

The Impact of Islamic Banking Credits on Saudi Arabia's Economic Growth

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The objective of this research is to investigate the impact of Islamic banking credits on Saudi Arabia's economic growth during the period 1990-2015. The results showed that the relationship between the variables in the long and short-term is significant. The results also indicated a significant impact of Islamic banking credits on Saudi Arabia's economic growth during 1990-2015. The results are appropriate with the government's Saudi Vision 2030 effort to expand non-oil revenue in light of a declining dependence on oil. The real GDP reflected economic growth as a dependent variable, while other independent variables were trade openness (TO), money supply M3 and stock market index (SMI). There is a positive and significant relationship between M3 and economic growth owing to a new reliance on Saudi Arabia's M3 and was acknowledged by the gross domestic product. Trade openness and stock market indices during the research period were significant in explaining the change in economic growth. The results of the Wald causality test revealed a strong causality between the variables in the short-term, and stability tests (CUSUM and CUSUMSQ) affirmed that this relationship was stable in the long term and well-utilised to make a forecast. Consequently, Islamic banking credits, in particular, have an essential role in Saudi Arabia to finance the private sector.

Key words: *Islamic Banking Credits, Economic Growth, Saudi Arabia.*



Introduction

The relationship between the financial sector and economic growth is critical in economic research. Financial sectors, including banks, have significant roles where they contribute to the macro economy particularly by encouraging economic growth. Banks as a financial intermediation institution mobilise capital surplus from debtors to creditors into various economic sectors. The more funding allocated to productive sectors, the more capital gain is obtained with a positive contribution to economic growth. Banks and other financial institutions' solid performance correlate positively to the country's economic performance, including the relationship between GDP, employment, and investment. Banking, including Islamic banking, is expected to encourage national economic growth as the banking system has an important role in the economy. Overall, there are slight differences with conventional banking and the fundamental difference lies in financial and operational transaction principles. The goals of Islamic banking are of theoretically widespread economic prosperity, full employment levels and an optimum growth rate,

Islamic finance is the provision of financial services that are compliant with Sharia law. As an Islamic country, Saudi Arabia has a powerful economy in the Middle East. Being the most important 'oil economy' in the world, Saudi Arabia is also well-known in Islamic finance for having large majority assets. Although Indonesia, Malaysia, Pakistan, and Turkey are seeing an increase of assets, Saudi Arabia's growth in this area has been the fastest. Recently, in the banking sector, the Saudi Arabian Monetary Authority (SAMA) has licensed 24 banks, including conventional banks and Islamic Banks. The financial credits and economic growth has increased significantly and is represented by Islamic banks such as Alrajhi Bank, Bank Albilad, Bank Alinma, and Bank Aljazera. In fact, while the banking concept in Saudi Arabia is based on Islamic principles, in some cases, those operated on conventional principles include the Arab National Bank (ANB), and Asia Bank. On the other hand, foreign-licensed banks include Banque Nationale de Paris and Paribas (BNP), Deutsche Bank (DB), Emirates National Bank of Dubai (NBD) and Gulf International Bank (GIB).

Islamic banks' funding comes from no interest deposits and profit-sharing investment accounts with a return decided by the bank's profit. Dissimilarly, bonds in conventional banks reflect a responsibility of the borrower to repay the borrowed amount with an imposed interest rate. Sukuk (Islamic bonds) have structured returns which are linked to the main asset with the lender receiving a claim on the asset in return (asset-backed securities). In an Islamic financial context, there are two essential components, namely: banking services and the Sukuk market. Both consider accounts around 95% of the \$1.8 trillion worth of Islamic financial assets at the end of 2013.

The objective of this research is to investigate the long-term relationship and impact between Islamic banking credits and Saudi Arabia's economic growth. Autoregressive distributed lag (ARDL) is used as an approach. This research is organised into four parts: an introduction, literature review, research methodology and, finally, a discussion of the results, that includes a conclusion and recommendations.

Literature Review

The relationship between Islamic banking credits and economic growth in the majority of previous studies aligns with financial and economic growth theory. These studies also affirm the significant effect of Islamic banking credits on economic growth to be positive. Nevertheless, the contribution of conventional banking credits still contribute to economic growth in Muslim countries.

Banking and Economic Growth

The new classical model of growth assumes the increase in capital investment leads to an increased growth rate (Solow, 1987). An investment represented by financial development has a relationship to economic growth where credit is particularly important as a financial intermediary. Specifically, credit is essential for an economy to function properly as it finances new investments and purchases. Excessive lending and borrowing usually ends results in financial crisis; however credit availability is accomplished for economic growth. Moreover, in Islamic banking, credit should be restricted by ethics such as the prohibition of riba (usury), hazards and fraud. The bank credit ratio to the private sector refers to financial resources provided to the private sector by other depository corporations (deposit-taking corporations except for central banks), such as loans, purchasing of non-equity securities, trade credits and other accounts receivable. Banks designate credit expansion by the banking institutions to the private sector without involving any lending to the government. When the banking credit ratio to the private sector is approximately 70 percent of GDP or more, the country has a well-developed financial system. Credit can exceed 200% of GDP in some highly advanced economies, nevertheless the credit could be less than 15% of GDP in the case of underdeveloped countries.

Conventional and Islamic Banking in Practice

The Islamic banking system is controlled by Islamic (Sharia) law while conventional banking is a profit-oriented and made through the application of interest rates. There are differences between the two systems in stability and efficiency. With regards to previous studies, the principles of Islamic banks are attached to the real economy and allows for a comparison with economic growth. A developing country, particularly, has an opportunity to propagate Islamic banks because of their significant role with GDP. Islamic banking acquires assets from lenders and borrowers for the long-term in order to create projects with higher-risk-return profiles to support economic growth.



A comparison between Islamic banks and conventional banks, and their contributions to economic growth, focused on a sample of 120 banks between 2005 and 2012 by using a panel data-set had estimated by the three ordinary least-square (3LS) regressions. The empirical investigation revealed that the development of non-usurious banks supports economic growth. Furthermore, the collaboration between the two financing modes enhances economic growth. Appropriately this new funding mode never neglected the role of conventional methods of financing. The Islamic banking practice also skewed the theoretical model. (Daly et al., 2016)

A deposits determinant investigation of banking credits in conventional and Islamic banking is essential in an emerging economy. Akhtar et al., (2016) defined deposit determinants in 30 Pakistani banks: 25 conventional and 5 Islamic banks. The research concluded that profit-orientation is the main motive of Pakistan's Islamic bank customers and indicates their natural behaviour to reduce the conventional system substitution effect. Alternatively, Islamic banks must offer a competitive profit rate similar to conventional banks. Akhtar et.al showed that the Base Lending Rate (BLR), Consumer Price Index (CPI), Gross Domestic Product (GDP), Money Supply (M3), Karachi Stock Exchange Composite Index, The Karachi Interbank Offered Rate (KIBOR), and profit rate of Islamic banks as the independent variables affecting deposits. Together they are dependent variables in conventional and Islamic banks. The long-term relationship between these variables are examined, as well as in the short-term, by utilising an advanced time series analysis. An augmented Autoregressive Distributed Lag (ARDL) bounds testing for co-integration has been used to examine the co-integration and Error Correction Model (ECM) for short-term dynamics. The results concluded that variables such as BLR, the interest rate of conventional banks, CPI, Islamic bank profits and M3 had a different impact on conventional and Islamic bank deposits. Customers of conventional and Islamic banks are affected cautiously on the deposit returns received.

Many factors contribute to economic growth, especially financial liberalisation which is the elimination of financial markets and financial institution restrictions and the introduction of financial innovations such as Islamic banking (non-usurious) to the financial markets. The prohibition of interest by Islamic law consequently assigns loss and profit share to support its operational activities. The principle of risk sharing theoretically provides the best long-term funding allocation for investments with high-risk profiles and thereby enhancing economic growth. The empirical evidence of Rabaa and Younes, (2016) has shown the impact of financial liberalisation and the performance of sharia banking on economic growth. It indicated that there is a positive and significant relationship between Islamic banking variables and economic growth during the period 2001-2012 in the case of Abu Dhabi, Saudi Arabia, Bahrain, Britain, and Tunisia.

Islamic Banking Credit and Economic Growth

According to Aliyu et al., (2017), the crucial issue is a cursory study through Islamic banking sustainability. Islamic banks have the challenge to negotiate among the needs for long-term economic, social, and environmental sustainability due to the difficult synergy among them to achieve sharia objectives. In particular, Islamic banking is the most controversial in terms of how credit contributes to the economic development process. The relationship reveals significance to economic activity and its importance to GDP. Related to this issue, some researchers attempt to analyse the impact of Islamic banking credits on economic growth. Islamic banking has a significant relationship to economic growth and Islamic banking development in the short and long term. With regards to Indonesia (2003:1–2010:2 Quarterly) a bi-directional relationship was demonstrated; however, it is was limited relationship. The study employed co-integration and Error Correction Model (ECM) developed by Autoregressive Distributed Lag (ARDL). (Abduh and Umar, 2012).

In the case of five GCC countries (Bahrain, Kuwait, Qatar, Saudi Arabia, and United Arab Emirate), an insignificant relationship was observed between Islamic financial development and growth. This stands in contrast to Grassa and Gazdar (2014) hypothesis that states Islamic finance leads to growth in the five GCC countries. Islamic finance developed less than conventional finance, making clear the imperative to accelerate financial reform amongst the region to improve efficiency and to encourage saving and investment in the long-term. The different effects of conventional and Islamic financial systems on economic growth (1996-2011) were proven by using Generalised Least Square (GLS), Ordinary Least Square (OLS). The Islamic financial system that operates simultaneously with conventional financial systems becomes more effective. However, this result is contrary to Islamic rule.

The relationship between Islamic banking and economic growth in the context of Kingdom of Saudi Arabia (1990-2010) specifically analysed Islamic banking credits in the private sector using econometric analysis; unit root, co-integration and Granger causality tests. Variables such as Gross Domestic Product (GDP), Gross Fixed Capital Formation (GFCF) and Foreign Direct Investment inflow (FDI) represent real economic growth and the credits show Islamic financial development. The relationship between Islamic banks financing and GDP, FDI, GFCF has a unique co-integration vector (all stationary variable data after first difference) and means there is a long-term, stable relationship between Islamic banks and economic growth in Saudi Arabia. Granger causality has shown a relationship between Islamic bank financing to investment and FDI. Clearly, Islamic financial existence stimulates an attraction of FDI and FDI in order to reinforce economic growth. (Mosab and Dhankar, 2014)

Wardhany and Shaista Arshad (2015), during the quarterly period 2003–2011, showed that Islamic banks in Indonesia were still unable to contribute significantly to Indonesia's economic growth as a positive causality relationship between Islamic banks and economic



growth in Indonesia weakly correlated. Variables were GDP, a total credit of Islamic banks, CPI as an inflation proxy and the ratio of total exports and imports. A financial expansion of banks performs an important role for particular funds in the real sector. For the case of ten randomly chosen European countries (Finland, France, Germany, Greece, Hungary, Italy, Poland, Turkey, United Kingdom, and Spain), domestic credits of the banking sector effect macroeconomic variables, such as inflation and economic growth. Panel data analysis examined domestic credits banks' influence on economic growth and inflation variables of these countries by adopting annual data that incorporates during the period from 2006 to 2012. Banking credits and economic growth were stationary and inflation was stationary at the first difference. The absence of heteroscedasticity, multiple correlation, and autocorrelation, as a result, proved that domestic credits by the banking sector for 10 European countries did not affect inflation but affected economic growth. (Korkmaz, 2015; Zharikov, Bezpалov & Ershova, 2017)

In the case of South East Asia, the study revealed evidence in the long-term relationship between economic growth and Islamic banking. The Muslim population in every country has provided a positive and significant role in Islamic banking contributing to economic growth. It was analysed by using the Error Correction Model (PMG, MG, and DFE) with panel data and 2SLS. (Lebdaoui and Wild, 2016). The relationship between the interest rate changes on the profitability of the three major participation banks in Turkey (2008 Q1 to 2016 Q3) was measured by examining financial statements. The panel data analysis and panel co-integration estimation technique were adopted while the coefficient of the interest rate on profitability was estimated by Fully Modified OLS (FMOLS). The Kao co-integration test results show that the variables are co-integrated. The empirical analysis proves that there was a significant and positive relationship between the interest rate changes and the profitability of the participating banks. (Minny, 2017)

The relationship between Islamic banks performance and economic growth through financial stability has attempted to analyse whether Islamic banks are a prerequisite for economic development or whether their financial stability a consequence of it. The cross-sectional data from six banks over six countries (2011-2013) and Pearson regression analysis is utilised to measure causality relationship between GDP and banks performance in Islamic modes of finance. The relationship between them is significant, while the causality relation between Z-score and GDP is negative, a negative relation between Ijara, Murabaha modes, and GDP. Additionally, there is a significant negative relationship between modes of finance except for Mudaraba and Z-score $R=0.93$. However, there is an insignificant relationship between Z-score and Murabahah, Mudaraba. Two models are developed, according to regression tests. (HGB, 2017)

An Overview of Saudi Arabia's Economy

Saudi Arabia, as an oil-based economy and under strong government control over its industrial activities, has 18% of the world's proven oil reserves and is the largest oil exporter. As a leading player of the Organization of Petroleum Exporting Countries (OPEC), Saudi Arabia has decreased oil dependency in recent years in accordance with Saudi Vision 2030. With the second largest proven oil reserves and as the world's largest oil exporter, it also has the fifth largest proven reserves of natural gas, making Saudi Arabia an energy superpower. Saudi Arabia also has the third largest estimated natural resource value, with a total of \$ 34.4 trillion in 2016. This wealth led to the rapid growth of the national economy. Perhaps the most remarkable indicator of this is the doubling of GNP more than 33 times in 28 years, as the value of goods and services produced by the country jumped from US \$ 4.4 billion in 1969 to about US \$ 248 billion in the year 1999/2000. This enabled the country to adopt and implement ambitious five-year development plans since 1970 which focused on the establishment of infrastructure, human resources development and diversification of the non-oil economy by developing other productive sectors such as industry, mining and agriculture. Saudi Vision 2030 aims to reduce its dependence on oil, provides for a diversification in the economy and expands public service sectors. Islamic banking, on the other hand, has made Saudi Arabia the largest market for Islamic finance in the world, with Islamic financing credits totalling is SAR 308,651.39 Million in 2015.

Bank's Credit Growth

Regarding the 53rd Annual Report 2017 1438H of the Saudi Arabian Monetary Authority (SAMA), banking credits contribute a percentage to economic activity. A breakdown of banking credit by economic activity during 2016 shows mixed trends. Banking credit extended to agriculture and fishing increased by 15.3% (SAR 1.7 billion) to SAR 12.8 billion compared to a decline of 4.3% in the previous year. Moreover, banking credit extended to the commerce activities and expanded by 5.1% (SAR 14.6 billion) to SAR 300.1 billion compared to an increase of 11.7% in the previous year. Banking credits extended to manufacturing and production also rose by 2.2% (SAR 3.9 billion) to SAR 176.4 billion compared to an increase of 8.9% in the previous year. Banking credit extended to electricity, water, gas and health services also rose by 1.5% (SAR 623 million) to SAR 41.1 billion compared to an increase of 12.1% in the previous year. On the other hand, banking credits extended to mining and quarrying fell by 8.4% (SAR 1.8 billion) to SAR 19.4 billion compared to a rise of 4.5% in the previous year. Finance activity also declined 6.2% (SAR 2.1 billion) to SAR 31.8 billion compared to a rise of 3.7% in the previous year. Transport and communications also declined 5.3% (SAR 2.2 billion) to SAR 40.4 billion compared to a decrease of 1.4% in the previous year. Banking credits extended to services felt a decrease of 3.8% (SAR 2.7 billion) to SAR 70 billion compared to a rise of 20.5% in the previous year. The building and construction also fell by 1.3% (SAR 1.4 billion) to SAR 104.4 billion compared to a rise of 27.1% in the previous year.

Gross Domestic Product (GDP)

There are many indicators to measure Saudi Arabia economy, for instance, economic growth by real GDP, unemployment, Consumer Price Index as a proxy of inflation and the current accounts. Other indicators measure national debt, real disposable income, Gini co-efficient, labour productivity, investment levels, exchange rate, overall living standards and human development index (HDI). The most prominent of these indicators is real GDP as it is the final value of the goods and services produced within a country during a set time period (a year) that importantly measure economic activity and services in a country. The real GDP is a common indicator to represent economic performance.

Islamic Banking Credits

The terminology of credit most commonly relates to a conventional bank. In the case of Islamic banking, the most popular for credit is financing, but, this study uses credit in order to interpret macroeconomic concepts, precisely economic growth. In Saudi Arabia, Islamic bank credits represented by financing from Bank Alrajhi, Bank Albilad, Bank Aljazera, and Bank Alinmaa. Indeed, Saudi Arabia remains the largest market for Islamic finance in the world, with Islamic financing credits totalling SAR 308,651.39 million in 2015.

The progress of Islamic Bank Credits in Saudi Arabia was an insignificant percentage for nine years (1990-1999) due to the establishment of Islamic banks and bank Alrajhi as the only one Islamic bank at that time. The total credits in 1990 were SAR 15,536.18 million and those increased slowly SAR 34,888.9 million which represented by Bank Alrajhi. Those rose slightly from 2000 to 2004 after the establishment of Bank Aljazira. From 2005-2008, the total of Islamic credit gradually increased in Bank Albilad. Incredibly, it continued from 2009 to 2015 with Bank Alinma and with its total of SAR 3,086,513.92 million.

Money Supply (M3)

Every country has a distinct classification of money supply. M1 in Saudi Arabia consists of currency outside banks and demand deposits, while M2 includes M1 and time and saving deposits and M3 includes M2 and other quasi-money deposit. According to the data from SAMA, money supply (M3) in Saudi Arabia, increased from SAR 188,438.41 Million in 1990 to SAR 1,773,296.42 Million in 2015. It averaged SAR 658,544.76 million by reaching it highest amount (SAR 1,773,296.42 Million) in 2015 and a record low of SAR 188,438.41 Million in 1990. It flat lined for ten years, from 1990 to 2000, due to the reliance on monetary policy on M1 and M2. It continued in this way until 2015, albeit it remained slow in 2014 and was worth SAR 1,729,355.57 Million.

Trade Openness

Saudi Arabia's government selects trade partners to achieve trade integration and to create the economic and political environment in support of extending the maximum trade benefits and

return margins from international trade. The trade openness performance rates of Saudi Arabia remained high through sustained improvement and exports and imports growth of about 83.48 % during the period 2001-2008. During the second oil boom (2003-2008), Saudi Arabia, particularly as an oil exporting country, expanded in global economic activity which accelerated the development of international trade. All of these contributed to the increase in trade openness in Saudi Arabia where the highest rates of 83.48 %, 88.2% and 86.49 in 2008, 2012 and 2013 respectively. Despite the low levels of global oil prices following the global financial crisis in 2008, Saudi Arabia's trade rates remained high at 83.48 % until 2014. This phenomenon explains that the growth of Saudi Arabia's imports during the period is higher than export growth. Accordingly, development plans of Saudi Arabia need justification for increasing domestic consumption of consumer and intermediate goods. In 2015, there was a significant declining in trade rates to 55.73% owing to a sharp decrease in Saudi Arabia's export volume in the same year (23.46 %) compared to the previous year. The economy had been relying heavily on oil exports and the decline in oil exports is a result of the reduction of the domestic production volume of oil reciprocally.

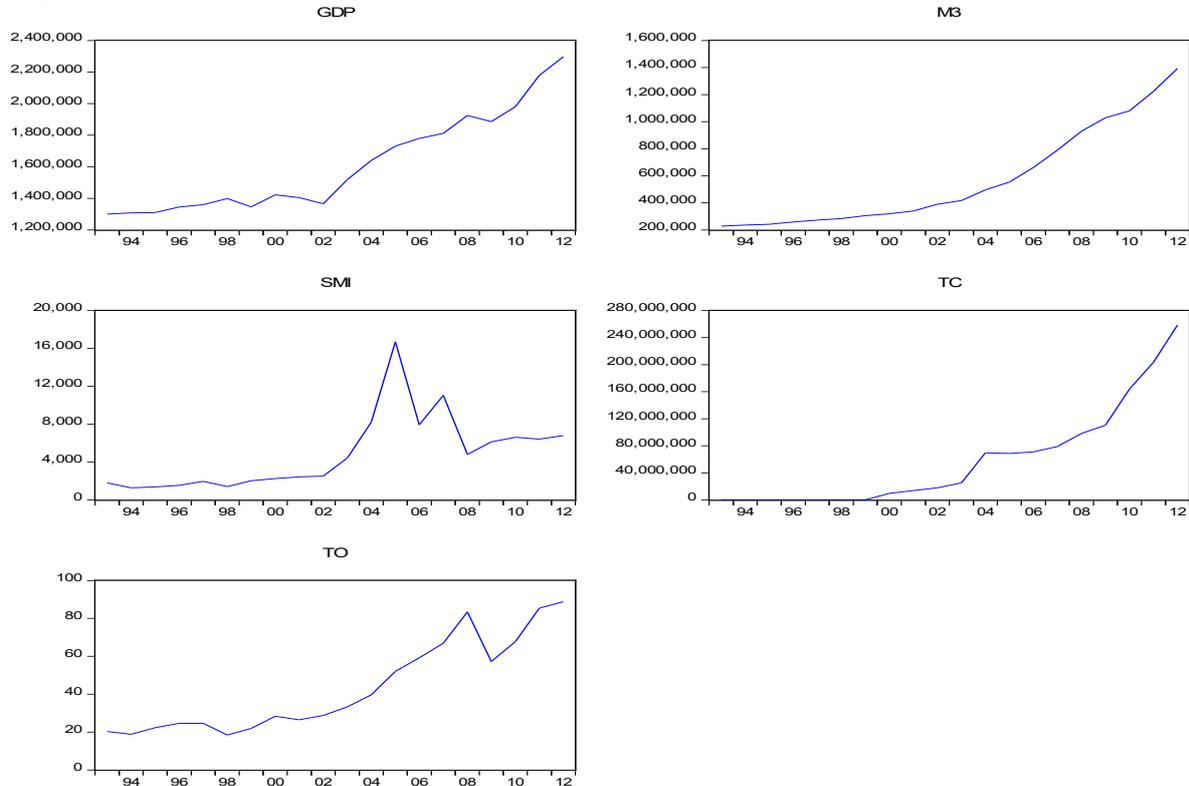
Stock Market Index

The stock market index indicates a fundamental changing at the index level which used to measure the price level of a traded companies group in the financial markets. The stock indices reflect the current economic situation and economic forecast. The indicators inform a market sentiment idea, a country's economy reflection, and market-changing management. The Saudi stock exchange is the only licensed stock company by the capital market authority of Saudi Arabia (CMA) for the trading of securities. The Saudi Stock Exchange (SSE) was established in 1984 to develop and regulate the kingdom's securities market. The formation of the SSE's new regulation in 2003, the Saudi Capital Markets Authority (CMA) continued to grow rapidly until the 2007-2008 global financial crisis. Saudi Arabia launched its stock market to foreigners for the first time in 2015. The policy allowed gradually approved foreign investors from the Gulf Cooperation Council countries to directly own Saudi stocks. Representing approximately 90 percent of government income, it was part of an endeavour by King Salman to diversify the Arab world's biggest economy away from oil.

From 1990 to 2002, the capital stock market index grew slowly on average 1,785.71 points. At the beginning of 2003, it increased sharply to 2005 parallel with the SSE's new regulation. However, it surprisingly decreased until 2006 and weakened continuously until 2015. The SSE was transformed from a mutually-owned organization into a joint-stock company in 2007. With investment markets in the Middle East launching in 2008, the CMA migrated to shore up trading on the SSE to encourage more foreign investment in Saudi securities markets. In August 2008, the CMA announced new investment rules for non-resident foreign investors that permitted them to enrol swap agreements with Saudi intermediaries to

recognise the commencement of Saudi Arabia's securities ownership. The SSE currently registers 160 companies and about \$2.5 billion worth of traded shares every day.

Figure 1. Saudi Arabia's Economic Variables



Data and Variables

This research employs time series data during the period 1990–2015. The data of Gross Domestic Product (GDP), Trade Openness (TO), Stock Market Index (SMI), and Money Supply (M3) were collected from General Authority for Statistics, Kingdom of Saudi Arabia and total credits of Islamic banks (TC) from Islamic Finance Data, Islamic Development Bank. The variables are the total credits of Islamic banks (TC), Gross Domestic Product (GDP) as the representation of economic growth, Money Supply (M3), and trade openness (TO):

$$GDP_t = \alpha + \alpha_1 TC_t + \alpha_2 M3_t + \alpha_3 TO_t + \alpha_4 SMI_t + \varepsilon_t$$

While;

- GDP = Gross Domestic Product
- TC = Total Credit of Islamic Banks
- M3 = Money Supply (M3)
- TO = Trade Openness $\{(import + export)/GDP\}$
- SMI = Stock Market Index

The Expected Signs of Variables

This study estimates that Islamic banking credits (TC), Trade Openness (TO), and Money Supply (M3) should have an expected positive and significant coefficient. Consequentially, real GDP is growing rapidly by affected dependent variables that include Islamic banking credits (TC) in the availability of assets and funds under the government control.

Research Methodology

To investigate the research objectives, the analytical framework of this study begins by analysing the Self-Modelling Regression for Autoregressive Distributed Lag (ARDL) co-integration. To estimate a relationship in the long-term, the Error Correction Model (ECM) combined the long and short-term relationship of the impact of Islamic banking credits on Saudi Arabia's economic growth. A subsequent discussion focuses on the stability between variables such as heteroscedasticity, Durbin Watson Test, Lagrange Multiplier, Multi-collinearity and autocorrelation.

The ARDL model has become the most common econometric approach in recent years. The most applied, estimated and interpreted co-integration techniques in analysing time series variables are the Autoregressive Distributed Lag (ARDL) co-integration technique or bound co-integration technique. The appropriation of the ARDL co-integration technique does not require pre-tests for unit roots, unlike other techniques. Even though the ARDL co-integration technique is preferable when dealing with variables that are integrated, of a different order, I (0), I (1) or combination of the both and, it becomes strong when there is a single long-term relationship between the main variables in a small sample size. In this approach, the long-run relationship is assumed to be stationary when the F-statistic exceeds the critical value. One of the advantages of the ARDL co-integration approach is to elude misleading estimation, interpretation and application because the model will be incompatible, incoherent and inaccurate when the necessary conditions are inadequate. As a result, it should influence the forecast. This method also matches in its identification of the multiple co-integrating vectors. For anticipating a forecast failure, alternatively, the test for unit roots is selected. However, this approach will fall in the presence of an integrated stochastic trend of I (2). (Nkoro and Uko, 2016).

Autoregressive Distributed Lag (ARDL) Approach

The ARDL (p, q₁, q₂... q_k) model generally

$$\phi(L)y_t = \varphi + \theta_1(L)x_{1t} + \theta_2(L)x_{2t} + \theta_k(L)x_{kt} + \mu_t$$

Adopting the Lag operator L applied to each component of a vector, $L^k y = y_{t-k}$, is convenient to explain the lag polynomial $\theta(L, p)$ and the vector polynomial $\beta(L, q)$. Thorough it can be assumed that the error term u_t is a white noise process, or more generally is stationary and independent of x_t, x_{t-1}, \dots and y_t, y_{t-1}, \dots , the ARDL models can be estimated consistently by ordinary least squares (OLS).

Furthermore, the ARDL (p, q_1, q_2, \dots, q_k) model specification is given as follows;

$$\phi(L, p)Y_t = \sum_{i=1}^k \beta_i(L, q_i)x_{it} + \delta w_t + u_t$$

Where

$$\begin{aligned} \phi(L, p) &= 1 - \phi_1 L - \phi_2 L^2 - \dots - \phi_p L^p \\ \beta(L, q) &= 1 - \beta_1 L - \beta_2 L^2 - \dots - \beta_q L^q, \text{ for } i = 1, 2, 3 \dots \dots k, u_t \sim iid(0; \delta^2) \end{aligned}$$

L is a lag operator such that $L^0 y_t = X_t$, $L^1 y_t = Y_{t-1}$, and w_t is a $s \times 1$ vector of deterministic variables such as exogenous variables with the fixed lags, the intercept term, time trends, or seasonal dummies. $P = 0, 1, 2 \dots m$, $q = 0, 1, 2 \dots, m$, $i = 1, 2 \dots, k$: a total of $m + 1^{k+1}$ distinct ARDL models. The maximum lag order, m , is selected by the user. Sample period, $t = m + 1 + 2 \dots, n$.

Results and Discussions

Prior to the co-integration test, the time series in the model might be verified either at the level $I(0)$ or the first difference $I(1)$ by using unit root tests which showed the majority of variables as shown in Table 2 below. Accordingly, the Auto Regressive Distributive Lag (ARDL) approach can be applied to test the existence of a co-integration relationship between the variables by testing the null hypothesis:

$$H: \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = 0$$

Additionally, there is no long-term relationship between the variables in the case of acceptance of the null hypothesis. The model in this research utilised the Augmented Dickey-Fuller (ADF) and Philips Perron (PP) (1988) test equation by selecting a lag parameter with using Akaike (1973) Information Criterion (AIC) and Bayesian information criterion information (BIC) or Schwarz Information criterion (SIC). SIC gave criteria for adapting to the Schwarz-Bayesian standard.

Table 2: Unit Root Test

Variables	Level				First Difference			
	ADF		PP		ADF		PP	
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	Intercept	Trend and Intercept	Intercept	Trend and Intercept
GDP	1.460	-0.486	1.848	-0.369	-4.131	-5.209	-4.131	-8.694
TC	2.635	-0.608	2.056	-0.697	-2.639	-3.975	-2.627	-3.406
M3	5.273	-0.115	4.859	0.115	-1.844	-3.395	-1.844	-3.364
TO	-1.106	-1.892	-1.126	-1.992	-3.993	-3.835	-3.923	-3.762
SMI	-2.175	-2.970	-2.137	-3.051	-7.212	-7.052	-7.145	-6.989
Table								
1%	-3.724	-4.374	-3.724	-4.374	-3.738	-4.498	-3.738	-4.394
5%	-2.986	-3.603	-2.986	-3.603	-2.992	-3.658	-2.992	-3.612
10%	-2.633	-3.238	-2.633	-3.238	-2.636	-3.269	-2.636	-3.243

For any of the time series, the null hypothesis of unit root test at the majority 5% significance level is rejected. The results consequently indicated that the time series has a unit root and stationary at the first difference. In fact, for M3 an additional test on the first difference with a constant was run. These tests are Elliot, Rothenberg, and Stock (1996) DF-GLS, and Kwiatkowski, Phillips, Schmidt, and Shin (KPSS, 1992). The latter test differs from all other tests in that it assumes series is stationary under the null. The first test rejects that this variable has a unit root in its first difference at 10% level, while the second test does not reject its being stationary in its first difference at 5% level. Therefore, it is assumed that M3 is I (1) with a constant case.

Table 3: DF-GLS and KPSS Results of Unit Root Tests

Variable	DF-GLS	KPSS
TC	- 2.601 (-1.85)**	0.471 (0.74)
M3	- 1.829 (-1.61)***	0.611 (0.74)

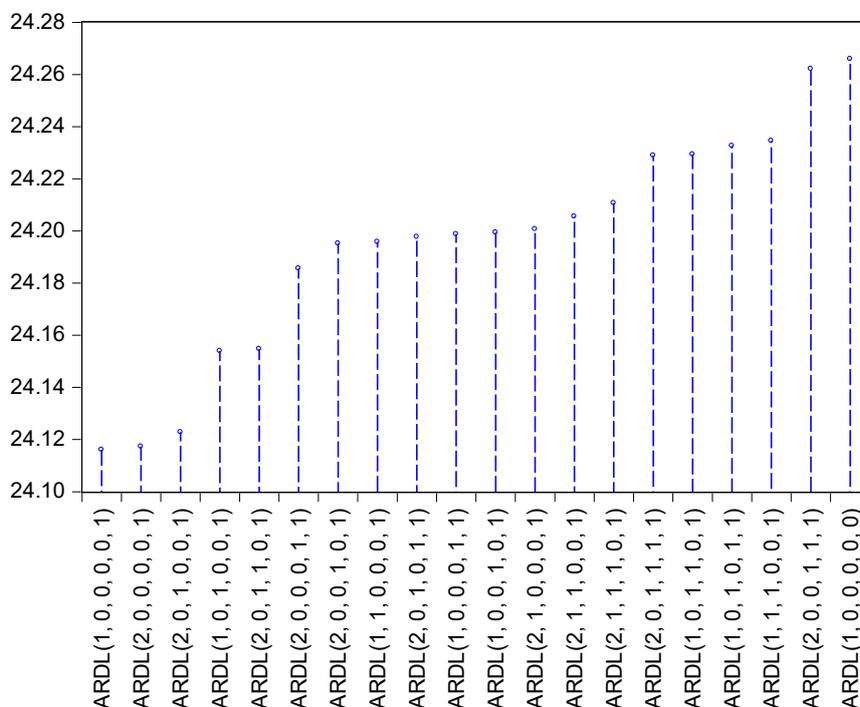
With regards to Table 3 above, note that *, ** and *** indicate statistical significance of actual value at 1%, 5% and 10% significance levels, respectively. Five lags are used as

maximum and optimal lag is selected by Schwarz criterion automatically in DF-GLS test. The numbers in brackets are the critical values.

According to Liew (2004), automatic selection (using Akaike Information Criterion) is more appropriate when the observations are less than 60. Moreover, an optimal lag is 2 lags from dependent variables and the single lag from the regressor. The procedure has selected an ARDL (1, 0, 1, 0, 1), a single lag of TC, G, TO, 2 lags of SMI, and two lags of GDP and out of 64 models evaluated. (See Figure 2).

Figure 2.

Akaike Information Criteria (top 20 models)



As shown in Table 4 below, in the long-term, the Bounds Test result showed that there is a relationship between research variables in the long term. Table 1 (see appendix) showed also the test of co-integration for the model: at 5% significance, F-statistic value (5.82) is greater than F-calculated (2.86). So that, the H_0 is rejected, which means there is a long-term relationship between the variables. (Abduh and Umar, 2012).

Table 4: Long-term Relationship of the ARDL Model (1, 0, 1, 0, 1) with GDP as a Dependent Variable

Variables	Coefficient	Standard Error	T-Ratio
TC	0.001	0.0005	2.201
M3	0.414	0.132	3.131
TO	2422.613	1387.003	1.746
SMI	14.874	3.1749	3.968
α	1161399.777	37421.69	31.035

Table 4 above demonstrates that the sign of TO is positive and significant and means that economic growth in Saudi Arabia positively correlated with Islamic banking credits during the period of research with a coefficient (0.001). The interpretation is that any increase in Saudi Arabia's Islamic banking credits by 1% will lead to the acceleration of economic growth by 0.002. The result of the statistical function at the level of significance of 5 % as indicated by the T calculated value (2.201). The results of this research deeply elaborated the relationship between Islamic banks credit and the economic growth in the long-term and short-term. Tabash and Dhankar results (2014) were previously utilised by a Granger Causality and Johansen Test for co-integration. The results also demonstrated that the economic growth of Saudi Arabia is linked to money supply (M3) and is considered the broadest measure of the economy's money supply. There is a positive relationship due to the new reliance of Saudi Arabia's M3, which the money supply in Saudi Arabia dramatically improved in 2004. Saudi Arabia's economic growth and trade openness during the research period were relevant to Saudi Arabia's economy with the coefficient (2422.613) at the significance level of 5% (0.099). This demonstrates that trade openness has a significant relationship on Saudi Arabia economic growth.

The relationship between Saudi Arabia's economic growth and stock market indices is verified with the coefficient 14.874 at the significance level of 5% (3.968). On the other hand, the distribution of local government Sukuk securities enhances Saudi Arabia's government to issue the first Sukuk under the primary dealers' program. Approximately SR3.5 billion of the total amount is for the development of Islamic debt capital markets for expanding the investor base toward government Sukuk securities in the primary market and liquidity promotion in the secondary market. The Saudi government has been issuing regular Islamic bonds since the Ministry of Finance established a Saudi riyal-denominated Sukuk program in 2017. The government's financial development program elaborates on debt capital markets, particularly the local government Sukuk market, through primary dealers to encourage the stable demand of government formulation for Sukuk securities by facilitating public access to sovereign debt.

Table 5: Error Correction Model (ECM) (1, 0, 1, 0, 1)

Variable	Coefficient	Std. Error	t-Statistic
D(TC)	0.001	0.000	2.487
D(M3)	-0.151	0.395	-0.383
D(TO)	2186.336	1129.399	1.936
D(SMI)	6.010	3.101	1.938
CointEq(-1)	-0.902	0.159	-5.682
R-squared = 0.994 F-statistic = 425.966 Durbin-Watson stat = 2.085 Serial Correlation LM F(2,15) = 1.934 (0.179) Normality JB = 0.328 (0.849) Heteroscedacity F (7,17) = 0.318 (0.936) Functional Form F (1, 16) = 0.520 (0.481)			

This model demonstrated the dynamic behaviour of the ARDL model which measures the recent and previous value of exogenous variables in Saudi Arabia's economic growth variable. The dynamic correlation between the long and the short-term relationship is also confirmed. The results indicated that the effect of previous values of independent variables on the dependent variable is specific deceleration.

With regards to Table 5 above, the testing form model varied from econometrics problems, such as normal distribution and heteroscedasticity. Moreover, an absence of autocorrelation among the residuals indicated that there was no autocorrelation. Naturally, a heteroscedasticity problem in this model did not exist. This model structure determination is relevant to Ramsey's (1969) test. (Pesaran and Shin, 1997). The results also indicated that the Error Correction Coefficient (ECM_{t-1}) satisfied the conditions of a real integrative correlation relationship, where it was a negative and moral value between zero to one. The error correction coefficient showed the velocity of the correction from the short-term to the long-term relationship where the value is -0.90. The value of the correction is approximately one year for the annual data. Hence, the correction process of the divergence from the equilibrium needed about 90% every one year to reach the long-term relationship.

Wald Test

Abraham Wald (1945) presented three levels to determine the extent of causality relationship between economic variables that have already been examined for a co-integration relationship (Fears et al., 1996). The first test: the short-term causality is weak by subjecting

all parameters in the short-term model to testing except ECM_{t-1} error correction parameter where the following null hypothesis test performed:

$$H_0: \beta = \beta = \beta = \dots = \beta = \mathbf{0}$$

The second test: the long-term causality test by testing the ECM_{t-1} error correction parameter only as the following null hypothesis:

$$H_0: \beta = \mathbf{0}$$

The third test: the strong short-term causality test within a combination of the two previous tests which means a combination of the short-term estimated model parameters with the ECM_{t-1} error correction coefficient. In each of the previous estimations in using the F statistic, the null hypothesis is rejected. Accordingly, there is a causality relationship between the variables.

By performing the previously estimated ECM model (1, 0, 1, 0, 1), the results confirmed a strong causality between the research variables in the short-term relationship which indicated by F calculated value 269.911 (0.000). The causality between the variables in the long-term (3.00) with a potential level of 0.10 is also powerful (see appendix table 2 and table 3).

Stability Test

To test stability, CUSUM and CUSUM Square tests are employed. These tests are utilised to detect the average of the process during the time period, either by fully practicing of it or dividing it into subgroups according to the data used (annual, quarterly, monthly). It works in the accumulation of information during previous periods to explain the shifts and deviations in the average operation during the period and thus using regression in prediction for future periods. It may thereby reveal any undetected process by drifting upwards or downwards cumulatively beyond the limits of the selected morale (1%, 5%, 10%). (Farhani, 2012). CUSUM tests estimate the stability of coefficients (β) in a multiple linear regression model of the form $y = X\beta + \varepsilon$. The assumption related to a sequence of sums, or sums of squares, of recursive residuals (standardised one-step-ahead forecast errors), computed iteratively from nested subsamples of the data. Under the null hypothesis of coefficient constancy, values of the sequence outside an expected range propose a structural change in the model during a period. The results of CUSUM and CUSUM Square, from Figure 3 and Figure 4 below, have verified that there were no divergences during the research period (1990-2015) at the 5% significance level. The CUSUM series keep remaining far away from the critical line. This results meant that there was a stable relationship in the long-term during the research period. (See also Appendix Form 1).

Figure 3. Cumulative Sum of Recursive Residuals

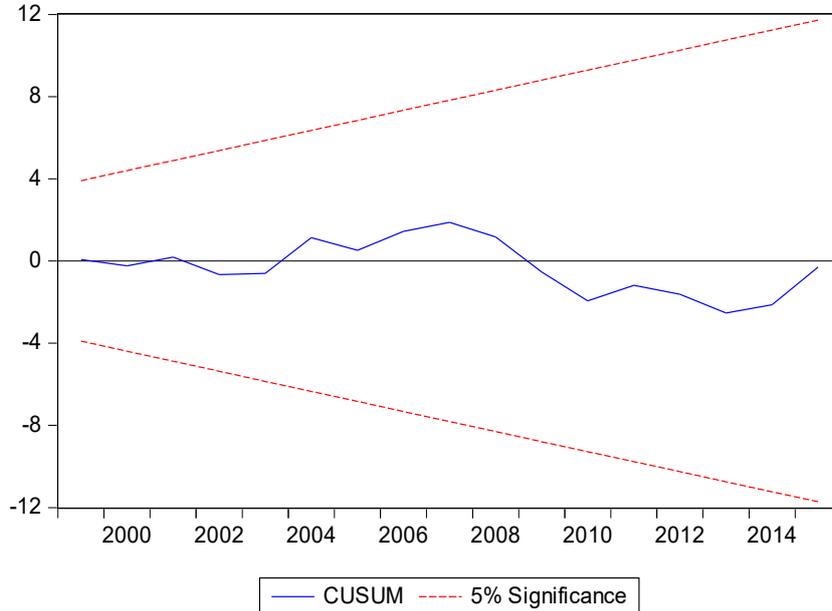
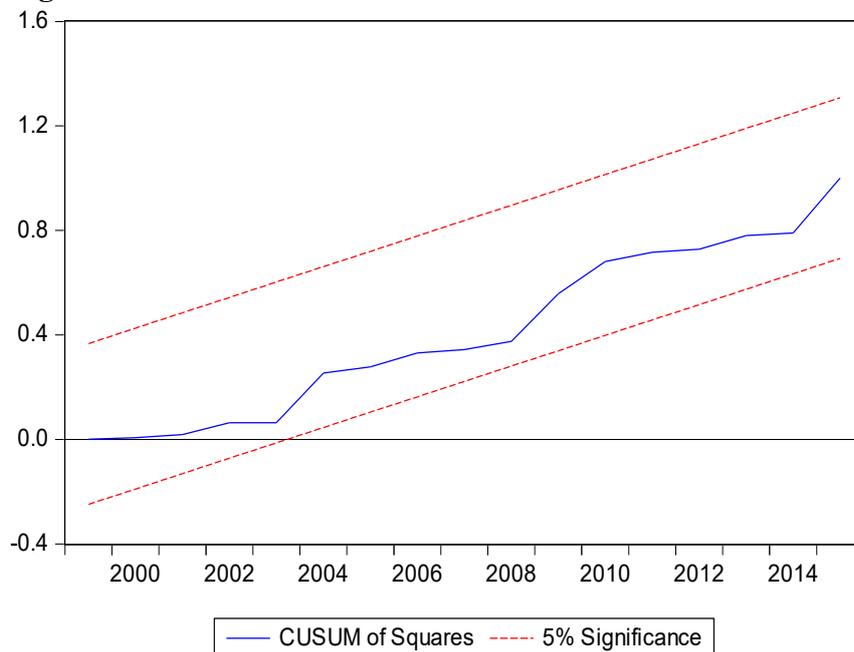


Figure 4. Cumulative Sum of Recursive Residuals



Conclusions

The results showed that real GDP reflected Saudi Arabia's economic growth. It also contributed to the explanation of a large percentage of change in economic growth, as indicated by the values of the coefficients and the coefficient of selection is $R^2 = 99\%$. The

impact of Islamic banking credits on Saudi Arabia's economic growth had confirmed its significant contribution in the economy (0.002 %). M3 revealed the broadest measure of the economy's money supply. There is a positive and significant relationship due to the new reliance of Saudi Arabia's M3. It was acknowledged, by the gross domestic product of Saudi Arabia. Trade openness and stock market indices during the research period were significant in explaining the change in economic growth. Influenced economic factors depended on other factors such as oil price, investment volume, domestic consumption, imports volume from other countries. The results of the Wald Causality Test revealed a strong causality between the variables in the short-term, and stability tests (CUSUM and CUSUMSQ) assigned that this relationship was stable in the long term and well-utilised for a forecast. Saudi Arabia's economy is one of the most successful economies. However, Islamic banking credits linked to the other variables such as the stock market indices, Sukuk, credit return margins of Islamic banks and other conventional banks and finance makes Saudi Arabia's financial stability robust in facing global oil market fluctuations.

Recommendations

To overcome the research shortcomings and to promote the research implications, the following recommendations are made:

1. The intensification of the private sector in Saudi Arabia is associated with Islamic banking credit and reflects Islamic banking development. The objectives and efforts of the improvement plan to achieve the economic diversification of private sectors to enhance the economic growth is aligns with Saudi Vision 2030.
2. The impact of Islamic banking credits in economic growth shows a positive sign and significant. Given this, Saudi Arabia's government should support Islamic banking and finance development. Islamic banks, on the other hand, should promote their credit as being accessible.
3. The difference between conventional banking and Islamic banking in some of the credit features should be clear. For instance, murabaha, in practice, seems to be similar with interest rate concepts. This phenomenon should be investigated in the future.
4. A separated data of credits between conventional banks and Islamic banks are supposed to be available by the Saudi Arabia Monetary Authority.



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APPENDIX

Table 1

The result of Cointegration Test (ARDL Bounds Test)

ARDL Bounds Test

Date: 12/14/18 Time: 21:18

Sample: 1991 2015

Included observations: 25

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.819331	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Table 2

The Result of Causality Relationship in the Short-Term

Wald Test:

Equation: ARDL CORRECT

Test Statistic	Value	df	Probability
F-statistic	269.6846	(6, 17)	0.0000
Chi-square	1618.108	6	0.0000

Null Hypothesis: C(1)=0, C(2)=0, C(3)=0, C(4)=0, C(5)=0, C(6)=0

Table 3

The Result of Causality Relationship in the Long-Term

Wald Test:

Equation: ARDL_CORRECT

Test Statistic	Value	df	Probability
t-statistic	1.938000	17	0.0694
F-statistic	3.755843	(1, 17)	0.0694
Chi-square	3.755843	1	0.0526

Form 1

Plot of Cumulative Sum of Recursive Variables

