Islamic Finance and Economic Growth: A Comparative System-GMM Dynamic Panel Analysis of Türkiye and Selected OIC Countries

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Abstract

Purpose: This study examines the relationship between Islamic finance and economic growth in OIC selected countries, namely Türkiye, Saudi Arabia, the UAE, Qatar, Kuwait, Oman, Malaysia, Indonesia, and Nigeria.

Method: A dynamic panel System Generalized Method of Moments (System-GMM) is employed to estimate the effects of Islamic banking profitability, sukuk issuance, and takaful on GDP per capita while accounting for endogeneity, dynamic effects, and country-specific heterogeneity.

Results: The findings indicate that Islamic banking profitability, sukuk, and takaful positively and significantly affect GDP per capita. The results also reveal substantial cross-country differences, with Türkiye serving as the benchmark and the remaining countries exhibiting significantly different growth effects. Diagnostic tests confirm the robustness of the estimates, indicating no second-order serial correlation and the validity of the instruments under the Hansen test.

Originality Relevance: This study extends the existing body of knowledge by mitigating endogeneity concerns, incorporating dynamic effects, and offering comparative cross-country evidence on the contribution of Islamic finance to economic growth. The empirical findings provide meaningful implications for policymakers by highlighting the potential of Islamic financial institutions and instruments as strategic mechanisms for promoting sustainable economic development.

Keywords: Islamic Banks, GDP per capita, System-GMM, Sukuk, Takaful

JEL Classifications: G12, G21, G22, O16, O47

Finance islamique et croissance économique: une analyse comparative en données de panel dynamique par la méthode SGMM de la Türkiye et de certains pays de l'OCI

Résumé

Objectif: Cette étude examine la relation entre la finance islamique et la croissance économique dans les pays sélectionnés de l'Organisation de la coopération islamique (OCI), à savoir la Türkiye, l'Arabie saoudite, les Émirats arabes unis (EAU), le Qatar, le Koweït, Oman, la Malaisie, l'Indonésie et le Nigéria.

Méthode: Une approche de panel dynamique basée sur la méthode des moments généralisés (System-GMM) est utilisée afin d'estimer les effets de la rentabilité des banques islamiques, des émissions de sukuk et du takaful sur le PIB par habitant, tout en tenant compte des problèmes d'endogénéité, des effets dynamiques et de l'hétérogénéité entre pays.

Résultats: Les résultats indiquent que la rentabilité des banques islamiques, les sukuk et le takaful ont un effet positif et statistiquement significatif sur le PIB par habitant. Les résultats révèlent également des différences importantes entre les pays, la Turquie servant de référence, tandis que les autres pays présentent des effets de croissance significativement différents. Les tests diagnostiques confirment la robustesse des estimations, en indiquant l'absence d'autocorrélation d'ordre deux et la validité des instruments selon le test de Hansen.

Originalité / Pertinence: Cette étude enrichit la littérature existante en atténuant les préoccupations liées à l'endogénéité, en intégrant les effets dynamiques et en fournissant des preuves empiriques comparatives entre pays sur la contribution de la finance islamique à la croissance économique. Les résultats empiriques offrent des implications importantes pour les décideurs publics en mettant en évidence le potentiel des institutions et des instruments financiers islamiques comme mécanismes stratégiques pour promouvoir un développement économique durable.

Mots-clés: Banques Islamiques, PIB par habitant, System-GMM, Sukuk, Takaful

Classifications JEL: G12, G21, G22, O16, O47

1. Introduction

Islamic banking is well documented to have emerged in 1963 in Egypt and has since grown into a major element of the global financial system. Islamic banks are expected to support economic growth and sustainable development by channeling financial resources towards productive activities through mobilizing savings in compliance with Shariah laws. The efficiency of the financial sector in channeling resources toward productive investments constitutes a fundamental determinant of economic growth, conventionally proxied by real GDP per capita (GDPpc). Islamic banking and economic growth can be connected theoretically using financial intermediation theory, endogenous growth theory, and institutional economics. Financial Intermediation Theory focuses on financial institutions' contribution to reducing transaction costs, smoothing information asymmetries, and increasing the efficiency of resource allocation (Allen & Santomero, 1997). Endogenous Growth Theory highlights the importance of financial development in promoting capital accumulation, innovation, productivity, and long-term economic growth (Aghion et al., 1998). Moreover, Institutional Economics Theory states that institutional quality, regulatory frameworks, and governance structures affect the effectiveness and performance of financial systems (North, 1990). Based on that, Islamic banking can contribute to economic growth by improving financial intermediation, capital formation, and institutional efficiency.

Türkiye represents a particularly relevant case for analysis due to the rapid expansion of its participation banking sector, ongoing regulatory reforms, and the increasing role of state-owned participation banks. Participation banking currently makes up about 8.7% of banking assets, highlighting its increased importance in the Turkish financial system in 2023 (Türkiye Katılım Bankaları Birliği, 2023). Even with this progress, empirical knowledge regarding the Islamic banking–economic growth nexus in Türkiye is still limited and incomplete. Existing studies have mainly focused on the GCC countries, Malaysia, Indonesia, and Pakistan, leaving the Turkish case comparatively under-researched in cross-country empirical studies (Yusof & Bahlous, 2013). Moreover, the existing literature has focused mainly on the financial intermediation channels that may link Islamic banking with economic performance, while institutional intermediation channels have attracted little interest. Thus, a more targeted comparative analysis is required to gain a clearer understanding of Türkiye's position in the world of Islamic finance.

Islamic banking, as an integral component of the broader Islamic finance ecosystem, operates synergistically with takaful and sukuk within an interconnected and Shariah-compliant financial framework. Türkiye’s financial system comprises conventional banks, investment and development banks, and participation banks. The Islamic banking sector in Türkiye consists of six participation (Islamic) banks: Albaraka Türk Katılım Bankası, Kuveyt Türk Katılım Bankası, Türkiye Finans Katılım Bankası, Türkiye Emlak Katılım Bankası, Ziraat Katılım Bankası, and Vakıf Katılım Bankası. In recent years, the sector has witnessed steady growth along with institutional development and regulatory efforts to boost Islamic financing in Türkiye. Economic growth is a sustained rise in the output of goods and services by an economy, usually expressed in terms of GDP or gross national income (GNI). When comparing across regions, purchasing power parity (PPP) adjustments are often used to correct for price differences. Other indicators of development outcomes, such as the Human Development Index (HDI), offer a broader evaluation than GDP. Turkey experienced GDP growth of 4.52% in 2023, continuing its steady growth path despite international economic challenges.

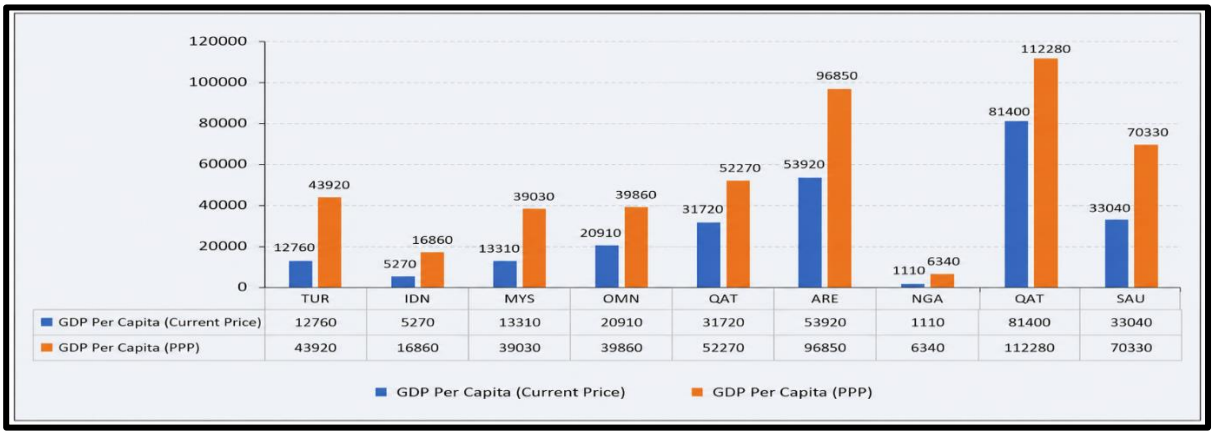
Within this context, this study examines the contribution of Islamic banking to economic growth in Türkiye and compares it with selected leading Islamic finance countries. The objective of this study is to assess whether Islamic banking contributes more effectively to economic growth in Türkiye than in its international peer countries. To address this gap, the study develops an integrated analytical framework drawing on Financial Intermediation Theory, Endogenous Growth Theory, and Institutional Economics to explain the transmission mechanism between Islamic banking and economic growth. By incorporating a comparative cross-country perspective, the study evaluates the relative effectiveness

of Türkiye's participation banking model. Accordingly, this research contributes to the existing literature by providing updated empirical evidence on Türkiye, adopting a multi-theoretical approach, and offering comparative insights into the role of Islamic banking in promoting economic growth across Islamic finance economies.

2. Literature Review

The literature review is divided into two sections. The first part covers gross domestic product per capita (GDPpc) and Gross domestic product per capita on purchasing power parity (GDPpc-PPP). Also, it offers a comparative overview of the economic situation of the OIC selected countries. GDPpc is one of the more commonly used traditional indicators of economic performance and income level of countries. GDP per capita statistics, however, are not always strictly comparable in the sense of being a correct reflection of real income and living standards due to differences in price levels across countries; therefore, GDP per capita statistics based on purchasing power parity are a better measure. In Figure 1, GDP per capita (GDPpc) and GDP per capita on purchasing power parity (GDPpc-PPP) are shown, and the influence of purchasing power parity is seen in the fact that it accounts for the true purchasing power of an economy. For instance, the GDP per capita in Türkiye is around USD 12,760. However, GDP per capita on purchasing power parity stood at around USD 43,920 in 2024, which represents a significant level of real purchasing power once adjusted for domestic price differences.

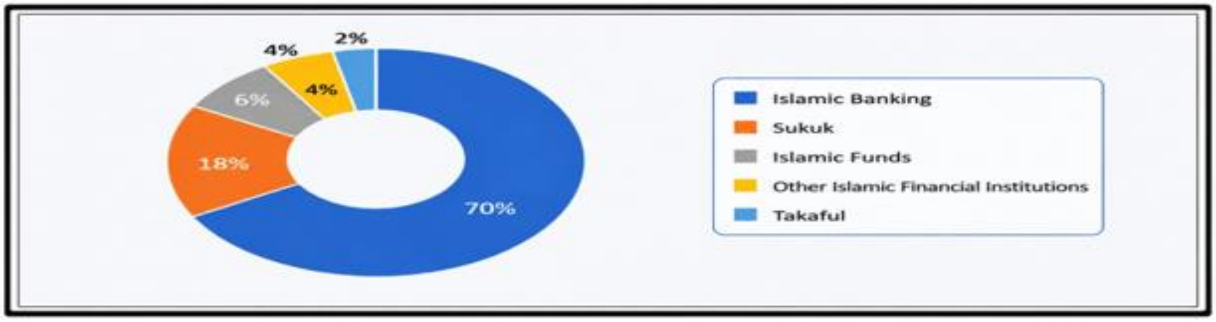
Fig 1. GDPpc and GDPpc-PPP Across Selected Countries, 2024



Source: Authors' own calculations based on IMF data

In terms of total assets, Islamic banking, Sukuk, and Islamic funds represent the three largest segments of the global Islamic finance industry. Islamic banking accounts for approximately 70% of total Islamic finance assets, highlighting its dominant role within the Islamic financial system. In contrast, Takaful represents a relatively smaller segment of Islamic finance, as illustrated in Figure 2.

Fig 2. Islamic Finance Assets



Source: Authors' own calculations based on IFDI data

Based on the financial performance sub-indicator of the Islamic Finance Development Indicator (IFDI), countries demonstrate different levels of competitiveness across Islamic finance sectors. In 2021, Sudan achieved the highest ranking in Islamic banking, Saudi Arabia ranked first in Takaful, Kuwait led in Other Islamic Financial Institutions (OIFIs), while Malaysia recorded the highest performance in Sukuk and Islamic funds. The second-ranked countries were Bahrain in Islamic banking, Iran in Takaful, Malaysia in OIFIs, and Saudi Arabia in both Sukuk and Islamic funds. Furthermore, Saudi Arabia, Bangladesh, Saudi Arabia, Indonesia, and Iran are ranked third in Islamic banking, takaful, other Islamic financial institutions (OIFIs), sukuk, and Islamic funds, respectively, based on their financial performance scores. The repetition of Saudi Arabia indicates its third-place ranking in two separate Islamic finance sectors: Islamic banking and OIFIs. The detailed rankings are presented in Table 1 below.

Table 1: Financial Performance Sub-Indicator of the Islamic Finance Development Indicator (IFDI)

Rank	Islamic Banking	Takaful	OIFIs	Sukuk	Islamic Funds
1	Sudan 137	Saudi Arabia 69	Kuwait 91	Malaysia 182	Malaysia 125
2	Bahrain 92	Iran 62	Malaysia 76	Saudi Arabia 58	Saudi Arabia 54
3	Saudi Arabia 70	Bangladesh 54	Saudi Arabia 74	Indonesia 50	Iran 32
4	Iraq 64	Malaysia 44	Iran 68	Bangladesh 47	Luxembourg 34
5	Iran 63	Maldives 36	UAE 45	Kuwait 27	Mauritius 27

Source: IFDI (2022)

The second section rigorously analyzes the existing literature on Islamic finance and economic growth or development, emphasizing the significant empirical and methodological shortcomings. The current literature is still disjointed, varied in methodology, and constrained in scope. Early research (e.g., Ben Jedidia, 2014; Caporale & Helmi, 2018) primarily presents theoretical discussions or long-term evidence on the role of Islamic finance in economic growth, yet it provides minimal econometric validation of dynamic connections. Multiple empirical investigations (e.g., Zarrouk et al., 2017; Çınar & Ünsal, 2022) highlight potential endogeneity concerns, reverse causation, and the complex link between financial development and economic growth; nonetheless, these concerns are not uniformly addressed using suitable dynamic panel techniques. Despite the use of sophisticated econometric techniques like System-GMM and VECM in recent research (e.g., Ledhem & Mekidiche, 2021, 2022; Hikmah et al., 2025), these studies are constrained by their limited cross-country scope and fail to adequately illustrate how the development of Islamic finance differs across various institutional and economic contexts. Moreover, evidence specific to countries, especially for Türkiye, is still lacking, as empirical research is scarce on the performance of Islamic banking compared to conventional banking (Alam & Ullah, 2022; Çınar & Ünsal, 2022). Furthermore, most current research focuses on separate elements of Islamic finance, particularly Islamic banking. In contrast, the collective impact of Islamic banking profitability, Sukuk, and Takaful within a cohesive dynamic growth framework remains largely unexamined. Consequently, this research addresses these gaps by using a System-GMM method that accounts for potential endogeneity, reflects the continuity of GDP trends, incorporates multiple Islamic finance tools, and offers a cross-country comparative analysis with a specific focus on Türkiye. Table 2 provides an overview of earlier empirical and conceptual research, detailing their methods, key results, and recognized research gaps.

Table 2: Literature Review

Study	Method / Context	Key Findings	Research Gap
Ben Jedidia (2014)	Review; Islamic banks and Sukuk markets in Tunisia	Islamic banking–Sukuk integration can support economic development through better financing and investment.	No econometric testing or empirical evidence of the growth impact.
Zarrouk et al. (2017)	VAR model; UAE time-series data (1990–2012)	Financial development promotes economic growth, while GDP drives Islamic finance development.	Excludes Sukuk and Islamic equity markets; limited to UAE context.
Ledhem & Mekidiche (2021)	Dynamic System-GMM; Islamic banks in Southeast Asia (Malaysia, Brunei, Indonesia) (2013Q4–2019Q4)	Islamic finance has a positive impact on economic growth in Southeast Asia.	Limited country coverage; focuses only on Islamic financing, excluding other Islamic finance instruments.
Ledhem & Mekidiche (2022)	Quantile regression with Markov chain bootstrap; Turkish Islamic banks (2013Q4–2019Q4)	Islamic finance positively contributes to Türkiye's economic growth.	Limited to Türkiye and Islamic banking financing; excludes other Islamic finance instruments.
Kismawadi (2025)	OLS; panel data of 90 Islamic banks in 21 countries	Islamic banking indicators positively influence GDP.	Uses OLS only; does not address endogeneity or panel heterogeneity.
Khan & Badjie (2022)	Conceptual framework; blended Islamic finance for impactful SMEs and SDGs	Proposed a blended Islamic finance model combining philanthropy, private, and public sector funds to support SMEs and sustainable development.	Lacks empirical testing and evidence on the actual impact of blended Islamic finance on SMEs or economic development.
Hikmah et al. (2025)	VECM; Indonesia (Quarterly data 2015–2023)	Islamic banking assets and deposits positively affect GDP in the long run.	Single-country study; limited generalizability across countries.
Chowdhury & Haron (2021)	DEA and Malmquist Index; 31 Islamic banks in Southeast Asia (2014–2019)	Islamic banks showed improved efficiency and productivity growth.	Focuses on bank efficiency, not the relationship between Islamic banking and economic growth.
Alam & Ullah (2022)	Critical literature review; Islamic finance and economic development in Türkiye.	Islamic finance has potential to support Türkiye's economic development.	Conceptual review; lacks empirical evidence on economic growth effects.

Tan & Mohamad Shafi (2021)	ARDL cointegration; Malaysia (1998–2018)	Sukuk and capital market development have a long-run relationship with economic growth.	Limited to Malaysia; excludes government sukuk.
Caporale & Helmi (2018)	Time series and panel causality methods; emerging countries with and without Islamic banks	Islamic banking strengthens the long-run relationship between credit and economic growth.	Limited emerging-country sample; focuses on banking credit only, excluding other Islamic finance instruments.
Çınar & Ünsal (2022)	GMM; panel data of 81 Turkish provinces	Islamic banking has no significant short-run effect on economic growth; Islamic and conventional loans act as substitutes.	Single-country focus; limited to banking loans and short-run effects.
Hassan et al. (2023)	Bibliometric analysis; 120 Scopus articles on Islamic banking in Bangladesh (1999–2021)	Identified 14 research streams and future directions in Islamic banking literature.	Focuses on literature trends; lacks empirical evidence on Islamic banking and economic outcomes.

Note: VAR = Vector Autoregression; System-GMM= System Generalized Method of Moments; OLS = Ordinary Least Squares; VECM = Vector Error Correction Model; DEA = Data Envelopment Analysis; ARDL = Autoregressive Distributed Lag; GMM = Generalized Method of Moments; SDGs = Sustainable Development Goals; SMEs = Small and Medium Enterprises.

3. Methodology

The study relies on the System Generalized Method of Moments (SGMM) approach to analyze the dynamic relationship between Islamic finance development and economic growth in nine major economies that are based on Islamic finance: Türkiye, Kuwait, Qatar, the United Arab Emirates, Oman, Malaysia, Indonesia, Saudi Arabia, and Nigeria. The analysis is based on annual balanced panel data from 2015 to 2021. Other data such as Gross Domestic Product per capita (GDPpc) are drawn from the World Bank's World Development Indicators (WDI) database. In contrast, data on Islamic banking profitability, Sukuk issuance, and Takaful contributions are gathered from the Statistical, Economic and Social Research and Training Center for Islamic Countries (SESRIC) and the Islamic Financial Services Board (IFSB). Internationally used databases provide a higher degree of reliability, consistency, and comparability across countries. A System-GMM estimator is used because the endogeneity in the financial development-economy performance relationship is inherent and the dynamic properties of economic growth will cause bias in the conventional OLS approach. System-GMM was originally suggested by Arellano and Bover (1995) and later expanded by Blundell and Bond (1998), and is especially suitable for dynamic panel models where there are endogeneity issues and the time dimension is relatively small. Economic growth is an ongoing process, which means that the value of the current GDP per capita depends on the previous value. Furthermore, the link between Islamic finance and economic growth could be simultaneous; that is, the profitability of Islamic banking, the issuance of Sukuk, and the growth of Takaful would lead to economic growth, and economic growth, in turn, would fuel the growth of Islamic financial sectors. Thus, standard panel estimators can result in biased and inconsistent estimates when the sample heterogeneity is unobserved, the regression model may be mis specified (reverse causality), or the omitted variable bias is present. To overcome these econometric problems, the System-GMM estimator is based on endogenous instruments that

are defined as lagged values of endogenous variables in both levels and first differences. This method provides consistent parameter estimates and controls for unobserved country-specific effects and potential endogeneity. Hence, the System-GMM approach is a suitable analytical method to test the impact of Islamic financial instruments on economic growth in a cross-country dynamic panel framework.

3.1. Variables Description

The empirical model incorporates the lagged logarithm of GDP per capita (L. LogGDPpc) to capture the dynamic persistence of economic growth, reflecting the influence of past economic performance on current income levels. Islamic banking profitability (PROF) is included as the primary explanatory variable, representing the financial performance of Islamic banking institutions and their potential contribution to economic activity. The SUKUK variable captures the development of Islamic capital markets through Shariah-compliant bond issuance, reflecting the role of Islamic capital market instruments in supporting economic growth. Meanwhile, TAKAFUL represents the development of Islamic insurance activities and their contribution to financial system diversification and economic resilience. Table 3 provides the definitions of the variables and explains their expected roles in the empirical model.

Table 3: Description of Variables and Their Expected Roles in the Empirical Model

Variable	Definition	Expected Role
L. LogGDPpc	Lagged logarithm of GDP per capita	Captures persistence in economic growth
PROF	Islamic banks' profitability	Core explanatory variable (Islamic finance)
SUKUK	Islamic bond issuance volume	Islamic capital market development
TAKAFUL	Islamic insurance activity	Risk-sharing financial sector indicator

Source: Authors' own elaboration

3.2. Econometric Models' Specification

A Fixed Effects (FE) model is used to investigate the correlation between Islamic finance variables and economic growth while controlling for unobserved, time-invariant country-specific effects. The dependent variable is GDP per capita (GDPpc), which proxies economic growth. Islamic banking profitability (PROF), Sukuk issuance (SUKUK), and Takaful development (TAKAFUL) are the main explanatory variables representing the performance and depth of the Islamic financial system. In the FE specification, country-specific effects are addressed by allowing unobserved heterogeneity to vary across countries, including differences in institutional quality, the legal environment, and economic structure. To account for the difference between Türkiye and the other countries in the sample, an interaction term between a dummy variable for Türkiye and Islamic banking profitability ($D_i^{\text{Türkiye}} * PROF_{it}$) is added to the model. This interaction term is used to assess the difference in effect of Islamic finance on economic growth in Türkiye compared to the rest of the countries. The FE model accounts for unobserved heterogeneity while delivering a static framework for cross-country analysis of the relationship between Islamic finance and growth. As discussed above, the fixed-effects (FE) model is formulated as follows in Equation (1):

$$GDPpc_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 SUKUK_{it} + \beta_3 TAKAFUL_{it} + \beta_4 \left(D_i^{\text{Türkiye}} * PROF_{it}\right) + \mu_i + \varepsilon_{it} \quad \text{..... (1)}$$

Furthermore, the System-GMM(SGMM) approach is used to study the linkage between economic growth and Islamic finance variables in a dynamic panel model. The dependent variable is GDP per capita (GDPpc), which reflects economic growth, and is written in lagged form ($GDPpc_{(t-1)}$) to emphasize the persistence of economic growth over time. The key explanatory variables are Islamic banking profitability (PROF), Sukuk issuance (SUKUK), and Takaful development (TAKAFUL), all of which

are important aspects of the Islamic financial system. To account for the difference between Türkiye and the other countries in the sample, an interaction term between a dummy variable for Türkiye and Islamic banking profitability ($D_i^{\text{Türkiye}} * PROF_{it}$) is added to the model. This interaction term is used to assess the difference in effect of Islamic finance on economic growth in Türkiye compared to the rest of the countries. The error term (ε_{it}) represents factors that are not observed that impact economic growth. In general, this specification makes it possible to estimate the overall effects of Islamic finance at the country level and country-specific deviations in the case of Türkiye, in a dynamic and endogeneity-corrected framework. As discussed above, the System Generalized Method of Moments (SGMM) model is specified as follows in Equation (2):

$$GDPpc_{it} = \alpha GDPpc_{it-1} + \beta_1 PROF_{it} + \beta_2 SUKUK_{it} + \beta_3 TAKAFUL_{it} + \gamma_1\left(D_i^{\text{Türkiye}} * PROF_{it}\right) + \mu_i + \lambda_t + \varepsilon_{it} \quad \text{(2)}$$

3.3. Models Hypotheses

The hypotheses of this study are developed based on established financial and economic theories, including Financial Intermediation Theory, Endogenous Growth Theory, and Institutional Economics. These theories suggest that financial development, particularly through Islamic banking, sukuk markets, and takaful institutions, can enhance economic growth by improving capital allocation, increasing investment efficiency, mobilizing financial resources, and strengthening financial stability. Accordingly, the study proposes a set of hypotheses to empirically examine the relationship between Islamic finance variables and economic growth, measured by gross domestic product per capita (GDPpc). In addition, given the cross-country nature of the analysis, the hypotheses also account for potential heterogeneity across countries, with Türkiye serving as a benchmark to capture differential effects in the Islamic finance–growth nexus. Based on these theoretical arguments and the expected relationships among the study variables, the research hypotheses are formulated as follows:

H_1: Islamic banking profitability (PROF), Sukuk issuance (SUKUK), and Takaful development (TAKAFUL) have a significant positive impact on GDP per capita (GDPpc).

H_2: The impact of Islamic banking profitability (PROF) on GDP per capita (GDPpc) differs significantly across countries, with Türkiye exhibiting a statistically different effect compared with other Islamic finance economies.

4. Models Analysis with Findings

Table 4 shows the descriptive statistics of variables used in the empirical model. The results show a high degree of variation among the sampled Islamic finance economies. The mean value of the logarithm of GDP per capita (LogGDPpc) is 26.55, and the interval between 25.04 and 27.80 is not very wide, indicating moderate variation in income level among countries. On the other hand, Sukuk issuance exhibits high dispersion, ranging from 3.47 to 39603, with an average of 9698, suggesting significant differences in Islamic capital market development across the sampled economies. Likewise, there is significant variation in Takaful contributions, with a mean of 3342 and a range from −22.73 to 16861, due to differences in the maturity and size of Takaful insurance sectors among countries. Islamic banking profitability (PROF) is relatively less volatile, with a mean value of 1.62 and a range of 0.67 to 2.50, indicating relatively consistent profitability patterns among Islamic banking institutions. The variation observed in the Islamic finance indicators provides rationale for employing a dynamic panel estimation methodology, including System-GMM, to address the cross-country dimension of the data and possible endogeneity issues.

Table 4: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
LogGDPpc	63	26.551000	0.845000	25.04200	27.805000
PROF	63	1.6260000	0.429000	0.670000	2.5000000
SUKUK	63	9698.5010	11348.25	3.470000	39603.449
TAKAFUL	63	3342.4880	5038.094	-22.73000	16861.881

Source: Authors' own elaboration

Table 5 presents the correlation matrix among the variables included in the empirical model. The correlation results reveal generally weak to moderate relationships between Islamic finance indicators and economic growth. Islamic banking profitability (PROF) and Takaful have positive correlations with GDP per capita (GDPpc) of 0.538 and 0.298, respectively, indicating that increases in these Islamic banking sectors would lead to increases in GDP per capita. However, at the descriptive level, the relationship between Sukuk and GDPpc is relatively weak with a correlation coefficient of 0.119, suggesting a limited linear association between Sukuk development and economic growth. The Islamic finance variables are found to have moderate positive correlation with Takaful (0.341), while Islamic banking profitability has negative correlation with Sukuk (−0.06) and Takaful (−0.47). The correlation coefficients are generally below the usual thresholds for multicollinearity, indicating that multicollinearity is not likely to be a significant issue for the regression analysis. However, these correlations represent only preliminary associations and do not imply causal relationships, which are further examined using the System-GMM estimation approach.

Table 5: Correlation Matrix

Variable	GDPpc	PROF	SUKUK	TAKAFUL
GDPpc	1.00	1.00	1.00	1.00
PROF	0.538	-0.27	0.266	0.173
SUKUK	0.119	-0.06	0.243	0.341
TAKAFUL	0.298	-0.47	0.306	0.450

Source: Authors' own elaboration

Table 6 presents the estimation results of the Fixed Effects (FE) and System Generalized Method of Moments (SGMM) models. The findings reveal that Islamic banking profitability (PROF), Sukuk issuance (SUKUK), and Takaful development (TAKAFUL) are positively and statistically significantly correlated with GDP per capita in the sampled countries. The FE model suggests very high positive correlations for PROF (0.1282; p = 0.000), SUKUK (0.000007; p = 0.000), and TAKAFUL (0.0000659; p = 0.011), but the estimates can be affected by endogeneity bias and unobserved heterogeneity. The results for the System-GMM, however, are more reliable and conservative, and the PROF (0.09, p = 0.002), SUKUK (0.000005, p = 0.001), and TAKAFUL (0.000052, p = 0.016) all remain statistically significant, underscoring their positive impact on economic growth. Further, GDPpc (-1) (0.60, p = 0.000) shows the presence of economic growth dynamics, as evident by strong persistence over time. The base coefficients of the country dummies are meant to capture the average effect of all other countries in the sample (Saudi Arabia, Malaysia, UAE, Qatar, Kuwait, Indonesia, Oman, and Nigeria) and to allow for the examination of country heterogeneity through interaction terms. The interaction terms show that in Türkiye, the relationship between Islamic banking and economic growth is stronger than the average of the countries. Specifically, the effect of Islamic banking profitability on GDP per capita is greater in Türkiye, by 0.067 units, than the benchmark group, $(D_i^{\text{Türkiye}} * PROF_{it})$ (0.067, p = 0.018). In general, these results indicate that Islamic finance development also brings economic growth and is more effective in Türkiye than the average of other countries in the sample.

Table 6: Fixed Effects and System-GMM Regression Results

Component	Variable	FE Coef.	p-value	SGMM Coef.	p-value
Model Variables (Average Effect Across Countries)	PROF	0.1282***	0.000	0.09***	0.002
	SUKUK	0.000007***	0.000	0.000005***	0.001
	TAKAFUL	0.0000659**	0.011	0.000052**	0.016
	GDPpc (-1)	—	—	0.60***	0.000
Türkiye Interaction Effects	$(D_i^{\text{Türkiye}} * PROF_{it})$	0.085**	0.021	0.067**	0.018

Source: Authors' own elaboration

Table 7 shows the diagnostic tests performed to examine the robustness and validity of the System Generalized Method of Moments (SGMM) estimation. To ensure the reliability of the System-GMM model, the model was tested using several specification tests, including the validity of the instrument test and the test of serial correlation. The second-order autocorrelation test (AR (2)) from the Arellano–Bond test (p-value = 0.23) is statistically insignificant; thus, the null hypothesis (no second-order serial correlation) is not rejected. This indicates that there is no second-order serial correlation in the error terms; hence, the estimates obtained from the System-GMM are consistent. This verifies the validity of the conditions used in the model's moment estimator. The Hansen test gives a value of 0.33, which is higher than the conventional significance test, meaning that the instruments used in the estimation are valid and not over-identified. This helps to validate the instrumental variables technique used in the System-GMM. Moreover, the lagged dependent variable GDPpc (-1) is very significant (0.60, p = 0.000), supporting the dynamic aspect of economic growth and thereby the choice of a dynamic panel model. The stability of this coefficient, along with its high level of significance, also supports the robustness of the model, as it shows that past economic performance has a strong impact on the current level of GDP per capita. Furthermore, the number of instruments (11) is within an acceptable range, avoiding the problem of instrument proliferation, which is a common concern with System-GMM estimations. Overall, these diagnostic results confirm that the System-GMM model is robust, statistically reliable, and appropriate for addressing endogeneity, unobserved heterogeneity, and dynamic relationships in the panel data.

Table 7: Robustness Tests of System Generalized Method of Moments (SGMM)

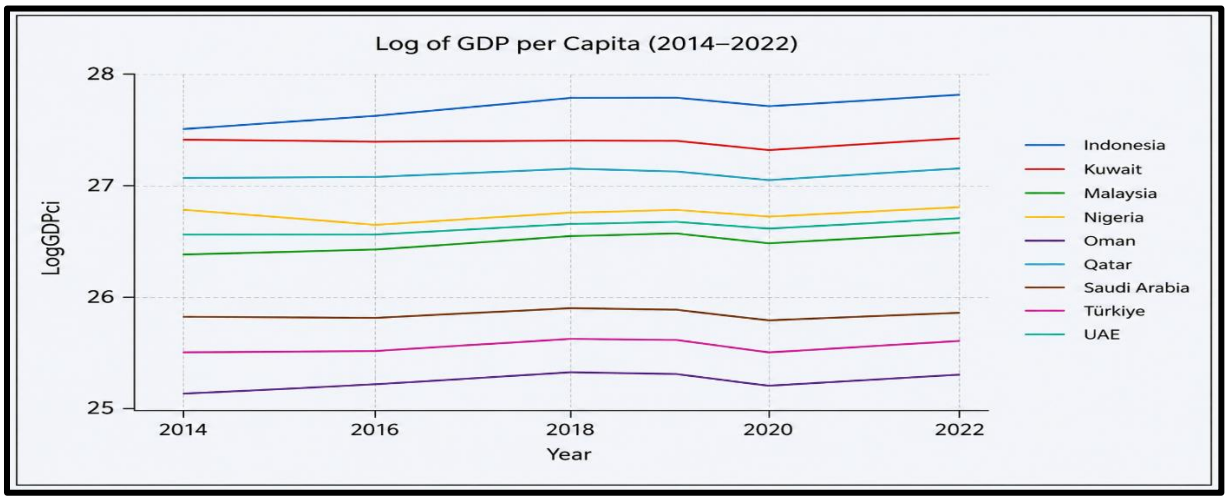
Test / Component	Value	Interpretation
AR (1) Test	0.02	First-order autocorrelation expected (Not a problem)
AR (2) Test	0.23	No second-order autocorrelation (Model is valid)
Hansen Test	0.33	Instruments are valid (No over-identification problem)
No. of Instruments	11	Within acceptable range (No instrument proliferation)
GDPpc (-1) Coefficient	0.60*** (p = 0.000)	Strong dynamic persistence
Estimation Method	System-GMM	Efficient and bias-corrected estimator
Model Validity	Confirmed	System-GMM is robust and reliable

Source: Authors' own elaboration

The preliminary visual evidence from the panel-data line plots indicates substantial cross-country heterogeneity in both economic growth and Islamic finance development among the selected countries. Figure 3 presents a comparative overview of GDP trends, showing that Indonesia maintained relatively higher GDP levels over the 2015–2021 period, whereas Oman consistently remained at the lower end of the GDP distribution. This cross-country variation is broadly consistent with the econometric findings. In the System-GMM estimates, Indonesia, Oman, Kuwait, Nigeria, Qatar, Saudi

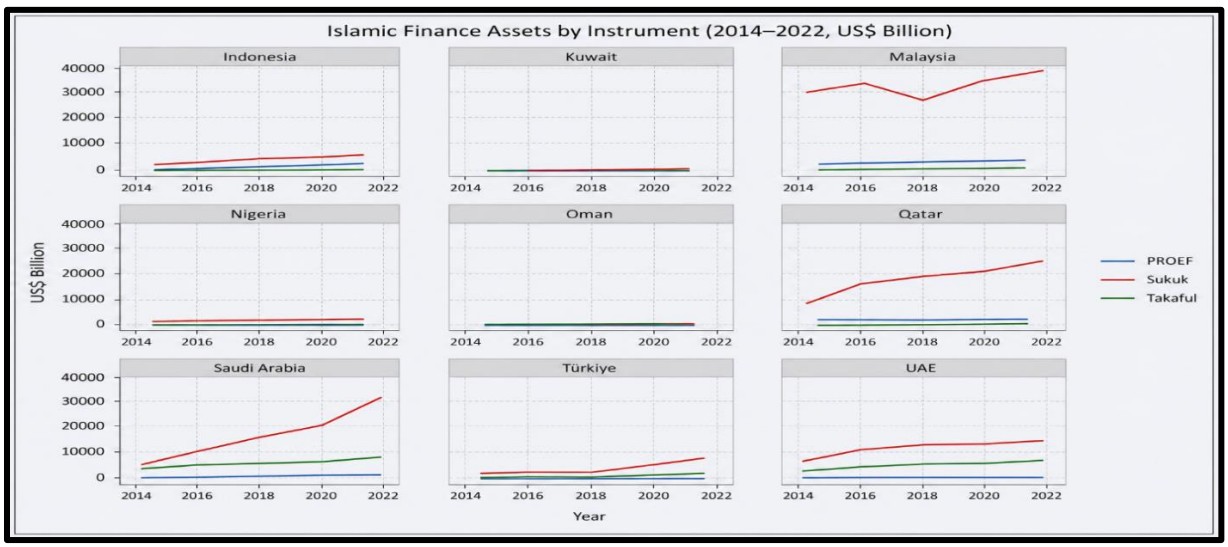
Arabia, the UAE, and Malaysia exhibit statistically significant country-specific effects relative to Türkiye, pointing to structural differences in economic growth dynamics across Islamic finance economies. Likewise, Figure 4 illustrates the dynamics of Islamic banking profitability (PROF), Sukuk issuance (SUKUK), and Takaful (TAKAFUL) across the selected countries. Saudi Arabia exhibits greater fluctuations and divergence across Islamic finance indicators, whereas Oman displays relatively stable and closely aligned trends. The regression results are broadly consistent with these descriptive patterns, as the Islamic finance variables—PROF, SUKUK, and TAKAFUL are positively and significantly associated with GDP per capita. This finding suggests that a more developed and dynamic Islamic financial sector is associated with stronger economic performance. Overall, the graphical evidence complements the System-GMM estimates by providing additional insights into cross-country heterogeneity and the role of country-specific characteristics in the relationship between Islamic finance and economic growth. Importantly, the stronger Türkiye-specific effect of Islamic banking profitability is identified through the interaction term ($D_i^{\text{Türkiye}} * PROF_{it}$) in the econometric specification rather than through graphical analysis alone.

Fig 3. GDP per Capita Trends Across Selected Islamic Finance Economies (2015–2021)



Source: Authors' own calculations based on World Development Indicators (WDI) data

Fig 4. Trends in Islamic Finance Indicators (PROF, SUKUK, and TAKAFUL) Across Selected Countries (2015–2021)



Source: Authors' own calculations based on SESRIC and IFSB data

4.1. Remarks on Hypotheses of The Model

Table 8 summarizes the results of the hypothesis testing based on the Fixed Effects (FE) and System-GMM estimations. Overall, the findings provide empirical support for both hypotheses. H_1 is supported by the positive and statistically significant coefficients of PROF, SUKUK, and TAKAFUL in both the FE and System-GMM models, indicating that the development of Islamic banking profitability, Sukuk issuance, and Takaful contribution is positively associated with GDP per capita (GDPpc). H_2 is also supported, as the interaction term ($D_i^{\text{Türkiye}} * PROF_{it}$) is positive and statistically significant across both model specifications, indicating that the association between Islamic banking profitability and GDP per capita differs significantly for Türkiye relative to the reference group of Islamic finance economies. Taken together, these findings highlight substantial cross-country heterogeneity in the relationship between Islamic finance and economic growth, emphasizing the importance of country-specific institutional and economic conditions in shaping the growth effects of Islamic finance.

Table 8: Summary of Hypotheses Testing Using System-GMM

Hypothesis	Statement	Result	Conclusion
H_1	Islamic banking profitability, Sukuk issuance, and Takaful development have a significant positive impact on GDP per capita (GDPpc).	PROF, SUKUK, and TAKAFUL are positive and statistically significant in FE and System-GMM models.	**Accepted**
H_2	The impact of Islamic banking profitability on GDP per capita differs significantly across countries, with Türkiye exhibiting a statistically different effect compared with other Islamic finance economies.	The interaction term ($D_i^{\text{Türkiye}} * PROF_{it}$) is positive and statistically significant in both the FE and System-GMM models.	**Accepted**

Source: Authors' elaboration based on the Fixed Effects (FE) and System-GMM results

5. Conclusion

The System Generalized Method of Moments (SGMM) results indicate that Islamic finance variables exert a positive and statistically significant impact on economic growth across the sampled countries, including the United Arab Emirates, Qatar, Saudi Arabia, Türkiye, Kuwait, Oman, Malaysia, Indonesia, and Nigeria. Specifically, Islamic banking profitability (PROF) positively affects GDP per capita (β = 0.09, p = 0.002), while Sukuk issuance (β = 0.000005, p = 0.001) and Takaful development (β = 0.000052, p = 0.016) also contribute significantly to economic growth. The lagged dependent variable GDPpc (-1) is highly significant (β = 0.60, p = 0.000), confirming strong persistence in economic growth and supporting the dynamic specification of the model. Türkiye is employed as the benchmark country to examine cross-country heterogeneity in the Islamic finance–growth nexus. The positive and statistically significant interaction term ($D_i^{\text{Türkiye}} * PROF_{it}$) (β = 0.067, p = 0.018) indicates that the effect of Islamic banking profitability on economic growth is stronger in Türkiye compared to the other sampled countries. Overall, the findings confirm that Islamic finance promotes economic growth through banking profitability, capital market development, and insurance channels, while also highlighting meaningful cross-country differences in the strength of these effects.

Policy implications suggest that strengthening Islamic banking systems through enhanced regulatory quality, governance structures, and financial stability frameworks can improve their growth-enhancing role. Policymakers should also prioritize the deepening of Sukuk markets as strategic instruments for long-term development financing and support the expansion of the Takaful sector to reinforce financial resilience. In addition, countries with comparatively weaker performance may benefit from adopting institutional and regulatory best practices observed in higher-performing economies such as Türkiye

to improve the efficiency of Islamic finance transmission mechanisms. Future research could extend the analysis by employing longer time horizons and alternative dynamic panel methodologies to ensure greater robustness of results. Expanding the dataset to include additional Islamic finance economies such as Iran and Sudan would further enhance comparative insights and improve the external validity and generalizability of the findings.

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