

Augmenting agricultural productivity through Islamic bank decomposed finance sources in the context of Malaysia

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Received: December 7, 2022

Last revised: September 30, 2023

Accepted: December 5, 2023

Abstract

Purpose:

The current body of literature presents two contrasting theories: the 'too much finance' hypothesis and the 'more finance, more growth' hypothesis. These hypotheses propose that the association between finance and economic growth can be positive or negative, depending on a specific threshold of financing. However, previous research on financing through Islamic banks and output growth has yielded conflicting findings, mainly due to a narrow focus on total financing. To fill this research gap, the current study examines the impact of Islamic consumer financing and Islamic producer financing on the growth of agricultural output in Malaysia during the period from Q4 2010 to Q4 2020, taking into account the potential nonlinear effects.

Methodology: This study utilizes the Autoregressive Distributive Lag (ARDL) approach to examine the nonlinear impact of Islamic decomposed financing on agricultural output growth. The study utilizes the Dawson approach to visualize the effect of a moderator on the nonlinear model.

Findings: The study finds a U-shaped nonlinear relationship between Islamic consumer financing, Islamic producer financing, and agricultural output growth in Malaysia. Beyond a specific threshold, financial development positively affects economic growth.

Originality: This study significantly enhances our understanding of the impact of Islamic decomposed financing and its threshold effect on a country's economic growth, making a valuable contribution to the existing literature in this field.

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Policy implications: Threshold points are vital for policymakers to stimulate agricultural output growth through an improved Islamic financial system. This involves expansion and a robust infrastructure, including monitoring, adherence, marketing, and farmer incentives to reinforce the financial growth nexus and improve the system quality.

Keywords: Agriculture Growth, Islamic Consumer Finance, Islamic Producer Finance, Threshold effects

1. Introduction

The relationship between financial development and economic growth has garnered significant attention from researchers, scholars, and policymakers globally (Kalim et al., 2016; Hussain et al., 2020). Economic growth is intricately interconnected with the expansion of the financial system, particularly the banking sector (Yasmin et al., 2022) as it encourages investment and enhances capital productivity (Schumpeter, 1911). Banks play a crucial role in distributing financing by accepting deposits and providing advances. Financing supports innovative inventions and new manufacturing methods, thereby boosting productivity (Sohail & Arshed, 2022).

Scholars such as Schumpeter (1911); Gurley and Shaw (1960); and Goldsmith (1969) emphasize the importance of providing financing to entrepreneurs to enhance productivity and overall economic development. Various research studies have indicated a positive correlation between financial development and economic growth (Abduh and Omar, 2012; Kalim et al., 2016; Bahri et al., 2018). However, some empirical studies present contradictory evidence, proposing that exceeding a specific threshold level in financial development may hamper economic growth (Arcand et al., 2012). Similarly, Ductor et al. (2015) highlight that the effect of financing on output growth turns negative if rapid financial development is not accompanied by increased productivity in specific sectors.

Agriculture sector has the potential to accelerate the country's economic growth. Some nations have taken proactive measures to support agricultural producers (Akpan, 2015). Special banks for agricultural entrepreneurs have been founded in Iran, China, Sudan, and Malaysia. Lewis's theory (1955) postulates that the agriculture sector contributes to other sectors' development in terms of providing raw materials or inputs. Therefore, agriculture has had a positive linkage with other sectors (Tekilu et al., 2018). Financing plays a significant role in promoting financial development, which in turn, can enhance output growth of any sector of the economy (Hall et al. 2010; Shabbir, 2016).

Obtaining financing facilities from formal sources creates many problems for the borrowers either for agriculture or even for corporate clients (Yasmin & Ayaz 2023). They encounter challenges such as high interest rates, intricate procedures, insufficient collateral, and delays in credit approval and its resultant utilization for productivity (Saqib et al., 2016). The OECD (Organization for Economic Cooperation and Development, 2015) recommends that the implementation of a strategic approach by the government to enhance the financial market in order to allow finance for agricultural investment and expand farm size.

In conventional financing, borrowers incur interest rates as expenses, which subsequently diminish their profits (Saqib et al., 2016). In contrast, Islamic banks operate without relying on interest (Yasmin & Ayaz, 2023) which is expressly forbidden in Islam; but that is the foundation of conventional banking operations. Islamic banks provide various products based on profit and loss sharing mechanism that causes equitable resource distribution and ensures social justice as a whole. With its unique and comprehensive options, Islamic finance is capable of covering all farm size groups (Yasmin et al., 2022). Islamic finance industry is getting momentum particularly in Muslim countries and generally around the world, and its growth is rapid. Majority of banking customers including both Muslims and non-Muslims have switched from conventional to Islamic finance because of its gratifying features (Arshed et al., 2020).

Undoubtedly, a robust and well-established Islamic financial system holds a crucial position in driving an economy. Extensive research has explored the relationship between a well-developed and efficient financial system and economic growth. Researchers have identified diverse channels linking the Islamic financial system to economic growth (Furqani & Mulyany, 2009; Abduh & Chowdury, 2012; Arshed et al., 2021). Islamic banking system is basically a product and investment-based system having the propensity to cause an upsurge in the disaggregated output growth (Bougatef et al., 2020).

The evaluation of Islamic finance's impact on the real economy is a timely and crucial endeavour, considering the substantial assets held by the Islamic banking industry, its expanding market share, and its active role in financial intermediation, both domestically in Malaysia and on a global scale. Income patterns of a farmer and an entrepreneur differ from those of other business operations that might provide consistent profits. The harvest season determines their revenue, and their debt payments behave differently than other types of finance (Kaleem & Wajid., 2009). The risk-sharing strategy of Islamic banks may be advantageous for farmers who are constantly exposed to agricultural risks because they also face issues as a result of unpredictable natural disasters that

affect agricultural production (Khasanah et al., 2013). According to the Islamic Development Bank (2015), this approach also makes significant contributions to poverty reduction, the resolution of disparities, the preservation of social and financial stability, and the promotion of equitable human resource development. In some countries, governments have taken significant measures to help the agricultural sector whereas agriculture-specific banks have also been established in China, Iran, Malaysia, Pakistan and Sudan. In Malaysia, Islamic finance is expected to have a substantial impact on the economy, as it now represents a significant portion of the assets of the banking sector (Indrawan & Rahman, 2020). This becomes particularly important in uplifting the agriculture sector. Furthermore, Malaysia has often served as a role model for other countries seeking to develop and expand their Islamic banking and finance institutions (Kassim, 2016).

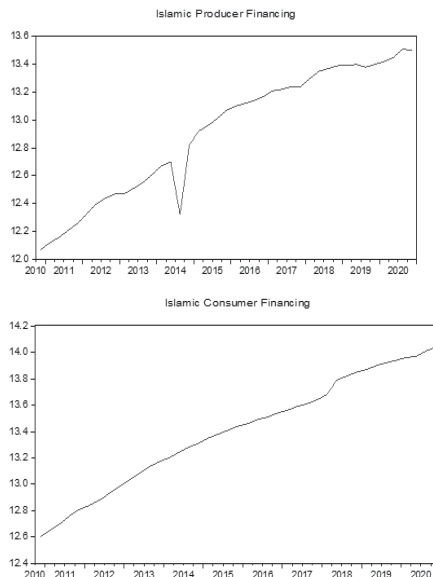


Figure.1 Islamic decomposed financing trend

There are two prominent channels through which financing can impact growth; one is supply side financing considered as producer financing, and the other is demand side financing considered as consumer financing, where the dynamics of both types of financing are different (Yasmin & Ayaz, 2023).

Over the last ten years, Islamic consumer financing and Islamic producer financing in Malaysia have exhibited a noticeable upward trend, as depicted in Figure 1. Islamic banks in Malaysia provide consumer finance to support individuals in improving their standard of living without involving interest-based transactions (Manzoor & Arshed, 2021). Thus, Islamic consumer financing leads to the involvement of the bank in acquiring the assets being consumed. Dar et al. (2004) explain that this approach undoubtedly encourages moderation in society. They argue that the consumption patterns of individuals have a significant influence on all economic sectors. If people spend wastefully on non-productive activities, such as leisure and entertainment, it reduces the availability of capital for productive purposes. Therefore, Islamic consumer finance acts as a moderator, curbing excessive utility-maximizing behavior among consumers (Chapra, 1991). To promote improved governance, disclosure, and transparency within the banking sector, the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) and the Islamic Financial Services Board (IFSB, 2019) have introduced various standards and guidelines.

Malaysia took a significant step in 1983 by establishing Bank Islam Malaysia Berhad which is the first Islamic bank in the country (Bougatfe et al., 2020). Followed by the launch of the Special Programme for Islamic Transactions (SPTF) in 1993, which involved 17 traditional financial institutions setting up dedicated Islamic windows. These developments have transformed Malaysian Islamic financial system, making it a competitive and sustainable component of the overall financial system. This has contributed to economic growth and development, as the country has successfully established inclusive Islamic financial infrastructures, including Islamic insurance, Islamic banking, Islamic inter-bank money market, an Islamic capital market, and a Shariah Index on the Kuala Lumpur Stock Exchange. Malaysia's Islamic financial industry has witnessed significant growth in operations and assets over the past decade, with Islamic banking assets and capital experiencing substantial increases.

Despite economic recessions, Malaysia's Islamic banking sector demonstrated resilience and achieved remarkable growth. The efforts made by the country in the field of Islamic finance are geared towards positioning Malaysia as a prominent global Islamic financial centre, encouraging international economic and financial interactions. These initiatives focus on institutional growth, strengthening domestic financial infrastructure, enhancing Shariah and legal

framework, and promoting greater international integration. However, it is essential to conduct further analyses to understand the specific impact of Malaysia's Islamic financial system on agricultural output growth, as well as to evaluate its effectiveness and efficiency in this context.

2. Problem Statement and Research Gap

Financial constraints are often seen as obstacles to income-generating activities, especially in developing countries. Previous studies have examined the correlation between bank financing and economic growth but available studies typically overlook the nonlinear dynamics and sector-specific impacts of financing (Kalim et al., 2016; Rabaa et al., 2016; Tabash et al., 2017; Ayoub et al., 2020). This study investigates the impact of Islamic consumer and producer financing on agricultural productivity growth in Malaysia. Existing research on the finance-growth relationship presents conflicting evidence, proposing both positive and negative effects. By exploring the quadratic relationship and identifying the optimal financing level, this research aims to enhance agricultural productivity in Malaysia. The findings will offer valuable insights for policymakers and scholars, shedding light on the significance of Islamic finance principles in accelerating economic development.

3. Objective of the study

This study aims to explore the impact of Islamic financing on real sector in Malaysia with a specific focus on agricultural output growth. With an emphasis on consumer and producer types of financing availability and threshold effects, the core objectives of the study are set to:

1. explore the quadratic effects of IPF and ICF on agriculture output growth.
2. assess the current incidence of IPF and ICF with respect to the threshold financing levels.
3. provide a framework for the stakeholders in transforming the Islamic financing sector to achieve the optimal level of growth.

4. Literature Review

4.1 Literature on Finance-Growth Nexus

According to Schumpeter (1911), the financial sector, particularly the banking industry exerts a significant impact on economic growth by enhancing capital productivity and stimulating investment. Limited access to financing has been a major obstacle for agricultural sector growth (Hassan et al., 2012). Nonetheless, Oliynyk (2017) postulates a positive relationship between financial development

and the agricultural sector growth in Pakistan and Ukraine. Asghar et al. (2018) also observed a positive impact of financial development on the agricultural sector. In spite of this, farmers face several challenges due to interest-based financing mechanism including heavy debt burdens; limited access to financing for small-scale farmers because of collateral requirements; and inflexible seasonal income variations. Furthermore, in some conventional financing arrangements, the lack of ethical considerations doesn't align with the farmers' values and principles.

The Financial system modernization, particularly the Islamic banking industry, has demonstrated a significant influence on economic growth in Malaysia (Hassan et al., 2011). According to Khasanah et al. (2013), Islamic finance system offers alternative financing options on the basis of profit and loss sharing mechanism that can support agricultural development. Moreover, the principle of risk sharing is also inherited in the practices of Islamic banking system (Saqib et al., 2014). Islamic bank financing enables farmers to choose between lump-sum or installment payments. Ensuring social and financial stability by sharing the risk of producers, also promotes entrepreneurial activities (Islamic Development Bank, 2015). In Malaysia, Majid et al. (2015) empirically evaluated the impact of Islamic bank financing and other financial institutions and found a significant influence of Islamic financing on ???. Having the range of unique and comprehensive products, shariah based financing mechanism facilitates all farm size groups that improved the welfare of the people in Malaysia (Hi et al. (2015).

The agricultural industry can benefit from various Islamic bank products, including mudharaba, musharaka, muzarah, musaqah, murabahah, istisna, salam, and rahn (Saragih, 2017). Monetary policy goals encompass price stability promoting economic growth, and ensuring equitable credit distribution. In this realm, increased productivity, facilitated by Islamic financing, can also contribute to poverty reduction by raising income levels of the farmer (Asghar et al., 2018). Literature provides a comprehensive and in-depth description of the shariah compliant financing mechanism as representing the true characteristic of an Islamic banking system that specifically rejects interest (Arshed et al., 2016; Siddiqi et al., 2016; Hi et al., 2018). However, empirical findings are contradictory in the literature, and the causation patterns appear to be variable. Literature also highlights that some macroeconomic variables like interest rate, inflation, exchange rate etc., also plays a crucial role in an economy. According to (Nino et al. 2011) exchange rate depreciation is connected to more robust economic accelerations. Moreover, Munir et al. (2009), considering a certain threshold level, found a positive significant relationship between inflation and output growth in Malaysia. Moreover, Obi et al. (2016) state that inflation significantly

contributes to economic growth in Nigeria. Similarly, Majumder (2016) also indicates that the effect of inflation on GDP growth is positive in Bangladesh.

4.2. Literature on Threshold Effects

Studies related to finance-growth nexus indicate that financial development can positively impact economic growth up to a certain threshold level of financing. However, beyond that level, it may hinder growth due to diminishing returns and the vanishing effect of additional financing (Arcand et al., 2012). There are two key channels through which financing can impact growth: supply-side financing (producer) and demand-side financing (consumer), with each type having its own dynamics (Beck, 2012). Hung (2009) argues that if a country's financial development supports producer financing, it can stimulate output growth, while consumption or household loans are often viewed as non-productive, impeding economic progress. Arcand et al. (2012) propose the "Too Much Finance" hypothesis, suggesting that the positive impact of financing diminishes beyond a specific threshold. Alaabed & Masih (2016) investigated the threshold impact of financial development on Malaysia's economy, revealing a negative impact beyond a credit-to-GDP ratio of 24.45%. Benczur et al. (2019) emphasize that the type of financing and the recipients can significantly influence outcomes when it exceeds the optimal level of financing. In this context, excessive finance can be as detrimental as insufficient finance (Yasmin & Ayaz, 2023). Furthermore, considering the optimal levels of financing, Islamic financing arrangements such as *mudaraba* and *murabaha* hold promising potential to notably enhance real sector growth in Malaysia (Yasmin et al., 2022).

This research contributes new empirical evidence on finance growth nexus after the 2007-08 Global Financial Crisis. Drawing on insights from Benczur et al. (2019) and Yasmin et al. (2022), we employ a non-linear model to examine the presence of U-shaped and inverted U-shaped profiles in the context of Malaysia. The relationship between finance and growth may depend on a country's level of financial development, with progress eventually leading to economic growth but potentially reaching a threshold point. This study fills a gap in the literature by examining the nonlinear relationship between Islamic bank finance and output growth of agricultural sector in Malaysia through the decomposition of Islamic financing into Consumer (ICF) and Producer (IPF) financing. This decomposition allows us to understand the varying effects of financing at different levels and provides insights into how Islamic financial systems facilitate development in the economy (Benczur et al., 2019). Valuable insights are provided for policymakers and industry participants to enhance the impact of Islamic finance on real economic activity.

Table 4.1. Modelling Strategy, Employed Model, and Parameter Estimation

Dependent variable	Symbols	Units	Source
Agriculture Output	AP	VAD %age of GDP	International Finance Statistics (IFS)
Independent Variable			
Islamic Producer Financing	IPF	%age	Bank Negara Malaysia (BNM)
Islamic Consumer Financing	ICF	%age	Bank Negara Malaysia (BNM)
Interest Rate	INT	% p.a	International Finance Statistics (IFS)
Consumer price Index	INF	Consumer Price Index	International Finance Statistics (IFS)
Exchange rate	EXR	\$	International Finance Statistics (IFS)

This study focuses on investigating the nonlinear relationship between Islamic finance and output growth by using agriculture output growth as the dependent variable.

The study considers several independent variables, including Islamic producer financing, Islamic consumer financing, interest rate, inflation, and exchange rate. To ensure appropriate analysis, all financial variables are subjected to logarithmic transformation. To ensure robustness, this study employs a single-country analysis using time series data, following the framework suggested by Jalil et al. (2010). The time series data utilized in this research spans from 2010 Q4 to 2020 Q4 and is obtained from various reliable sources, as depicted in Table 1, focusing on Malaysia.

Equations (1) and (2) illustrate functional form.

$$AGR = f(IPF + IPF^2 + INF + INT + EXR) \dots \dots \dots (1)$$

$$AGR = f(ICF + ICF^2 + INF + INT + EXR) \dots \dots \dots (2)$$

In line with earlier research conducted by Bahri et al. (2018) and Yasmin et al. (2022), this study employs a quadratic term (IPF^2 & ICF^2) to analyze the potential nonlinear effects of Islamic financing on agriculture sector output. Furthermore,

this study aims to investigate the validity of the hypothesis 'more finance more growth' and 'too much finance' in the context of Malaysia.

Table 4.2. Possible outcomes

α_1, α_2	Positive (+)	Negative (-)	Insignificant
Positive (+)	Exponential increase	Inverted U-Shaped	Linear Positive slope
Negative (-)	U-Shaped	Exponential decrease	Linear Negative slope
Insignificant	Linear Positive slope	Linear Negative slope	No effect

Nonlinear model of financing

$$Y = \alpha_0 + \alpha_1 X^1 + \alpha_2 X^2 + \dots$$

$$AGR = f(\beta_1 IPFit + \beta_2 IPFit^2 + \beta_3 INTit + \beta_4 INFit + \beta_5 EXRit + e_t \dots) (3)$$

$$AGR = f(\beta_1 ICFit + \beta_2 ICFit^2 + \beta_3 INTit + \beta_4 INFit + \beta_5 EXRit + e_t \dots) (4)$$

The equation-estimated threshold will play a crucial role in identifying the optimal levels of IPF and ICF, achieved by equating the first derivative of the equation to zero.

$$\beta ICF / \beta AGR = \beta_1 ICFit + 2 * \beta_2 ICFit = 0$$

$$ICFit^* = - \beta_1 ICFit / 2 * \beta_2 ICFit$$

Our econometric research strategy involves a log-linear specification and various statistical tests to assess the association between variables and ensure robust results. Model estimation and analysis are performed using E-Views12 software. Stationarity is evaluated using ADF and KPSS unit root tests, while the ARDL bounds testing approach by Pesaran et al. (2001) is applied. To ensure model robustness, four diagnostic tests are conducted, including the Breusch-Godfrey LM test, Jarque-Bera test, Breusch-Pagan test, and Ramsey RESET test, as used by Yasmin et al. (2022).

5. Results and Discussion

The empirical findings of the study are presented in the following sections.

5.1. Descriptive Summary

An overview of the variables under investigation is presented as follows

Table 5.3. Summary statistics

	LNAGR	LNIPF	LNIPF ²	LNICF	LNICF ²	LNINF	LNINT	LNEXR
Mean	2.1663	12.9115	166.9066	13.3981	179.6856	4.7273	1.0734	4.5188
Median	2.1500	13.0700	170.7900	13.4400	180.6800	4.7400	1.0900	4.4900
Std. Dev.	0.1318	0.4601	11.8056	0.4230	11.3009	0.0614	0.1365	0.0703
Skewness	0.6123	-0.3736	-0.3461	-0.2220	-0.1788	-0.291	-2.8876	0.1341
Kurtosis	2.8542	1.6830	1.6609	1.9441	1.9277	1.6567	10.9435	1.3545
Jarque-Bera	2.5979	3.9169	3.8819	2.2417	2.1830	3.6610	164.772	4.7484
Probability	0.2728	0.1411	0.1436	0.3260	0.3357	0.1603	0.0000	0.0931
Observations	41	41	41	41	41	41	41	41

Source: Estimation using E-views statistical software

Table 3 provides a descriptive overview of the variables including basic details and distributional characteristics. The evaluation includes considerations such as the normal distribution of the data, where a higher mean value compared to the standard deviation suggests normality. The Jarque-Bera test confirms normal distribution of the data sets.

5.2. Unit Root Test

To avoid spurious regression, unit root tests based on the ADF and KPSS methods are used, considering both intercept and no trend specifications.

Table 5.4. Unit Root Test

Variable	at level			1st difference		
	ADF test (Prob)	KPSS test	Decision at level	ADF test (Prob)	KPSS test	Decision at 1st diff.
LNAGR	-1.201 (0.668)	0.4771	Nonstationary	-2.663(0.082)	0.409	Stationary
LNIPF	-1.673 (0.438)	0.9607	Nonstationary	-7.044(0.000)	0.274	Stationary
LNIPF ²	-1.475 (0.536)	0.9628	Nonstationary	-5.434(0.000)	0.316	Stationary
LNICF	2.469(0.13)	0.9608	Nonstationary	-4.197(0.007)	0.348	Stationary
LNICF ²	- 2.56(0.105)	0.9639	Nonstationary	-2.950(0.047)	0.339	Stationary
LNINT	- 2.38(0.157)	0.1289	Mixed	-4.649 (0.000)	0.158	Stationary
LNINF	-1.47(0.54)	0.9532	Nonstationary	-3.835(0.005)	0.285	Stationary
LNEXR	-1.063 (0.729)	0.9587	Mixed	-4.711 (0.000)	0.137	Stationary

Note: KPSS Critical values 0.739 @ 1%, 0.463 @ 5% and 0.347 @ 10%. *Significant at 5%.

Table 4 shows the probability values obtained from the ADF test indicate that, at level the values are greater than 0.05, but at the first difference, they are less than 0.05. Moreover, for the KPSS test, all the values at level exceed the critical values, but at the first difference, values shown are below the critical values. These findings suggest that all variables exhibit nonstationary characteristics. Additionally, none of the variables show second-order integration, supporting the appropriateness of using the ARDL method in this study.

5.3. Bounds Testing for Cointegration

Table 5 displays the results of bounds testing for cointegration, examining the long-run equilibrium among the variables in the ARDL models with critical values at the 95% confidence level.

Table 5.5. ARDL Model Statistics

	AGR= f (IPF+ IPF ² +INF+INT+EXR)	AGR= f (ICF+ ICF ² +INF+INT+EXR)
F-statistic	8.646	3.766
95% Upper bound	4.68	3.355
90% Upper bound	2.26	2.262
CUSUM	Stable	Stable
CUSUMsq	Stable	Stable
R-squared	0.99	0.99
Adjusted R-squared	0.98	0.98
DW-Statistics	2.396	2.069

Source: Estimation using E-views statistical software

F bound statistics in both quadratic models of Islamic decomposed financing surpass the critical value for the ICF and IPF models. This indicates a significant co-movement of the variables, confirming a causal relationship between the dependent and independent variables, despite their non-stationarity and feedback effects. Additionally, the independent variables exhibit a high explaining power of 98% for the ICF model and 98% for the IPF model, further confirming the reliability of this relationship.

Table 5.6. Results of Long run Coefficients of Islamic decomposed Financing models

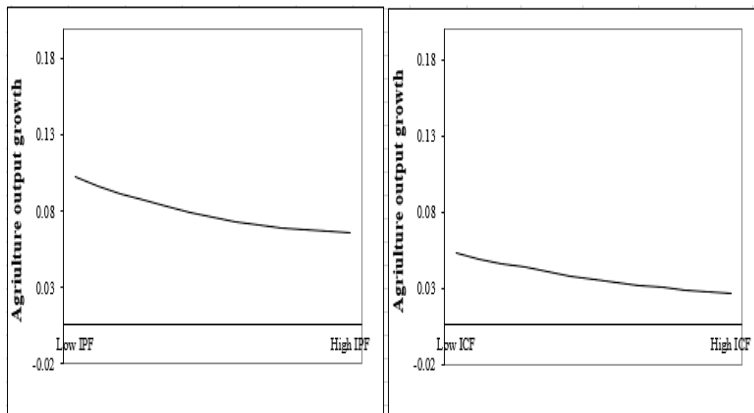
	Islamic Producer Financing		Islamic Consumer Financing
Regressors	Coefficient (Prob.)	Regressors	Coefficient (Prob.)
LNIPF	-2.5706 (0.0007)	LNICF	-1.5869 (0.0043)
LNIPF ²	0.0783 (0.0044)	LNICF ²	0.0436 (0.0278)
LNINT	-0.4229 (0.000)	LNINT	-0.6414 (0.000)
LNINF	0.5886 (0.1629)	LNINF	0.3892 (0.4154)
LNEXR	-1.7248 (0.000)	LNEXR	-0.5841 (0.0001)
Threshold	16.42%	Threshold	18.22%

Source: Estimation using E-views statistical software

For both types of Islamic financing models, the long-run estimates are provided in Table 6. Based on the ARDL long-term estimations, the linear term (β_1) for IPF is negative, while the quadratic term (β_2) is positive. A 1% increase in IPF initially decreases agricultural output by 2.57%, but as IPF continues to rise, it eventually enhances output by 0.078% in the long run. These findings support a U-shaped profile, indicating that after a turning point, increased IPF leads to improved agricultural output growth. This aligns with the hypothesis of "more financing, more growth" and reinforces the importance of finance in driving economic well-being, as emphasized by Abdul Bahri et al. (2018).

Islamic banks, operating in accordance with Islamic principles, are renowned for interest-free financial services. This study uses interest rate as the cost of capital. When this cost increases, that can result in higher equity requirements or increased rent for debt financing, making financing more expensive for the producers (Manzoor & Arshed, 2021). In line with the neoclassical growth paradigm which emphasizes the inverse relationship between interest rates and investment for achieving stable full employment, the findings of IPF model align with this theoretical perspective where 1% increase in interest rate will decrease agriculture output by 0.42% in the long run. These findings are aligned with the findings of Svilokos et al. (2019). Exchange rate fluctuations also play a significant role as evidenced by the Islamic producer finance model where if exchange rate appreciates by 1%, that will lead to a 1.72% decrease in agricultural productivity in the long run. These findings are aligned with Magacho et al. (2022) who demonstrate that overvalued exchange rate could negatively impact growth.

The long-term estimations of the Islamic consumer finance model also reveal a U-shaped profile, with a negative linear term (β_1) and a positive quadratic term (β_2) for Islamic consumer financing. This supports the hypothesis of 'more finance, more growth'. Initially, a 1% increase in ICF leads to a 1.58% decrease in agricultural output, but over time, the production increases by 0.04% as ICF rises. These nonlinear findings of the study are in line with the findings of Yasmin et al. (2022). Moreover, empirical findings demonstrate that a 1% increase in interest rates significantly decreases agricultural output growth by 0.64%. When interest rates (cost of capital) rise, consumers may be more inclined to save money in order to earn higher interest rates, leading to reduced spending. Additionally, they underscore the influence of interest rates on the financing decisions of Islamic banks and consumer behavior.



Source: Haans et al., 2016

Production gradually decreases as a result of imbalances in supply and demand. Hence, Interest rates have a detrimental influence on output growth. Inflation became insignificant in our analysis, since the agriculture sector is a given sector, hence its connection with the rate of inflation is inelastic (Munir et al. 2016). The primary purpose of agricultural sector is to meet the fundamental necessities of those who are not particularly impacted by a drop in their buying power (Asghar

et al, 2018). Furthermore, in the long run, a 1% appreciation of exchange rate will negatively impact the agriculture output by 0.58%. Habib et al. (2016) claim that an increase in exchange rates significantly slows the expansion of the real sector's production.

This research sought to investigate the correlation between Islamic decomposed financing and agricultural output growth. To account for potential simultaneous positive as well as negative dynamics in the economy, as suggested by Haans et al. (2016), a quadratic specification translated into nonlinear model is utilized. The outcomes of the study reveal a U-shaped relationship amongst both types of Islamic financing (producer and consumer) and agricultural output in Malaysia. Specifically, the linear term (β_1) showed a negative association, while the quadratic term (β_2) displayed a positive association, indicating that economic growth experiences favorable outcomes from financial development when a specific level of financing is achieved. These findings align with previous research conducted by Bahri et al. (2018) and Yasmin et al. (2022). Figure 1 illustrates the U-shaped relationship between both types of Islamic financing and agricultural productivity, highlighting the nonlinear impact in Malaysia for the selected time period. The solid line's fitted value falling within the 95% confidence interval provides evidence supporting the existence of a quadratic relationship between agricultural production growth and Islamic finance development in Malaysia. This graphical representation supports the theory of a positive significant relationship between Islamic finance and economic development (Levine, 2005; Bahri et al., 2018). The methodology used to present potential outcomes is influenced by Dawson (2014) and employs calculation techniques from Chiang (1984) in Fundamental Methods of Mathematical Economics.

According to available statistics, last incidence of Islamic producer financing is 13.50 % disbursed in 2020Q4. In Table 6, our findings indicate that Islamic producer financing (IPF) should be expanded up to the threshold level of 16.52% of total Islamic financing to positively impact agricultural output growth in Malaysia. However, exceeding this threshold may lead to increased costs and reduced productivity. Similarly, for Islamic consumer financing, with a disbursement of 14.04% of total Islamic financing in 2020Q4, our results suggest that the threshold level of financing is calculated to be 18.21%. This signifies that consumer financing can be extended up to the predicted turning points of total Islamic finance, to attain maximum output growth.

The sustainability of the equilibrium is determined by the convergence of short-run model to the long-run equilibrium. As shown in Table 7, the ECM coefficients

of -0.82 for IPF and -0.89 for ICF indicate how changes in the independent variables influence the equilibrium position and the adjustment process towards it. Therefore, policy interventions targeting Islamic producer financing are expected to achieve their goals in approximately 0.82 years, while those related to Islamic consumer financing will take around 0.89 years. The short-run model for Islamic producer financing highlights several key factors that impact agricultural output growth, including the present value of the IPF linear term, exchange rate, and interest rate. Whereas for the model of Islamic consumer financing, in short run agriculture output growth, the present value of ICF linear term, ICF quadratic term and exchange rate are significant variables.

Table 5.7. Results of Short run Coefficients of Islamic decomposed Financing

	Islamic Producer Financing		Islamic Consumer Financing
Variable	Coefficient (Prob.)	Variable	Coefficient (Prob.)
D(LNAGR(-1))	0.414259(0.0014)	D(LNAGR(-1))	0.4322 (0.0011)
D(LNIPF)	-0.3677 (0.6044)	D(LNAGR(-2))	0.4817 (0.0015)
D(LNIPF(-1))	0.1065 (0.0466)	D(LNICF)	-1.4236 (0.0178)
D(LNIPF(-2))	0.1526 (0.0032)	D(LNICF ²)	0.0390 (0.0474)
D(LNIPF ²)	0.0092 (0.7357)	D(LNER)	-0.5239 (0.000)
D(LNER)	-0.7776 (0.000)	D(LNINF)	-0.1883 (0.5435)
D(LNER(-1))	0.4911 (0.0096)	D(LNINF(-1))	-0.6529 (0.0655)
D(LNER(-2))	0.2007 (0.1344)	D(LNINF(-2))	-0.6742 (0.071)
D(LNINF)	0.4848 (0.2165)	D(LNMMR)	-0.0162 (0.8294)
D(LNMMR)	-0.1362 (0.0431)	D(LNMMR(-1))	0.3736 (0.0175)
D(LNMMR(-1))	0.3532 (0.0067)	D(LNMMR(-2))	0.2333 (0.1286)
CointEq(-1)	-0.82355 (0.000)	CointEq(-1)	-0.8971 (0.000)

Source: Estimation using E-views statistical software

5.4. Robustness Test

Various diagnostic tests have been carried out to verify the reliability and robustness of the estimated models presented in table 8.

Table 5.8. Diagnostics Tests

	Serial correlation	Functional form	Normality Test	Heteroscedasticity
Islamic producer financing	1.6021 (0.2274)	0.9024 (0.3535)	1.7136 (0.4245)	0.8384 (0.6358)
Islamic consumer financing	0.0529 (0.9485)	0.0991 (0.756)	2.3029 (0.3161)	0.9475 (0.5284)

Source: Estimation using E-views statistical software

Given the insignificant results from all the tests, we can conclude that the chosen model of Islamic finance in the study is valid and reliable at a 10% confidence level.

5.5. Stability Test

The CUSUM and CUSUM Square tests as recommended by Pesaran (2001) confirm the stability of the Islamic decomposed finance models. The statistical stability of both the IPF and ICF models has been confirmed at a significance level of 5% as indicated by the presence of a line between the critical boundaries in the figures.

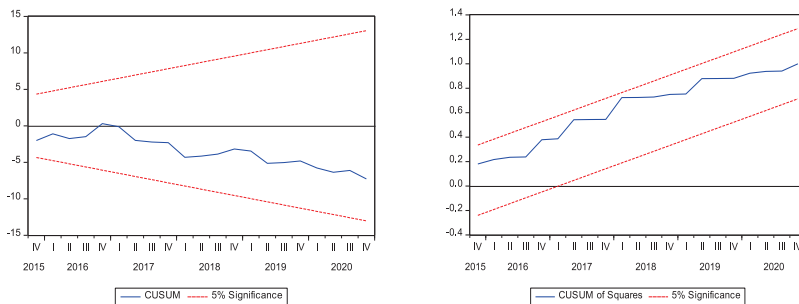


Figure 5.2. IPF and agriculture output

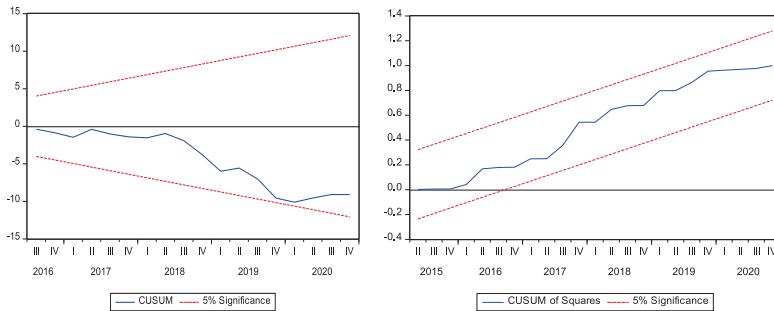


Figure 5.3. ICF and agriculture output

6. Conclusion and Policy Recommendations

Within the scholarly discourse, the nexus between Islamic finance and economic growth exhibits an intriguing U-shaped phenomenon, as debates unfold and curiosity drives exploration, a vibrant narrative of intellectual quest takes center stage, shaping our understanding of this intriguing connection. On the one hand, there are proponents who argue that a superfluous financial activity can have adverse effects on growth, illustrating an inverted U-shaped relationship. Conversely, in the realm of Islamic financing and its impact on productivity growth, the existing literature falls short in adequately exploring the nonlinear aspects of this association in Malaysia. As a result, this study endeavors to bridge this gap by empirically investigating the trend of both types of Islamic financing on agricultural output in Malaysia. The research findings shed light on the diverse effects that various financial resources, depending on their origins and recipients, exert on output growth. Remarkably, the empirical results challenge the conventional notion of an inverted U-shaped relationship, favoring instead a U-shaped trend among the variables of the study. These findings challenge the previously held notion that excessive financial availability hampers economic growth. Instead, they align more closely with the hypothesis that increased financial resources actually foster greater economic growth. The observation of a U-shaped profile in the recent Malaysian economy adds to the growing evidence that unravels the intricate dynamics between finance and growth.

From a policy standpoint, this study emphasizes enhancing the financial system's quality for agricultural sector growth. Policymakers must find the right balance between financial expansion and regulation to ensure positive economic impact. Unravelling the nonlinear relationship between Islamic decomposed financing and output growth is a fascinating pursuit, guiding policymakers to focus on improving quality rather than just scale. A well-regulated Islamic finance system can benefit individuals, society, and foster overall economic growth.

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