




“Islamic financial depth, inflation, interest rates, and economic growth in Saudi Arabia: An application of vector autoregression model”

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ISLAMIC FINANCIAL DEPTH, INFLATION, INTEREST RATES, AND ECONOMIC GROWTH IN SAUDI ARABIA: AN APPLICATION OF VECTOR AUTOREGRESSION MODEL

Abstract

This study investigates the short-run dynamics among Islamic financial depth, interest rates, inflation, and their impact on Saudi Arabian economic output using quarterly information spanning 2017–2023. The study employed a vector autoregressive model due to the non-cointegrated nature of the variables. Results indicate positive short-run relationships between the current GDP per capita and its lagged value, and between economic growth and inflation. Conversely, interest rates demonstrated a negative short-run relationship with economic growth, while Islamic financial depth showed a positive but lagged impact. Wald tests confirmed short-run causality from inflation, interest rates, and Islamic financial depth to GDP. These findings suggest that keeping inflation in check with good central bank policies is important for stable markets and a growing economy. Furthermore, the size of the Islamic finance sector in Saudi Arabia seems to boost the country's economy. The findings provide useful information for Saudi Arabian decision-makers in government and Islamic financial institutions.

Keywords

Islamic financial depth, economic growth, VECM,
Johansen cointegration, Wald test, Saudi Arabia

JEL Classification

E44, E52, G21

INTRODUCTION

The pursuit of sustainable economic growth is a shared objective among global economies. The banking sector assumes a vital function in realizing this objective. Nonetheless, macroeconomic conditions, particularly fluctuations in interest rates and inflationary pressures, pose significant impediments to the performance of banking institutions, thereby impacting economic growth. While both conventional and Islamic banks provide fundamental financial services, Islamic banks operate under the principles of Islamic law (Shari'ah), which prohibits interest-based transactions due to ethical and societal considerations. The unique nature of Islamic banking necessitates a specialized analytical framework to evaluate the dynamics of monetary and fiscal interventions, as well as financial systems, on economic growth.

The ability of Islamic banks to effectively gather funds and direct them towards investments that stimulate economic activity is crucial for overall economic advancement. Although a well-researched area, the precise nature of how Islamic finance influences economic growth

continues to be debated. There is limited research on this subject in Saudi Arabia, a prominent participant in the Islamic finance market with a considerable market share. This gap is especially important given the substantial growth of Islamic banking assets in Saudi Arabia, largely driven by Shari'ah-compliant financing in the retail sector.

LITERATURE REVIEW

The interplay between Islamic financial depth, inflation, interest rates, and economic growth is complex and multifaceted. Islamic finance, guided by Shari'ah principles, operates differently from conventional financial systems, raising questions about its distinct impact on economic outcomes. This literature review examines the existing research on these interrelationships, exploring the channels through which Islamic financial depth influences economic growth and how inflation and interest rates affect GDP growth.

Many empirical investigations have scrutinized the relationship between inflation and economic growth, producing results that are often inconsistent across different regions and temporal contexts. While certain studies propose a positive correlation, particularly in the short term, a considerable corpus of evidence underscores a negative or negligible relationship. Evidence supporting a positive short-run association between economic growth and inflation was elucidated in the research undertaken by Gatawa et al. (2017), utilizing Nigerian data spanning from 1973 to 2013, alongside the inquiry by Issie (2023), which examined six Central African economies from 2000 to 2018. Conversely, a significant array of research suggests a deleterious effect of inflationary pressure on economic expansion. The investigation conducted by Su and Soon (2024) concerning the ASEAN-5 nations from 1990 to 2020 unveiled a negative correlation, specifically in the Philippines and Indonesia, suggesting that inflation may impede economic expansion in select economies. Similarly, Khan and Khan (2018) found a negative effect across various Asian nations (1973–2016), encompassing Bangladesh, Iran, Indonesia, Malaysia, and Pakistan. The study by Malec et al. (2024) on Ethiopia from 1991 to 2020 further corroborated this adverse relationship by applying an ARDL model, emphasizing the potential for inflation to diminish the production of goods and services. This negative short-run dynamic is

additionally substantiated by Atigala et al. (2022), who researched Sri Lanka with data ranging from 2000 to 2021, and Kunkuaboor et al. (2021), utilizing Ghanaian data from 1995 to 2019. These findings indicate that inflationary pressures may adversely affect short-term economic performance. Manamperi (2013) analyzed the BRICS countries and uncovered a significant negative short-run relationship in four out of five nations; yet no long-run effects were identified, suggesting that the impact of inflation on growth may be primarily short-lived. In contrast, Mukoka (2018) reported an absence of any relationship between inflation and economic growth in Zimbabwe. These varying outcomes demonstrate the intricate and context-specific nature of the inflation-growth nexus.

The nexus between interest rates and economic growth, especially in emerging markets, remains a subject of ongoing debate. While traditional economic theorists have asserted that reduced interest rates serve to catalyze economic growth through enhanced investment levels, empirical observations, especially from developing nations, reveal a more complex narrative. For instance, Luyanda et al. (2024) examine the interconnections between economic growth and monetary policy indicators in South Africa from 1980 to 2022, employing a Vector Error Correction Model for their analysis. The study found no long-run influence of interest rates on economic growth. In a similar vein, Njie and Badjie (2021), in a study conducted in Gambia between 1993 and 2017, discovered a negative long-term correlation between interest rates and economic growth. Alkhalwaldeh et al. (2020) likewise identified that interest rates negatively affect economic growth in Jordan in the long run, implying that increased interest rates may discourage economic growth. Conversely, other studies have presented a positive or more intricate relationship. Adegoke et al. (2021), employing an autoregressive distributed lag model on Nigerian data, identified a strong long-term relationship between interest

rates and gross domestic product (GDP). However, their findings also highlighted an asymmetrical pattern, characterized by a negative correlation between the two variables. This finding intimates that the influence of interest rates on economic growth may differ depending on specific circumstances and the trajectory of interest rate fluctuations. Lee and Werner (2022), for example, observed no correlation among monetary policy instruments and economic progress in their investigation of 19 advanced and emerging economies, even suggesting a potential inverse relationship. Similarly, Adabor (2022) identified a negative short-term relationship between lending rates and economic growth in Ghana, highlighting the asymmetrical effects of interest rate fluctuations. Contrasting perspectives are offered in other studies, such as Kiley (2014), who determined that both short- and long-term interest rates influence consumer spending in the United States, with short-term rates exerting a more pronounced impact due to their influence on the overall term structure. This suggests that the type of interest rate examined can shape the perceived relationship with economic growth. Mushtaq and Siddiqui (2016) identified a notable disparity in the influence of interest rates on economic outcomes, distinguishing between countries with majority Muslim populations and those without. Their study found that while interest rates positively impacted economic performance in Muslim-majority countries, this effect was not evident in non-Muslim-majority nations. This highlights the potential impact of the current financial framework on the relationship between interest rates and economic growth.

Financial depth, referring to the size and sophistication of a country's financial industry, has been extensively studied in relation to economic progress (Demirgüç-Kunt & Levine, 2008; Khan, 2002; Mabeba, 2024). A nation's level of development can influence the relationship between its financial sector's depth and its economic progress (Sepehri & Moshiri, 2004). Hussain et al. (2024), using financial inclusion as a proxy for financial depth, found that the variable demonstrates a statistically significant long-run influence on economic development. Similarly, Demirgüç-Kunt and Levine (2008), in their cross-country analysis of over one hundred countries, identified a strong positive association between financial depth and economic

expansion. Boukhatem and Moussa (2018) observed that in certain MENA countries, a larger Islamic financial depth (relative to GDP) corresponded with higher long-term GDP per capita. Hachicha and Amar (2015), analyzing Malaysian data, found that Islamic finance exerts a stronger short-term influence on economic growth than a long-term, using various metrics to capture different aspects of Islamic finance, including its level of activity, depth, and role in capital accumulation. These convergence findings highlight the pivotal role of financial development, encompassing both inclusion and depth, in fostering sustainable economic growth. Creating resilient financial systems and enhanced access to financial services will likely contribute significantly to economic expansion. However, other research presents contrasting findings. Yüksel and Canöz (2017), in their study of the Turkish economy, found an inverse correlation between the depth of Islamic finance and overall economic expansion. They concluded that Islamic finance did not significantly influence Turkey's economic progress, attributing this to the relatively small size of the Islamic banking sector in the country. This suggests that the influence of Islamic finance on economic progress can differ based on the prevailing conditions and how deeply Islamic financial services are incorporated into the overall economy.

The literature presents mixed findings on the impacts of Islamic financial depth, inflation, interest rate on economic growth. While some studies posit a positive correlation between these variables and economic progress, others indicate a negative or negligible impact. Therefore, this research aims to contribute to this discourse by examining the complex relationship between these factors and their combined effect on Saudi Arabian economic growth.

1. METHODS

This study conducts an empirical investigation regarding the impacts of inflationary trends, interest rate fluctuations, and the depth of Islamic financial system on economic growth of Saudi Arabia. The paper utilizes quarterly observations over a seven-year period (2017Q1–2023Q4). The selected timeframe for this study was determined by the

availability of data pertaining to Islamic banking activities within the country. Macroeconomic indicator data were obtained from the World Bank, while individual bank data were collected from the Statistical Report of the Saudi Central Bank (SAMA) and the General Authority of Statistics (GASTAT). Economic growth is assessed using GDP per capita, which is the endogenous variable in this analysis. Furthermore, the study’s model incorporates explanatory factors, inflation, interest rate, and Islamic financial depth. Corroborating previous findings by Anwar et al. (2020) and Saleem et al. (2021), GDP stands out as a pivotal and significant factor in portraying the economic progress of any given nation, thus being deemed a metric for evaluating the overall economic well-being of Saudi Arabia. Unlike prior research efforts, the present study combines economic and Islamic financial metrics to assess the robustness of the Saudi economy. Therefore, the study assesses the expansion of Islamic financial institutions by examining the ratio of total Islamic banking financing to nominal Gross Domestic Product (Saleem et al., 2021; Anwar et al., 2020). This metric serves as an indicator of the Islamic financial system’s prevalence within the Saudi Arabian economy. Inflation represents the rate at which the aggregate price level of consumer products and services rises over a year, while interest rates are defined in this research as the Saudi Arabia interbank offered rate (SIBOR). The research model comprises four factors, encompassing GDP, INF (inflation), INT (interest rate), and IsFD (Islamic financial depth). The research model is formulated and presented as follows:

$$GDP = \beta_0 + \beta_1 INF + \beta_2 INT + \beta_3 IsFD + \varepsilon. \tag{1}$$

The necessary data were gathered to empirically examine the interrelationships among the ex-

planatory factors and their impact on economic growth. While other variables were measured quarterly, GDP data, originally available as annual data, were converted to quarterly data. This approach is appropriate for mitigating seasonal fluctuations, as recommended by earlier studies (Faisal et al., 2018; Cheng et al., 2012). Table 1 provides a detailed summary and descriptions of the variables examined in this study.

1.1. Model specification

Since the variables in this study exhibit stationarity after first-order differencing (I) and do not demonstrate long-term cointegrating relationships, a vector autoregression (VAR) model with p lags is utilized to investigate their short-term dynamics.

$$Y_t = c + A_1 Y_{t-1} + A_2 Y_{t-2} + \dots + A_p Y_{t-p} + u_t, \tag{2}$$

where c represents a vector of constant terms, A_i signifies coefficients matrices capturing the relationships between the variables at different lags and u_t symbolizes a vector of error terms.

Vector autoregression is a statistical model employed to analyze the complex dynamic relationships among the set of variables examined. The following equations outline the specific VAR model for each of the four variables examined in this study.

$$\Delta GDP_{it} = \alpha_{1j} + \gamma_{1i} ECT_{it-1} + \sum_{k=1}^m \beta_{11ik} \Delta INF_{it-k} + \sum_{k=1}^m \beta_{12ik} \Delta INT_{it-k} + \sum_{k=1}^m \beta_{13ik} \Delta IsFD_{it-k} + \varepsilon_{1it}, \tag{3}$$

$$\Delta INF_{it} = \alpha_{1j} + \gamma_{1i} ECT_{it-1} + \sum_{k=1}^m \beta_{11ik} \Delta GDP_{it-k} + \sum_{k=1}^m \beta_{12ik} \Delta INT_{it-k} + \sum_{k=1}^m \beta_{13ik} \Delta IsFD_{it-k} + \varepsilon_{1it}, \tag{4}$$

Table 1. Definition of variables

Variables	Explanation	Symbols	Source	Variable category
Economic growth	Real gross domestic product	GDP	World Development Indicators (WDI)	Dependent
Inflation	Consumer Price Index	INF	General Authority for Statistics (GASTAT)	Independent
Interest rate	Discount Rate/SIBOR	INT	Saudi Central Bank (SAMA)	Independent
Islamic financial depth	The proportion of Islamic financing relative to GDP	IsFD	Saudi Central Bank (SAMA)	Independent

$$\begin{aligned} \Delta INT_{it} = & \alpha_{1j} + \gamma_{1i} ECT_{it-1} + \sum_{k=1}^m \beta_{11ik} \Delta GDP_{it-k} \\ & + \sum_{k=1}^m \beta_{12ik} \Delta INF_{it-k} + \sum_{k=1}^m \beta_{13ik} \Delta IsFD_{it-k} + \varepsilon_{1it}, \end{aligned} \tag{5}$$

$$\begin{aligned} \Delta IsFD_{it} = & \alpha_{1j} + \gamma_{1i} ECT_{it-1} + \sum_{k=1}^m \beta_{11ik} \Delta GDP_{it-k} \\ & + \sum_{k=1}^m \beta_{12ik} \Delta INF_{it-k} + \sum_{k=1}^m \beta_{13ik} \Delta INT_{it-k} + \varepsilon_{1it}. \end{aligned} \tag{6}$$

2. RESULTS

This section presents an analysis and interpretation of the statistical model’s outcomes in this study.

Table 2 shows the findings of the stationarity testing performed on the study’s variables. The Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) unit root tests were employed on the natural logarithms of economic output, INT, INF, and IsFD, at both level and first difference. These tests are widely used in statistical analysis to establish the degree and integration order in the time series data (Phillips & Hansen, 1990; Dickey & Fuller, 1981). The ADF test demonstrates that while the series are non-stationary at levels, they exhibit stationarity at first difference. This suggests that the variables follow a trend over time (Akaike, 1974; Said & Dickey, 1984). Furthermore, the ADF test statistics for all variables demonstrate statistical significance at a 1% level.

The Phillips-Perron unit root test produced outcomes consistent with the ADF test. Specifically, the data series for GDP, INT, INF, and IsFD all exhibit non-stationarity at their level (Phillips and Ouliaris, 1990). Therefore, further data series

analysis was conducted at their first differences to assess stationarity. As shown in Table 2, all variables achieve stationarity after undergoing first difference. This conclusion is supported by p-values approaching zero, indicating 1% level of statistical significance. These findings provide strong evidence to reject the presence of stationary behavior in each of the series. Furthermore, it is essential to ensure the variables exhibit consistent integration orders (I) before proceeding with cointegration testing. This ensures the soundness of examining the long-term relationships among the series. Given that the ADF and PP tests confirmed stationarity, a Johansen cointegration test was conducted. This test aimed to establish the presence of cointegration among the series, suggesting a potential long-term relationship.

Table 3 presents Johansen’s cointegration results. The results indicate that the calculated trace statistics and maximum eigenvalues fall below the critical values for both dependent and independent variables. This outcome exceeds the 5% significance level as suggested by MacKinnon et al. (1999). These results lend credence to the null hypothesis asserting the absence of long-term cointegration among the variables being examined. Consequently, the vector autoregressive (VAR) model is applied to analyze the data.

Table 4 displays the statistical criteria used to determine the optimal lag length for the model. Lag length selection was based on five statistical tests: a likelihood ratio test, final prediction error, and the information criteria of Akaike, Schwarz, and Hannan-Quinn. The table clearly shows agreement among the lag order selection criteria, all indicating an optimal lag of one.

Table 3 reveals the lack of cointegration between the series. Consequently, a VAR model was devel-

Table 2. Unit root test

Variables	ADF		PP		Remark
	Level	1 st Difference	Level	1 st Difference	
GDP	-0.7630	-4.8000***	-0.7630	-4.8006***	Stationary at I (1)
INT	-1.5524	-4.4947***	-1.6438	-4.4947***	Stationary at I (1)
INF	-0.4407	-5.0209***	-0.3124	-5.1214***	Stationary at I (1)
IsFD	-1.1955	-4.5024***	-1.2230	-4.5024***	Stationary at I (1)

Note: The Akaike Information Criterion was used to determine the optimal lag lengths. The t-statistics were compared against critical values from Mackinnon (1996). *** symbolizes a 5% significance level.

Table 3. Johansen cointegration test

Trace Test			
Hypothesized No. of CE(s)	Trace Statistics	5% Critical Value	Prob.
None	37.32553	47.85613	0.3323
At most 1	22.76944	29.79707	0.2576
At most 2	8.213350	15.49471	0.4429
At most 3	0.011379	3.841466	0.9148
Maximum Eigenvalue Test			
Hypothesized No. of CE(s)	Max-Eigen statistic	5% Critical Value	Prob.
None	14.55609	27.58434	0.7824
At most 1	14.55609	21.13162	0.3212
At most 2	8.201971	14.26460	0.3585
At most 3	0.011379	3.841466	0.9148

Note: The trace and maximum eigenvalue tests demonstrate the absence of cointegration at a 5% significance level.

Table 4. Statistical criteria for VAR lag order selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	93.1659	NA	3.55e-09	-8.1060	-7.9076	-8.0593
1	145.0010	80.1088*	1.41e-10*	-11.3637*	-10.3719*	-11.1301*
2	148.7743	4.4593	5.08e-10	-10.2522	-8.4669	-9.8316

Note: * indicates the lag order chosen by the respective criterion.

oped to assess the causal relationships and short-term dynamics of the variables. The error correction term, obtained from the first cointegrating equation, sheds light on the short-term dynamics between the exogenous and endogenous variables. As shown in Table 5, the short-term estimates demonstrate a statistically significant negative Coint Equation across all variables at 5% level of significance. The analysis signals that previous imbalances in economic growth are resolved on a quarterly basis at a rate of 43%. The short-run analysis reveals a significant influence of past GDP per capita values on current GDP per capita. Specifically, per capita income in the current period rises by 0.73% for every 1% increase in the preceding period. The findings also highlight a significant short-term relationship linking inflation with economic growth. This suggests that inflation directly influences business operations countrywide. The study also reveals a substantial inverse correlation linking interest rates with economic growth over the short term. A 1% rise in interest rates is related to a 0.06% decline in economic output in the following year. The empirical results demonstrate that greater depth in Islamic financing is positively and significantly associated with economic progress ($p < 0.10$). The findings indicate that a 1% rise in Islamic financial depth leads to a 0.37% growth in national output

in the subsequent period. This suggests that Islamic financial depth's effect on economic progress is realized with a time lag.

Table 5. Short-run effects

Variables	Coefficients	t-statistics	p-values
Coint Equation (1)	-0.430589	-2.007661	0.0599
GDP _{t-1}	0.739068	3.930333	0.0013
INF	3.123048	4.732358	0.0003
INF _{t-1}	-1.895854	-1.977171	0.0667
INT	0.076082	2.227635	0.0416
INT _{t-1}	-0.060443	-1.650767	0.1196
IsFD	-0.480086	-3.074129	0.0077
IsFD _{t-1}	0.372568	1.973390	0.0672

Note: The selection of ARDL (1, 1, 1, and 1) is based on AIC.

Following the completion of the VECM tests, the Wald test (see Table 6) was subsequently used to specifically assess the short-term causal interactions among the variables. The results demonstrated compelling proof of short-term causation stemming from inflation, interest rates, and Islamic financial depth on GDP. Particularly, Inflation and Islamic financial depth exhibited probabilities below 5%, with significance levels of 0.0011 and 0.0231, respectively. These results strongly imply that variations in both inflation and the depth of the Islamic financial system has a direct and substantial impact on short-term

GDP expansion. The interest rate also presented a statistically significant, notwithstanding less pronounced, causal impact on GDP, with a significance level of 0.0701. This finding, significant at the 10% level, suggests that adjustments in interest rates also contribute to shaping short-term GDP growth, albeit possibly with a slightly lesser impact compared to inflation and Islamic financial depth. It is important to emphasize that the findings of the Wald test were extracted from the original Vector Autoregression table, as outlined in Table 5. This method ensures that the analysis of short-term causation is firmly anchored in the broader dynamic correlations captured by the VAR model.

Table 6. Wald test

Variable	F-Statistic	Probability
Inflation	11.20407	0.0011
Interest Rate	5.315548	0.0701
Islamic Financial Depth	4.895534	0.0231

Table 7 presents diagnostic tests. The study comprehensively evaluated the model's robustness, employing several statistical tests. These included the Jarque-Bera test to assess normality, the Breusch-Godfrey LM test for detecting autocorrelation, the Breusch-Pagan-Godfrey LM test to identify heteroskedasticity, and the Ramsey RESET test to confirm the model's operational form. The F-statistics and p-values surpassed the 0.05 significance threshold, indicating the overall reliability and soundness of the model. The analytic tests confirm that the residuals follow a normal distribution, there is no autocorrelation, the model exhibits homoskedasticity, and the functional form is correct. Consequently, all the diagnostic assessments validate the proper specification of the model.

Table 7. Diagnostic tests

Diagnostic Tests	F-statistics
Serial Correlation – Breusch-Godfrey LM	1.484 (0.256)
Normality – Jarque Bera	2.840(0.242)
Heteroskedasticity – Breusch-Pagan-Godfrey	0.273(0.891)
Ramsey RESET	2.519(0.129)
Model Fit	
Durbin-Watson statistics	1.968
R ²	0.962
Adjusted R ²	0.944

Note: The values in brackets represent the probability for each diagnostic test.

The model's fitness has been assessed using Durbin-Watson statistics. As shown in Table 7, the

DW statistics meet the predefined criteria, with values falling between 1.5 and 2.5, indicating that the model exhibits a good fit. Furthermore, the R² and adjusted R² values of 0.96 and 0.94, respectively, suggest that the model is a stable and well-fitting representation of the data, as corroborated by the diagnostic test results.

3. DISCUSSION

The result of this study reveals that inflation demonstrates a negative influence on short-term GDP growth. This implies that if Saudi Arabia can control inflationary fluctuations, it can enhance business activities and promote economic expansion in the short-term. This short-run effect aligns with Atigala et al. (2022) in Sri Lanka and Kunkuaboor et al. (2021) in Ghana, who also observed inverse relationships between inflation and GDP growth. Similarly, Manamperi (2013) documented significant short-run associations among the variables under consideration, but no such relationship was found in the long run. However, this study contrasts with Gatawa et al. (2017) and Issie (2023), who found positive relationships in Nigeria and Central African economies, respectively, and Mukoka (2018), who found no relationship in Zimbabwe. These differences likely reflect variations in methodologies, sample periods, and economic contexts.

Similarly, this study shows that interest rates have a significant and negative effect on short-term economic growth, with a 1% interest rate increase leading to a 0.06% decrease in subsequent growth. This aligns with Njie and Badjie's (2021) findings of a long-run negative correlation in Gambia and Lee and Werner's (2022) suggestion of a potential inverse relationship in advanced and emerging economies. However, this result diverges from some existing research which has shown either a direct or statistically insignificant effect of interest rates on GDP growth. For example, Adegoke et al. (2021) revealed that interest rates played a key role in stimulating growth within Nigeria's economy in the long run. Luyanda et al. (2024), however, established that these variables lacked a statistically significant long-run association within the South African economy. The varied outcomes emphasize the complexity and contextual nature of how interest rates influence a nation's output.

The study further demonstrates a robust positive link between the depth of Islamic financing and GDP growth. This is consistent with Boukhatem and Moussa's (2018) research in MENA countries. This suggests that boosting Islamic financial depth by 1% corresponds to a 0.37% increase in national output. The analysis also strongly supports a short-term causal influence from Islamic financial depth to economic output, offering a dynamic perspective on their interaction. Previous research has consistently shown a connection between financial depth and GDP growth. However, the nature of this relationship can vary depending

on a country's developmental stage, as highlighted by Sepehri and Moshiri (2004). In their work on financial inclusion, Hussain et al. (2024) and Demirgüç-Kunt and Levine (2008), using a global sample, have demonstrated a strong positive correlation between Islamic financial development and overall economic prosperity. Building upon this foundation, the present study distinguishes itself by specifically examining the impact of Islamic financial depth on economic growth. This in-depth analysis allows for a deeper understanding of this increasingly prominent segment of the financial system.

CONCLUSION

This study investigates how Islamic financial depth, alongside inflation and interest rates, influences the growth path of the Saudi Arabian economy. Utilizing the VECM, the study analyzed quarterly data spanning from 2017Q1 to 2023Q4. After implementing first-order differencing, the unit root analysis revealed that the data exhibited stationarity. The VAR model also revealed a short-run cointegrating relation among the explanatory and response variables. This suggests that a well-defined Islamic financial structure can substantially foster overall economic growth and expansion. Likewise, the findings indicate that the Saudi interbank offered rate (SIBOR), serving as a proxy for interest rate levels, demonstrates a moderate influence on the trajectory of gross domestic product (GDP) expansion. This is attributable to the unique characteristic of the Islamic financial system, which prohibits interest (riba) due to ethical and social implications. The distinct relationship between Islamic and conventional banks in Saudi Arabia could lead to central bank interest rate policies unevenly impacting Islamic institutions. This difference stems from the Islamic banking sector's prohibition on interest. The study also finds that inflation, as reflected in the index of consumer prices, has a considerable effect on GDP growth in Saudi Arabia. Hence, independent variables have demonstrated significance in enabling real economic activity and promoting economic development. Although all exogenous factors significantly impact short-term economic growth, the study reveals that inflation wields a considerably stronger effect compared to interest rates or Islamic financial depth. Importantly, the capacity of a low inflationary environment to foster sustainable economic expansion largely relies on the effectiveness of a country's regulatory and administrative frameworks.

The outcomes of this study indicate that economic growth exhibits a higher degree of responsiveness to adjustments in the inflation rate when contrasted with the other variables in the model. Consequently, it is imperative for the Saudi Arabia government to formulate a proficient monetary policy targeting inflation to maintain equilibrium in the consumer market. Such measures are poised to enhance consumers' purchasing power and capacity for financing. Furthermore, the leadership of Islamic financial institutions ought to promote industrial output, manufacturing, investment, and other commercial endeavors to broaden the scope of Islamic financial services. This will grant Islamic banks increased avenues to contribute to economic growth and financial progress.

The analysis could be further enriched by incorporating a wider range of macroeconomic and Islamic finance indicators. Additional investigation into disaggregated data concerning the interrelation among Islamic finance and economic growth is imperative to further unveil the impact of macroeconomic factors on individual Islamic banking institutions. Future studies should examine additional macroeconomic indicators, like government spending, money supply, and trade within various analytical frameworks. Additional investigation could explore the specific form of Islamic finance that stimulates the economic sphere.

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REFERENCES

- Adabor, O. (2022). Exploring the asymmetric effect of lending rate on economic growth in Ghana: Evidence from nonlinear autoregressive distributed lag model. *Cogent Business & Management*, 9(1), 1-22. <https://doi.org/10.1080/23311975.2022.2087464>
- Adegoke, T. D., Azeez, B. A., Ogiamien, F. O., & Osasona, V. A. (2021). The Relationship between Interest Rate and Economic Growth in Nigeria: ARDL Approach. *International Journal of Research and Innovation in Social Science*, 5(7), 350-355. <https://doi.org/10.47772/ijriss.2021.5716>
- Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*, 19(6), 716-723. <https://doi.org/10.1109/TAC.1974.1100705>
- Alkhalwaldeh, B. Y., Mahmood, S., & Jakada, A. H. (2020). An Empirical Assessment of the Effect of Taxes and Interest Rate on Economic Growth in Jordan: An Application of Dynamic Autoregressive-Distributed Lag. *Research in World Economy*, 11(3), 92-98. <https://doi.org/10.5430/rwe.v11n3p92>
- Anwar, S. M., Junaidi, J., Salju, S., Wicaksono, R., & Mispayanti, M. (2020). Islamic bank contribution to Indonesian economic growth, *International Journal of Islamic and Middle Eastern Finance and Management*, 13(3), 519-532. <https://doi.org/10.1108/IMEFM-02-2018-0071>
- Atigala, P., Maduwanthi, T., Gunathilake, V., Sathsarani, S., & Jayathilaka, R. (2022). Driving the pulse of the economy or the dilution effect: Inflation impacting economic growth. *PLoS ONE*, 17(8), e0273379. <https://doi.org/10.1371/journal.pone.0273379>
- Boukhatem, J., & Ben Moussa, F. (2018). The effect of Islamic banks on GDP growth: some evidence from selected MENA countries. *Borsa Istanbul Review*, 18(3), 231-247. <https://doi.org/10.1016/j.bir.2017.11.004>
- Cheng, M., Chung, L., Tam, C., Yuen, R., Chan, S., & Yu, I. (2012). *Tracking the Hong Kong Economy* (Occasional Paper 03/2012). Hong Kong Monetary Authority. Retrieved from https://www.hkma.gov.hk/media/eng/publication-and-research/research/occasional-papers/HKMAOP12_03.pdf
- Demirgüç-Kunt, A., & Levine, R. (2008). *Finance, Financial Sector Policies, and Long-Run Growth* (Policy Research Working Paper No. 4469). The World Bank. Retrieved from <https://ssrn.com/abstract=1081783>
- Faisal, F., Turgut, T., & Niyazi, B. (2018). Linear and non-linear impact of Internet usage and financial deepening on electricity consumption for Turkey: Empirical evidence from asymmetric causality. *Environmental Science and Pollution Research*, 25, 11536-11555. <https://doi.org/10.1007/s11356-018-1341-7>
- Gatawa, N. M., Abdulfafar, A., & Olarinde, M. O. (2017). Impact of Money Supply and Inflation on Economic Growth in Nigeria (1973–2013). *IOSR Journal of Economics and Finance*, 8(3), 26-37. Retrieved from https://www.academia.edu/54127631/Impact_of_Money_Supply_and_Inflation_on_Economic_Growth_in_Nigeria_1973_2013_
- Hachicha, N., & Ben Amar, A. (2015). Does Islamic bank financing contribute to economic growth? The Malaysian case. *International Journal of Islamic and Middle Eastern Finance and Management*, 8(3), 349-368. <https://doi.org/10.1108/IMEFM-07-2014-0063>
- Hussain, S., Ur Rehman, A., Ullah, S., Waheed, A., & Hassan, S. (2024). Financial Inclusion and Economic Growth: Comparative Panel Evidence from Developed and Developing Asian Countries. *Sage Open*, 14(1), 1-15. <https://doi.org/10.1177/21582440241232585>

14. Issie, F. M. (2023). Does Inflation Contribute to Economic Growth: The Case of CEMAC (Central African Economic and Monetary Community). *JJET (Jurnal Ilmu Ekonomi Terapan)*, 8(1), 81-93. <https://doi.org/10.20473/jiet.v8i1.41154>
15. Khan, M. A. (2002). *Restructuring of Financial Sector in Pakistan* (MPRA Paper No. 3921). University Library of Munich, Germany. Retrieved from <https://ideas.repec.org/p/pramprapa/3921.html>
16. Khan, M. A., & Khan, S. (2018). Inflation and Economic growth: Evidence from Five Asian Countries. *Pakistan Journal of Applied Economics*, 28(2), 235-252. Retrieved from <https://ideas.repec.org/a/pje/journal/article28winiv.html>
17. Kiley, M. T. (2014). The Aggregate Demand Effects of Short- and Long-Term Interest Rates. *International Journal of Central Banking*, 10(4), 69-104. Retrieved from <https://www.ijcb.org/journal/ijcb14q4a3.pdf>
18. Kunkuabo, Y. C., Adamu, M., Sommik-Duut, M., & Abdul-Seidu, F. (2021). The effect of inflation on economic growth in Ghana, 1995–2019: Post democratic analysis. *World Journal of Advanced Research and Reviews*, 12(03), 230-242. <https://doi.org/10.30574/wjarr.2021.12.3.0660>
19. Lee, K. S., & Werner, R. A. (2022). Are lower interest rates really associated with higher growth? New empirical evidence on the interest rate thesis from 19 countries. *International Journal of Finance & Economics*, 28(4), 3960-3975. <https://doi.org/10.1002/ijfe.2630>
20. Luyanda, M., Mpungose, S., & Msomi, S. (2024). Econometric Analysis of South Africa's Fiscal and Monetary Policy Effects on Economic Growth from 1980 to 2022. *Economies*, 12(9), 1-24. <https://doi.org/10.3390/economies12090227>
21. Mabeba, M. (2024). The Effect of Financial Market Depth on Economic Growth in Developing Countries with Large Financial Sectors. *Social Science Studies*, 4(2), 66-81. Retrieved from <https://typeset.io/papers/the-effect-of-financial-market-depth-on-economic-growth-in-s20bfdoatw>
22. Mackinnon, A., Jorm, A. F., Christensen, H., Korten, A. E., Jacomb, P. A., & Rodgers, B. (1999). A short form of the Positive and Negative Affect Schedule: Evaluation of factorial validity and invariance across demographic variables in a community sample. *Personality and Individual Differences*, 27(3), 405-416. [https://doi.org/10.1016/S0191-8869\(98\)00251-7](https://doi.org/10.1016/S0191-8869(98)00251-7)
23. MacKinnon, J.G. (1996). Numerical Distribution Functions for Unit Root and Cointegration Tests. *Journal of Applied Econometrics*, 11(6), 601-618. [https://doi.org/10.1002/\(SICI\)1099-1255\(199611\)11:6%3C601::AID-JAE417%3E3.0.CO;2-T](https://doi.org/10.1002/(SICI)1099-1255(199611)11:6%3C601::AID-JAE417%3E3.0.CO;2-T)
24. Malec, K., Maitah, M., Rojik, S., Aragaw, A., & Fulnečková, P.R. (2024). Inflation, exchange rate, and economic growth in Ethiopia: A time series analysis. *International Review of Economics and Finance*, 96(A), 1-14. <https://doi.org/10.1016/j.iref.2024.103561>
25. Manamperi, N. (2013). The Short and Long-run Dynamics between Inflation and Economic Growth in BRICS. *Applied Economics Letters*, 21(2), 140-145. <https://doi.org/10.1080/13504851.2013.844318>
26. Mukoka, S. (2018). An Econometric Assessment of the Impact of Inflation on Economic Growth: A Case Study of Zimbabwe Economy. *Science Publishing Group*, 7(1), 17-22. <https://doi.org/10.11648/j.eco.20180701.13>
27. Mushtaq, S., & Siddiqui, D. A. (2016). Effect of interest rate on economic performance: evidence from Islamic and non-Islamic economies. *Financial Innovation*, 2(9), 1-14. <https://doi.org/10.1186/s40854-016-0028-7>
28. Njie, M., & Badjie, M. (2021). The effects of interest rate on economic growth: Further insights from the Gambia. *Journal of Economics and International Finance*, 13(2), 100-105. <https://doi.org/10.5897/jeif2021.1127>
29. Phillips, P. C., & Hansen, B. E. (1990). Statistical Inference in Instrumental Variables Regression with I(1) Processes. *The Review of Economic Studies*, 57(1), 99-125. <https://doi.org/10.2307/2297545>
30. Phillips, P. C., & Ouliaris, S. (1990). Asymptotic Properties of Residual Based Tests for Cointegration. *Econometrica*, 58(1), 165-193. <https://doi.org/10.2307/2938339>
31. Said, E., & Dickey, D. A. I. (1984). Testing for Unit Roots in Autoregressive-Moving Average Models of Unknown Order. *Biometrika*, 71(3), 599-607. <https://doi.org/10.1093/biomet/71.3.599>
32. Saleem, A., Sági, J., & Setiawan, B. (2021). Islamic financial depth, financial intermediation, and sustainable economic growth: ARDL approach. *Economies*, 9(2), 1-22. <https://doi.org/10.3390/economies9020049>
33. Sepehri, A., & Moshiri, S. (2004). Inflation-Growth Profiles Across Countries: Evidence from Developing and Developed Countries. *International Review of Applied Economics*, 18(2), 191-207. <https://doi.org/10.1080/0269217042000186679>
34. Su, S. K. W., & Soon, S. V. (2024). The impact of inflation on economic growth. *Issues and Perspectives in Business and Social Sciences*, 4(2), 187-201. <https://doi.org/10.33093/ipbss.2024.4.2.6>
35. Yüksel, S., & Canöz, I. (2017). Does Islamic banking contribute to economic growth and industrial development in Turkey? *Ikonomika*, 2(1), 93-102. Retrieved from <https://ejournal.radenintan.ac.id/index.php/ikonomika/article/view/945>