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Impact of Islamic Finance on Economic Growth in Egypt

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Abstract: The importance of Islamic finance is increasing worldwide not only in countries which its majority are Muslims but also in countries where Muslims are minority such as Japan and the United Kingdom whereas the number of Islamic financial institutions has increased significantly in the Middle East and Southeast Asia, however, the literature that examined Islamic finance impact on the real economy is rare, thus, the aim of this paper is to examine the effect of Islamic finance, specifically Islamic banking, on economic growth and on investment in Egypt through two empirical models; the first one examines the impact of Islamic finance on economic growth and the second one examines the impact of Islamic finance on investment. For both models, the paper utilizes annual time series data during the period from 2002 up to 2021 and employs Autoregressive Distributed Lag (ARDL) bounds testing approach, and Error Correction Model (ECM). The results of the paper demonstrate that there is a significant positive relationship between Islamic finance and economic growth and between Islamic finance and investment in Egypt. The paper recommends increasing the accessibility to Islamic financial services by increasing the Islamic banks branches and ATMs and Islamic banks should care about marketing of its products.

Keywords: Islamic Finance, Economic Growth, Investment, ARDL Bounds Test, ECM, Egypt

1. Introduction

The beginning of the modern Islamic finance institution was in 1963 in Egypt by the establishing of the Mit-Ghamr bank, then the Morocco first Islamic Summit Conference in 1969 and after that the foundation of Islamic Development Bank in 1973 in Saudi Arabia and the main goals of the previous events were to encourage Islamic banking and thus enhance economic development. The attention to the Islamic finance importance in generating economic growth has increased especially after the 2007-2008 global financial crisis, but until now the literature which has investigated the relationship between economic growth and Islamic finance is rare in Egypt [1, 2].

The importance of Islamic finance phenomenon has increased worldwide not only in countries that has a majority of Muslims but also in countries where Muslims are minority such as Japan and the United Kingdom whereas the number of Islamic financial institutions has increased significantly in the Middle East and Southeast Asia for many reasons one of them is the attraction of investors who favor Islamic finance instruments such as Mudarabah, Murabaha, Ijara, and Musharakah, because unlike the conventional instruments, it includes prohibition of Riba (interest), Gharar (uncertainty), unethical investments, and Darar (detriment). The second reason is that conventional finance fails in providing financial opportunities and services to the micro enterprises and poor households due to processes of bureaucratic requirements of banks [3]. Islamic finance based on the principle of profit and loss sharing (PLS). By comparing the effect of the finance based on the PLS principle and the finance adopted the non-PLS principle on economic growth, it is noted that finance based on PLS has a greater effect on economic growth than the non-PLS finance in the short run and also in the long run [4].

The savings banks which were established in Egypt specifically in Mit-Ghamr in 1963 are regarded as the first banks that don't work with interest in the Islamic society [1, 2]. The Islamic finance in Egypt has witnessed a great growth in the last two decades whereas the total assets of the 3 Islamic banks existing in Egypt have increased from only 12.6 in 2002 to about 303 billion Egyptian Pound in 2021. Faisal Islamic bank in Egypt takes over the largest percentage

of Egyptian Islamic banks total assets in the period 2013-2019 as shown in figure 1.

The effect of Islamic finance on economic growth has been mostly studied not only the direct effect but also the indirect effect through number of variables such as investment, financial stability, and financial inclusion. For example, Chouri et al, [5] has investigated the effect of the Islamic banking development on investment and found that Islamic banking can increase investment in Malaysia, Turkey, and Iran.
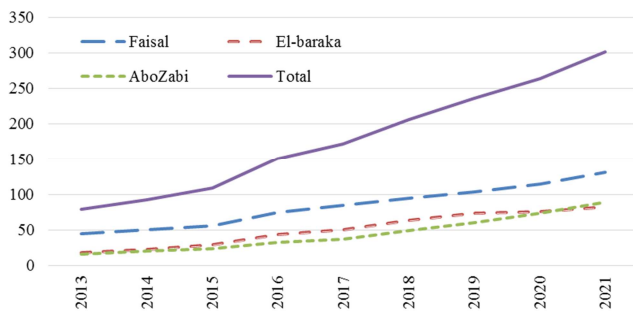

Figure 1. *Total Assets of Faisal, El-baraka, and AboZabi Islamic banks in Egypt (Billion Egyptian Pound).*

Source: Annual financial statements of Faisal, El-baraka, and AboZabi Islamic banks

The objective of this paper is to discuss empirically the relationship between Islamic finance and economic growth directly and indirectly through investment in Egypt. To reach this objective, this paper has been divided into five sections as following: section 1: introduction, section 2: literature review, section 3: methodology, results, and findings, and discussions, section 4: conclusion and section 5: recommendations.

2. Literature Review

2.1. Theoretical Literature Review

2.1.1. Conceptual Framework

Several literatures examined the basic concepts of Islamic finance for instance, Tabash & Dhankar [6], Komijani & Taghizadeh-Hesary [7], and Al Jabouri [8] denotes to Islamic finance as a financing system that is compatible with the Islamic Shariah principles, based on the Holy Quran and the Sunnah which prohibit Riba. Riba means an unreasonable increase in capital in the form of a loan or sale. It is a fixed positive interest rate related to the period and the amount of principal that is guaranteed regardless of the investment performance. It also prohibits Gharar which is the risky and ambiguous transactions and activities, such as betting, and gambling. It emphasizes on the risks and rewards sharing and on activities in the real economy and affirm that money should be used as a medium of exchange and as an instrument for evaluating the goods, services, and properties value, thus the Islamic banks take deposits from the individuals without any obligation of giving interest, whereas

it is based mainly on the principle of participation in profit and loss.

2.1.2. Islamic Finance Instruments

The investment methods in Islamic banks are different from that of the traditional banks, whereas traditional banks accept deposits with specific rate of interest and lend investors with greater interest rate, thus the bank has been considered as a borrower from the depositors and a debtor to the investors, hence the traditional banks obtain profits from the difference between those two interest rates but in the other hand for Islamic banks, scholars and jurists have provided numerous modes and methods for investing in Islamic banks in line with Islamic sharia rules for instance:

Musharakah: Musharakah can be defined as following, it is a joint enterprise that is formed to do a business, in that business all the partners share the profit based on a specific ratio upon which they agreed, share the loss based on their contributions' ratio. [9].

Mudarabah: Mudarabah can be considered as a debt to the Mudarib (customer), whereas first, it is considered as a claim by the Islamic bank, upon the initial amount given to the customer in addition to achieved profits or losses. Second, it is terminal Like debt, whereas the cooperation can be terminated by one party or by mutual agreement of the two parties [10].

In Mudarabah, both the customer and the bank are agreed upon a contract of cooperating in a business, in this contract the bank is the provider of the capital, and the customer is the provider of the skills and the labor needed to implement the project. The contract is based on a profit and loss sharing between the bank and the customer, but the bank bears the whole financial loss, except in the case that the customer displays a negligence, but in Musharakah, both the customer and the bank are providers of the capital in financing a business that they have cooperated to do with an agreement that both the customer and the bank share profit and loss in proportion to their participation in the business [11].

Murabaha: One of the most important Islamic finance instruments is the Murabaha sale, which means a customer asks the bank to purchase products that the customer identifies and describes, and to buy them from the bank, the customer pays the price either in cash or in installments agreed between the bank and the client [12].

Ijarah: Ijarah word means renting. It involves two parties: the first one is the lessor and the second one is the lessee. What happens in the Ijarah contract is that the first party allows the second one to use the benefits on a tangible asset for a rental consideration. Ijarah has two necessary requirements to be accepted as a mode of financing that is compatible with Shariah: generating profit from renting something which has intrinsic value which means that it is real assets, and the lessor assumes the risk. Ijarah has some steps: firstly, which is done by the customer: asset identifying, requesting from the bank to get it, promising the bank that he will lease it after getting it with specific rent upon which they are agreed, and purchase it later at a specific

price. Secondly, which is done by the bank: asset purchasing from the supplier with the price equals the cost price, and asset leasing to the customer with a fixed rent [13].

Sukuk: Another Islamic financial tool is Sukuk which are Islamic bonds. It is like the conventional bonds, however there is a difference between them. Sukuk are asset-backed and act like a proportional beneficial ownership in this asset and the holders of Sukuk are sharing in the generated revenues and in the proceeds of the realization of the Sukuk assets [14].

2.1.3. The Effect of Finance on Economic Growth

Finance has been proved to have a positive effect on the real economy whereas the development of the money market enables the capital flow to the productive sectors. Schumpeter argued that financial intermediaries, especially banks, take the center-stage in the process of economic development [15]. Later, the endogenous growth models gave further basis and insights for the empirical examination on the effect of finance on economic growth. There are several empirical studies that supported the nexus between finance and economic growth such as King & Levine [16] and Rajan & Zingales [17].

Although there are several studies conducted on the relationship between finance and growth, economists were divided on the nature of this relationship, whereas two hypotheses emerged, first, the hypothesis of supply-leading, that was pioneered by Schumpeter [15] and defended by Mckinnon [18], showed that financial development leads to the growth of the economy. Second, the hypothesis of demand-following, which was pioneered by Robinson [19], confirmed that the real economy's growth leads to financial development. Islamic finance has been developed in several countries globally, however studies on its contribution in the real economy remain few. With the increasing significance and presence of Islamic finance, several studies have started to focus on the role that Islamic finance may play in the real economy's growth. Other economists showed that there is a bidirectional relationship between finance and economic growth whereas financial development triggers economic growth, and economic growth causes development of the financial sector [20].

2.1.4. The Effect of Islamic Finance on Economic Growth

Islamic banking has important advantages which helps in achieving economic growth:

First, encouraging lending, whereas Conventional banks' lending in most countries is based on a form of collateral and guarantee. Islamic banking is based on risk-sharing which means that the bank and the borrower are sharing the risk of any project by dividing any losses or any profits between them on agreed terms, without guarantees. Sharing of risk leads entrepreneurs and financial capital providers to share the risks of business in return for profits share, unlike the conventional banks, which should encourage more investment especially by individuals who can't borrow because they have a lack of assets that can be a guarantee and then enhance growth [21]. Through Islamic finance principle

of Riba prohibition, the borrowers and the lenders incentives are met, hence decreasing moral hazard which helps to enhance investment, and then growth [22].

Second, stimulating saving, whereas Islamic banking can increase the savings of some individuals who abstain from utilizing the conventional banks, because of religious reasons, whereas they want to put savings into a financial system which is based on the religion's principles [21].

Third, promoting financial stability, whereas the Islamic banks' higher capitalization combined with higher liquidity reserves explains the better performance of Islamic banks during the global financial crisis. The non-transparent products are also forbidden, which combined with the profits and losses sharing, thus creates a less crisis vulnerable system [23], thus we can say that the diversification of the banking systems, by including Islamic banks as a complementary to the conventional ones, which contributes to the stability of the financial system [24]. Islamic finance is regarded as a stable financial system which is able to enhance growth and create long-term jobs. It prohibits interest, hoarding, speculation, and contractual uncertainty in favor of the real economy and productive activities. The unregulated credit growth was a cause of the recent crisis, in addition to the resulting massive bankruptcies, thus the crisis emphasized the need for financial stability, such as taking the Islamic finance principles as an example whereas Islamic finance was not affected by the credit expansion [21].

Fourth, efficient allocation of resources, the financial resources allocation is more efficient than its allocation according to pure lending whereas the aspect of the sharing of risk acts as an incentive to the Islamic banks to be more careful in their lending decisions and, thus, the allocation of liquidity is more optimal than the conventional banks. It also seems that Islamic banks perform corporate governance well, because they benefit from the reduction of the risk of information asymmetry. Therefore, they could affect corporate governance and be able to control the firms' performance. Hence, these financing modes are more efficient in monitoring by reducing adverse selection and moral hazard risks, which enables Islamic banks to allocate resources efficiently. Hence, it is theoretically expected that the impact of Islamic finance on the economic development will be more important [25].

Theoretical literature on the relationship between the level of interest rate and the allocation of resources optimality shows that a zero-interest rate is an essential condition to achieve the allocation of resources optimality [26]. A positive interest rate means a positive cost of the use of money which pushes traders to substitute the real resources for money which withdraws the real resources from the sector of production to the sector of transactions thus reducing the interest rate to zero removes the incentives to such substitution. Hence, the optimal output level can be maintained [27].

Islamic finance is more linked to the real economy than conventional finance. Considering Islamic finance's connectivity to economic growth, an efficient and well-

designed Islamic financial system would gather more funds for investment and distribute them to enterprises, which leads to an increase in investment, hence the real sector growth [28].

2.2. Empirical Literature Review

Some studies examined the empirical impact of Islamic finance on economic growth and the majority of them concluded that it has a positive impact on economic growth. For instance, Daly & Frikha [29], examined the contribution of Islamic finance in economic growth by using panel data. It compared conventional banks with Islamic banks in their contribution to economic growth by taking a sample of 120 banks between 2005 and 2012. It used three ordinary least-square regressions. It concluded that islamic banks development leads to economic growth and the two financing modes cooperation supports economic growth. Boukhatem & Ben Moussa [30], attempted to estimate the effect of Islamic banking loans on the economic growth in 13 countries in the MENA region from 2000 up to 2014 by employing Pedroni and Westerlund to test for the existence of a cointegrating relationship among the variables. It concluded that there is a strong relationship between financial system development and economic growth in the chosen MENA countries over the selected period. IŞIK [31], investigated the relationship between Islamic banking, economic growth, and innovation in the five Gulf Arab States (Bahrain, Kuwait, United Arab Emirates, Saudi Arabia, and Qatar) in the period of (2001-2015) by using panel dynamic ordinary least squares method. It concluded that Islamic banking funds and innovation in the selected Gulf Arab states lead to a positive effect on economic growth. Mushtaq, et al [32], attempted to explore how Islamic banking development can lead to economic growth by using the estimation-based Vector Error Correction model (VECM). It tested Ijarah, Murabaha and Diminishing Musharakah as proposed products of Islamic finance. It concluded that Islamic banking products finance positively leads to economic growth in Pakistan and Islamic banks net finance is based on financing in Murabaha and Ijarah. Aldalaien [33], examined the impact of Islamic banks on the gross domestic product (GDP) in Dubai. It used a descriptive analytical approach. It used a questionnaire by selecting a sample from two Islamic banks' department of credit facilities which consists of 100 employees. It concluded that GDP can significantly increase because of Islamic banks and finance in the United Arab Emirates (UAE), specifically Dubai. Nawaz, et al [34], examined the relationship between Islamic finance and economic growth in Pakistan by employing Granger Causality and cointegration tests and showed that Islamic finance is an appropriate environment to increase gross domestic investment and Muslim population percentage enhances Islamic finance. Anwar et al [35], examined the long-run and short-run contribution of Islamic bank to economic growth in Indonesia by using quarterly data from 2009 up to 2019 by employing autoregressive distributed lag (ARDL), and vector error correction model (VECM), and concluded that the

relationship between the deposits of Indonesian Islamic banks and economic growth is a bidirectional relationship in the short-run and the long-run. Sekmen [36], compared the effect of Islamic finance on economic growth and that of the conventional finance in Turkey by using quarterly time series data over the period from 2005 up to 2018 by employing Autoregressive Distributed Lag Model (ARDL) and confirmed that conventional banks contribution to economic growth in Turkey more than Islamic banks, As, Islamic banking part of the financial system is very small, and the development of more instruments of Islamic finance can rise the effect of Islamic finance on economic growth. The positive effect of Islamic banking on economic growth can be increased by promoting more Islamic financial instruments which is going to attract more people to the financial system and can be supportive to the flows of foreign funds from Muslim countries.

Other studies examined the effect of Islamic finance on investment (the indirect effect on economic growth) for instance, Tabash & Dhankar [37], examined the relationship between Islamic finance system development and economic growth in United Arab Emirates (UAE) at the period from 1990 to 2010 by using the cointegration test and Granger Causality tests. It concluded that there is a positive relationship between Islamic finance and economic growth in UAE and this relationship is only a one direction relationship; from Islamic finance to economic growth, Islamic finance leads to increase in investment and attracting Foreign Direct Investment inflow (FDI) in the long term in UAE, and there is a bidirectional relationship between Islamic finance and FDI; Islamic finance attracts FDI and FDI enhances Islamic finance. Alawneh, et al [38], investigated the impact of Islamic finance on number of macroeconomic variables over the period (2000-2011) in Jordan and concluded that the Islamic finance has a positive effect on the domestic investment and GDP which enhances economic growth, and a negative effect on the inflation rate. Alafif & Shaheen [39], investigated the contribution of Islamic banking in economic growth in the Kingdom of Saudi Arabia (KSA) by employing autoregressive distributed lag (ARDL) technique, and concluded that the system of Islamic banking positively affects the Kingdom of Saudi Arabia's economic development process through investments, national income, and net inflows of foreign direct investment.   ~In addition to other studies which concluded that Islamic finance has an indirect impact on economic growth not a direct one, for instance, Mifrahi & Tohirin [40], examined the Islamic financing impact on economic growth in Qatar, Indonesia, Saudi Arabia, Malaysia, UAE and Turkey by utilizing panel data annually from 2005 up to 2015 through mediating analysis models and found that Islamic financing hasn't a direct impact on economic growth. But it has an indirect effect on economic growth through consumption spending and investment.

A few studies concluded that Islamic finance hasn't an effect on the economic growth, for instance, Tabash et al [41], examined the interaction between Islamic banking and

the Nigerian economy growth in the short and long run by using quarterly time series data from 2013 to 2020 Q2 by employing ARDL and ECM approaches and found that the contribution of Islamic banking to Nigerian economy is positive in the long and short-run, but it is not significant.

3. Methodology

3.1. Theoretical Framework

3.1.1. Model 1

Following Cobb-Douglas production function:

$$(Y = AK^{\beta_2}L^{\beta_3}) \tag{1}$$

which confirmed that the growth of output (Y) occurs through the capital (K) increase through the saving and the investment, and the quantity and quality of labor (L) increase through the growth of population and education and technology improvements (A) are considered as an exogenous variable [42]. This paper has formulated its primary equation by proxying capital and labour with GCF and total population respectively, as following:

$$GDP_t = A \, Assets_t^{\beta_1} GCF_t^{\beta_2} POP_t^{\beta_3} \tag{2}$$

Then, transforming all variables to the log form and obtaining equation (3)

$$log(GDP_t) = log(A) + \beta_1 log(Assets_t) + \beta_2 \, log \, log \, (GCF_t) + \beta_3 \, log \, log \, (POP_t) \tag{3}$$

log(A) can be treated as a constant β_0 hence adding the error term (ε_t) as showing in equation (4)

$$log(GDP_t) = \beta_0 + \beta_1 \, log \, log \, (Assets_t) + \beta_2 \, log \, log \, (GCF_t) + \beta_3 \, log \, log \, (POP_t) + \varepsilon_t \tag{4}$$

Thus, simplifying equation (4) as following

$$LGDP_t = \beta_0 + \beta_1 LAssets_t + \beta_2 LGCF_t + \beta_3 LPOP_t + \varepsilon_t \tag{5}$$

Where:

$lGDP_t$ represents logarithm (log) of Gross Domestic Product (LCU) at time t.

$lAssets_t$ represents log of total Islamic banks assets (LCU) (sum of the 3 Islamic banks assets (Faisal, El-baraka, and AboZabi) at time t.

$lGCF_t$ represents the log of Gross Capital Formation (LCU) at time t.

$lPOP_t$ represents the log of the total number of Population at time t.

β_0 is the constant term, $\beta_1, \beta_2, \beta_3$ are the coefficients of the explanatory variables, and ε_t is the error term.

3.1.2. Model 2

Following, Jorgenson [43], who developed a neoclassical theory of investment by utilizing the neoclassical Cobb-Douglas production function. He has showed that the marginal product of capital (MP_K) can be derived from a Cobb-Douglas production function

$$(Y = AK^\alpha L^\beta) \tag{6}$$

Getting the MP_K by taking the Y first partial derivative with respect to K as following:

$$MP_K = \frac{\partial Y}{\partial K} = \alpha K^{\alpha-1} L^\beta = \frac{\alpha Y}{K} \tag{7}$$

The optimal capital stock ($\dot{K}$) occurs when marginal costs (the user cost of capital) (C) equal marginal benefits (MP_K) of investment projects as following:

$$A\frac{Y}{K} = C \tag{8}$$

The previous equation will be rearranged thus:

$$\dot{K} = \alpha \frac{Y}{C} \tag{9}$$

Thus, according to Jorgenson the main determinants of capital formation is real output and cost of capital which can be explained as following:

$$\dot{K} = F(Y, C) \tag{10}$$

From the previous, the paper has utilized the following equation by proxied capital, real output, and cost of capital by GFCF, RGDP and RIR respectively, and then adding the main variable which is Assets and then transforming all variables to the log form except RIR because it has negative values:

$$lGFCF_t = \beta_0 + \beta_1 lAssets_t + \beta_2 lRGDP_t + \beta_3 RIR_t + \varepsilon_t \tag{11}$$

Where:

$LGFCF_t$ represents the log of Gross Fixed Capital Formation (LCU) at time t.

$LAssets_t$ represents log of total Islamic banks assets (LCU) (sum of the 3 Islamic banks assets (Faisal, El-baraka, and AboZabi) at time t.

$LRGDP_t$ represents the log of Real Gross Domestic Product at time t.

RIR_t represents Real Interest Rate at time t.

3.2. Data

Table 1. Variables Definition.

Abbreviation	Variable and Measurement	Source of the data
Model 1		
LGDP	Economic growth measured by log of Gross Domestic Product (LCU)	Database of WDI
LASSETS	Islamic banking measured by log of the sum of total assets of Faisal, El-baraka, and AboZabi Islamic banks (LCU)	Annual financial statements of Faisal, El-baraka, and AboZabi Islamic banks

Abbreviation	Variable and Measurement	Source of the data
LGCF	Capital measured by log of Gross Capital Formation (LCU)	Database of WDI
LPOP	Labour measured by Log of Total number of Population	Database of WDI
Model 2		
LGFCF	Investment measured by Log of Gross Fixed Capital Formation (LCU)	Database of WDI
LASSETS	Islamic banking measured by log of the sum of total assets of Faisal, El-baraka, and AboZabi Islamic banks (LCU)	Annual financial statements of Faisal, El-baraka, and AboZabi Islamic banks
RGDP	Real output measured by log of real GDP (GDP divided by GDP deflator) (LCU)	Database of WDI
RIR	Cost of capital measured by Real interest rate	Database of WDI

This paper uses two econometric models. For the first one, Gross Domestic Product (GDP) as a dependent variable, which represents the economic growth, Islamic banking total assets as a proxy of Islamic banking, in addition to two controlled variables: Gross Capital Formation (GCF) as a proxy of capital and the number of the population as a proxy of labour. For the second one, Gross fixed capital formation (GFCF) has been used as a dependent variable, representing investment, Islamic banks total assets to represent Islamic finance, as well as two controlled variables which are real GDP and real interest rate.

The data utilized is annually time series data expressed in local currency (Egyptian pound) for all variables except the population in model 1 which is used as an absolute number of the total population and real interest rate for model 2 which has been used as an annual percent and with logarithm (log) transformation for all variables in model 1 and all the variables of the second one except the real interest rate since it includes values with negative sign. The data span is from 2002 up to 2021.

The data of Islamic banking assets was obtained from the annual financial statements of the Islamic banks (Faisal, El-baraka, and AboZabi) by taking the sum of the total assets of the three Islamic banks, the dependent variables: GDP and GFCF and the controlled variables (GCF, total population, RGDP and RIR) were obtained from world bank data (world development indicators). As shown in Table 1.

Table 2. Descriptive Statistics of Variables.

Variables	Mean	Std. Dev	Max	Mini
Model 1				
LGDP	28.04490	0.911154	29.48026	26.66054
LASSETS	17.83826	1.101660	19.52843	16.34921
LGCF	26.25925	0.836334	27.59984	24.94571
LPOP	18.26949	0.119886	18.46238	18.08500
Model 2				
LGFCF	26.22327	0.815041	27.50171	24.93556
LASSETS	17.83826	1.101660	19.52843	16.34921

Table 2 shows the summary of the variables' descriptive statistics, the mean, the standard deviation (Std. Dev), and the minimum (Mini) and the maximum (Max) values of each variable. It shows that the average value of log (GDP) equals almost 28% in Egypt in the selected period with Max value equals almost 29.5% and Mini value equals almost 26.7% and with a standard deviation equals 0.9 and so on for other variables.

3.3. Empirical Approach for Both Models

This paper has used ARDL bounds test to assess the long run direct and indirect impact of Islamic banking on economic growth in Egypt. ARDL is the most appropriate approach in our case for two reasons: the sample data size is small (20 observations), and the variables of this paper are not integrated at the same order, some variables are integrated at the level (I(0)) and others are integrated at the first difference (I(1)) as shown in Table A1 at Appendix: A, the paper has used Augmented Dicky Fuller (ADF) test which was beneficial to reach a result of whether there is a unit root of the time series. If the time series is stationary at level, thus it is integrated of order zero I(0), and if it is not stationary at level we take the first difference, hence it is integrated of order zero I(1) [44]. If ADF value is less than its critical value, the series is nonstationary. On the other hand, when it is greater than its critical value the series is stationary [45]. Accordingly, all the variables are I(0) or I(1) thus we can use ARDL model.

The bounds test was developed by Pesaran et al [45] to test if there is a level relationship between a dependent variable and independent variables, when it is not surely known whether the independent variables are first-difference stationary or trend stationary. It is based on standard f-statistics and t-statistics under a null hypothesis says that there is no level relationship and two critical values are provided for two cases: the first assumes that all the regressors are purely I(1), and the other assumes that all the regressors are purely I(0). If the calculated F-statistic lays outside the critical values, a decisive inference can be done without any need to know the integration status of the regressors, and if the f-statistic is lower than the lower bound critical value, the null hypothesis (No levels relationships) cannot be rejected, on the other hand if the f-statistic is greater than the upper bound critical value, the null hypothesis (No levels relationships) can be rejected. However, if the F-statistic lies inside these critical values, inference is indecisive, and it is required to know the integration order of the regressors before making any inferences.

Model 1: ARDL (1,1,0,1) bounds test equation:

$$\Delta lGDP_t = \beta_0 + \sum_{i=1}^{1}\beta_1 \Delta lGDP_{t-1} + \sum_{i=0}^{1}\beta_2 \Delta lAssets_{t-1} + \sum_{i=0}^{0}\beta_3 \Delta lGCF_{t-1} + \sum_{i=0}^{1}\beta_4 \Delta lPOP_{t-1} + \delta_1 lGDP_{t-1} + \delta_2 lAssets_{t-1} + \delta_3 lGCF_{t-1} + \delta_4 lPOP_{t-1} + U_t \tag{12}$$

Model 2: ARDL (3,0,0,0) bounds test equation:

$$\Delta lGFCF_t = \alpha_0 + \sum_{i=1}^{3} \alpha_1 \Delta lGFCF_{t-1} + \sum_{i=0}^{0} \alpha_2 \Delta lAssets_{t-1} + \sum_{i=0}^{0} \alpha_3 \Delta LRGDP_{t-1} + \sum_{i=0}^{0} \alpha_4 \Delta RIR_{t-1} + \gamma_1 lGFCF_{t-1} +$$
$$\gamma_2 lAssets_{t-1} + \gamma_3 LRGDP_{t-1} + \gamma_4 RIR_{t-1} + \omega_t \qquad (13)$$

It also uses Error Correction Model (ECM) to examine the short run cointegration, and to provide the adjustment speed. The Error Correction Model (ECM) shows the extent to which any disequilibrium in the previous period is being adjusted in the current point. A positive coefficient of Error Correction term (ECT) refers to a divergence, while a negative coefficient refers to convergence. If ECT coefficient equals 0, it shows that there is no adjustment, and there is no long-run relationship but if it equals for instance 0.5, 50% of the adjustment occurs each period [46].

Model 1: Error correction model equation:

$$\Delta lGDP_t = \beta_0 + \sum_{i=1}^{1} \beta_1 \Delta lGDP_{t-1} + \sum_{i=0}^{1} \beta_2 \Delta lAssets_{t-1} + \sum_{i=0}^{0} \beta_3 \Delta lGCF_{t-1} + \sum_{i=0}^{1} \beta_4 \Delta lPOP_{t-1} + \delta ECT_{t-1} + \varepsilon_t \qquad (14)$$

Model 2: Error correction model equation:

$$\Delta lGFCF_t = \alpha_0 + \sum_{i=1}^{3} \alpha_1 \Delta LGFCF_{t-1} + \sum_{i=0}^{0} \alpha_2 \Delta lAssets_{t-1} + \sum_{i=0}^{0} \alpha_3 \Delta LRGDP_{t-1} + \sum_{i=0}^{0} \alpha_4 \Delta RIR_{t-1} + \gamma ECT_{t-1} + e_t \qquad (15)$$

Where: $\beta_1, \beta_2, \beta_3, \beta_4, \alpha_1, \alpha_2, \alpha_3, \alpha_4$, and α_5 are the short run coefficients of the explanatory variables, $\delta_1, \delta_2, \delta_3, \delta_4$, $\gamma_1, \gamma_2, \gamma_3, \gamma_4$, and γ_5 are the long run coefficients, and U_t, and ω_t are the disturbance terms at time t and δ, and γ are the coefficients of the Error Correction Term (ECT), and ε_t, and e_t are the disturbance terms at time(t).

3.4. Estimation Technique

3.4.1. ARDL Bounds Test

Table 3. Long-run Relationships.

Variable	Coefficient	t-Statistic
	Model 1	
LASSETS	0.278590	5.506642***
LGCF	0.680132	9.315242***
LPOP	0.266310	4.262431***
	Model 2	
LASSETS	0.162672	2.106068*
LRGDP	0.628537	6.268369***
RIR	-0.083402	-6.708343***

Significant at 10% (*), Significant at 5% (**), Significant at 1% (***)

Table 3 shows: The Model 1 results of the long-run relationships between the dependent (LGDP) and independent variables (Lassets, LGCF, LPOP), which come as following: There is a positive relationship between economic growth and Islamic banking at 1% significance level, with a coefficient equals 0.278590, which means that if the Islamic banking assets increase by one unit the economic growth will increase by the previous value of the coefficient, there is a positive relationship between economic growth and domestic investment represented by gross capital formation (GCF) at 1% significance level, with a coefficient equals 0.680132, hence if the domestic investment increases by one unit the economic growth will increase by the value of the coefficient. This result follows Bakari [47], Mohamed et al [48], and Nguyen & Thanh Nguyen [49], and there is a positive relationship between economic growth and population growth rate at 1% significance level, with a coefficient equals 0.266310, thus if the population growth rate increases by one unit the economic growth will increase by the value of the coefficient. Many studies reach the same result such as Azam et al [50], Tartiyus et al [51], and Thuku [52].

Model 2 has investigated the relationship between the dependent variable (LGFCF) and independent variables (Lassets, RGDP and RIR). The results of the long-run relationships were as following, there is a positive relationship between investment and Islamic banking at 10% significance level, and if the Islamic banking assets increase by one unit the investment will increase by 0.162672, there is a positive relationship between investment and real GDP (RGDP) at 1% significance level. If the RGDP increases by 1 unit, investment will increase by about 0.628537. This result follows Bader & Malawi [53], and Onwe & Olarenwaju [54], and there is a negative impact of real interest rate (RIR) on investment at 1% significance level, with a coefficient equals -0.083402, thus if the RIR increases by 1% investment will decrease by the value of the coefficient. Many studies reach the same result such as Bader & Malawi [53], and Tadeu & Silva [55].

Table 4. F-Bounds Test.

	F-statistic Value
Model 1	18.50289***
Model 2	7.265049***

Significant at 10% (*), Significant at 5% (**), Significant at 1% (***)

Table 4 shows the bounds test results, which are, the f-statistic values are 18.50289, 7.265049 for model 1, and 2 respectively which are greater than the upper bound at 1% significance level (4.84), hence the null hypothesis can be rejected, and we can say that there is a cointegration between variables in model 1 and model 2.

3.4.2. Error Correction Model

Table 5. Error Correction Regression.

	Coefficient	t-Statistic
	Model 1	
CointEq(-1)*	-0.470649	-9.544168***
	Model 2	
CointEq(-1)*	-0.859416	-7.131293***

Significant at 10% (*), Significant at 5% (**), Significant at 1% (***)

Table 5 shows that the coefficients of ECT are -0.470649 and -0.859416 for model 1 and model 2 respectively which are a negative signs, its absolute values are less than one and

it is significant at 1% significance level which indicate that 47% for model 1 and 86% for model 2 of adjustment from short run to long run can happen each year, which means that the adjustment is taken place after about 2 years and 1 year for model 1 and model 2 respectively.

3.4.3. Diagnostic Tests

Table 6. Diagnostics Tests.

Tests	Test Statistics (Model 1)	Test Statistics (Model 2)
Breusch-Godfrey Serial Correlation LM	1.94	2.07
White Heteroskedasticity	1.98	0.93
Ramsey Reset	0.00	0.71
Jarque-Bera Normality	1.07	0.55

(i). Serial Correlation

The Breusch-Godfrey Serial Correlation LM Test is used to test serial correlation of the residuals and it found that there is no serial correlation between residuals for both models. Table 6 shows that the test statistics equals 1.94 and 2.07 for model 1, and model 2 respectively, thus the null hypothesis which says that there is no serial correlation cannot be rejected, hence there is no serial correlation in the residuals of both models.

(ii). Heteroskedasticity

The white Test is used to test Heteroskedasticity, and it found that there is no Heteroskedasticity. Table 6 shows that test statistics equals 1.98 for model 1 and 0.93 for model 2, thus the null hypothesis which says that there is no Heteroskedasticity cannot be rejected, hence there is no Heteroskedasticity.

(iii). Regression Error Specification Test (RESET)

The estimation of the econometric model can be biased and inefficient because of Misspecification of variables for this reason Ramsey (1969) established (RESET) to examine for misspecification in the econometric models, which detects for improper functional form and omitted variables in the model. As shown at table 6 the test statistics equal almost 0 for model 1 and 0.71 for model 2, thus we can't reject the null hypothesis which says that there are no omitted variables in the model, hence there is no misspecification.

(iv). Normality Test

The Jarque-Bera (JB) tests the normality of the residuals, under the null hypothesis: the residuals are normally distributed, if the probability (p-value) is lower than 5%, we reject the null hypothesis which says that the residuals are normally distributed thus it is not normally distributed and on the other hand, if the probability (p-value) is greater than 5%, we can't reject the null hypothesis thus we can say that the residuals are normally distributed. As shown at table 6, the test statistics are 1.07 for model 1 and 0.55 for model 2, thus the residuals are normally distributed.

(v). Stability

Cumulative sums (CUSUM) and cumulative sums of squares (CUSUM of squares) tests are used to test the accuracy and stability of the coefficients of the model [56].

Figures A1, and A2 at appendix A show that the CUSUM and CUSUM of squares statistics which are between the two lines, means that it is inside the critical limits at the 5% level of significance. Hence, we can say that the coefficients in the ARDL models are stable.

3.5. Findings and Discussions

According to the empirical results, there is a positive relationship between economic growth and Islamic banking at 1% significance level. This result is consistent with Tabash & Dhankar [37] findings that there is a positive relationship between Islamic finance and economic growth in the UAE. There is a positive relationship between investment and Islamic banking at 10% significance level which is compatible with the findings of Alawneh, et al [38], that the Islamic finance has a positive effect on the domestic investment which enhances economic growth.

For model 1, 47% of adjustment from short run to long run can happen each year, which means that the adjustment takes place after about 2 years.

For model 2, 86% of adjustment from short run to long run can happen each year, which means that the adjustment takes place after about 1 year.

Based on this paper results, what is discussed earlier can be proved that Islamic finance can encourage lending, stimulate saving, promote financial stability, and allocate resources efficiently thus enhance economic growth.

4. Conclusion

This paper aimed to investigate the empirical relationship between Islamic banking and economic growth. It conducted two econometric models using ARDL bounds test approach and error correction model (ECM). The first, to assess the direct relationship between Islamic finance and economic growth, it proxied economic growth by GDP and Islamic finance by the total assets of the 3 Islamic banks which existed in Egypt (Faisal Islamic Bank, Al baraka Bank, and Abu Dhabi Islamic Bank). The second, to investigate the indirect one through investment which is proxied by GFCF. This paper concluded that there is a significant positive long run direct and indirect relationship between Islamic finance and economic growth in Egypt.

5. Recommendations

Based on the paper results that showed the importance of Islamic finance in enhancing economic growth, we recommend:

1) Based on the paper's empirical results, the Islamic finance has a positive impact on economic growth, however it has a little effect thus we can suggest that Islamic banks should make more effort to create new financial tools and instruments which apply the Sharia rules to increase its effect on economic growth.

2) The literature that is conducted to examine the relationship between Islamic finance and economic growth is rare, thus the interested researchers should conduct more studies about the relationship between Islamic finance and economic growth in Egypt and the Arabic world. It is also suggested that the researchers may advance this topic by adding other proxies or variables related to Islamic banking. In addition to that the researchers may use other approaches to enrich and enhance the topic related to economic growth and Islamic finance.

3) Islamic financial institutions should train their staff members to get the professional skills that are needed to appropriately manage these institutions.

4) Islamic banks, by comparing with conventional banks, don't exert a great effort to market their products thus Islamic banks should be interested in marketing their products.

5) policymakers should go on strategies to be able to develop the Islamic banking. Islamic banks should consider the use of the Microfinance model for attracting SMEs which struggle for loans obtaining from the conventional banks. Moreover, policymakers should work to build strong institutions.

6) Islamic banks in Egypt should increase their branches and Automated Teller Machines (ATMs) to increase the accessibility to Islamic financial services.
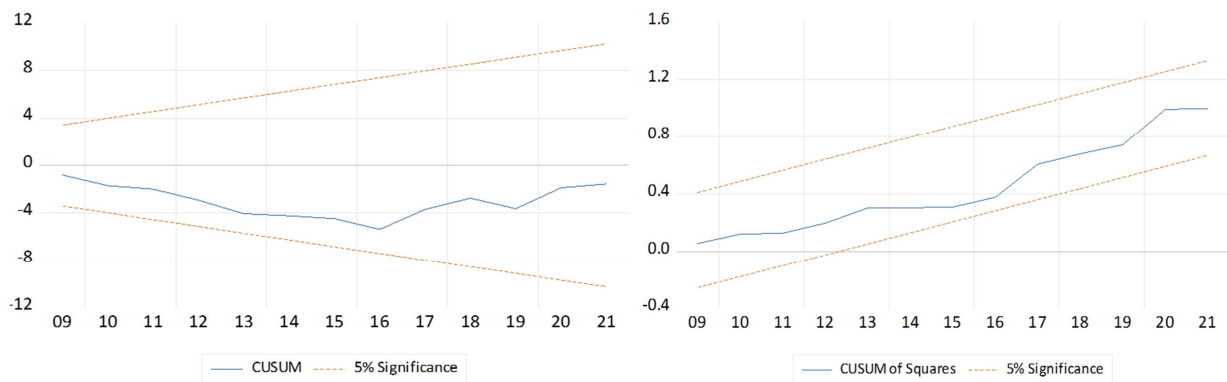
Appendix

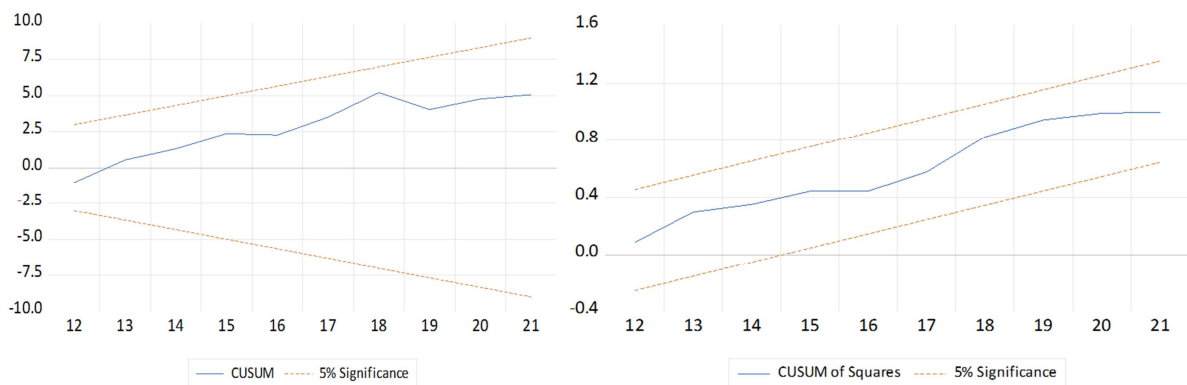*Figure A1. CUSUM and CUSUM of Squares Tests for Model 1.*

Figure A2. CUSUM and CUSUM of Squares Tests for Model 2.

Table A1. Augmented Dickey-Fuller Unit Root Test.

Variables	T-statistics (at level)	The order
Model 1		
LGDP	-3.317114*	I(0)
LASSETS	-2.282694	-
LGCF	-3.769198**	I(0)
LPOP	-9.734460***	I(0)
Model 2		
LGFCF	-4.481065***	I(0)
LASSETS	-2.282694	-
LRGDP	-2.612936	-
RIR	-3.518680***	I(0)
Variables	T-statistics (at first difference)	The order
Model 1		

Variables	T-statistics (at level)	The order
LASSETS	-4.168075**	I(1)
Model 2		
LASSETS	-4.168075**	I(1)
LRGDP	-3.353770*	I(1)

Significant at 10% (*), Significant at 5% (**), Significant at 1% (***)

References

[1] Alharbi, A. (2015, June). Development of the Islamic Banking System. Journal of Islamic Banking and Finance, 3 (1), 12-25.

[2]   El-Galfy, A., & Khiyar, K. A. (2012). Islamic Banking and Economic Growth: A Review. The Journal of Applied Business Research, 28, 943-956.

[3]   Abdu, M., Jibir, A., Abdullahi, S., & Rabi'a, A. (2018). Can Islamic Banking and Finance Spur Financial Inclusion: Evidence from Sub-Saharan Africa. Journal of Applied Statistics, 77-104.

[4]   Masrizal, R., & Trianto, B. (2022). the role of PLS financing on economic growth: Indonesian case. Journal of Islamic Monetary Economics and Finance, 8, 49-64.

[5]   Chouri, H. B., Khaki, A. A., Moghadam, B. A., & Hadizadeh, A. (2021). The impact of Islamic banking development and inflation rate on investment: A panel approach based on data from Iran, Malaysia, and Turkey. International Journal of Nonlinear Analysis and Applications.

[6]   Tabash, M., & Dhankar, R. (2014). The Relevance of Islamic Finance Principles in Economic Growth. International Journal of Emerging Research in Management &Technology, 3 (2).

[7]   Komijani, A., & Taghizadeh-Hesary, F. (2018, July). An overview of Islamic Banking and Finance in Asia. ADBI Working Paper Series.

[8]   Al Jabouri, A. N. (2021). The comparative role between commercial and Islamic banks in Iraq: Rafidain Commercial Bank, Tigris Bank and Islamic Euphrates - Case Studies. Ishtar Journal of Economics and Business Studies (IJEBS), 3, 87-103.

[9]   Farooq, M., & Mushtaq, M. M. (2013). Musharakah Financing: Experience of Pakistani Banks. World Applied Sciences Journal, 181-189.

[10]   Bacha, O. I. (1997, June). Adapting Mudarabah Financing to Contemporary Realities: A Proposed Financing Structure. The Journal of Accounting, Commerce & Finance, 1 (1).

[11]   Warninda, T. D., Ekaputra, I. A., & Rokhim, R. (2019). Do Mudarabah and Musharakah financing impact Islamic Bank credit risk differently? Research in International Business and Finance, 166-175.

[12]   Elmaghraby, A. A. (2004). the strategic management in Islamic banking. The Islamic Research and Teaching Institute (IRTI).

[13]   Zafar, F. (2012). Ijarah contract: a practical dilemma. Emerald Insight, pp. 67-69.

[14]   Zin, M. Z., Abdul Kadir, A. R., Ishak, S., & Abdul Latif, M. S. (2011). Growth and prospect of Islamic finance in Malaysia. International Proceedings of Economics Development & Research, (pp. 180-184).

[15]   Schumpeter, J. A. (1983). The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle. USA: Transaction Publishers.

[16]   King, R. G., & Levine, R. (1993, August). Finance and Growth: Schumpeter Might Be Right. the Quarterly Journal of Economics, 717-737.

[17]   Rajan, R. G., & Zingales, L. (1998, Jun). Financial Dependence and Growth. The American Economic Review, 88 (3), 559-586.

[18]   McKinnon, R. (1974, Dec). Money and Capital in Economic Development. The American Political Science Review, 68 (4), 1822-1824.

[19]   Robinson, J. (1952). The Rate of Interest and Other Essays. London: THE MACMILLAN PRESS LTD.

[20]   Odedokun, M. (1992). Supply-Leading and Demand-Following Relationships between Economic Activity and Development Banking in Developing Countries: An Empirical Analysis. Singapore Economic Review, 46-58.

[21]   Imam, P., & Kpodar, K. (2016). Islamic banking: Good for growth: Economic Modelling, 387-401.

[22]   Ben Naceur, S., Barajas, A., & Massara, A. (2015). Can Islamic Banking Increase Financial Inclusion. IMF Working Paper.

[23]   Hassan, M., & Dridi, J. (2010). The Effects of the Global Crisis on Islamic and Conventional Banks: A Comparative Study. IMF Working Paper.

[24]   Imam, P., & Kpodar, K. (2013). Islamic Banking: How has it Expanded? Emerging Markets Finance and Trade, 49, 112-137.

[25]   Siddiqi, M. N. (1999). Islamic finance and beyond: premises and promises of Islamic economics. Proceedings of the Third Harvard University Forum on Islamic Finance. Center for Middle Eastern Studies, pp. 49-53.

[26]   Friedman, M. (1969). The Optimum Quantity of Money and Other Essays. United States of America: University of Chicago.

[27]   Al-Jarhi, M. (2017). Islamic Finance at Crossroads. Munich Personal RePEc Archive (MPRA).

[28]   Kassim, S. (2016). Islamic finance and economic growth: the Malaysian experience. Global Finance Journal, 66-76.

[29]   Daly, S., & Frikha, M. (2016). Banks and economic growth in developing countries: What about Islamic banks? Cogent Economics & Finance, 4 (1), 1-26.

[30]   Boukhatem, J., & Ben Moussa, F. (2017). The effect of Islamic banks on GDP growth: Some evidence from selected MENA countries. Borsa Istanbul Review, 231-247.

[31]   IŞIK, N. (2018). Growth, Islamic Banking and Schumpeterian Vision: An Empirical Evidence from the Gulf Arab States. International Journal of Islamic Economics and Finance Studies, 4 (1), 40-55.

[32]   Mushtaq, A., Arshed, N., & Kalim, R. (2018, January). Islamic banking financing effect on growth. Islamic Banking and Finance Review, 5, 69–87.

[33]   Aldalaien, B. A. (2019). The Impact of Islamic Banks on the Gross Domestic Product (GDP): an Empirical Study in Dubai. International Journal of Business and Management, 135-142.

[34]   Nawaz, H., Abrar, M., Salman, A., & Bukhar, S. (2019). Beyond finance: Impact of Islamic finance on economic growth in Pakistan. Economic Journal of Emerging Markets (EJEM).

[35]   Anwar, S. M., Junaidi, J., Salju, S., Wicaksono, R., & Mispiyanti, M. (2020). Islamic bank contribution to Indonesian economic growth. International Journal of Islamic and Middle Eastern Finance and Management, 13, 519-532.

[36]   Sekmen, T. (2021). Islamic Banking and Economic Growth in the Dual Banking System. Optimum Journal of Economics and Management Sciences, 183-196.

[37] Tabash, M., & Dhankar, R. (2014). Islamic Finance and Economic Growth: An Empirical Evidence from United Arab Emirates (UAE). Journal of Emerging Issues in Economics, Finance and Banking, 3 (2).

[38] Alawneh, A. M., Al-Fawwaz, T. M., & Shawaqfeh, G. N. (2019). The Impact of Islamic Finance on Some Macro Economic Variables (A case study of Jordan Islamic Bank). Interdisciplinary Journal of Contemporary Research in Business (IJCRB).

[39] Alafif, W. M., & Shaheen, R. (2021). An empirical evaluation of the impact of Islamic financing on economic growth in Saudi Arabia. Palarch's Journal of Archaeology of Egypt/Egyptology.

[40] Mifrahi, M. N., & Tohirin, A. (2020). How does Islamic banking support economic growth. SHARE Jurnal Ekonomi dan Keuangan Islam, 9, 72-91.

[41] Tabash, M., Abdulkarim, F. M., Akinlaso, M. I., & Dhankar, R. (2022). Islamic banking and economic growth: fresh insights from Nigeria using autoregressive distributed lags (ARDL) approach. African Journal of Economic and Management Studies.

[42] Todaro, M. P., & Smith, S. C. (2015). Economic Development. Pearson.

[43] Jorgenson, D. W. (1963). Capital theory and investment behavior. American Economic Association.

[44] Gujarati, D. N., & Porter, D. C. (2009). Basic Econometrics (fifth ed.). McGraw-Hill.

[45] Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 289-326.

[46] Alogoskoufis, G., & Smith, R. (1991). On error correction models: specification, interpretation, estimation. Journal of Economic Surveys, 97-128.

[47] Bakari, S. (2017). The Impact of Domestic Investment on Economic Growth: New Evidence from Malaysia. The Munich Personal RePEc Archive (MPRA).

[48] Mohamed, M. R., Singh, K. S., & Liew, C. (2013). Impact of Foreign Direct Investment & Domestic Investment on Economic Growth of Malaysia. Malaysian Journal of Economic Studies, 21-35.

[49] Nguyen, K., & Thanh Nguyen, H. (2021). The Impact of Investments on Economic Growth: Evidence from Vietnam. Journal of Asian Finance, Economics and Business, 345-353.

[50] Azam, M., Khan, H. N., & Khan, F. (2020). Testing Malthusian's and Kremer's population theories in developing economy. International Journal of Social Economics.

[51] Tartiyus, E. H., Dauda, M. I., & Peter, A. (2015, April). Impact of Population Growth on Economic Growth in Nigeria (1980-2010). IOSR Journal of Humanities and Social Science, 20 (4), 115-123.

[52] Thuku, G. K., Paul, G., & Almadi, O. (2013). The impact of population change on economic growth in Kenya. International Journal of Economics and Management sciences, 43-60.

[53] Bader, M., & Malawi, A. I. (2010). The Impact of Interest Rate on Investment in Jordan: A Cointegration Analysis. Journal of King Abdulaziz University: Economics and Administration. 24, 199-209.

[54] Onwe, O. J., & Olarenwaju, R. R. (2014). Impact of Inflation on Corporate Investment in the Sub-Saharan African Countries: An Empirical Analysis of the West-African Monetary Zone. International Journal of Business and Social Science, 5, 189-199.

[55] Tadeu, H. F., & Silva, J. T. (2013). The Determinants of the Long-term Private Investment in Brazil: An Empirical Analysis Using Cross-section and a Monte Carlo Simulation. Journal of Economics, Finance and Administrative Science, 11-17.

[56] Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for Testing the Constancy of Regression Relationships over Time. Journal of the Royal Statistical Society, 37, 149-192.