301841

Source: Research finding.

Table 8. Variance Decomposition of KIBOR

Period	S.E	LSMI	KSE100	KMI30	EXG	KIBOR
1	0.541902	0.217879	0.006618	1.048578	0.093027	98.63390
2	0.727955	0.246044	0.010084	2.907642	0.067382	96.76885
3	0.837362	0.186003	0.081625	3.196387	0.080735	96.45525
4	0.914355	0.157477	0.292636	3.133539	0.137734	96.27861
5	0.971652	0.139464	0.617316	3.013682	0.251983	95.97756
6	1.016412	0.131550	1.034891	2.892163	0.431807	95.50959
7	1.052859	0.137458	1.521926	2.786695	0.681185	94.87274
8	1.083632	0.159779	2.054337	2.702100	1.000293	94.08349
9	1.110447	0.198818	2.610131	2.639314	1.386288	93.16545
10	1.134453	0.252846	3.170467	2.598945	1.833789	92.14395
11	1.156436	0.318863	3.720071	2.582293	2.335701	91.04307
12	1.176943	0.393332	4.247241	2.591346	2.883896	89.88418

Source: Research finding.

Conclusion

The study focuses on unveiling the dynamic relationship between the Shariah-compliant index and real economic activity in Pakistan using robust time series techniques. The findings of the study confirm the existence of the long term relationship between the variables in our model. The findings show bi-directional causal relationship between KMI-30 and LSMI in Pakistan. The results imply that the development of Shariah-compliant index contributes to the growth of real economic activity in Pakistan. The findings of the study corroborate

theoretical percept that states the emergence of Islamic financial and capital markets accelerates economic output and growth. The findings also imply show that the introduction of KMI-30 on PSX provides investors enhanced investment opportunities for portfolio diversification. In addition, we also find similar findings for conventional KSE-100 index. This highlights that the development of stock market attracts investors to invest in both Islamic and conventional portfolios. Furthermore, we also showcase negative relationship between interest rate and Islamic equity index.

Despite the long term causal relationship between KMI-30 and LSMI, the findings of the study show Shariah-compliant index offers little explanation of the change in real economic activity in the short run. This highlights the existence of market inefficiencies limit Shariah-compliant index from the true representation of economic output in the economy, in particular during the short-run period. The findings show a significant role of other economic factors in determining the economic output level in the economy. It can be concluded from the findings that induction guidelines for companies to be included in KMI-30 can be relooked to make it a closer representative of real economic activity in the economy. Moreover, the study recommends reforms of such nature will assist in coinciding with the objectives Islamic moral economy and development of the Shariah-compliant index in Pakistan.

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