Islamic banking's contribution to the Malaysian real economy

Ibrahim Musa Gani
*Economics Department, Isa Kaita College of Education,
Dutsinma, Nigeria, and*

Zakaria Bahari
*Centre for Islamic Development Management Studies (ISDEV),
Universiti Sains Malaysia, George Town, Malaysia*

Abstract

Purpose – Malaysia is one of the fastest-growing Asian economies with a properly designed and developed Islamic financial system. This unique feature of the Malaysian economy made it an important case study, and the purpose of this study is to assess for the dynamic contribution of Islamic finance to the growth of the real economy.

Design/methodology/approach – The study uses a quarterly data set of 20 years analysed via the autoregressive distributive lag bounds test approach to cointegration.

Findings – The results in the short-run show a non-significant relationship between Islamic banking indices and the real economy. However, in the long-run, financing and deposits of Islamic banks are favourable and contribute significantly to the growth of the Malaysian economy. There was an accumulation of meaningful and wide-ranging investment over the period of the study and productivity of capital was also extra-efficient. The direction of causality is found to be bidirectional between Islamic banking deposits and Malaysian gross domestic product (GDP), but there is a weak causal effect from Islamic banking financing to GDP.

Research limitations/implications – Malaysia has a dual financial system (conventional and Islamic) and both can affect its real economy. This research is limited to Islamic banking's effects on Malaysian economic growth. The research also limits the scope and coverage for 20 years, from 1998 to 2017 to cover the years for which data is available for all the variables used in the study.

Practical implications – The results confirm that the Islamic banking sector in Malaysia is performing well in carrying out its major function of financial intermediation, which is the pooling and channelling of funds to productive investment activities. Consequently, the fact that Malaysia excels in Islamic finance is not a fluke. It is because of the effective performance of Islamic financial institutions in the country. Furthermore, Malaysian authorities are doing their level best in promoting Islamic financial activities.

Originality/value – The study fulfills the need to uncover the relationship between the Islamic financial system and the real economy in Malaysia. It differs from other studies as it uses the most recent available data, introduces new variables and identifies the channel by which Islamic banking development transmits growth.

Keywords Capital accumulation and productivity of capital, Deposits, Economic growth, Financing, Islamic banking, Islamic finance

Paper type Research paper

Introduction

The relationship between financial activities and economic growth has attracted massive interest amongst researchers, scholars and policymakers across the globe (Aziakpono, 2003). The financial sector, especially the banking sector, may have an impact on the growth of the economy by promoting investment and enhancing the productivity of capital (Schumpeter, 1911). Schumpeter (1911) stressed the need for the provision of credit to entrepreneurs so that productivity within the economy will improve. Productivity is increased by financing new techniques of production and exciting innovations. Financing is transmitted through the banking process by mobilising savings and giving it out as loans. Notable scholars such as Gurley and Shaw (1955), Hicks (1969) and Goldsmith (1969) shared Schumpeter's view as they contended that financial processes augment economic growth and development.

In conventional economics, financial intermediaries operate on the basis of unregulated interest rates underlying the liberalisation hypothesis. However, the institution of interest is severely condemned by Islam, as mentioned in several verses of the Holy Qurʾān (2:275–280, 3:130, 4:160–161 and 30:39) and the teachings of Prophet Muhammad Peace be upon Him (PBUH). Moreover, interest has been criticised by prominent thinkers in human history, like Aristotle who labelled it as the "birth of money for money" (Ahmad, 1993). It was equally condemned by other religions.

For over five decades, Islamic economics ideas have been transformed into reality. They have brought about the introduction of financial activities and institutions based on Islamic laws and regulations (Sharīʿah) in different Muslim states. Many countries embraced Islamic finance as a unique model of banking operations and an alternative mode of financing, especially countries in the Middle East and Asia, including Malaysia, where there is a high concentration of Muslims.

Malaysia, as one of the fastest-growing Asian economies with a well-designed and developed financial system, adopted Islamic financial policy in the early 1980s (DOSM, 2019). The Islamic financial sector in Malaysia, which includes Islamic banking, Islamic capital market and *takāful* (Islamic insurance), has been significantly growing in its activities, as well as in its assets and capital, for the past 10 years. Although the Malaysian economy suffered from a recession in 2001 and 2009, the assets/capital of the Islamic financial system grew significantly over the period 2008–2009 from RM1.8bn in 2008 to RM2.4bn in 2009, representing an increase of over 76% (Bank Negara Malaysia, 2017). Moreover, as of December 2019, the asset size of Islamic banks alone stood at RM835.19bn (Bank Negara Malaysia, 2020). This evidence suggests that the Malaysian Islamic financial sector has been able to extend financing even during the recessionary periods, which might have helped in the recovery of the Malaysian economy.

With the exception of 2009, when it experienced negative growth of −1.80%, Malaysia's gross domestic product (GDP) has recorded positive single-digit growth for more than a decade:

- 6.15% (2007)
- 4.45% (2008)
- 7.08% (2010)
- 5.20% (2011)
- 5.25% (2012)
- 4.80% (2013)
- 5.47% (2014)
- 4.86% (2015)
- 7.45% (2016)

- 5.90% (2017)
- 4.90% (2018)
- 3.60% (2019) (DOSM, 2020)

Likewise, Islamic finance maintained a trend of positive and significant growth for the past 13 years between 2007 and 2019. It spurred the growth of the whole financial sector's assets and liabilities and confirmed the strength and contribution of Islamic finance to the Malaysian economy (Bank Negara Malaysia, 2019). One exciting fact about Malaysia is that conventional and Islamic banking institutions co-exist within its financial system and are operating simultaneously successfully. The assets and capital of both banking systems have been increasing significantly over the past years.

In Malaysia, the Islamic banking sector has contributed significantly to the development of the whole financial system – which may, in turn, have an impact on economic growth (Hassan *et al.*, 2011). This research attempts to examine the influence of Islamic banking development on the growth of the Malaysian economy. It covers a period of 20 years (1998 to 2017). This period has been selected because of the availability of accurate data for Islamic banking and finance. Moreover, the study analyses the channels through which Islamic banking institutions pool investment and influence capital accumulation and productivity of capital in Malaysia. This paper intends to add to the literature by providing dynamic empirical evidence on the contribution of Islamic banking development to economic growth. It also differs from previous studies and fills in the existing literature gap by providing a new combination of variables and identifying the channels through which Islamic banking and finance affect Malaysian economic growth.

The rest of the paper is organised as follows: after this introduction, a review of related literature is provided. Thereafter, the research methodology and theoretical frameworks used in this research are delineated. Results analysis and discussions then follow. The paper ends with the conclusion and recommendations.

Literature review
Financial activities and economic growth
Financial activities and services have an impact on economic growth according to many scholars. Bagehot (1873/1999) and Schumpeter (1911) provided an explicit analysis of the positive effect of financial development on the growth of the economy. Since then, scholars have developed four different hypotheses on this relationship.

(1) The first is "finance causes growth" hypothesis (supply-leading). It was originated by Schumpeter (1911) and was later advanced by McKinnon (1973), whose model focusses on the complementarity hypothesis, and by Shaw (1973), who discussed the debt intermediation hypothesis. They based their argument on the higher level of banks' financial intermediation (because of financial liberalisation), which propels the growth of the economy (Ang, 2007).

(2) In the same vein, Robinson (1952) argued that growth causes financial development and developed the hypothesis of "demand-following" – the second hypothesis on the relationship between financial development and economic growth. He postulated that economic growth positively influences financial activities within the economy, leading to increased financial development.

(3) Patrick (1966) then pioneered the "bi-directional" hypothesis. According to this third hypothesis, the causal effect between finance and growth is mutual dependence, which means finance and growth cause each other. Patrick (1966)

postulated that in underdeveloped countries, finance causes growth and in developed countries, it is growth that causes financial activities.

(4) Finally, Lucas (1988) advanced the hypothesis of no existing relationship between finance and growth ("neutrality" hypothesis). Under this hypothesis, finance is not needed in the process of economic growth.

According to Lucas (1988), the relationship between finance and growth is unnecessarily overstressed. The four types of hypotheses are summarised below:

H1. Finance causes growth (supply-leading).

H2. Growth leads to financial development (demand-following).

H3. Finance and growth cause each other (bi-directional relationship).

H4. Finance is not needed in the process of economic growth (neutrality relationship).

However, the foundations of those arguments centred on the conventional setting of financial intermediaries where interest is the basis of the intermediation process. Moreover, in many instances, interest rate-based financial intermediation failed to finance the real economy of many countries, especially developing economies. The principles of Islamic economics have been transmuted from theory to practice with the introduction of interest-free financial intermediaries, where the concept of trade and the sharing of profit and loss are the underlying bases of financial intermediation. Islamic financial activities, like those of conventional finance institutions, comprise debt financing (e.g. through *murābaḥah*) but also include equity financing (e.g. *muḍārabah* and *mushārakah*). Sharīʿah compliance is the unique characteristic of Islamic banking and finance, underlined by the Islamic economic principle of profit-and-loss sharing (ISRA, 2012).

With the increasing significance of Islamic banking and finance all over the world, studies have focussed on the unique feature of Islamic finance (dominantly equity-based), as well as the functions it performs in the processes of economic growth (Cham, 2018). It has been postulated that Islamic finance is more connected to the economy, especially the real sector, than conventional finance. Considering the connectivity of Islamic finance and economic growth, the causal relationship between Islamic financial activities and economic growth might be reciprocal. Thus, a well-designed and efficient Islamic financial system would mobilise more funds for investment and allot them to enterprises, which means investment would increase, as well as growth in the real sector. In the same vein, stable and profitable real industry would bring more returns to the Islamic financial sector, consequently expanding its development (Kassim, 2016). The effect can be achieved through important channels of pooling investments. The channels include capital accumulation (quantity effect) and productivity of capital (quality effect).

Capital accumulation (quantity effect) is initiated when Islamic financial institutions (IFIs) accept deposits from households and firms. Naturally, this generates an upturn in financial deepening. In other words, as the banks' or IFIs' liquidity increases, more funds for financing investment will be made available (deficit side). The level of investment will automatically increase as a result of the availability of capital, hence propelling economic growth.

The process of increasing productivity of capital (quality effect) happens when IFIs gather information and conduct investment appraisals to determine viable and productive investments, and then direct the funds to the most viable and profitable investments. During this process, IFIs screen and select potential users of capital to provide financing to the most viable investment projects, leading to an increase in the productivity of capital. This also

leads to distributive efficiency, which brings an intensification in the productivity of capital and the whole economy, hence promoting economic growth (Waheed and Younus, 2010).

Past studies on Islamic banking and economic growth

Lehnert (2019) investigated the performance of Islamic banking on economic growth in 32 developed and developing countries. The study used different econometric specifications such as pooling ordinary least squares (POLS), fixed effects, panel data with an over-identified generalised method of moments and dynamic differences. The findings confirmed that, while Islamic banks are considered small relative to the total size of the financial sector, Islamic banks are positively correlated with economic growth even after monitoring the financial structure, macroeconomic factors and other variables. In another development, Chazi *et al.* (2020) assessed Islamic banking growth to check whether it has an impact on the growth of industries. The study selected 28 industries in 14 countries and applied tools inherent to the faith-based model of banking to test the hypothesis. The study suggested that the absolute and relative size of Islamic banks has a positive impact on the growth of the industrial sector, which, in turn, stimulates economic growth. Consequently, the two studies provided positive evidence in support of the Islamic banking sector's contribution on growth, but the long-run cointegration amongst the variables were not provided. Once more, the studies were conducted on a pool of countries.

Furthermore, Gazdar *et al.* (2019) analysed five Gulf Cooperation Council (GCC) countries from 1996 to 2016. Their study explored the possible impact of Islamic finance on the connection between oil terms of trade, growth volatility and economic growth in those GCC economies. The investigation found empirical evidence of a positive and significant connection between growth volatility in oil terms of trade and economic growth. It further indicated that the Islamic financial system strengthens the impact of economic growth volatility in oil terms of trade on economic growth. Meanwhile, Leon and Weill (2018) examined the impact of Islamic banking development on access to credit. The study combined data from a unique database on Islamic finance called IFIRST and data from Doing Business (a hand-collected database) that cover Islamic banks with firm-level data in developing and emerging countries over the period 2006–2009. The sample included 15,309 firms from 52 countries. The study found that Islamic banking development has no overall impact on credit constraints while conventional banking development alleviates obstacles to financing. However, Islamic banking development exerts a positive impact on access to credit when conventional banking development is low. Overall, Gazdar *et al.* (2019) support the view that Islamic banking can influence the economic growth of oil-producing states. Even though oil terms of trade played a role, the study does not capture countries without oil revenue inflows. Meanwhile, the study by Leon and Weill (2018) supports the view that Islamic banking does not generally alleviate obstacles to financing, but it can act as a substitute to conventional banking. However, the study used only three years' data from non-popular databases, and it does not clearly mention the countries where the data were collected. These studies were also conducted on a panel pool of countries.

Tabash and Anagreh (2017) conducted a study on the case of the United Arab Emirates (UAE) to find whether Islamic banks contribute to the growth of the country's economy. The study used time series techniques of cointegration and error correction models (ECMs). The findings revealed a supply-leading causal relationship between Islamic banking and economic growth in the UAE. The findings also revealed the existence of a long-run relationship between Islamic finance and growth, as well as confirmed a bi-directional relationship between Islamic banks' investments and foreign direct investment in the UAE. Moreover, Tabash (2018) examined the Islamic banking system and economic growth in the

UAE through the role of Islamic banking investments in enhancing economic growth. It used the autoregressive distributive lag (ARDL) cointegration framework together with the error correction mode on annual time series data. The study's findings indicated that Islamic banks' investments spur economic growth in the UAE in the long-run. It portrayed a relationship, which is significant and positive between Islamic banks' investments and economic growth in both the short-run and long-run. Furthermore, in another study, Tabash (2019) re-examined the contribution of Islamic banking and its performance on the growth of the UAE's economy. The POLS together with the multi-collinearity test were carried out to test the hypotheses. The study empirically showed that there is a positive relationship between the performance of Islamic banks and economic growth in the UAE. Empirical results from these studies on UAE suggested that policymakers in the country should support the Islamic banking sector by setting new measures for its growth and progress. However, the studies on UAE did not capture the channels of growth transmission from Islamic banking to economic growth. The findings of Tabash and Anagreh (2017) and Tabash (2019) were opposite to those of Zarrouk *et al.* (2017), who studied the same country, the UAE. The latter instead confirmed a demand-following causal relationship between the variables, where growth causes Islamic financial development. This may be a result of using different proxies to represent the Islamic financial sector.

A study of Abduh *et al.* (2012) on the long-run and causal relationships between Islamic banking and economic growth in Bahrain are in line with that of Tabash and Anagreh's (2017) findings. However, they are contrary to Abduh's *et al.* (2012) findings on the short-run relationship variant. Both studies applied the same time series techniques, although Abduh *et al.* (2012) used data for the whole Islamic financial sector in Bahrain. Meanwhile, Rafay and Farid (2017) studied the case of Pakistan to find whether there exists a dynamic relationship between the Islamic banking system and real economic activities. They applied Julius and Johansen (JJ) cointegration within the framework of vector error correction model (VECM) test, Granger causality test, impulse response forecast and variance decomposition (VDC) techniques. The results of the study revealed a significant, positive and dynamic long-run association amongst the variables. They also affirmed a bi-directional causal relationship between real economic activities and Islamic banking in Pakistan. Abduh and Omar (2012) assessed the short-run and long-run relationships between economic growth and Islamic financial development in Indonesia. The study used the bound testing approach of cointegration (ARDL) and ECMs within the ARDL framework and applied it on quarterly data for eight years (2003 to 2010). The findings revealed the existence of a significant relationship between Islamic finance and economic growth in both the short-run and long-run. A bi-directional causal relationship was found between Islamic banking and economic growth in Indonesia. However, the study of Rafay and Farid (2017) used JJ cointegration techniques, which are marred with weaknesses compared to ARDL; nevertheless, the findings are deemed sufficient for policy recommendation. In the same vein, the study of Abduh and Omar (2012) did not use any control variable in its specification of the model, but the findings are found to be in line with those of Gudarzi and Dastan (2013) and Yusof and Bahlous (2013) on the Indonesian economy.

The study of Furqani and Mulyany (2009) is amongst the earliest empirical studies, which examined the interaction of Islamic banking activities and Malaysian economic growth. The study used vector autoregressive (VAR) cointegration techniques and VECM. The findings revealed that interest-free Islamic fixed investments influenced Islamic banking but only in the short-run. They also indicated a mutual causal effect between Islamic banking and Islamic fixed investment. Furthermore, the results indicated a demand-following causal effect where Malaysian economic growth influences Islamic banking.

Though this study supports Robinson's (1952) argument on the finance-growth nexus, the variables used are few and no control variable was included in the estimators. Furthermore, the study covered a short period.

In another research, Majid and Kassim (2015) empirically investigated the contribution of Islamic banking and other financial institutions on the Malaysian economy. They used an ARDL bound test, VECM and VDCs. The study found a significant contribution of Islamic finance on the Malaysian economy. A unidirectional (supply leading) causal relationship was found to exist between Islamic finance and Malaysian economic growth. This study is contrary to the findings of Furqani and Mulyany (2009) on the causal relationship between Islamic banking and the economic growth of Malaysia. The channels of transmitting growth by Islamic finance were, however, not identified in this study. Kassim (2016) then determined how Islamic banks and Islamic financial markets channel investment into the real economy. The study recognised capital accumulation but did not recognise the productivity of capital as the channel for Islamic banking to transmit growth over the period 1998–2013. However, the study was ambiguous about the causal effect between Islamic banking and economic growth.

Similarly, Hachicha and Ben Amar (2015) studied the role of Islamic bank financing (IBF) on the growth of the Malaysian economy. The study adopted JJ and VECM. It also estimated the elasticity of economic growth. The study documented that Islamic financing impacted on Malaysian economic growth in the short-run but Islamic financing is not sensitive to the growth of the Malaysian economy in the long-run. However, the study covered only some types of financing offered by Islamic banks (e.g. *murābaḥah* financing), which do not adequately represent total IBF. Moreover, the number of years studied (11 years) does not sufficiently establish a long-run relationship, given that annual data was used. The findings also did not determine the causal effect amongst the variables. The methodology used was moreover weaker compared to the ARDL test used by Majid and Kassim (2015) and Kassim (2016). The findings are contrary to those of Majid and Kassim (2015) and Kassim (2016). Gani (2015) also examined the long-run and short-run effects, as well as causal relationships between Islamic banking sector development and Malaysian economic growth. The study adopted the JJ approach of cointegration based on the VECM and VAR causality test developed by Granger (2001). The findings revealed that Islamic banking, capital accumulation as a channel of transmitting growth, and international trade are positively and significantly related to the growth of the Malaysian economy in the long-run. Furthermore, Malaysian economic growth was found to be negatively associated with inflation. The study also showed a mutual dependence causal relationship amongst the variables representing Islamic banking and economic growth. The findings are in line with those of Majid and Kassim (2015) and Kassim (2016), especially on the long-run relationships. The methodology used in Gani (2015) was, however, found to have some weaknesses compared to ARDL (what Majid and Kassim (2015) and Kassim (2016) used). The findings are also contrary to Hachicha and Ben Amar's (2015) findings on the long-run relationship. The research further used total Islamic financing by Islamic banks to represent the banking sector and failed to consider deposits made in Islamic banks. It also identified the channel of transmitting growth but used only capital formation without acknowledging the productivity of capital as another channel of growth transmission by the Islamic banking system.

After reviewing the related literature on Islamic banking and economic growth, many shortcomings were revealed. One relates to the variables used in representing Islamic banking. In most of the literature reviewed, either financing or deposits of Islamic banking were used to represent Islamic banking. Secondly, none of the literature reviewed covered a data period of more than 16 years. Thirdly, most of the literature reviewed did not identify

the different channels through which Islamic banking affects Malaysian growth. Few of them identified only one channel of transmitting growth. Finally, many of the studies reviewed have some defects in the methodology adopted, the model specification and the variables combination. These defects may not be able to assess the dynamic impact appropriately. Therefore, this study re-investigates the contribution of the Islamic banking system on the growth of the Malaysian economy while addressing the gaps in the literature.

Methodology

Theoretical framework

Recent research on the relationship between financial intermediation and growth comes mainly from the perspectives and techniques of the endogenous growth model. The latter reveals that self-sustained growth in relation to economic preferences, technology level, income distribution and institutional structures such as financial institutions can occur without exogenous technical progress (Romer, 2006). Moreover, in conventional models of growth that dominated the literature before the emergence of endogenous models, capital and labour were the only two elements in production. The definition of capital in this regard was narrowed to physical and financial capital, while human capital played no role (Sinha, 2001). Therefore, this study followed the aggregate production function of Mankiw *et al.* (1992) and De Gregorio (1995) as an endogenous growth model. The model of the study is constructed and presented as follows:

$$GDP = f(IBF, IBD, GFCF, TFP, GOVT, INF)$$

where:

GDP = Gross Domestic Product;
BF = Islamic Bank Financing;
IBD = Islamic Bank Deposits;
GFCF = Gross Fixed Capital Formation;
TFP = Total Factor Productivity;
GOVT = Government Expenditure; and
INF = Inflation.

Variables descriptions and data

GDP is the dependent variable in the model of this study. GDP is the common measure used to represent economic growth, and it is the output produced by the economy at a particular period. GDP, in the model of this study, describes the total output of the Malaysian economy. High GDP in an economy means high economic growth.

The variables that represent and measure Islamic financial deepening or Islamic banking development in this research include total financing of Islamic banks (IBF) and total deposits of Islamic banks (IBD). IBF and IBD can affect GDP positively through financial intermediation. When there is an increase in savings and investment deposits at the level of IFIs, more funds are available for financing economic activities to expand production and marginal productivity of capital. Furthermore, it can negatively affect GDP when there is a decline in savings and investment deposits in IFIs. The financial deepening of Islamic banking, just like in conventional banking, is a necessary precondition for the growth of an economy (Darrat, 1999). IBF and IBD, in the model of this study, are to replicate the significant role of financial intermediation of Islamic banks.

Capital accumulation as a total investment is represented by the gross fixed capital formation (GFCF). GFCF is best to be used as a proxy of the total investment of the

economy; it is an economic indicator that shows the level of business activity. GFCF also measures the net investment by business entities of the economy in fixed capital assets during an accounting period (Furqani and Mulyany, 2009). GFCF is one of the intermediate variables; it is to serve as one of the channels for transmitting growth and it represents the total investment of the Malaysian economy in the model of this study. GFCF can affect GDP positively through an expansion of capital. When there is an increase in capital formation as a result of an increase in investment, the production within the economy will increase and income will also increase, hence the rise in GDP.

Another intermediate variable is the total factor productivity (TFP), which is the measure of capital efficiency in production processes. TFP is the portion of output not expounded by the number of inputs used in production. It can also be described as the output ratio of production to the amount of all inputs used. As such, the TFP level is determined by how efficiently and intensely the inputs are used in production (Adak, 2009). TFP is to serve in the model of this study as one of the channels for transmitting growth and it represents the productivity of capital in the Malaysian economy. TFP affects GDP when there are changes in factor inputs such as labour and capital. As factor inputs increase, more goods and services are going to be produced within the economy, hence raising GDP. Also, when there is a decrease in factor inputs, total output will decrease, which may cause a decline in GDP growth.

Moreover, there is no justification to apply only these variables in a bivariate analysis. A bivariate model can arrive at a misleading conclusion. The misleading conclusion may be a result of the causal effects of one common variable's reaction on other common variables (Altarturi and Abduh, 2016). Therefore, to avoid the possibility of biases by omitting some variables, there is a need for control variables, which will assist in getting comprehensive and realistic results. The control variables used in this study are inflation (INF) and government expenditure (GOVT). INF stands for Malaysian rate of inflation in this study and is represented by the consumer price index (CPI). When inflation increases, the purchasing power of individuals will decrease and spending will also decrease, which means that economic activities will suffer, hence affecting GDP negatively. The volatility of inflation can be used to measure the extent of macroeconomic stability. A high rate of inflation reduces potential investment in productive projects, and hence, causes an adverse effect on the growth of the economy (Aziakpono, 2003).

GOVT represents public sector spending within the Malaysian economy in this study. GOVT can affect GDP negatively when budget deficits are financed through loans from domestic financial institutions. The loans would crowd out private investment, hence affecting growth. However, when government spending is carried out effectively, it may contribute to growth positively (Kassim, 2016).

Therefore, based on the above description and explanation of the variables, the selection of the variables can be justified. Justification for variable selection is to avoid specifying the wrong model. The choice of these variables is in line with current studies in this area, which include Furqani and Mulyany (2009), Abduh and Omar (2012), Abduh et al. (2012), Yusof and Bahlous (2013), Gani (2015), Majid and Kassim (2015), Kassim (2016), Tabash (2018), Gazdar et al. (2019) and Lehnert (2019), among others.

This study uses documented quarterly data of the Malaysian economy from different sources, covering 20 years (1998Q1–2017Q4). The sources of the data include statistical bulletins and publications of Bank Negara Malaysia (BNM) and the Department of Statistics Malaysia where data on Islamic banking financing and deposits, CPI, government expenditure, as well as GDP of Malaysia were sourced. Other sources of data for this study include International Monetary Fund publications, where data of GFCF were sourced. TFP

data were sourced from the United Nations Industrial Development Organisation and the International Financial Statistics.

Estimation techniques

This study uses cointegration techniques to estimate the influence of Islamic banking activities on the Malaysian real economy. The justification for choosing these techniques is that there is a predisposition towards the occurrences of a unit root in most financial and macroeconomic time series data, which may result in spurious regression (Kassim, 2016). The cointegration technique with its implicit error correction specification has been asserted to have certain advantages over the traditional partial adjustment model. The advantages include steady parameter estimates because the analysis is based on stationary time series data. Another advantage of the cointegration technique is that the data are consistent with the theory and are admissible, which would augment the power of forecasting and the model capabilities in policy formulation (Essien, 1997).

In cointegration econometrics modelling, a long-run relationship can be examined amongst the variables that are integrated and stationary. When time series data are non-stationary at the level and integrated of order one I (1), then there is a need to proceed and check for the presence of any long-run association amongst the data series (Aliyu, 2009). There are many possible tests for cointegration, including Engle and Granger (1987), Johansen and Juselius (1990) and Pesaran *et al.* (2001), termed as ARDL. This study used the method developed by Pesaran *et al.* (2001). The method is applicable even if the variables are not integrated at the unique level of integration; that is, there maybe I (0) and I (I) level of integration amongst the variables. This is one of the other weaknesses that ARDL overcomes, which are associated with both Engle and Granger (1987) and Johansen and Juselius (1990). ARDL comprises the valuation of the restricted error correction term (ECT) of the model, and thus, in this study, the ARDL model, which encompasses the real sector and Islamic banking sector can be constructed as follows:

$$\Delta\ln(\text{GDP})_t = \alpha_0 + \lambda_1\ln(IBF)_{t-1} + \lambda_2\ln(IBD)_{t-1} + \lambda_3\ln(GFCF)_{t-1} + \lambda_4\ln(TFP)_{t-1}$$

$$+ \lambda_5\ln(GOVT)_{t-1} + \lambda_6(INF)_{t-1} + \lambda_7\ln(GDP)_{t-1} + \sum_{i=1}^{p}\beta_1\triangle\ln(IBF)_{t-1}$$

$$+ \sum_{i=0}^{p}\beta_2\triangle\ln(IBD)_{t-1} + \sum_{i=0}^{p}\beta_3\triangle\ln(GFCF)_{t-1} + \sum_{i=0}^{p}\beta_4\triangle\ln(TFP)_{t-1}$$

$$+ \sum_{i=0}^{p}\beta_5\triangle\ln(GOVT)_{t-1} + \sum_{i=0}^{p}\beta_6\triangle(INF)_{t-1} + \sum_{i=0}^{p}\beta_7\triangle\ln(GDP)_{t-1} + \varepsilon_1$$

$$(1)$$

In equation (1), p stands for the lag length of the model, α is the constant co-efficient and λ_{1-6}, β_{1-6} are the estimator's co-efficient. *GDP* is gross domestic product; and *IBF* and *IBD* are Islamic banking financing and deposits, respectively. *GFCF* is gross fixed capital formation and represents capital accumulation, *TFP* stands for total factor productivity, *GOVT* is total government spending and *INF* represents inflation. Finally, ε_t is the white noise error correction or disturbance term.

In estimating cointegration vectors using ARDL, computation of the equations in the OLS method is the first step to be undertaken. The calculation of *F*-statistics follows to

jointly determine the significance of the variables. This will determine the long-run relationship that prevails amongst the variables in the model. The null and alternative hypotheses for the test in the above model are as follows:

H_O. $\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = 0$.

H_1. $\lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq \lambda_7 \neq 0$.

The distribution of F-statistics may not be standard for bound testing. However, Pesaran *et al.* (2001) provided the critical values of the F-statistics. Those critical values with time trend and without time trend are classified into two categories. The first is the lower critical bound or lower bound criteria, which has an assumption that all the variables are at level. The second is the upper bound critical values or upper bound criteria, which has an assumption that all the variables are at first difference. The rule of thumb in the ARDL bound test for cointegration is "if the computed F-statistics is less than the lower bound value, then the conclusion is that there is no evidence of long-run relationship amongst the variables"; thus, H_O cannot be rejected. In the same vein, "if the computed F-statistics is greater than the lower bound value, then the conclusion is that evidence of a long-run relationship amongst the variables is established"; thus, H_O would be rejected (Narayan, 2005). Consequently, in the event that the calculated value is within or equal to the two provided bounds, then the results would be declared as inconclusive, and thus, no cointegration exists.

Many lags in a model may affect the F-statistics. Therefore, to obtain each variable optimal lag length, the modified ARDL framework must compute $(p+1)^k$ number of regressions, where p is the number of lags to be adopted and k represents the number of variables in the model. Accordingly, the need for choosing an appropriate number of lags is critical in the model. There are many lag criteria available to choose from, including Akaike information criterion, Schwarz-Bayesian criteria, Hannan-Quinn criterion and Schwarz Information Criterion (SIC), etc. This study uses SIC, one of the widely accepted lag criteria by scholars and researchers, to select the lag length in the model. SIC is also adopted because the model of this study shows the lowest value of the criterion on SIC when the optimal lag lengths were computed using *eviews* econometric package.

After determining the cointegration relationship between the variables, the next step is to compute a long-run relationship. The equation used to measure the long-run relationship in the ARDL approach is as follows:

$$\ln(GDP)_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \ln(GDP)_{t-i} + \sum_{i=0}^{p} \beta_2 \ln(IBF)_{t-i}$$

$$+ \sum_{i=0}^{p} \beta_3 \ln(IBD)_{t-i} + \sum_{i=0}^{p} \beta_4 \ln(GFCF)_{t-i} + \sum_{i=0}^{p} \beta_5 \ln(TFP)_{t-i}$$

$$+ \sum_{i=0}^{p} \beta_6 \ln(GOVT)_{t-i} + \sum_{i=0}^{p} \beta_7 INF_{t-i} + \varepsilon_t \qquad (2)$$

Similarly, to establish the short-run connection amongst the variables, a short-run equation is constructed by substituting the lagged level variables with an ECT, also known as ECM, in the ARDL equation:

$$\ln(GDP)_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta \ln(GDP)_{t-i} + \sum_{i=0}^{p} \beta_2 \Delta \ln(IBF)_{t-i} + \sum_{i=0}^{p} \beta_3 \Delta \ln(IBD)_{t-i}$$

$$+ \sum_{i=0}^{p} \beta_4 \Delta \ln(GFCF)_{t-i} + \sum_{i=0}^{p} \beta_5 \Delta \ln(TFP)_{t-i} + \sum_{i=0}^{p} \beta_6 \Delta \ln(GOVT)_{t-i}$$

$$+ \sum_{i=0}^{p} \beta_6 \Delta (INF)_{t-i} + \theta ECT_{t-1} + \varepsilon_t \qquad (3)$$

The ECT or ECM reveals the speed of adjustments and indicates the fastness of the variables in going back to long-run equilibrium. Moreover, in ECM, a cointegration relationship can only be established when the coefficient value of ECT or ECM is negative and statistically significant. Furthermore, ECM provides the chance of distinguishing the long-run and short-run Granger (1969) causality amongst the variables. The short-run effects can be found within lagged term specific coefficients if each lag independent variable coefficient is significant. Then, it becomes evident that causation in the short-run exists (Granger, 2001). The ECT provides evidence of the long-run causal relationship. When it is negative and significant, it is evidence of a long-run causal relationship amongst the variables (Adebola *et al.*, 2011).

Furthermore, this study conducted diagnostic tests to ensure that the model is in a good fit so that the results can be used for policy recommendations. At this juncture, tests for serial correlation, heteroskedasticity and stability were conducted.

Results and discussions
This section is divided into four parts. The first part covers the unit root tests to check the stationary status of the variables. The second part finds out whether a cointegration relationship exists amongst the variables. The third part estimates the long-run and short-run coefficients, as well as the ECT and the causal relationship amongst the variables. The fourth and final part discusses the diagnostic tests to confirm the goodness of fit and the stability of the model.

Tests of stationarity (unit root)
The ARDL techniques to cointegration can be estimated even if the variables are not at the same order of integration; let's say one is I (0) and the other is I (1). However, conducting a stationarity test is still feasible. This is to confirm that all the variables are integrated at either order I (0) or I (1), and none at the order I (2). When there is an occurrence of I (2) variables, the computed *F*-statistics by Pesaran *et al.* (2001) are classified as invalid (Ouattara, 2004). As a result, the most widely accepted tests for stationarity were used. These tests include the Augmented Dickey-Fuller test and the Phillips-Perron test. This study chooses these two out of many stationary tests for accuracy and reliability. When the variables are plotted, they indicate the appearance of intercept and trend; however, all of the tests conducted include a constant and a linear trend.

The stationarity test results presented in Table 1 reveal that the logs of IBF, IBD, TFP and INF contain unit root at level. This is an indication that the variables are non-stationary. However, upon conducting the first difference, the variables became stationary; and henceforth, the variables were integrated at order I (1). In the same vein, the null hypothesis is rejected on the logs of GDP, GFCF and GOVT for having a unit root at level. It indicates

| Variables | ADF unit root test | | PP unit root test | | Status |
	At level	At first difference	At level	At first difference	
LGDP	−3.798**	−5.729***	−3.224*	−10.395***	I(0)
LIBF	−1.405	−6.583***	−1.500	−6.586***	I(1)
LIBD	−2.563	−7.692***	−2.563	−7.693***	I(1)
LGFCF	−3.742**	−5.732***	−4.975***	−10.916***	I(0)
LTFP	−2.500	−4.051***	−1.967	−4.051***	I(1)
LGOVT	−1.746	−5.621***	−8.653***	−33.313***	I(0)
LINF	−2.494	−9.299***	−2.518	−9.339***	I(1)

Note: The lag lengths selection is based on SIC and the critical values from Mackinnon (1996) compared with *t*-statistics, the signs *, ** and *** denote significance level at 10, 5 and 1%, respectively

Table 1.
Results of
stationarity
(unit root) test

that the variables are stationary at level, suggesting that the variables are I (0) variables. The results show a mixture of I (0) and I (1) variables. Thus, ARDL can be applied if there are such cases. This justifies the selection of the ARDL framework to test for cointegration.

Cointegration test: bounds F-test

Earlier in this study, it was mentioned that the bounds *F*-tests approach to cointegration will be used. The results can be demonstrated in Table 2.

The results in Table 2 reveal that the value of computed *F*-statistics for the model is 7.62, which is greater than the upper critical bounds value (4.39 at 1% significance level). Hence, it indicates strong statistical evidence for the existence of a long-run relationship amongst the variables under investigation. This provides evidence that Islamic banking activities have an equilibrium relationship in the long-run with the real economy in Malaysia.

Estimation of the autoregressive distributive lag long-run relationship

This study builds a model to estimate the association between Islamic financial development and the real economy. While GDP represents the real economy, IBF and IBD serve as a measure of Islamic financial development. GFCF and TFP serve as the channels of growth transmission, while GOVT and INF are included as control variables in the model. The results of the model are estimated and presented in Table 3.

Table 3 reveals that IBF was found to have a positive and robust significant influence on the Malaysian real economy in the long-run. This is translated as follows: a 1% change in IBF causes an increase of 0.067% in the Malaysian real economy. This is encouraging because IBF is selective in terms of the economic activities that financing can be provided to, i.e. Sharīʿah-legitimate economic activities including personal consumer products and investment activities.

| Computed *F*-statistics | 7.622 | |
| | Critical bounds (k = 6) | |
Level of significance (%)	I(0)	I(1)
10	2.33	3.25
5	2.63	3.62
1	3.27	4.39

Table 2.
The bounds test for
cointegration results

In Malaysia, both personal consumer products and investments are frequently financed by Islamic banks. Personal consumer financing such as vehicle financing and house financing stood at RM60.5bn as at end of December 2019 (Bank Negara Malaysia, 2020). Personal financing can affect the economy indirectly as it increases the volume of production of the products that Islamic banks provide financing for, such as vehicles, electronics and even housing. Personal financing is dominantly in the form of *murābaḥah* (cost-plus financing) while it appears that *mushārakah* (profit-and-loss sharing) and *muḍārabah* (profit sharing) equity financing are highly neglected. It is to be noted that the initial model of Islamic banking was built around these two equity forms of financing (*mushārakah* and *muḍārabah*) (ISRA, 2012).

On the other side, deposits of Islamic banks also show a positive sign and IBD is found to be statistically significant. Thus, it can be said that IBD is strongly influencing Malaysian economic growth. A 1% change in IBD causes a 0.62% increase in Malaysian GDP. The increase is highly encouraging because it can make a significant impact on the economy. This means that it is important to ensure that Islamic banks' deposits are used judiciously for financing the acquisition of personal consumer products, investments and businesses, especially small and medium enterprises, which are making a significant contribution to Malaysian GDP. The results are found to be contrary to the findings of Hachicha and Ben Amar (2015) while they are consistent with those of Abduh and Omar (2012), Majid and Kassim (2015), Kassim (2016) and Rafay and Farid (2017).

The findings thus, show that financial intermediation in Malaysia through Islamic banks contributes highly to the growth of the country's economy. Accordingly, the present effort in supporting and promoting the Islamic finance industry should be maintained.

Capital formation or investment, which was proxied by GFCF, also indicates a positive sign and is found to be significantly strong. This means that Islamic banking development uses investment as a channel for transmitting economic growth in Malaysia. Therefore, through investments from Islamic banks' funds, capital is formed and increases economic activities, hence contributing to spurring the Malaysian economy.

The productivity of capital in the form of TFP is also found to be positive and significant. It appears to have the most robust coefficient amongst the regressors in the model. It shows that a 1% change in TFP leads to a 1.62% change in the real economy. This means that Islamic banking activities bring about higher efficiency in production within the economy, which will increase the volume of goods and services produced, and, hence, causes economic growth.

Conversely, GOVT has a negative but significant relationship with the real economy. It is the same with INF. It shows the expected sign on GDP, which is negative; and at a minimum magnitude, it is also insignificant. Even though GOVT and INF serve as control variables in

Regressors	Coefficients	*t*-statistics
LIBF	0.067***	2.977
LIBD	0.062***	2.869
LGFCF	0.186***	3.518
LTFP	1.620***	10.662
LGOVT	−0.126***	−3.376
LINF	−0.025	−0.200
Intercept and trend	0.016***	8.204

Note: ***, ** and * denote the significance level at 1, 5 and 10%, respectively

Table 3.
ARDL Long-run
estimation results

this research, their presence is to augment the impact of Islamic finance on the growth of the economy. Therefore, based on this result, GOVT does not have any impact on Islamic banking in influencing the economy, and INF is found to negatively affect economic growth.

The diagnostics tests conducted in this research to ensure the fitness of the model for policy recommendations are presented in Table 4.

The diagnostic tests in Table 4 show that no serial correlation is detected amongst the residuals in the model of this study. The residuals are distributed normally and they are out of heteroscedasticity. The p values of the F-statistics for both are > 0.05 level of significance. This proves that the model was correctly specified. They confirm that the computed coefficients in this model were unbiased and efficiently stable; thus, they can effectively be used for policy recommendations.

Short-run relationship estimation and error correction model
The short-run estimate of the impacts of Islamic banking development on Malaysian economic growth is presented in Table 5.

The results depicted in Table 5 show that IBF and IBD are insignificant, which means that they do not affect Malaysian GDP in the short-run. This may be a result of the slow movement in financial intermediation. Deposited funds are not usually immediately given out for financing. That is, deposits may be held up before they are used for financing Malaysian real economic activities. This time lag may cause the funds to be unproductive for a while. This may also be a result of the nature of financing and deposits in Malaysian Islamic banks. Most of Islamic banks' financing is used for long-term financing in Malaysia;

Diagnostic test	F-statistics
Serial correlation X^2 (Breusch-Godfrey LM)	0.432 [0.78]
Normality X^2 (Jarque-Bera)	1.290 [0.52]
Heteroscedasticity X^2 (Breusch-Pagan-Godfrey)	1.780 [0.08]
CUSUM	S
CUSUMSQ	S

Table 4.
Diagnostic tests

Note: The selection of ARDL (2, 0, 0, 0, 1, 0 and 0) is based on SIC, p-values are in parenthesis and S signifies a stable model

Regressors	Coefficients	t-statistics
ΔGDP (-1)	0.658***	7.034
ΔLIBF	0.050	0.929
ΔLIBD	0.019	0.655
ΔLGFCF	0.118**	2.357
ΔLTFP	1.788***	3.904
ΔLGOVT	−0.011	−0.725
ΔLINF	−0.137	−0.858
Intercept	9.222***	9.511
$ECM(-1)$	−0.841***	−9.495

Table 5.
ARDL short-run estimation and ECM

Notes: ***, ** and * denote significance level at 1, 5 and 10%, respectively. The selection of ARDL (2, 0, 0, 0, 1, 0 and 0) is based on SIC

e.g. home financing, leasing, vehicle financing, trade/capital financing and even educational
financing.

Bank Negara Malaysia's (2019) first quarter bulletin provided that, as at December 2018,
a total of RM153.6bn were given out as home financing while RM372.52bn were for long-
term *tawarruq* fixed deposits (Home financing represented 26.82% of RM572.62bn of total
financing by Islamic banks, and long-term *tawarruq* fixed deposits represented 65.2% of
RM571.20bn of total deposits of Islamic banks). As of December 2019, a total of RM184.41bn
were disbursed as financing for the purchase of residential property and RM407.73bn were
for long-term *tawarruq* fixed deposit (Bank Negara Malaysia, 2020) (Home financing
represented 29.83% of RM618.20bn of total financing by Islamic banks, and long-term
tawarruq fixed deposits represented 66.07% of RM617.10bn of total deposits of Islamic
banks).

As noted above, Islamic banks in Malaysia are more of long-term financing, the banks
only disburse short-term financing in the form of *murābaḥah* especially for the purchase of
home appliances (ISRA, 2012). This kind of financing by Islamic banks is mostly for
mitigating and minimising risks; however, they also involve default risk because some
customers may default in making timely payments (Gani, 2015). The defaults in payment by
Islamic banks' customers can affect the banks and their ability to finance more economic
activities; however, the short-run effect on the growth of the Malaysian economy is
insignificant. The finding of this study in the short-run is contrary to the conclusions of
Abduh and Omar (2012), Hachicha and Ben Amar (2015) and Kassim (2016). Their results
suggest that Islamic banks' financing affects the Malaysian economy in the short-run but
Islamic banks' deposits do not.

The ECM is found to be negative and significant at 1%. It can be interpreted as 84% of
all the divergences from the long-run equilibrium route are corrected in one quarter. The
ECM result is also evident that a long-run Granger causal relationship exists between
Islamic banking activities and Malaysian economic growth. It resulted in a bidirectional
causal relationship between Islamic banking indicators and the growth of the Malaysian
economy. The excellent fit of the model is presented in Table 6. The DW statistics is within
the range of 1.5 and 2.5, the R^2 is 0.60 and the adjusted R^2 is 0.54 (above 50%). All these
signify that the model is fit for policy recommendations.

Conclusion and recommendations

In this study, Malaysian Islamic banks' total financing and deposits are used as variables
representing Islamic banking. The study covers 20 years of data and two channels of
transmitting growth are identified (capital accumulation and productivity of capital). The
ARDL framework, which allows the adding of a dependent variable as an explanatory
variable and is widely recognised as an adequate time series technique, is used as the
method of data analysis. This solves the issues identified from previous literature reviewed;
notably, the use of inappropriate variables, shorter time period, non-identification of
channels of transmitting growth and weak methodology. The findings of this study can be
appropriate for policy recommendations.

Dublin Watson (DW) statistics	2.103
R^2	0.601
Adjusted R^2	0.541

Table 6.
Model excellent fit

This study reveals that the contribution of Islamic banking on the Malaysian real economy in the short-run is not significant. Capital formation from Islamic banks' financing and the productivity of capital sourced from Islamic banks are positive and significantly contributing to the economy; hence, they are serving as channels of transmitting growth. However, government expenditure and inflation have no short-term effect on economic growth. Moreover, Islamic banking is positively and significantly contributing to the real economy of Malaysia in the long-run. Substantial investment was accumulated, and there is an efficient productivity of capital that influences the growth of the Malaysian economy. Government spending does not affect the real economy and, as expected, inflation is negatively and insignificantly affecting the economy.

Meanwhile, the direction of causality is bidirectional between Islamic banking indicators and Malaysian GDP. The results confirm that the Islamic banking sector in Malaysia is performing effectively in carrying out its primary function of financial intermediation, which is the channelling and pooling of funds into productive investment activities. Therefore, the Malaysian dominance in Islamic banking and finance and its position as a world leader is proven to be not by chance (NST, 2018). It is a result of the efficiency of the sector and the efforts of the Malaysian authorities and other stakeholders in promoting Islamic banking activities and sustaining the sector.

This study recommends that Islamic banks need to create new products and services that can attract more customers to deposit and acquire short-term and long-term financing. It is evident from the findings that the connection of Islamic banks financing with the real sector of the economy is a necessary condition in the quest for economic progress. The findings of this study are also evident that the marginal effects of both capital accumulation and TFP are higher than the marginal effects of deposits and financing in the long-run. Hence, BNM should give directives to Islamic banks to channel more of their financing to productive activities rather than for pure consumption. Incidentally, appropriate monetary policy instruments such as moral suasion and directives can be used for that purpose. This is necessary to sustain GDP growth over a long period.

References

Abduh, M. and Omar, M.A. (2012), "Islamic banking and economic growth: the Indonesian experience", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 5 No. 1, pp. 35-47.

Abduh, M., Brahim, S.A. and Omar, M. (2012), "A study on finance-growth nexus in dual financial system countries: evidence from Bahrain", *World Applied Sciences Journal*, Vol. 20 No. 8, pp. 1166-1174.

Adak, M. (2009), "Total factor productivity and economic growth", *International Journal of Research in Management, Economics and Commerce*, Vol. 1 No. 1, pp. 54-68.

Adebola, S.S., Yusoff, U.S. and Dahalan, J. (2011), "An ARDL approach to the determinants of non-performing loans in the Islamic banking system in Malaysia", *Arabian Journal of Business and Management Review*, Vol. 1 No. 2, pp. 34-56.

Ahmad, A. (1993), "Contemporary practices of Islamic financing techniques", *Review of Islamic Economics*, Vol. 2 No. 1, pp. 19-57.

Aliyu, S.U.R. (2009), "Impact of oil price shock and exchange rate volatility on economic growth in Nigeria: an empirical investigation", *Research Journal of International Studies*, Vol. 11 No. 1, pp. 4-15.

Altarturi, B.H.M. and Abduh, M. (2016), "Stock markets and economic growth: a comparative analysis between Islamic and conventional markets in Malaysia", *Middle East J. of Management*, Vol. 3 No. 1, pp. 34-48.

Ang, J.B. (2007), "Financial deepening and economic development in Malaysia", Asian Business and Economics Research Unit, Discussion Paper 42.

Aziakpono, M. (2003), "Financial intermediation and economic growth in an economic and monetary union: the case of SACU and CMA", paper presented at the ESSA Conference, 19 September 2003, Lord Charles Hotel, Somerset West.

Bagehot, W. (1873/1999), *Lombard Street: A Description of the Money Market*, John Wiley and Sons Inc, New York, NY.

Bank Negara Malaysia (2017), "Quarterly statistical report bulletin", available at: www.bnm.my (accessed 18 April 2018).

Bank Negara Malaysia (2019), "Quarterly statistical report bulletin", available at: www.bnm.my (accessed 29 March 2019).

Bank Negara Malaysia (2020), "Quarterly statistical report bulletin", available at: www.bnm.my (accessed 16 March 2020).

Cham, T. (2018), "Determinants of Islamic banking growth: an empirical analysis", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 11 No. 1, pp. 18-39.

Chazi, A., Mirzaei, A., Zantout, Z. and Azad, A.S. (2020), "Does the size of Islamic banking matter for industry growth: international evidence", *Applied Economics*, Vol. 52 No. 4, pp. 361-374, doi: 10.1080/00036846.2019.1645288.

Darrat, A.F. (1999), "Are financial deepening and economic growth causally related? Another look at the evidence", *International Economic Journal*, Vol. 13 No. 3, pp. 72-94.

De Gregorio, J. (1995), "Borrowing constraints, human capital accumulation, and growth", *Journal of Monetary Economics*, Vol. 37 No. 1, pp. 49-71.

DOSM (2019), "Malaysian economic performance", Department of Statistics Malaysia, available at: www.dosm.gov.my (accessed 16 March 2020).

DOSM (2020), "Malaysian economic performance", Department of Statistics Malaysia, available at: www.dosm.gov.my (accessed 16 March 2020).

Engle, R.F. and Granger, C. (1987), "Cointegration and error correction: representation, estimation, and testing", *Econometrica*, Vol. 55 No. 2, pp. 251-276.

Essien, E.A. (1997), "Public sector growth: an econometric test of Wagner's law", *CBN Economic and Financial Review*, Vol. 35 No. 3, pp. 123-137.

Furqani, H. and Mulyany, R. (2009), "Islamic banking and economic growth: empirical evidence from Malaysia", *Journal of Economic Cooperation and Development*, Vol. 30 No. 2, pp. 59-74.

Gani, I.M. (2015), "Islamic banking sector development and economic growth: empirical evidence from Malaysia and a lesson for Nigeria", in *Islamic Banking and Finance: The Nexus with the Real Economy*, Proceedings Book of 2nd IIIBF Conference, Bayero University, Kano, Nigeria, Benchmark Publishers Limited, Kano, pp. 352-368.

Gazdar, K., Hassan, M.K., Safa, M.F. and Grassa, R. (2019), "Oil price volatility, Islamic financial development and economic growth in Gulf cooperation council (GCC) countries", *Borsa Istanbul Review*, Vol. 19 No. 3, pp. 197-206.

Goldsmith, R.W. (1969), *Financial Structure and Development*, 1st ed., Yale University Press, New Haven.

Granger, C.W.J. (1969), "Investigating causal relations by econometric models and cross-spectral methods", *Econometrica*, Vol. 37 No. 3, pp. 424-438.

Granger, C.W.J. (2001), "Investigating causal relations by econometric models and cross-spectral methods", *Econometric Society Monographs*, Vol. 33 No. 1, pp. 31-47.

Gudarzi, F.Y. and Dastan, M. (2013), "Analysis of Islamic banks' financing and economic growth: a panel cointegration approach", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 6 No. 2, pp. 156-172.

Gurley, J.G. and Shaw, E.S. (1955), "Financial aspects of economic development", *American Economic Review*, Vol. 45, pp. 515-538.

Hachicha, N. and Ben Amar, A. (2015), "Does Islamic bank financing contribute to economic growth? The Malaysian case", *International Journal of Islamic and Middle Eastern Finance and Management*, Vol. 8 No. 3, pp. 349-368.

Hassan, M.K., Sanchez, B. and Yu, J. (2011), "Financial development and economic growth in the organisation of Islamic conference countries", *JKAU: Islamic Econ*, Vol. 24 No. 1, pp. 145-172.

Hicks, J.R. (1969), *A Theory of Economic History*, Oxford University Press, Oxford.

ISRA (2012), *Islamic Financial System: Principles and Operations*, 1st ed., International Shari'ah Research Academy for Islamic Finance (ISRA), Kuala Lumpur.

Johansen, S. and Juselius, K. (1990), "Maximum likelihood estimation and inference on cointegration with applications to the demand for money", *Oxford Bulletin of Economics and Statistics*, Vol. 52 No. 2, pp. 169-210.

Kassim, S. (2016), "Islamic finance and economic growth: the Malaysian experience", *Global Finance Journal*, Vol. 30 No. 1, pp. 66-76.

Lehnert, T. (2019), "Islamic finance and economic growth: new evidence", Paper presented at the 9th International Conference on Economics, 23-25 January, Luxembourg.

Leon, F. and Weill, L. (2018), "Islamic banking development and access to credit", *Pacific-Basin Finance Journal*, Vol. 52, pp. 54-69.

Lucas, R.E. (1988), "On the mechanics of economic development", *Journal of Monetary Economics*, Vol. 22 No. 1, pp. 3-42.

MacKinnon, J.G. (1996), "Numerical distribution functions for unit root and cointegration tests", *Journal of Applied Econometrics*, Vol. 11 No. 6, pp. 601-618.

Majid, M.S. and Kassim, S.H. (2015), "Assessing the contribution of Islamic finance to economic growth", *Journal of Islamic Accounting and Business Research*, Vol. 6 No. 2, pp. 292-310.

Mankiw, N.G., Romer, D. and Weil, D.N. (1992), "A contribution to the empirics of economic growth", *The Quarterly Journal of Economics*, Vol. 107 No. 2, pp. 407-437.

McKinnon, R. (1973), *Money and Capital in Economic Development*, The Brookings Institute, Washington, DC.

Narayan, P.K. (2005), "The saving and investment nexus for China: evidence from cointegration tests", *Applied Economics*, Vol. 37 No. 17, pp. 1979-1990.

NST (2018), "Malaysia maintains position as Islamic finance global leader", *New Straits Times*, available at: www.nst.com.my/business/2018/10/417367/malaysia-maintains-position-islamic-finance-global-leader (accessed 29 March 2019).

Ouattara, B. (2004), "The impact of project aid and programme aid on domestic savings: a case study of Côte d'Ivoire", Paper presented at the conference of Growth, poverty reduction and human development in Africa, March 2004, Centre for the Study of African Economies, Oxford, UK.

Patrick, H.T. (1966), "Financial development and economic growth in underdeveloped countries", *Economic Development and Cultural Change*, Vol. 14 No. 2, pp. 174-189.

Pesaran, M.H., Shin, Y. and Smith, R.J. (2001), "Bounds testing approaches to the analysis of level relationships", *Journal of Applied Econometrics*, Vol. 16 No. 3, pp. 289-326.

Rafay, A. and Farid, S. (2017), "Dynamic relationship between Islamic banking system and real economic activity: evidence from Pakistan", *JKAU: Islamic Econ*, Vol. 30 No. 2, pp. 43-61.

Robinson, J. (1952), *The Generalisation of the General Theory, in the Rate of Interest, and Other Essays*, 2nd ed., Macmillan, London.

Romer, D. (2006), *Advanced Macroeconomics*, 3rd ed., McGraw-Hill Irwin, New York, NY.

Schumpeter, J.A. (1911), *Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle*, Transaction Books, New Brunswick.

Shaw, E.S. (1973), *Financial Deepening in Economic Development*, Oxford University Press, New York, NY.

Sinha, T. (2001), "The role of financial intermediation in economic growth: Schumpeter revisited", in Dahiya, S.B. and Orati, V. (Eds), *Economic Theory in the Light of Schumpeter's Scientific Heritage*, Spellbound Publishers, Rohtak.

Tabash, M.I. (2018), "Islamic financial investments and economic growth evidence from emerging economy, United Arab Emirates", *International Journal of Economics and Business Research*, Vol. 15 No. 1, pp. 125-139.

Tabash, M.I. (2019), "Islamic finance, investment and economic growth evidence from UAE", *International Journal of Economics and Business Research*, Vol. 16 No. 1, pp. 136-145.

Tabash, M.I. and Anagreh, S. (2017), "Do Islamic banks contribute to the growth of the economy? Evidence from the United Arab Emirates (UAE)", *Banks and Bank Systems*, Vol. 12 No. 1, pp. 113-118.

Waheed, A. and Younus, N. (2010), "Effects of financial sector's development and financial sector's efficiency on economic growth: empirical evidence from developing and developed countries", *International Journal of Economic Perspectives*, Vol. 4, No. 2, pp. 449-458.

Yusof, M.R. and Bahlous, M. (2013), "Islamic banking and economic growth in GCC and East Asia countries: a panel cointegration analysis", *Journal of Islamic Accounting and Business Research*, Vol. 4 No. 2, pp. 151-172.

Zarrouk, H., El Ghak, T. and Abu Al Haija, E. (2017), "Financial development, Islamic finance and economic growth: evidence of the UAE", *Journal of Islamic Accounting and Business Research*, Vol. 8 No. 1, pp. 2-22.

Further reading

Abdul Manap, T.A., Abduh, M. and Omar, M.A. (2012), "Islamic banking-growth nexus: evidence from Toda-Yamamoto and bootstrap granger causality test", *Journal of Islamic Finance*, Vol. 1 No. 1, pp. 59-66.

Anwar, M. and Haque, Z. (1991), "The role of Islamic financial institutions in the socio-economic development in Malaysia [with comments]", *The Pakistan Development Review*, Vol. 30 No. 4II, pp. 1131-1142.

McLeay, M., Radia, A. and Thomas, R. (2014), "Money creation in the modern economy", *Bank of England Quarterly Bulletin*, available at: www.bankofengland.co.uk/publications/Pages/quarterlybulletin/2014/qb14q1.aspx (accessed 4 September 2014).

Thiel, M. (2001), "Finance and economic growth: a review of theory and the available evidence (no. 158)", *Directorate General Economic and Financial Affairs (DG ECFIN)*, European Commission.

About the authors

Ibrahim Musa Gani, PhD, is a Senior Lecturer at the Economics department, Isa Kaita College of Education Dutsinma, Katsina, Nigeria. He obtained a PhD (Islamic economics) from the Centre for Islamic Development Management Studies (ISDEV), Universiti Sains Malaysia, Penang, Malaysia. His research interests include Islamic economics and finance, growth and entrepreneurship. Ibrahim Musa Gani is the corresponding author and can be contacted at: imgani@ikcoe.edu.ng

Zakaria Bahari, PhD, is a retired Associate Professor from the Centre for Islamic Development Management Studies (ISDEV), Universiti Sains Malaysia, Penang, Malaysia. His research interests include Islamic economics and finance, monetary economics and development economics.