International Journal of Economics, Management and Accounting 30, no. 2 (2022): 451-480

ISLAMIC BANKING SECTOR DEVELOPMENT AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM MALAYSIA

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ABSTRACT

This paper examines the linear association between Malaysian Islamic banking sector and short- and long-run economic growth for the quarterly period of 2007Q1 – 2019Q4 by employing the Pesaran et al. (2001) Autoregressive Distributed Lag (ARDL) technique of cointegration, The findings show that in the short run, the link between Islamic bank deposits and economic growth is positively insignificant. Meanwhile, in the long run, the findings suggest that Islamic bank deposits affect growth in a positively significant way, confirming the supply-leading hypothesis. Islamic bank financing is found to have a negative significant link with short-run economic growth. Meanwhile, in the long run, Islamic bank financing has positive and significant effect on growth, hence, supporting the supply-leading hypothesis. Furthermore, there is a significant positive correlation between Islamic bank assets and short- and long-run economic development, again supporting the supply-leading hypothesis. Generally, it can be concluded that Islamic banking development is affecting economic growth positively both in the short and long run, which supports the supply-leading hypothesis, as the majority of the Islamic bank indicators are found to affect both short- and long-run economic growth positively.

JEL Classification: E0, G2, O4

Keywords: Autoregressive Distributed Lag Cointegration Test, Error Correction Model, Islamic banking, Economic growth

Submitted: 26/02/2021 Accepted: 23/08/2021 Published: 28/12/2022

1. INTRODUCTION

According to both State of the Global Islamic Economy Report (2020) and World Islamic Economic Forum Foundation (2020), Malaysia, a Muslim-majority nation with slightly over 30 million population, is considered as the Islamic finance world leader, where it leads the rankings for the Global Islamic Economics Indicator (GIEI) for that particular industry, followed by Bahrain and United Arab Emirates (UAE). The Islamic finance sector is expanding robustly in line with the growing number of the world Muslim population, with the sector projected to reach US$2.2 billion by 2030 (State of the Global Islamic Economic Report, 2020). The overall assets of Islamic finance worldwide are forecasted to be worth US$2.5 trillion in 2018 and are estimated to exceed US$3.5 trillion by 2024 with a 5.5% compound annual growth rate (CAGR). Meanwhile, the total Malaysian Islamic financial assets market is around $521 billion, which ranks Malaysia in the top three globally, behind Iran and Saudi Arabia. Besides, it also states that the Islamic finance market size contributes most to the overall Islamic economy market size. Currently, both Muslim-majority and Muslim-minority nations recognize the sector's potential.

Malaysia implements a dual financial system, where the conventional financial industry is operating side by side with the Islamic financial industry. The banking industry consists of commercial banks, investment banks, and Islamic banks (Bank Negara Malaysia (BNM), 2021). According to the International Monetary Fund (IMF) (2021), the banking intermediaries are divided into two groups; the first group, falling under BNM supervision, consists of commercial banking institutions including Islamic banking institutions, investment banks as well as development financial institutions (DFIs), while the second group consists of non-bank financial institutions (NBFIs) such as credit co-operatives, other DFIs and non-governmental organizations (NGOs) such as Zakat and Waqf institutions, supervised by different government departments and agencies. Bank Negara Malaysia (BNM) is authorized to regulate banking institutions under the Financial Services Act, Islamic Financial Services Act and Central Bank of Malaysia Act 2009 (CBA). FSA is the key statute that governs the conventional finance industry while IFSA is the FSA's counterpart for the Islamic finance sector that replace the statutes such as the Islamic Banking Act 1983 and Takaful Act 1984.

According to the New Straits Times (NST) (2021), performance of both Malaysian Islamic and conventional banks is slowing down due to Covid-19, a global pandemic that began in 2020, but growth is still at a commendable 7.8% for Islamic banks. Compared to their conventional counterparts, Malaysian Islamic banks' assets have a higher share exposure in the household sector and small-medium companies. The government has been enacting moratoriums and other measures to assist vulnerable groups such as the B40, which delays the credit quality crystallization of their portfolio. As a result, the non-performing loan ratio has stayed relatively constant with a current rate of 1.3%. Another possible stumbling block to Islamic banking loan growth recovery during Covid-19 might be the liquidity issue. According to S&P Global Ratings, however, Malaysia's Islamic banking industry is expected to expand between 10% and 12% in loan growth this year as the nation recovers from Covid-19.

The expanding financial and banking system and the remarkable economic development have drawn attention to the associations among financial and banking systems as well as economic growth. It has been a popular topic in recent years as its growing importance has always been relevant and timely to be explored (Mensi et al., 2020). The finance-growth nexus theoretical base can be traced to Joseph Schumpeter's early twentieth-century studies, followed by Robinson (1952), Goldsmith (1969), and later Shaw (1973) and McKinnon (1973), who demonstrate the significance of financial liberalization in boosting local investment and savings. Empirical research by Roubini and Sala-I-Martin (1992) and King and Levine (1993) on the finance-growth nexus in the long run show that the established financial sectors will stimulate better financial resources allocation, contributing positively to economic development.

This study examines the link between Islamic banking development and economic growth both in the short- and long-run in Malaysia by employing the ARDL method for the period 2007Q1 to 2019Q4. The study is organized as follows. The next section presents the literature review. The third section explains the research methodology, followed by data analysis and findings in the fourth section. Finally, the conclusion and future areas of research are presented in the last section.

2. LITERATURE REVIEW

One of the most extensively researched subjects, especially in conventional finance, is the finance-economic development link. Finance is believed to positively impact real economic activities since the pioneering work of Bagehot (1873), when money market growth allowed transfer of capital to the profitable transactions in England at that time. Besides, financial intermediaries (mainly banks), according to Schumpeter (1911, 1934), are the core booster of economic growth. The financial repression theories advanced by Shaw (1973) and McKinnon (1973) have solidified these beliefs. Later, the endogenous growth models provide additional perspectives and a foundation for empirical research on the finance-growth nexus, with prominent empirical studies supporting it, including King and Levine (1993), Rajan and Zingales (1998), Levine and Zervos (1998), and Hassan et al. (2011).

According to Beck et al. (2015), although finance has been overlooked in the literature on economic development and policy debate for ages, following Joan Robinson's findings that "where the real economy leads, finance follows", the previous two decades have seen a great interest and focus on finance issues especially in developing countries. The literature on financial development and its association with the real sector outcomes are expanding as they gain more attention. Despite the abundance of literature on the topic, economists remain divided on the relation between the two. There is hardly any consensus in finance-growth theory that the enhancement of financial sectors will have the same influence on economic development of all countries.

The main four hypotheses for finance-growth nexus raised by previous researchers on this issue are demand-following, supply-leading, mutual dependence, and neutrality hypotheses. Chapra (1988, 2003) as well as Hasan and Dridi (2011) have suggested that theoretically, the Shariáh legal framework integration in the Islamic banking and financial sector is believed to improve national economic performance. Other scholars, such as Khan and Bashar (2008), Tag El-Din (2008), Farahani and Dastan (2013), and Hasan (2014), have also advocated for the generalization and application of Islamic financial rules, arguing that they are necessary for improving economic performance and contractual equity. Kuran (1995, 2004), Bjorvatn (1998), and Yusof and Wilson (2005), on the other hand, discover that Islamic finance laws have hampered growth of economic activities.

Studies exploring the possibilities of Islamic financial sector to positively contribute to growth were done by Furqani and Mulyany (2009), Nagaoka (2011), Abduh and Omar (2012), Abduh et al. (2012), Abdul Manap et al. (2012), and Yusof and Bahlous (2013), Kassim (2016), Ali and Uddin (2016), Zarrouk et al. (2017), Smaoui and Nechi (2017), and Boukhatem and Moussa (2018), and Chowdhury et al. (2018), Ledhem and Mekidiche (2020), Ullah et al. (2021), Gwadabe and Ab Rahman (2020), Anwar et al. (2020), Juhro et al. (2020), Mensi et al. (2020), Alafif and Shaheen (2021), Ali (2021), Siddiqui (2021), Hassan et al. (2021), Benbekhti and Bouteldja (2021), Zahid and Arshad (2021), Tan and Shafi (2021), Gani and Bahari (2021), and Arsyianti and Kassim (2021).

On the contrary, some studies that explore the possibilities of Islamic finance to contribute negatively or insignificantly to economic growth were done by Goaied and Sassi (2010), Barajas et al. (2013), Bm and Uddin (2016), Echchabi et al. (2018), and Khasanah and Wicaksono (2021). The studies in 2020 and 2021 were conducted during the Covid 19 crisis, and mostly discuss the role of Islamic finance in economic growth through mechanisms such as Waqf and charity. For instance, despite the economy being adversely impacted by the pandemic crisis, Arsyianti and Kassim (2021) have discovered that individuals are still willing to provide charity in order to apply Islamic values of brotherhood and assist one another.

In the studies on the Islamic finance-growth nexus, Budhathoki and Rai (2020) suggest that more indicators are needed for inclusion in the variables to represent the Islamic banking development such as Islamic banking assets, earnings growth rate, and also debt ratio. Therefore, this study aims at filling in the gap by including an additional variable, Islamic banking assets, to signify the volume of the Islamic banking sector business, besides two other variables used by previous researchers, which are Islamic banking deposits and financing to represent the Islamic banking development, as the major contributing factor of this study. This article is intended to offer a deeper analysis on the Islamic banking-growth nexus for the period of 2007Q1-2019Q4, covering the most recent data available pre-Covid 19, so that the findings are new and current without being distorted by the Covid-19 situation.

3. METHODOLOGY

3.1 SOURCES OF DATA AND VARIABLES

The Malaysian Gross Domestic Product (GDP) value is utilized as a proxy for Malaysian economic growth as the independent variable, while for the explanatory variables, Islamic banking total assets, deposits, and financing are used as proxies to signify Islamic banking sector development as they depict the volume of the Islamic bank business, and also the Islamic bank ability to finance commercial operations as well as mobilize funds through utilization of shariah-compliant financial products and instruments.

Besides, gross fixed capital formation (GFCF) is also included in the explanatory variable as a representative for investment. It is considered as one of the main ways that finance may affect economic growth. Moreover, general government expenditure (GGE), which represents the public sector, inflation (INF), which represents macroeconomic stability, and trade openness (OPN), which represents the external sector are also included in the model to prevent bias problems caused by missing variables, besides accounting for the impact of other growth-determining factors. GGE can lead to a budget deficit, which will then negatively affect growth but if it is carried out effectively, it may positively affect growth. On the other hand, inflation implies economic market stability, which determines savings, investments, and consumption decisions, together with the rate of Islamic bank deposits and financing. Meanwhile, OPN is contended to positively affect growth by giving domestic businesses international market access.

Variables were chosen in accordance with the previous research in this field such as Furqani and Mulyany (2009), Abduh et al. (2012), Abduh and Omar (2012), Abdul Manap et al. (2012), Yusof and Bahlous (2013), Kassim (2016), and Budhathoki and Rai (2020). This study is based on quarterly data calculated in domestic currency (RM millions) and at constant rates from 2007Q1 to 2019Q4. Islamic banking data come from the Monthly Statistical Bulletin from the Bank Negara Malaysia (BNM) official website, while data for other variables come from the Trading Economics website International Monetary Fund (IMF) database.

3.2 ESTIMATING MODEL

Cointegration technique is adopted to observe the linear nexus of Islamic banking indicators and economic growth. This method is preferred as there is a likelihood of the unit root existence in many time series data of finance and macroeconomics, in which a spurious regression may occur. In addition, two significant methodologies to cointegration have been broadly used in the literature: the Engle and Granger (1987) technique based on two-phase residual and the Johansen Juselius (1990) system-based reduced rank regression method. Nevertheless, there is a vital circumstance for employing these methods: the variables are required to be stationary at first difference, or integrated of order 1, I(1). However, this requirement establishes a certain level of vagueness in the study.

Moreover, because of the restrictions imposed by both Johansen and Juselius's and Engle and Granger's cointegration methods, this analysis implements the bound testing method to cointegration that is centered on the model framework of ARDL as demonstrated by Pesaran et al. (2001). In addition, the variables do not have to be integrated in the same order in ARDL unlike the previous methods. Hence the ARDL can be applied to any set of variables, whether stationary at level or integrated of order 0, I(0), or stationary at first difference or integrated of order 1, I(1) (Pesaran et al., 2001). According to Narayan (2004) and Odhiambo (2010), the issues of omitted variables and autocorrelations are also confronted by the ARDL method besides providing an unbiased and efficient estimate, with a valid *t*-statistic even with the occurrence of several endogenous regressors.

The ARDL method also includes the restricted error correction (EC) estimation, and in this paper, the model relating to Islamic bank deposits is depicted in (1), the model relating to Islamic bank financing is demonstrated in (2), and the model relating to Islamic bank assets is demonstrated in (3) as in the following:

$$(1)\quad \Delta\, ln(GDP)t = \alpha + \lambda 1\, ln(IBD)t - 1 + \lambda 2\, ln(GFCF)t - 1 + \lambda 3\, ln(GGE)t - 1 + \lambda 4\, ln(TOPN)t - 1 + \lambda 5\, ln(INF)t - 1 + \lambda 6\, ln(GDP)t - 1 + \sum_{1=0}^{\rho} \beta 1\, ln(IBD)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(INF)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(GDP)\, t - i + \mu t$$

$$(2)\quad ln(GDP)t = \alpha + \lambda 1\, ln(IBF)t-1 + \lambda 2\, ln(GFCF)t-1 + \lambda 3\, ln(GGE)t-1 + \lambda 4\, ln(TOPN)t-1 + \lambda 5\, ln(INF)t-1 + \lambda 6\, ln(GDP)t-1 + \sum_{1=0}^{\rho} \beta 1\, ln(IBF)\, t-i + \sum_{1=0}^{\rho} \beta 2\, ln(GFCF)\, t-i + \sum_{1=0}^{\rho} \beta 3\, ln(GGE)\, t-i + \sum_{1=0}^{\rho} \beta 4\, ln(TOPN)\, t-i + \sum_{1=0}^{\rho} \beta 5\, ln(INF)\, t-i + \sum_{1=0}^{\rho} \beta 6\, ln(GDP)\, t-i + \mu t$$

$$(3)\quad ln(GDP)t = \alpha + \lambda 1\, ln(IBA)t-1 + \lambda 2\, ln(GFCF)t-1 + \lambda 3\, ln(GGE)t-1 + \lambda 4\, ln(TOPN)t-1 + \lambda 5\, ln(INF)t-1 + \lambda 6\, ln(GDP)t-1 + \sum_{1=0}^{\rho} \beta 1\, ln(IBA)\, t-i + \sum_{1=0}^{\rho} \beta 2\, ln(GFCF)\, t-i + \sum_{1=0}^{\rho} \beta 3\, ln(GGE)\, t-i + \sum_{1=0}^{\rho} \beta 4\, ln(TOPN)\, t-i + \sum_{1=0}^{\rho} \beta 5\, ln(INF)\, t-i + \sum_{1=0}^{\rho} \beta 6\, ln(GDP)\, t-i + \mu t$$

where ρ indicates the optimum lag length, GDP denotes the Malaysian GDP value, IBD refers to Islamic banks total deposits, IBF indicates the total financing of Islamic banks, IBA indicates the total assets of Islamic banks, GFCF denotes the gross fixed capital accumulation, GGE indicates the general government expenditure, TOPN denotes the trade openness, INF represents the inflation rate, and last but not least, μt represents the disturbance term.

Furthermore, the entire variables as stated above are in the form of natural logarithm, excluding INF as it is considered as a rate, which may take positive or negative value, and therefore cannot be in the form of natural logarithm. Besides, the *F*-test is used to verify whether or not the variables are cointegrated. The null hypothesis (H0) and the alternative hypothesis (H1) for (1), (2), and (3) are:

H0: $\lambda 1 = \lambda 2 = \lambda 3 = \lambda 4 = \lambda 5 = \lambda 6 = 0$ (There is no long-run relationship between Islamic banking indicators and economic growth)

H1: $\lambda 1 \neq \lambda 2 \neq \lambda 3 \neq \lambda 4 \neq \lambda 5 \neq \lambda 6 \neq 0$ (There is a long-run relationship between Islamic banking indicators and economic growth)

Nevertheless, the critical values as anticipated by Pesaran et al. (2001) are utilized to calculate the computed *F*-statistic as the *F*-statistic asymptotic distribution is not typical for the bounds test. The critical values consist of two groups. The first one is the lower-bound, which assumes all variables to be I(0) and the second one is the upper-bound, which assumes all variables to be I(1). Suppose the lower-

bound values are higher than the computed *F*-statistic, H0 is then concluded to be accepted, which means that cointegration among the variables exists, and hence, the long-run relationship does not exist. On the contrary, if the upper-bound values are lower than the calculated *F*-statistic, then H0 is concluded to be rejected, which means that cointegration among the variables does not exist. Hence, the long-run relationship exists. However, the findings are inconclusive if the calculated values fall between the lower and upper bounds.

The long-run model of Islamic banking deposit and growth is illustrated in (4), the long-run model of Islamic banking financing and growth is illustrated in (5), and the long-run model of Islamic banking assets and growth is illustrated in (6), as shown in the following:

$$(4)\quad ln(GDP)t = \beta 0 + \sum_{1=0}^{\rho} \beta 1\, ln(GDP)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(IBD)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(INF)\, t - i + \mu t$$

$$(5)\quad \Delta\, ln(GDP)t = \beta 0 + \sum_{1=0}^{\rho} \beta 1\, ln(GDP)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(IBF)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(INF)\, t - i + \mu t$$

$$(6)\quad \Delta\, ln(GDP)t = \beta 0 + \sum_{1=0}^{\rho} \beta 1\, ln(GDP)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(IBF)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(INF)\, t - i + \mu t$$

In addition, by employing an error correction model (ECM), the short-run coefficients are calculated, where the term ECT in the equation denotes the error correction term. The three models as the following depict the ARDL specification of the ECM:

$$(7)\quad \Delta\, ln(GDP)t = \beta 0 + \sum_{1=0}^{\rho} \beta 1\, ln(GDP)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(IBD)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(INF)\, t - i + \phi(ECT)t - i + \eta t$$

$$(8)\quad \Delta\, ln(GDP)t = \beta 0 + \sum_{1=0}^{\rho} \beta 1\, ln(GDP)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(IBF)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(INF)\, t - i + \phi(ECT)t - i + \eta t$$

$$(9)\quad \Delta\, ln(GDP)t = \beta 0 + \sum_{1=0}^{\rho} \beta 1\, ln(GDP)\, t - i + \sum_{1=0}^{\rho} \beta 2\, ln(IBA)\, t - i + \sum_{1=0}^{\rho} \beta 3\, ln(GFCF)\, t - i + \sum_{1=0}^{\rho} \beta 4\, ln(GGE)\, t - i + \sum_{1=0}^{\rho} \beta 5\, ln(TOPN)\, t - i + \sum_{1=0}^{\rho} \beta 6\, ln(INF)\, t - i + \phi(ECT)t - i + \eta t$$

Besides, according to the Engle and Granger (1987) representation theorem, cointegration so far indicates only the interconnection link but its direction is not revealed. If cointegration exists among the variables, then the causality link must be examined within the context of dynamic error correction, as exemplified in (7), (8), and (9). Furthermore, ECM also allows for separation of both short- and long-run dynamics of Granger causality, where the short-run dynamic is detected in the lagged-term coefficients and the long-run causality is demonstrated by the ECT. According to Adebola et al. (2011), a short-term causation is discovered when the coefficient is significant for each of lag-independent variable but when the error correction term is negatively significant, a long-run causality exists.

Currently, the choice of the lag's ideal length is crucial at all analysis stages that have been defined above. The main lag length selection criterion chosen for this analysis is the Akaike Information Criterion (AIC) as it always opts for the suitable maximum lag length. Additionally, diagnostic tests such as stability, normality, serial correlation, and heteroscedasticity tests are performed to test the model structural stability and goodness of fit and allow the findings to be suitable for policy recommendations.

4. RESULTS AND DISCUSSIONS

4.1 RESULTS OF UNIT ROOT TESTS

To confirm that no variables in this study are stationary at second difference or integrated of order two, I(2) as the ARDL method is only valid when the variables are either I(0) or I(1) or a mix of I(0) and I(1), the stationary tests must be performed. According to Ouattara (2004), the computed *F*-statistic is invalid if one variable is I(2). As a result, two stationary tests, which are Augmented Dickey Fuller (ADF) and

Phillips-Perron (PP) were included in this analysis. The following Table 1 depicts the outcomes of the two stationary tests.

TABLE 1
Results of Unit Root Tests

Variables	ADF Test			PP Test		
	T-statistics	*p*-value	Order of Integration	T-statistics	*p*-value	Order of Integration
LN GDP Value (LGDP)	-1.538	0.505	-	-1.548	0.500	-
D(LGDP)	-6.599	0.000*	I (1)	-6.600	0.000*	I (1)
LN Total Islamic Banking Deposit (LIBD)	-4.363	0.001*	I (0)	-4.344	0.001*	I (0)
LN Total Islamic Banking Asset (LIBA)	-3.829	0.005*		-5.408	0.000*	I (0)
LN Total Islamic Banking Financing (LIBF)	-3.754	0.006*	I (0)	-4.378	0.001*	I (0)
LN Gross Fixed Capital Formation (LGFCF)	0.871	0.100	-	-1.537	0.801	-
D(LGFCF)	-4.681	0.003*	I (1)	-9.143	0.000*	I (1)

TABLE 1 *(continued)*

Variables	ADF Test			PP Test		
	T-statistics	*p*-value	Order of Integration	T-statistics	*p*-value	Order of Integration
LN General Government Expenditure (LGGE)	1.999	0.988	-	-7.408	0.000*	I (0)
D(LGGE)	-3.916	0.020**	I (1)	-	-	-
LN Trade Openness (LOPN)	-1.266	0.186	-	-1.252	0.191	-
D(LOPN)	-6.455	0.000*	I (1)	-6.427	0.000*	I (1)
Inflation Rate (INF)	-3.176	0.027**	I (0)	-3.390	0.016**	I (0)

Notes: *, **, *** indicate level of significance at 1%, 5% and 10%, respectively.

Table 1 shows that the natural logs IBD, IBF, and IBA, as well as inflation rate (INF) are I(0) as they are stationary at level, while the natural logs of GDP, GFCF, GGE, and OPN are I(1) as they are stationary at first difference, and consequently, it is valid for this analysis to employ ARDL method because of the combination of I(0) and I(1) variables.

4.2 RESULTS OF THE COINTEGRATION TEST: BOUNDS *F*-TEST

In this study, three models are estimated: 1) Islamic banks deposit and economic growth (IBD model), 2) Islamic banks financing and economic growth (IBF model), and 3) Islamic banks asset (IBA) and economic growth. The findings of bounds *F*-test are depicted in Table 2, where it is shown that the estimated *F*-statistics are higher than the 1% level of significance's upper critical bounds for all models (6.21 > 6.02 (IBD), 8.14 > 6.02 (IBF), and 9.86 > 6.02 (IBA)). Therefore, it is concluded that there is a significant long-run link among the variables of the study, suggesting that there is a long-run equilibrium connection

between Malaysian Islamic banks deposit, financing, and asset and economic growth. Meanwhile, k is the boundary between nonsignificant and significant results in a hypothesis test, which is optimally set to be 1.

TABLE 2
Results of Bound *F*-test

Computed F-statistic	IBD model, $F = 6.21$ IBF model, $F = 8.14$ IBA model, $F = 9.86$	
	Critical bounds (k = 1)	
Significance Level	I (0)	I (1)
1%	4.81	6.02
5%	3.15	4.16
10%	2.44	3.51

4.3 ESTIMATES OF LONG-RUN RELATIONSHIP

In the following Table 3, the results for all models are presented. It is shown that the associations between Islamic banks deposit and asset and long-run economic growth are positively significant at the 10% and 1% significance levels respectively. For the IBD model, a 1% increase in Islamic banks deposit will increase growth by 0.443%, while for the IBA model, a 1% increase in Islamic banks asset will increase growth by 0.664%, which shows that both of them adhere to the supply-leading hypothesis in the long run. This result is consistent with many studies, including Kassim (2016), Bm and Uddin (2016), Zarrouk et al. (2017), Smaoui and Nechi (2017), Chowdhury et al. (2018), Ledhem and Mekidiche (2020), and Ullah et al. (2021). In contrast, Islamic bank financing and long-run economic growth are found to have a negative significant relationship at the 10% significance level, where an increase of 1% in the Islamic banks financing will decrease growth by 0.791%. This may be explained by the unstable institutional frameworks as proposed by Boukhatem and Moussa (2018), who obtained similar result in their study. For instance, in 2015, a change of policy in the Islamic Financial Services Act (IFSA) 2013 affected the indicators of Islamic banking development in the study (Husin, 2020). Both IBD and IBA models depict the positive significant link among gross fixed capital formation

and long-run economic growth at the 1% significance level, where an increase of 1% in the GFCF will increase growth by 0.108% and 0.198% respectively. It shows that investment is significant in influencing the long-run economic growth.

Besides, the results also show that the general government expenditure is positively affecting growth at the 10% and 1% significance levels respectively for both IBF and IBA models, where a 1% increase in the GGE will increase growth by 0.058% and 0.078% correspondingly. It depicts that the government spending is being effectively carried out. In contrast, trade openness appears to have a significant negative link with growth for both IBF and IBA models at 1% significance level, where a 1% increase in the trade openness will decrease growth by 0.147% and 0.182% respectively. It depicts that the Islamic financial development in Malaysia is at an infant stage and still developing. Keho (2017) had proven in her study that trade openness is affecting growth negatively in countries with.low financial development; the result also depicts that access of domestic entrepreneurs to the international markets is still limited as mentioned by Kassim (2016). Meanwhile, the link among inflation and growth is found to be insignificant in all models. Diagnostic tests were also performed, and the findings are depicted in Table 4. The findings illustrate that all models are normally distributed, homoscedastic, and have no serial correlation as the probability F-statistic value and Probability Chi-Square value for both serial correlation and heteroskedasticity tests, together with Jarque-Bera Probability value for normality test for all models are more than 0.05, depicting that the null hypotheses of no serial correlation, no heteroscdasticity, and normally distributed results are accepted. Besides, the models are also correctly specified, which means that they are efficient, unbiased, and stable, since the null hypotheses of the correctly specified models are accepted in Ramsey Reset Test as the Probability F-statistic values are more than 0.05. Therefore, the results are suitable for use in policy recommendations.

TABLE 3
ARDL Estimate of Long-Run Relationship

	Model with IBD			Model with IBF			Model with IBA		
Regressors	Coefficients	*t*-Statistics	*p*-value	Coefficients	*t*-Statistics	*p*-value	Coefficients	*t*-Statistics	P-value
LIBD	0.443	1.715	0.09***	-	-	-	-	-	-
LIBF	-	-	-	-0.791	-1.902	0.0646***	-	-	-
LIBA	-	-	-	-	-	-	0.664	2.466	0.0179*
LGFCF	0.108	1.591	0.118	0.245	3.602	0.0009*	0.198	2.966	0.0050*
LGGE	0.022	0.743	0.461	0.058	1.784	0.0821***	0.078	2.413	0.0204*
LOPN	-0.059	-1.457	0.152	-0.147	-3.474	0.0013*	-0.182	-3.678	0.0007*
INF	-0.003	-1.039	0.304	-0.004	-1.162	0.2523	-0.002	-0.728	0.471
Diagnostic test statistics:									
	Serial Correlation			No Serial Correlation					
	Normality			Normally Distributed					
	Heteroscedasticity			No Heteroscedasticity					

Notes: *, **, *** indicate level of significance at 1%, 5% and 10%, respectively.

TABLE 4
Results of Diagnostic Tests

TEST		IBD	IBF	IBA
Serial Correlation Test	Prob. F	0.7671	0.7404	0.6728
	Prob. Chi-Square	0.7023	0.6784	0.6004
Heteroskedasticity Test	Prob. F	0.2215	0.2916	0.3066
	Prob. Chi-Square	0.2132	0.2727	0.2858
Normality Test	Jarque-Bera Prob.	0.3002	0.3241	0.2478
Ramsey Reset Test	Prob. F	0.1795	0.1822	0.1938

4.4 ESTIMATES OF SHORT-RUN RELATIONSHIP AND THE ECM

Table 5 illustrates the Islamic bank-growth nexus in the short run. It is shown that IBF and IBA significantly affect the short-run economic growth positively at the 1% significance level, where an increase of 1% in IBF and IBA will increase the short-run growth by 0.785% and 0.664% respectively, which shows that both of them adhered to the supply-leading hypothesis in the short run. Meanwhile, for the IBD model, the link is found to be insignificant in the short-run, suggesting there is a time lag between the duration of getting and channeling the deposit funds for economic activities, and therefore, proving that it adhered to the neutrality hypothesis in the short run. This result is in line with Kassim (2016) who suggests that Islamic banks are utilizing the time lag to undertake additional financial intermediation-related operations, which then assist in minimizing and diversifying risks and, in turn, guarantee that funds are being distributed properly to worthy investment opportunities. Besides, the findings also depict that gross fixed capital formation has a significant positive link with economic growth at the 1% significance level in all models, where an increase of 1% in IBD, IBF, and IBA will increase growth by 0.108%, 0.245%, and 0.198% respectively. It shows that investment is significant in influencing short-run economic growth.

TABLE 5
ARDL Estimate of Short-Run Relationship and ECM

Regressors	Model with IBD			Model with IBF			Model with IBA		
	Coefficients	t-Statistics	P-value	Coefficients	t-Statistics	P-value	Coefficients	t-Statistics	P-value
ΔGDP (-1)	0.771	10.810	0.0000*	0.683	4.732	0.0000*	0.652	7.954	0.0000*
ΔLIBD	0.101	1.305	0.1985	-	-	-	-	-	-
ΔLIBF	-	-	-	0.785	2.382	0.0222*	-	-	-
ΔLIBA	-	-	-	-	-	-	0.664	2.619	0.0123*
ΔLGFCF	0.108	2.642	0.0113*	0.245	3.659	0.0007*	0.198	4.242	0.0001*
ΔLGGE	0.022	0.763	0.4494	0.058	1.818	0.0768***	0.078	2.526	0.0155*
ΔLOPN	-0.059	-2.515	0.0155*	-0.147	-4.519	0.0001*	-0.182	-5.041	0.0000*
ΔINF	-0.003	-1.093	0.2799	-0.004	-1.191	0.2409	-0.002	-0.843	0.4041
ECM (-1)	-0.229	-3.562	0.0009*	-0.148	-4.087	0.0002*	-0.348	-5.569	0.0000*

TABLE 5 *(continued)*

Regressors	Model with IBD			Model with IBF			Model with IBA		
	Coefficients	t-Statistics	P-value	Coefficients	t-Statistics	P-value	Coefficients	t-Statistics	P-value
R-squared		0.990523			0.992152			0.992761	
Adjusted R-squared		0.989470			0.990341			0.991348	
SE Regression		0.037031			0.034603			0.033120	
Sum squared residual		0.061708			0.046699			0.044975	
Akaike info criterion		-3.643989			-3.709819			-3.815796	
DW-statistic		1.700600			1.768264			1.720516	

Notes: *, **, *** indicate level of significance at 1%, 5% and 10%, respectively.

In contrast, trade openness is found to negatively affect the short-run economic growth in all models at the 1% significance level, where an increase of 1% in all models, which are IBD, IBF, and IBA will decrease growth by 0.059%, 0.147%, and 0.182% respectively, suggesting that the Malaysian Islamic financial development is still developing. Furthermore, inflation is found to have no significant link with short-run economic growth. Besides, the IBD model's error correction term (ECT) is estimated to be -0.229 and it is statistically significant at the 1% level, which suggests around 22.9% of deviations that are adjusted in one quarter from the equilibrium path. Moreover, the ECT for IBF and IBA models are found to be around -0.15 and -0.35 respectively. They are both statistically significant at 1%, which implies that 15% and 35% of deviations are adjusted in one quarter from the equilibrium path correspondingly. Furthermore, the *R*-squared values for all models, which include IBD, IBF, and IBA models are found to be around 0.99, which means that 99% of the data fit the regression models, and hence, it is concluded that all models are a good fit.

Besides the diagnostic measures as stated in Table 4, this analysis also performs the cumulative sum of recursive residuals (CUSUM) and cumulative sum squares of recursive residuals (CUSUMSQ) tests, as proposed by Pesaran (1997), to check for structural stability. All plots of the CUSUM and CUSUMSQ statistics fall within the vital bounds of the 5% significance range, as seen in Figure 1, 2 and 3 which depicts that the null hypothesis of the test that asserts the findings to be stable, is accepted, and hence, the results are concluded to be applicable and appropriate for policy recommendations.

FIGURE 1
CUSUM and CUSUMSQ Tests for IBD Model

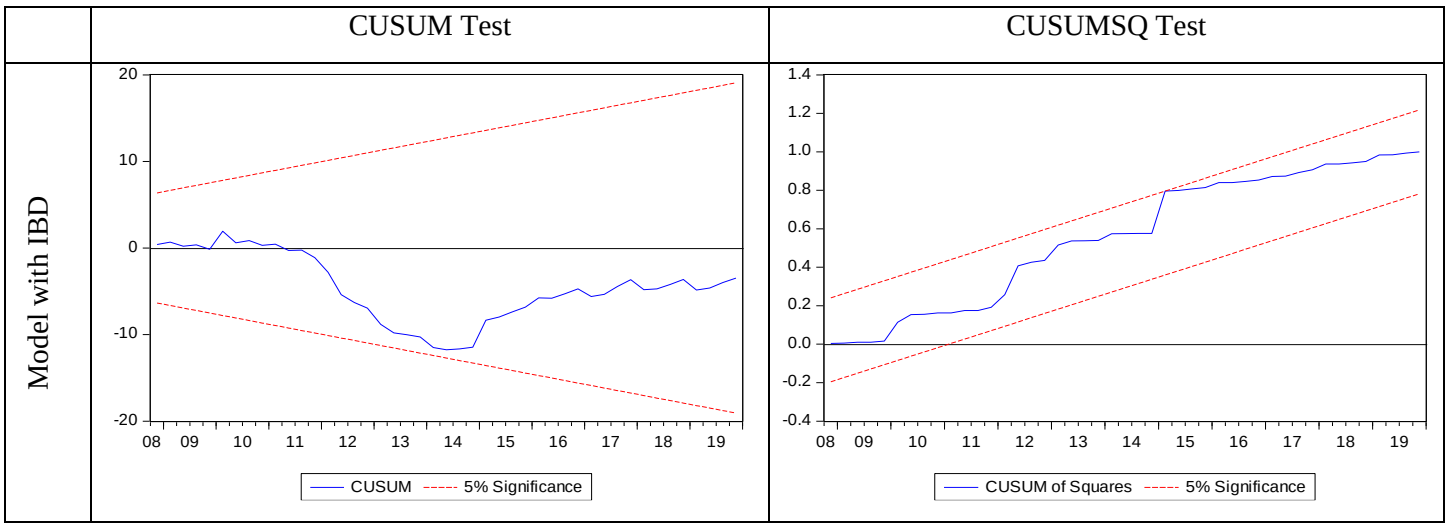


FIGURE 2
CUSUM and CUSUMSQ Tests for IBF Model

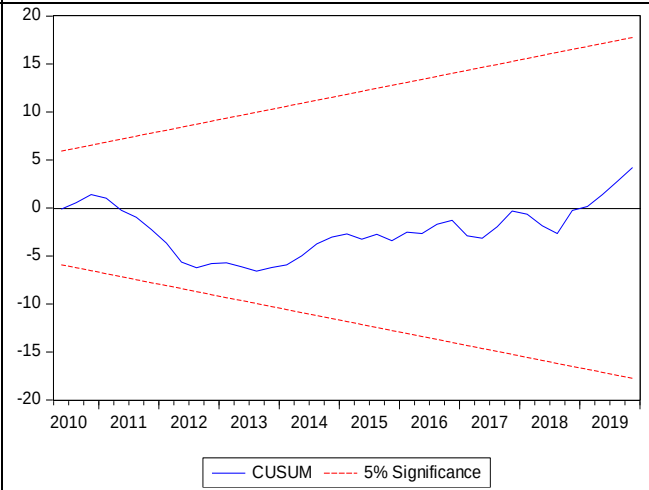
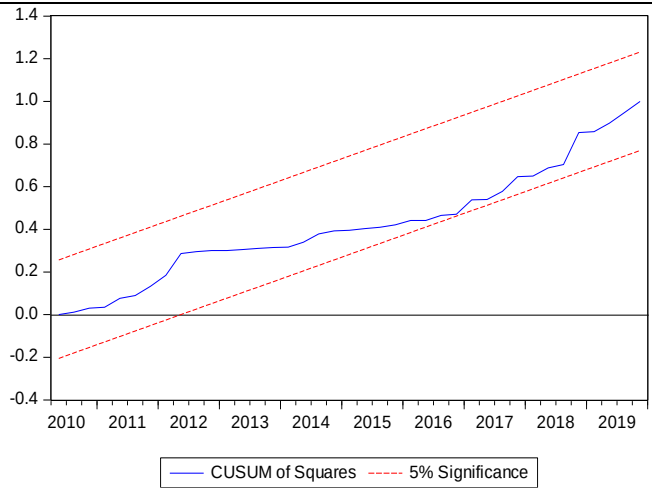
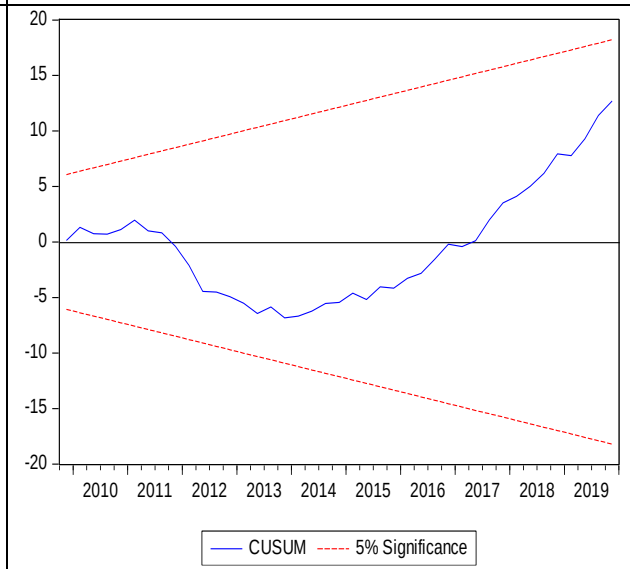
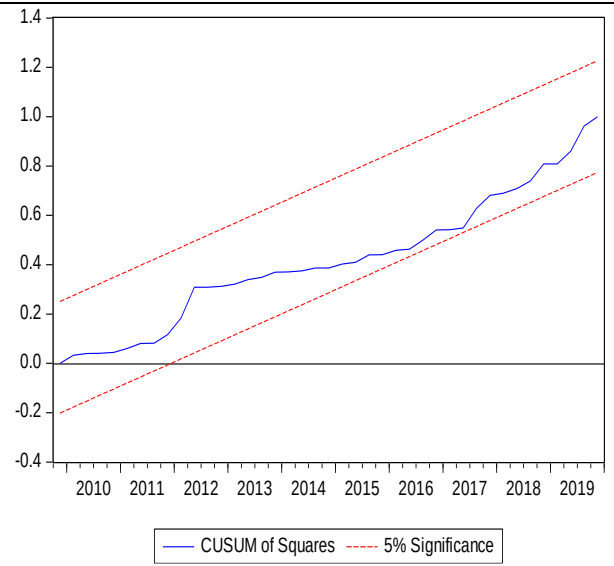
	CUSUM Test	CUSUMSQ Test
Model with IBF		

FIGURE 3
CUSUM and CUSUMSQ Tests for IBA Model

	CUSUM Test	CUSUMSQ Test
Model with IBA		

5. CONCLUSION

The vast amount of Islamic banking and finance reserves and their expanding authority and importance in the financial market in Malaysia have prompted a review of the sector's responsibility in boosting national economic development. Through an empirical observation, this study employs the ARDL method to observe the impact of Islamic bank deposit and financing on Malaysia's economic growth. The results indicate that while Islamic bank deposits do not significantly affect short-run economic growth, which supports the neutrality hypothesis, they have a positive significant impact on the long-run economic growth, supporting the supply-leading hypothesis, which is attributed to the time lag by Islamic banks in distributing the funds properly to worthy investments.

Our findings also indicate that Islamic bank financing significantly affects the short-run growth positively, confirming the supply-leading hypothesis. On the contrary, it is found to significantly affect the long-run economic growth negatively. This might be due to the unstable institutional frameworks and general macroeconomic downturns as suggested by Echchabi and Azouzi (2013), and Boukhatem and Moussa (2018). For instance, in 2015, a policy change in the Islamic Financial Services Act (IFSA) 2013 affected the indicators of Islamic banking development in the study (Husin, 2020). Goaied (2010) also discovered that both conventional and Islamic banking sector development must be within a stable macroeconomic environment. He also added that a good banking system supervision and regulation, a progressive economic opening, and adherence to the legal environment and international accountancy rules are also important for emergence of a robust financial system promising to economic growth. Consequently, poverty issues can also be reduced.

Besides that, our findings also show a positive significant relationship between Islamic bank assets and economic growth, both in the short and long run, which support the supply-leading hypothesis. Generally, it can be concluded that Islamic banking development is affecting economic growth positively both in the short and long run, which supports the supply-leading hypothesis; the majority of Islamic bank indicators are found to affect both short- and long-run economic growth positively. The findings of this study align with the findings of Goaied (2010) in the Middle East and North Africa (MENA) countries, Abduh et al. (2012) in Bahrain, Echchabi and Azouzi (2013) in Kuwait, and Bm and Uddin (2016) in Malaysia. However, they contradict the findings of Abduh and Omar (2012), Yusof and Bahlous

(2013) in Indonesia, Malaysia, and Gulf Cooperation Council (GCC) countries, as well as Chowdhury et al. (2018), and Boukhatem and Moussa (2018) in MENA countries. This study contributes to the literature by providing a deeper analysis on the Islamic banking development via an additional indicator of Islamic banking development, which is Islamic bank assets to signify the volume of the Islamic bank business. It also enriches the study of the Islamic banking-growth nexus in the case of Malaysia for the period 2007Q1-2019Q4 before the Covid-19 outbreak, so that the results will not be distorted by the pandemic situation.

Given the significant contribution of the Islamic finance industry to the Malaysian economy, ongoing endeavors to expand it are needed. One of them is by enhancing the legal and regulatory system to promote development of the Malaysian Islamic financial sector into a global sector, thus bolstering the nation's status as an outstanding role model and global pioneer in fostering Islamic finance (Kassim, 2016). Moreover, the Islamic financial sector contributions to economic growth are weak. Further research should include Islamic capital market and zakat funds as they also play a significant role, especially in rural areas (Bm and Uddin, 2016). Al Fathan and Arundina (2019) also suggest a need to explore the Islamic finance-growth nexus in many sub-sectors as most studies have been done on the banking sector. Besides, various issues still affect the Islamic banking system despite its contribution to economic growth. Some of them are failure to use real sector contracts, poor financial inclusion and convergence of Islamic banks into mainstream banking (Siddiqui et al., 2021). As the Islamic financial system is still relatively new and developing, there should be an extensive improvement to kick off higher financial inclusion, and further research shall explore this significant area.

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