



## Fiscal dynamics in selected OIC countries amid the COVID-19 pandemic: Evidence from an Islamic economics perspective

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### ABSTRACT

**Purpose** – This study examines fiscal dynamics in OIC countries over the period 2000–2025, with particular attention to the fiscal implications of the COVID-19 pandemic from an Islamic economics perspective. It investigates the dynamic relationships among public debt, government health expenditure, and other key fiscal and macroeconomic variables, and considers their implications for fiscal dynamics and the responsibility to preserve fiscal capacity for future generations.

**Design/Methodology/Approach** – The study uses panel data for OIC countries (2000–2025) and applies a Panel Vector Autoregression (PVAR) model. Granger causality tests, impulse response functions, and mean comparison tests are also conducted.

**Findings** – Results show strong persistence in fiscal variables. Public debt affects health expenditure depending on the influence of health spending on GDP. Debt shocks negatively affect primary balance, while COVID-19 significantly worsened fiscal conditions and increased debt, with no significant rise in health expenditure.

**Originality/Value** – The study links fiscal dynamics and Islamic economics in OIC countries during COVID-19. It highlights the role of Sukuk and Zakat as sustainable healthcare financing tools.

**Research Limitations/Implications** – Limitations include data availability and heterogeneity across OIC countries. Future studies may focus on country-specific or comparative analyses.

**Practical Implications** – Policymakers should improve spending efficiency, strengthen transparency, and build fiscal reserves. Islamic financial instruments can support sustainable healthcare financing and long-term fiscal stability.

**Keywords** - Public Finance, Panel VAR, COVID-19, OIC Countries, Islamic Economics.

**Article Classification** – Research Paper.

*Submitted: 11/02/2026*

*Accepted: 24/07/2026*

*Published: 29/07/2026*

### INTRODUCTION

From the perspective of Islamic economics, grounded in the objectives of Maqasid al-Shariah, public policy should prioritize the protection of fundamental human interests and the promotion of societal welfare. As argued by Chapra (2008), the concept of human well-being within Maqasid al-Shariah encompasses the preservation of essential dimensions of life, particularly Hifz al-Nafs (the protection of human life) and Hifz al-Mal (the protection of wealth). In this context, Hifz al-Nafs provides a normative foundation for designing policies

that safeguard human welfare and ensure equitable access to essential public services, whereas Hifz al-Mal emphasizes the prudent management and preservation of economic resources and public wealth. Applied to public finance, these principles underscore the importance of allocating expenditures toward essential services while maintaining sound fiscal governance. Such an approach enables governments to reconcile immediate social and developmental needs with the long-term objective of fiscal sustainability. This balance becomes particularly critical during periods of economic and social crises, when governments must respond effectively to urgent societal demands without undermining their long-term fiscal capacity.

The COVID-19 pandemic brought this challenge into sharp focus, particularly across OIC countries. The crisis placed unprecedented pressure on healthcare systems, compelling governments to expand health expenditures and implement large-scale emergency fiscal support measures. At the same time, severe economic disruptions suppressed economic activity, eroded government revenues, and intensified financing requirements, thereby accelerating the accumulation of public debt (Abdullah et al., 2022; Gaspar & Gopinath, 2021). These developments underscore a fundamental fiscal policy challenge: how governments can effectively address immediate economic and social shocks while preserving sufficient fiscal capacity to meet future obligations and respond to subsequent crises. Achieving this balance is essential for maintaining sound public finances and enhancing fiscal resilience.

While the fiscal implications of the COVID-19 pandemic—including rising public debt, widening primary deficits, increased government expenditure, declining government revenues, and slower economic growth—have been extensively examined in the international literature, considerably less attention has been devoted to understanding the dynamic interrelationships among public debt, health expenditure, primary balance, government revenue, and economic growth in OIC countries. From the perspective of Islamic economics, this issue is particularly significant because it concerns the equitable allocation of public resources, prudent fiscal management, and the protection of the welfare of both present and future generations in accordance with the objectives of *Maqasid al-Shariah*.

The relationship between public debt and health expenditure is inherently dynamic and potentially bidirectional. Rising public debt may increase fiscal pressures and constrain fiscal space, thereby limiting governments' ability to sustain health expenditures. Conversely, health expenditure may influence fiscal outcomes through its effects on human capital accumulation, labour productivity, economic growth, and societal resilience. Consequently, the interaction between these variables may also be shaped by other fiscal and macroeconomic factors, including primary balance, government revenue, and economic growth. Nevertheless, existing economic theory does not provide *a priori* justification for assuming a reciprocal or self-reinforcing relationship between these variables. Accordingly, whether such dynamics exist remains an empirical question.

However, previous studies have largely examined the determinants of public debt and health expenditure independently, with limited attention given to their dynamic interactions. Consequently, empirical evidence on the interrelationships among public debt, health expenditure, primary balance, government revenue, and economic growth in OIC countries remains scarce, particularly during the period encompassing the COVID-19 pandemic. To address this gap, the present study investigates the dynamic interactions among these variables in eight selected OIC countries over the period 2000–2025.

Specifically, the study addresses the following research questions: (i) Do changes in public debt predict subsequent changes in health expenditure? (ii) Do changes in health expenditure influence subsequent public debt dynamics? (iii) How do primary balance, government revenue, and economic growth interact with these variables within a dynamic

fiscal system? (iv) How did these fiscal dynamics differ before and during the COVID-19 pandemic?

To achieve these objectives, the study employs a Panel Vector Autoregression (PVAR) model, complemented by Granger causality tests, impulse response functions (IRFs), forecast error variance decomposition (FEVD), and mean-comparison analysis between the pre-COVID and COVID-19 periods. The PVAR framework is particularly appropriate because it captures the dynamic interactions among endogenous variables while accounting for feedback effects over time. The complementary analyses provide additional evidence regarding the temporal relationships among the variables. The empirical analysis is designed to identify dynamic interdependencies and predictive relationships rather than establish definitive structural causality.

This study contributes to the literature in several important ways. First, it provides new empirical evidence on the dynamic interactions among public debt, health expenditure, primary balance, government revenue, and economic growth in selected OIC countries. Second, it examines how these relationships evolved before and during the COVID-19 pandemic, thereby offering insights into fiscal resilience under crisis conditions. Third, it integrates the normative framework of Maqasid al-Shariah into the analysis by linking health expenditure to Hifz al-Nafs (the preservation of life) and fiscal and debt management to Hifz al-Mal (the preservation of wealth). This integration enriches the interpretation of the empirical findings by highlighting their ethical and intergenerational dimensions without treating the principles of Maqasid al-Shariah as directly measurable econometric variables.

The findings provide important policy implications for fiscal management in OIC countries. Understanding the dynamic interactions among public debt, health expenditure, primary balance, government revenue, and economic growth can assist policymakers in designing fiscal strategies that enhance resilience during future crises while preserving long-term fiscal sustainability. Furthermore, the findings contribute to the broader discussion on the complementary role of Islamic social finance and Shariah-compliant financial instruments in supporting essential public services and strengthening fiscal capacity from an Islamic economics perspective. These implications are presented as normative policy considerations rather than empirical evaluations of the effectiveness of specific Islamic financial instruments.

Importantly, this study does not presuppose the existence of a self-reinforcing "vicious cycle" between public debt and health expenditure. Instead, it empirically investigates whether reciprocal dynamic relationships emerge from the data. Likewise, fiscal dynamics are interpreted as patterns of interaction among key fiscal and macroeconomic variables rather than as formal tests of fiscal sustainability based on debt-stabilization conditions, fiscal reaction functions, or intertemporal budget constraints. Consequently, the study provides empirical evidence on fiscal pressures and dynamic adjustments that are relevant to the broader objective of sustainable public finance in OIC countries.

## LITERATURE REVIEWS

### Fiscal Sustainability and Debt Dynamics

The literature on fiscal sustainability has primarily focused on governments' capacity to maintain public debt at sustainable levels while ensuring long-term fiscal solvency. According to Adam (2015), fiscal sustainability rests on three fundamental pillars: the government's ability to implement credible fiscal adjustments, maintain adequate liquidity, and preserve long-term solvency. Within this framework, empirical research has largely emphasized the role of prudent debt management and sound fiscal policies in safeguarding sustainable public

finances, although the specific fiscal challenges and policy responses vary across countries. For example, in Romania, Bostan et al. (2018) highlighted fiscal vulnerabilities and the importance of effective fiscal governance in achieving sustainability. Similarly, Merza et al. (2019) examined public debt sustainability in Jordan and emphasized the need for fiscal adjustment and efficient public expenditure management. Comparable conclusions were reached by Belcaid (2022) for Morocco and Al Sayed et al. (2021) for Egypt, both of whom underscored the importance of fiscal discipline and sustainable public finance management. Collectively, these studies reinforce the critical role of fiscal prudence and debt management in promoting fiscal sustainability. However, they provide limited evidence on the dynamic interactions among public debt, primary balance, government revenue, health expenditure, and economic growth, particularly regarding how these variables jointly evolve.

### **Fiscal Space, Health Expenditure, and the COVID-19 Pandemic**

The second strand of the literature examines the fiscal consequences of major economic and public health crises, particularly the COVID-19 pandemic. The pandemic substantially increased public debt, widened fiscal deficits, and intensified fiscal pressures across both advanced and developing economies. Jaelani and Hanim (2020) emphasized the unprecedented fiscal challenges faced by governments during the pandemic and highlighted the necessity of timely fiscal interventions to support public health systems and economic recovery. Similarly, Gorie and Nicola (2023) underscored the importance of maintaining fiscal sustainability amid the heightened fiscal pressures generated by the pandemic. Focusing on OIC countries, Wibowo et al. (2024) found that the pandemic altered the cyclicity of fiscal policy, leading to greater fiscal stress and accelerating the accumulation of public debt. Likewise, Obeidat et al. (2020) examined Jordan's fiscal response to the COVID-19 crisis and discussed its implications for the sustainability of public finances. Although these studies provide valuable insights into the fiscal consequences of large-scale crises, their analyses are generally conducted at an aggregate level and offer limited evidence on the dynamic interactions among public debt, primary balance, health expenditure, government revenue, and economic growth. Consequently, the mechanisms through which these variables jointly evolve during periods of fiscal stress remain insufficiently explored.

### **Islamic Public Finance and Maqasid al-Shariah**

A growing body of literature has examined public finance from the perspective of Islamic economics and *Maqasid al-Shariah*. Unlike conventional approaches that primarily emphasize fiscal balances and debt sustainability, this perspective incorporates broader normative objectives, including social welfare, justice, accountability, and the responsible stewardship of public resources. Mohieldin and Hamzah (2022) highlighted the contribution of Islamic finance to sustainable development and its role in mitigating economic challenges across OIC countries. Similarly, Rabbani et al. (2021) emphasized the importance of Islamic financial and social finance mechanisms in addressing the economic and social consequences of the COVID-19 pandemic. Ghouse et al. (2022) further demonstrated the resilience and recovery performance of Islamic banks relative to conventional banks during the pandemic in OIC countries, underscoring the potential of Shariah-compliant financial systems to enhance economic stability during periods of crisis. More recently, Azwar et al. (2025) emphasized key principles of Islamic public finance, including accountability, justice, transparency, and the prudent management of public resources. Despite these valuable contributions, the existing literature remains predominantly conceptual and institutional in nature. Empirical studies

examining the dynamic interactions among public debt, health expenditure, and other key fiscal and macroeconomic variables within an Islamic economics framework remain limited, leaving an important gap in the literature that the present study seeks to address.

## Research Gap and Hypotheses Development

Despite the extensive literature on fiscal sustainability, public debt, and Islamic public finance, several important research gaps remain. First, previous studies have generally examined public debt, health expenditure, economic growth, or fiscal balances in isolation, with limited attention devoted to their dynamic interrelationships within a unified empirical framework. Second, relatively few studies have focused specifically on OIC countries over a period encompassing both the pre-pandemic and COVID-19 eras, despite the profound fiscal challenges experienced during this time. Third, although the principles of Islamic economics—particularly *Maqasid al-Shariah*, fiscal responsibility, and intergenerational stewardship—have been widely discussed in the conceptual literature, they have rarely been integrated into empirical analyses of fiscal dynamics.

To address these gaps, this study employs a Panel Vector Autoregression (PVAR) framework to examine the dynamic interactions among public debt, primary balance, government health expenditure, economic growth, and government revenue in eight selected OIC countries over the period 2000–2025. The PVAR approach enables all variables to be treated as endogenous, thereby capturing feedback effects and dynamic interdependencies over time. Importantly, the study does not presuppose the existence of a self-reinforcing relationship between public debt and health expenditure; rather, it empirically investigates whether reciprocal dynamic interactions emerge from the data. The empirical findings are subsequently interpreted through the normative lens of Islamic economics by relating health expenditure to *Hifz al-Nafs* (the preservation of life) and fiscal and debt management to *Hifz al-Mal* (the preservation of wealth), while considering the implications of fiscal policy decisions for long-term fiscal capacity and intergenerational responsibility.

Drawing on the existing theoretical and empirical literature, higher levels of public debt are expected to intensify fiscal pressures and potentially constrain fiscal space, thereby influencing governments' capacity to sustain health expenditure. At the same time, health expenditure is expected to contribute positively to economic growth through improvements in human capital, labour productivity, and societal resilience. Accordingly, public debt, primary balance, government revenue, health expenditure, and economic growth are expected to exhibit dynamic interdependencies within the fiscal system. These theoretical expectations are evaluated empirically using the PVAR framework, which is designed to identify dynamic relationships and feedback mechanisms rather than establish definitive structural causality or assume the existence of a debt–health expenditure "vicious cycle."

## RESEARCH METHODOLOGY

This study employs a Panel Vector Autoregression (PVAR) model to examine the dynamic interactions among key fiscal and macroeconomic variables in eight OIC countries—Egypt, Jordan, Indonesia, Morocco, Nigeria, Pakistan, Sudan, and Tunisia—over the period 2000–2025. These countries were purposively selected from the broader OIC membership based on the availability and consistency of annual data for all variables included in the PVAR system. In addition, the selected countries exhibit substantial heterogeneity in terms of fiscal conditions, public debt levels, economic structures, and macroeconomic performance, thereby providing an appropriate setting for investigating cross-country fiscal dynamics. Accordingly,

the sample is not intended to be statistically representative of all OIC countries; rather, it constitutes a purposive sample that ensures a consistent and comparable panel for empirical analysis.

The PVAR framework is particularly appropriate because it treats all variables as jointly endogenous, allowing each variable to be explained by its own lagged values as well as the lagged values of the other variables in the system. This approach captures the dynamic interdependencies among public debt, primary balance, government health expenditure, economic growth, and government revenue while accounting for feedback effects and the transmission of shocks across the fiscal system. Consequently, the analysis focuses on identifying dynamic relationships and fiscal pressures rather than formally testing fiscal sustainability through debt-stabilization conditions, fiscal reaction functions, or intertemporal budget constraints. To complement the PVAR analysis, the study employs Granger causality tests, impulse response functions (IRFs), and forecast error variance decomposition (FEVD) to examine temporal predictive relationships, trace the responses of endogenous variables to exogenous shocks, and quantify the relative contribution of each shock to fluctuations within the system. The definitions and measurements of all variables included in the empirical analysis are presented in Table 1.

The panel dataset is balanced with respect to the eight selected countries over the study period. However, the effective estimation sample differs across model specifications because the government health expenditure variable contains missing observations for certain country-year combinations. As a result, specifications including health expenditure are estimated using 184 country-year observations, whereas specifications excluding this variable utilize the full sample of 208 observations. Accordingly, while the panel structure remains balanced at the country level, the estimation sample varies depending on variable availability.

Fiscal and macroeconomic variables obtained from the International Monetary Fund (IMF) were retained through 2025, consistent with the latest release of the corresponding IMF databases. Depending on the database vintage, observations for the most recent years may represent officially reported data, official estimates, or IMF projections. In contrast, the government health expenditure data obtained from the World Bank are available only through 2022. No interpolation or imputation techniques were applied to replace missing observations; consequently, all estimations involving health expenditure were conducted using the available data only.

Table 1: Variables utilized in the model

| Name of Variables             | Abbreviation | Unit                   | Source                                                    |
|-------------------------------|--------------|------------------------|-----------------------------------------------------------|
| Dependent variable            |              |                        |                                                           |
| Primary net lending/borrowing | Pb           | %GDP                   | IMF, Fiscal Monitor Database 2000-2025                    |
| Independent variable          |              |                        |                                                           |
| General government gross debt | Debt         | %GDP                   | IMF, Global Debt Database (GDD)2000-2025                  |
| Current health expenditure    | He           | %GDP                   | World Bank 2000-2022                                      |
| Real GDP growth               | Gdp          | %Annual percent change | IMF, World Economic Outlook (WEO) 2000-2025               |
| Government Revenue            | Rev          | %GDP                   | IMF, Public Finances in Modern History Database 2000-2025 |

### ***Descriptive Statistic***

Descriptive statistics are reported to describe the characteristics of the variables included in the analysis and to provide an initial overview of the fiscal and macroeconomic conditions in the selected OIC countries.

### ***Correlation matrix***

Pairwise correlations are reported to provide an initial assessment of the associations among the variables and to identify any potential multicollinearity before estimating the PVAR model.

### ***Panel Unit Root Test***

Panel unit-root tests (LLC and IPS) are conducted to determine the stationarity properties of the variables and to identify the appropriate transformation before estimating the PVAR model. The Levin–Lin–Chu (LLC) test and the Im–Pesaran–Shin (IPS) test are employed, following Levin et al. (2002) and Im et al. (2003).

### ***Lag Selection and Model Diagnostics***

The lag-order selection procedure was conducted following the panel VAR framework proposed by Abrigo and Love (2016), considering a maximum of three lags. The optimal lag length was determined based on the Modified Bayesian Information Criterion (MBIC), Modified Akaike Information Criterion (MAIC), and Modified Hannan–Quinn Information Criterion (MQIC).

### ***Panel Vector Autoregression***

The Panel Vector Autoregression (PVAR) model extends the conventional Vector Autoregression (VAR) framework to panel data, enabling the analysis of dynamic interrelationships among multiple endogenous variables across countries and over time (Love & Zicchino, 2006; Canova & Ciccarelli, 2013). Unlike conventional single-equation models, the PVAR approach treats all variables in the system as endogenous, allowing each variable to be influenced by its own past values as well as the lagged values of all other endogenous variables. This feature makes the model particularly well suited for examining the feedback effects and dynamic interactions among public debt, primary balance, government health expenditure, economic growth, and government revenue within the selected OIC countries. The dimensions of the panel dataset—comprising eight cross-sectional units ( $N = 8$ ) and approximately 20 effective annual observations per country ( $T \approx 20$ )—are appropriate for the application of the PVAR framework. Model estimation is conducted using the Generalized Method of Moments (GMM), which employs lagged values of the endogenous variables as internal instruments to address potential endogeneity arising from the dynamic nature of the system. This estimation strategy is particularly suitable when the objective is to analyse mutually endogenous relationships and the transmission of shocks among fiscal and macroeconomic variables rather than to estimate a single structural equation.

The estimated PVAR model is specified in reduced form, whereby each endogenous variable is expressed as a function of its own lagged values and the lagged values of the remaining endogenous variables in the system. Consequently, the model captures dynamic

interdependencies and temporal feedback mechanisms without imposing structural restrictions or identifying contemporaneous causal relationships. The empirical findings should therefore be interpreted as evidence of dynamic associations and shock propagation within the fiscal system rather than definitive structural causality.

$$Y_{i,t} = A_1 Y_{i,t-1} + A_2 Y_{i,t-2} + \dots + A_p Y_{i,t-p} + \mu_i + \epsilon_{i,t}$$

where  $Y_{i,t}$  is a vector of endogenous variables for country  $i$  at time  $t$ ,  $A_1, \dots, A_p$  are coefficient matrices for lags 1 through  $p$ ,  $\mu_i$  captures country-specific fixed effects, and  $\epsilon_{i,t}$  is the idiosyncratic error term.

This reduced-form specification facilitates the estimation of dynamic interrelationships and the analysis of impulse responses while controlling for unobserved country-specific heterogeneity.

### ***Impulse Response Function***

To examine the dynamic responses of the endogenous variables within the Panel Vector Autoregression (PVAR) system, Impulse Response Functions (IRFs) are employed. Because the estimated PVAR is specified in reduced form, the residuals from the individual equations may be contemporaneously correlated and therefore do not represent independent structural shocks. To address this issue, orthogonalized impulse response functions are obtained by applying a Cholesky decomposition to the variance–covariance matrix of the reduced-form residuals. This procedure transforms the correlated residuals into mutually orthogonal innovations, allowing a one-standard-deviation shock to each endogenous variable to be interpreted as an isolated innovation and enabling the dynamic responses of all variables in the system to be traced over the specified forecast horizon (Sims, 1980; Lütkepohl, 2005).

The Cholesky decomposition follows the ordering: primary balance (PB), public debt (Debt), government health expenditure (HE), economic growth (GDP), and government revenue (REV). This ordering reflects the assumed contemporaneous information structure of the fiscal system and is motivated by economic considerations rather than by the identification of structural causal relationships. Primary balance is ordered first because it captures the government's immediate fiscal position and can contemporaneously reflect fiscal policy decisions. Public debt is placed second, as borrowing requirements and debt dynamics are closely associated with the prevailing fiscal stance. Government health expenditure follows, reflecting the possibility that health spending responds contemporaneously to fiscal conditions and debt pressures. Economic growth is ordered fourth to capture the immediate influence of fiscal policy and public expenditure on economic activity. Finally, government revenue is placed last, based on the assumption that revenue collections are more likely to respond with a short delay to changes in fiscal conditions, public expenditure, and economic performance.

The impulse responses are interpreted as the dynamic effects of a one-standard-deviation orthogonalized shock to one endogenous variable on the remaining variables in the system, holding all other shocks constant. The estimated responses are evaluated over the selected forecast horizon, with statistical inference based on the associated confidence intervals. Consequently, the IRFs provide evidence on the direction, magnitude, persistence, and statistical significance of the transmission of shocks among the fiscal and macroeconomic variables. It should be emphasized that the impulse response analysis does not establish structural causality. Rather, it illustrates how shocks propagate dynamically through the fiscal system, revealing temporal interdependencies and adjustment processes among public debt,

primary balance, government health expenditure, economic growth, and government revenue (Lütkepohl, 2005; Love & Zicchino, 2006).

### ***Forecast Error Variance Decomposition***

FEVD is employed to quantify the relative contribution of shocks to each variable in explaining the forecast error variance of the endogenous variables over the forecast horizon, thereby complementing the impulse response analysis (Lütkepohl, 2005; Love & Zicchino, 2006).

### ***COVID-19 Period Comparison***

To examine changes in fiscal and macroeconomic conditions associated with the COVID-19 period, the sample is divided into two periods. The pre-COVID period covers 2000–2019, while the COVID-period subsample covers 2020–2025. The year 2020 is treated as the beginning of the COVID-19 period because it marks the global onset of the pandemic and its immediate economic and fiscal effects. Mean-comparison tests are then used to examine whether the average values of the selected variables differ between the two periods. These comparisons provide descriptive evidence of differences in fiscal and macroeconomic conditions across the two periods and should not be interpreted as establishing a causal effect of the COVID-19 pandemic, given the absence of an experimental or causal identification strategy.

Because the dataset contains repeated annual observations for the same countries, the observations are not strictly independent across time within countries. Accordingly, the mean-comparison tests are interpreted primarily as descriptive comparisons between the pre-COVID and COVID-period subsamples. The results should therefore be understood as evidence of changes in average fiscal and macroeconomic conditions across the two periods rather than as estimates based on fully independent observations.

### ***Software Used***

All empirical analyses were conducted using Stata 17.0. The PVAR model was estimated using the pvar package, while lag-order selection, stability analysis, impulse response functions, forecast error variance decomposition, and Granger-predictive tests were implemented using the corresponding post-estimation procedures.

## **FINDINGS**

### ***Descriptive Statistic***

The descriptive statistics Table.2 indicates the most relevant features about the variables employed in the analysis: The primary balance (PB) has a mean value of  $-1.26\%$  of GDP, indicating that the selected countries recorded an average primary deficit during the study period, and public debt (Debt) is highly varied with a mean of  $67.5\%$  of GDP, and so there are dissimilarities in debt burdens across nations. The average of government health expenditure (He) is 4.64, and economic growth (GDP) is 3.58, but the panel has significant variation. The average revenue (Rev) is 18.3 percent of GDP, an aspect that shows the difference between the fiscal capabilities of countries.

Table 2: Descriptive statistics OIC countries

| Variables   | Obs | Mean  | Std.err | Max   | Min   |
|-------------|-----|-------|---------|-------|-------|
| <b>Pb</b>   | 208 | -1.26 | 2.84    | 6.70  | -13.1 |
| <b>Debt</b> | 208 | 67.5  | 41.9    | 278.3 | 5.2   |
| <b>He</b>   | 184 | 4.64  | 1.77    | 9.57  | 1.85  |
| <b>Gdp</b>  | 208 | 3.58  | 4.05    | 14.6  | -23.4 |
| <b>Rev</b>  | 208 | 18.3  | 7.20    | 35.4  | 2.93  |

### Correlation matrix

Table 3 presents the pairwise correlation matrix for the eight selected OIC countries over the study period. The results indicate a negative correlation between the primary balance (PB) and public debt ( $-0.3397^{***}$ ) and between the primary balance and health expenditure ( $-0.3790^{**}$ ). In contrast, economic growth is positively correlated with the primary balance ( $0.3758^{***}$ ). Public debt is negatively correlated with economic growth ( $-0.5090^{***}$ ) but positively correlated with health expenditure ( $0.2307^{***}$ ). Moreover, health expenditure exhibits a strong positive correlation with government revenue ( $0.6669^{***}$ ). These correlations provide preliminary evidence of the associations among the fiscal and macroeconomic variables in the pooled sample of the selected OIC countries and offer useful initial insights before the subsequent dynamic econometric analysis.

Table 3: Correlation matrix of the selected OIC countries

| Variables   | Pb              | Debt            | He              | gdp            | rev    |
|-------------|-----------------|-----------------|-----------------|----------------|--------|
| <b>Pb</b>   | 1.0000          |                 |                 |                |        |
| <b>Debt</b> | $-0.3397^{***}$ | 1.0000          |                 |                |        |
| <b>He</b>   | $-0.3790^{***}$ | $0.2307^{***}$  | 1.0000          |                |        |
| <b>Gdp</b>  | $0.3758^{***}$  | $-0.5090^{***}$ | $-0.1433^{***}$ | 1.0000         |        |
| <b>Rev</b>  | $-0.0190^{*}$   | $-0.0776^{*}$   | $0.6669^{***}$  | $0.1888^{***}$ | 1.0000 |

### Panel Unit Root Test

Based on the unit-root results reported in Table 4, the variables were entered into the PVAR system according to their stationarity properties. PB and GDP, which are stationary in levels according to both the IPS and LLC tests, were retained in levels. Debt and revenue, which are non-stationary in levels and become stationary after first differencing, were included in first differences. For health expenditure, the IPS and LLC tests provide mixed evidence regarding level stationarity; therefore, its first difference was used as a conservative specification to ensure stationarity. Accordingly, the PVAR system combines level and first-differenced variables based on the stationarity properties identified by the unit-root tests.

Table 4: Panel unit root tests

| Variables   | IPS             | First diff      | LLC             | First diff       |
|-------------|-----------------|-----------------|-----------------|------------------|
| <b>Pb</b>   | $-2.6541^{***}$ | $-7.6565^{***}$ | $-2.3585^{***}$ | $-8.4442^{***}$  |
| <b>Debt</b> | 0.2634          | $-5.7899^{***}$ | 0.3612          | $-3.9826^{***}$  |
| <b>He</b>   | $-0.7527$       | $-6.6980^{***}$ | $-2.5109^{***}$ | $-4.4968^{***}$  |
| <b>Gdp</b>  | $-4.9548^{***}$ | $-8.8790^{***}$ | $-3.4984^{***}$ | $-10.2203^{***}$ |
| <b>Rev</b>  | $-0.4458$       | $-7.7288^{***}$ | $-1.1870$       | $-6.8146^{***}$  |

(Note: \*, \*\*, \*\*\* is significant at 10%, 5% and 1%)

## Cross-Sectional Dependence Test

The Pesaran (2004) test indicates no statistically significant cross-sectional dependence among the panel units ( $CD = 1.277$ ,  $p = 0.2015$ ). Therefore, the null hypothesis of cross-sectional independence cannot be rejected. This result suggests that shocks affecting one country are not significantly correlated with contemporaneous shocks in the other countries in the sample.

## Panel Cointegration Test (Westerlund)

Given that some variables were found to be non-stationary in levels, a panel cointegration test was conducted before applying first differences. The Westerlund cointegration test was employed to examine whether a long-run equilibrium relationship exists among the variables in the PVAR system. The test produced a variance-ratio statistic of  $-0.3962$  with a p-value of  $0.3460$ . Therefore, the null hypothesis of no cointegration cannot be rejected, indicating no statistically significant evidence of a long-run cointegrating relationship among the variables. Accordingly, the non-stationary variables were included in first differences in the PVAR specification to ensure stationarity and avoid spurious dynamic relationships.

## Lag Selection

Table 5 reports the lag-order selection criteria for the PVAR model. The Modified Bayesian Information Criterion (MBIC), Modified Akaike Information Criterion (MAIC), and Modified Hannan–Quinn Information Criterion (MQIC) all attain their minimum values at the first lag. Accordingly, a first-order PVAR specification was selected for the subsequent analysis.

Table 5: Lag-Order selection criteria

| Lag | MBIC     | MAIC    | MQIC     |
|-----|----------|---------|----------|
| 1   | -196.797 | -57.422 | -114.023 |
| 2   | -107.851 | -38.164 | -66.464  |

**Note:** The preferred lag length is one because all three information criteria (MBIC, MAIC, and MQIC) attain their minimum values at lag 1.

## Panel Vector Autoregression

Table 6 presents the results of the PVAR model for the OIC countries. It demonstrates that the past values of the primary balance have a positive impact on it, whereas the effects of the public debt and health expenditure on the primary balance are not strong. It has a positive effect on economic growth because of its prior values, but the influence of revenues is weak and not statistically significant. All in all, the findings suggest that the interplay between the main fiscal variables is not only restricted and dynamic with the passage of time, but also that the influence of each variable on its own is significant. The stability of the estimated PVAR system was assessed using the eigenvalue stability condition. The moduli of the estimated eigenvalues were  $0.6906$ ,  $0.6382$ ,  $0.1699$ ,  $0.1699$ , and  $0.0088$ . Since all eigenvalue moduli are strictly below unity, the estimated PVAR system satisfies the stability condition. This result confirms that the system is dynamically stable and that the impulse response functions are well-defined, with shocks expected to dissipate over time rather than generate explosive dynamics.

Table 6: Panel Vector Autoregression (PVAR) results – OIC countries

| Variables     | Pb                    | d.debt              | d.he                 | Gdp                   | d.rev               |
|---------------|-----------------------|---------------------|----------------------|-----------------------|---------------------|
|               | Coef. (std.err)       |                     |                      |                       |                     |
| <b>L.Pb</b>   | 0.6657***<br>(0.1593) | -1.4153<br>(1.2822) | 0.0446<br>(0.0365)   | -0.1068<br>(0.1518)   | 0.0848<br>(0.1638)  |
| <b>L.Debt</b> | -0.0127<br>(0.0325)   | 0.0810<br>(0.3159)  | -0.0086*<br>(0.0048) | 0.0192<br>(0.0244)    | -0.0229<br>(0.0149) |
| <b>L.He</b>   | 0.5665<br>(0.4557)    | 2.4415<br>(3.6339)  | -0.2071*<br>(0.1105) | 1.1596*<br>(0.6909)   | 0.0210<br>(0.5015)  |
| <b>L.Gdp</b>  | 0.0761<br>(0.1051)    | 0.1531<br>(0.7244)  | -0.0263<br>(0.0231)  | 0.6277***<br>(0.1089) | -0.0719<br>(0.1013) |
| <b>L.Rev</b>  | 0.0498<br>(0.1080)    | 0.0277<br>(0.5045)  | -0.0215<br>(0.0341)  | -0.0423<br>(0.1888)   | -0.0496<br>(0.0975) |

Notes: Robust standard errors in parentheses. \*\*\*, \*\*, \* denote statistical significance at the 1%, 5%, and 10% levels, respectively.

### Panel VA–Granger Causality

The results provide weak evidence of a predictive relationship between changes in public debt (d\_debt) and subsequent changes in health expenditure (d\_he), with the null hypothesis of no Granger-predictive relationship rejected only at the 10% significance level ( $p = 0.074$ ). This finding suggests that past changes in public debt contain limited predictive information about subsequent changes in health expenditure; however, the evidence should be interpreted cautiously given the marginal level of statistical significance. Similarly, the results provide weak evidence that past changes in health expenditure (d\_he) contain predictive information about subsequent economic growth (GDP), with significance observed only at the 10% level ( $p = 0.093$ ). This finding indicates a limited short-run temporal predictive relationship rather than evidence of a structural causal effect. No statistically significant Granger-predictive relationships are detected among the remaining variable pairs. Importantly, the results do not establish a debt–health expenditure vicious cycle, since the evidence does not support statistically significant predictive relationships in both directions between public debt and health expenditure. Instead, the findings indicate only weak evidence of a one-directional predictive relationship from changes in public debt to subsequent changes in health expenditure.

Table 7: Panel VAR–Granger Causality results (OIC countries)

| Decision                                      | p-value | $\chi^2$ (Wald Test) | Excluded Variable  | Predictor Variable | Dependent Variable |
|-----------------------------------------------|---------|----------------------|--------------------|--------------------|--------------------|
| <b>Granger-Predictive Relationship at 10%</b> | 0.074*  | 3.184                | d_debt (Debt)      |                    | d_he (Health Exp.) |
| <b>Granger-Predictive Relationship at 10%</b> | 0.093*  | 2.817                | d_he (Health Exp.) |                    | gdp (Growth)       |
| <b>No Significant Predictive Relationship</b> | > 0.10  | -                    | Other Variables    |                    | All Equations      |

Notes: denotes statistical significance at the 10% level.

The null hypothesis states that the excluded variable does not Granger-cause the dependent variable.

### Forecast-Error Variance Decomposition

Table 8 indicates the Forecast Error Variance Decomposition (FEVD) of the OIC countries up to a 10-year horizon. The findings indicate the percentage of the variance in each response variable that the shocks of other variables in the model could explain. Primary balance (pb) is relatively determined by the shocks of its own, whereas public debt (d\_debt) is mainly

affected by its own past values, with a bit of help from pb. The shocks in health expenditure (dhe) and GDP (gdp) influence their own shocks significantly, which implies high self-dependence with time. Revenue (d rev ) is also largely responsive to its own shocks, although there is also some variance due to shocks to pb and gdp. In general, the FEVD shows that the key variables in the panel not only interplay with time, but also are highly determined by the historical movements that they have.

Table 8: Forecast error variance decomposition at horizon 10 (OIC countries)

| Response Variable | Shock to pb   | Shock to d_debt | Shock to d_he | Shock to gdp  | Shock to d_rev |
|-------------------|---------------|-----------------|---------------|---------------|----------------|
| <b>Pb</b>         | <b>94.43%</b> | 2.57%           | 0.64%         | 2.26%         | 0.09%          |
| <b>d_debt</b>     | 25.95%        | <b>73.18%</b>   | 0.59%         | 0.25%         | 0.03%          |
| <b>d_he</b>       | 11.93%        | 4.00%           | <b>80.83%</b> | 2.51%         | 0.72%          |
| <b>Gdp</b>        | 7.90%         | 8.67%           | 1.96%         | <b>81.36%</b> | 0.11%          |
| <b>d_rev</b>      | 25.77%        | 3.08%           | 2.13%         | 3.43%         | <b>65.60%</b>  |

**Notes:** The table presents the Forecast Error Variance Decomposition (FEVD) at a 10-year horizon. The values represent the percentage of the forecast error variance in the response variable that is explained by shocks to the impulse variables. Rows may not sum exactly to 100% due to rounding.

The mean comparison in Table 9 indicates a significant deterioration in the primary balance during the COVID-19 period, reflecting the widening of primary deficits as governments faced increased emergency spending pressures and declining fiscal revenues. Public debt also increased significantly, consistent with the greater reliance on borrowing to finance pandemic-related expenditures and compensate for reduced economic activity and revenue mobilization. Economic growth declined significantly, reflecting the adverse effects of lockdowns, disruptions to economic activity, and the broader contractionary effects of the pandemic. In contrast, health expenditure did not change significantly between the two periods, suggesting that the increased pressure on healthcare systems did not translate into a statistically significant increase in health expenditure as a share of GDP. Overall, the results indicate that the pandemic placed substantial pressure on fiscal balances, public debt, and economic activity, while the relative stability of health expenditure may reflect fiscal constraints and limited capacity to expand public health spending during the crisis.

Table 9: Mean comparison of fiscal and macroeconomic variables between the Pre-COVID and COVID/Post-COVID periods

| Variable    | Mean (Pre-COVID) | Mean (COVID) | t-statistic | p-value | Significance |
|-------------|------------------|--------------|-------------|---------|--------------|
| <b>Pb</b>   | -1.12            | -1.75        | 1.35        | 0.197   | <b>No</b>    |
| <b>Debt</b> | 61.06            | 89.16        | -4.23       | 0.001   | <b>Yes</b>   |
| <b>He</b>   | 4.63             | 4.72         | -0.23       | 0.822   | No           |
| <b>Gdp</b>  | 3.88             | 1.18         | 4.82        | 0.001   | <b>Yes</b>   |

Figure 1 demonstrates how the average primary balance (pb), the public debt (debt), economic growth (gdp), and government health expenditure (he) in the OIC countries would evolve between 2000 and 2025, the vertical line being the dashed one, which is at the start of the COVID-19 pandemic. The trend of the primary balance indicates a clear deterioration around 2020, reflecting a widening of the primary deficit during the COVID-19 period. The trend of public debt mirrors the upward trend, with its sharp rise in the period of COVID-19, which implies an increase in the pressure in the area of borrowing. In 2020, there was a severe contraction in economic growth and a partial recovery in the following years. On the contrary, government health spending is comparatively unaffected by time, and there was a slight decline during the pandemic, followed by a slow recovery. In general, the numbers show that the fiscal

and macroeconomic shocks of COVID-19 are significant, especially in terms of debt accumulation and growth performance, whereas health spending is relatively less volatile.



Figure 1: Trends in public finance and macroeconomic indicators in OIC countries (2000–2025)

Figure 2 presents the orthogonalized impulse response functions (IRFs) together with their 95% confidence intervals, represented by the shaded areas. The interpretation of the responses is therefore based not only on the direction and magnitude of the point estimates but also on whether the corresponding confidence intervals exclude zero. The response of the primary balance (pb) to a shock in the change in public debt (d\_debt) is initially negative and subsequently converges toward zero. However, the associated 95% confidence interval should be considered when assessing statistical significance; where the interval includes zero, the response cannot be interpreted as statistically significant. Similarly, the response of changes in health expenditure (d\_he) to a shock in economic growth (gdp) is positive in the initial periods, but its statistical significance depends on whether the 95% confidence interval excludes zero. Overall, most cross-variable responses appear relatively small, and their confidence intervals generally include zero, indicating limited evidence of statistically significant dynamic spillovers among the fiscal and macroeconomic variables. In contrast, the relatively persistent responses to own-variable shocks indicate stronger dynamic persistence within individual variables.

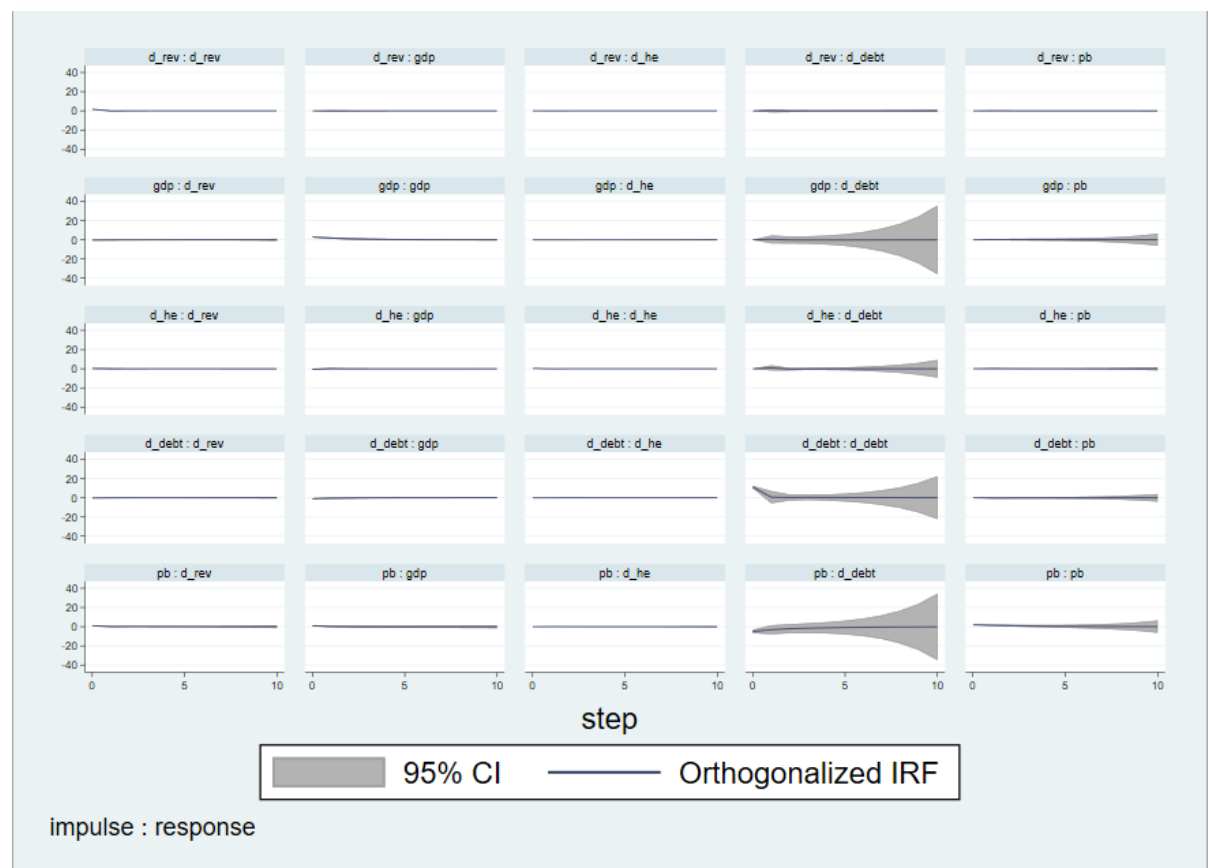


Figure 2: Panel VAR Impulse Response Functions (OIC countries)

## DISCUSSION

This paper examines the sustainability of public finance in the Organization of Islamic Cooperation (OIC) countries over the period 2000–2025 by analysing the dynamic relationships among public debt, government health expenditure, and other key fiscal and macroeconomic variables from an Islamic economics perspective. The findings are broadly consistent with previous studies highlighting the growing fiscal pressures facing emerging and developing economies, particularly during periods of global crisis (Adam, 2015; Merza et al., 2019). From the perspective of Maqasid al-Shariah, the empirical findings are interpreted through the complementary objectives of preserving human life (*Hifz al-Nafs*) and preserving public wealth (*Hifz al-Mal*), thereby linking the observed fiscal dynamics with the normative framework of Islamic economics.

According to the results of the Granger causality test, public debt is the cause of government health expenditure and vice versa. These results are similar to those in other studies, including Merza et al. (2019), which indicated weak debt sustainability in Jordan, substantiating the hypothesis that increasing debt will restrict the ability to use fiscal space in key areas like health. Moreover, the impact of health spending on economic growth confirms the idea that an investment in human capital has economic returns, which is in line with the Islamic economics viewpoint that emphasizes that the maintenance of life (health) is a core investment of sustainable development, as it is explained by Mohieldin and Hamzah (2022).

These are reinforced by Impulse Response Functions (IRF), which demonstrate that primary balance is negatively affected by a shock in the amount of public debt, which happens immediately, and the fiscal pressures caused by increasing debt levels are supported by the fact that the primary balance is negatively affected. The given result can be reconciled with the

theoretical framework presented by Adam (2015) on the aspects of solvency and realistic adjustment criteria, emphasizing the issues of sustainability of public finances in OIC countries. In addition, the positive reaction of health spending to the economic growth shocks illustrates that health spending is pro-cyclical, meaning that it is likely to rise with economic performance, and thus can be affected by recessionary conditions.

The outcomes of Forecast Error Variance Decomposition (FEVD) indicate that fiscal and economic variables of the OIC countries are heavily affected by historical dynamics of each country, and they are not interacting with each other as much. To some extent, these findings coincide with those obtained by Wibowo et al. (2024), who concluded that macroeconomics shaped primary deficits of OIC countries during the COVID-19 pandemic. Nevertheless, the prevalence of self-effects implies that domestic policies are highly significant in shaping these variables, and that structural reforms may also be in prospect.

Notably, the mean comparison indicates that the COVID-19 pandemic was associated with a significant deterioration in the primary balance and a significant increase in public debt, whereas government health expenditure remained comparatively stable. This observation is consistent with previous research, such as Jaelani and Hanim (2020) and Gorie and Nicola (2023), which highlighted the substantial fiscal pressures that the pandemic placed on government budgets. The relative stability of health expenditure despite deteriorating fiscal conditions may reflect the prioritization of health protection and the preservation of human life, which aligns with *Hifz al-Nafs*, one of the central objectives of *Maqasid al-Shariah*. From this perspective, maintaining essential health expenditure during a major public health crisis can be interpreted as consistent with the obligation to protect human life and social welfare. However, financing fiscal pressures through increased public borrowing also raises concerns related to *Hifz al-Mal*, understood here as the responsible preservation and management of public financial resources. Higher debt may create potential intergenerational fiscal pressures by increasing future debt-servicing obligations and reducing the fiscal space available to future taxpayers. Thus, the findings highlight a potential tension between the immediate protection of life through essential public health spending and the longer-term preservation of public financial capacity. This raises an important intergenerational responsibility concern within Islamic economics, although the findings do not directly establish intergenerational injustice because the study does not measure the distribution of fiscal costs and benefits across generations.

These findings underscore the importance of sustainable fiscal strategies in OIC countries that can reconcile the protection of health with long-term fiscal dynamics. In this regard, Islamic financial instruments and related mechanisms, including social *sukuk* and *zakat*, may provide complementary sources of financing for essential public services and may help diversify the financing structure of public expenditure, as discussed by Rabbani et al. (2021). However, such instruments should not automatically be considered debt-free or fiscally costless alternatives. In particular, *sukuk* may create repayment obligations and other financial liabilities depending on their contractual structure and the nature of the issuing entity, and may therefore affect public-sector indebtedness and fiscal risk. Accordingly, the use of *sukuk* should be assessed within a comprehensive framework of debt sustainability and public financial management. *Zakat* may provide non-debt-based support for healthcare-related needs of eligible beneficiaries, but it cannot automatically be treated as a general source of government revenue for financing the entire public healthcare system. Its use is subject to the *Shari'ah* eligibility of beneficiaries, relevant legal and institutional frameworks, and the capacity of national *zakat* institutions to collect, administer, distribute, and monitor funds transparently.

Differences in national *zakat* systems and *Shari'ah* interpretations may therefore limit the scalability and uniform application of *zakat*-based healthcare financing across OIC countries.

Such approaches may also be supported by the resilience of Islamic financial systems, as highlighted by Ghouse et al. (2022). Overall, the findings reveal a weak one-directional predictive relationship from changes in public debt to subsequent changes in health expenditure, but they do not establish a mutually reinforcing debt–health expenditure vicious cycle. The results therefore highlight the importance of balancing immediate health and social priorities with long-term fiscal dynamics and the responsibility to avoid imposing excessive fiscal pressures on future generations.

## CONCLUSION AND POLICY IMPLICATION

This study examined the dynamic interactions among public debt, government health expenditure, the primary balance, economic growth, and government revenue in selected OIC countries over the period 2000–2025. The analysis interprets these fiscal dynamics through the complementary perspectives of Islamic economics, Maqasid al-Shariah, and intergenerational responsibility. In particular, the framework relates the provision of essential health expenditure to Hifz al-Nafs (the preservation of life) and responsible public debt management to Hifz al-Mal (the preservation of wealth and public financial resources), while also considering the implications of current fiscal decisions for future fiscal capacity. The PVAR results reveal a dynamically interconnected fiscal and macroeconomic system, although the strength and direction of the relationships vary across variables. This combination of empirical analysis and normative interpretation allows the study to examine fiscal pressures not only in terms of short-run macroeconomic dynamics but also in relation to the broader responsibility of protecting essential human welfare and preserving public resources over time.

The Panel VAR–Granger predictive analysis provides weak evidence that changes in public debt contain predictive information about subsequent changes in health expenditure at the 10% significance level. However, the evidence does not establish a statistically significant predictive relationship in the reverse direction between health expenditure and public debt. The results therefore do not support the existence of a mutually reinforcing debt–health expenditure vicious cycle. A second weak predictive relationship is observed from changes in health expenditure to subsequent economic growth, also at the 10% significance level. These findings should be interpreted as limited short-run temporal predictive relationships rather than evidence of structural causality.

The impulse response analysis indicates that changes in health expenditure exhibit a modest positive response following a positive shock to economic growth during the initial periods. However, the associated 95% confidence intervals generally include zero, indicating that the response is not statistically significant over most of the forecast horizon. Overall, the IRFs provide only limited evidence of dynamic spillover effects among the variables, whereas the FEVD results suggest that forecast error variation is explained predominantly by each variable's own shocks, reflecting considerable persistence within individual variables rather than strong cross-variable shock transmission.

The mean comparison between the pre-COVID and COVID/post-COVID periods shows a significant deterioration in the primary balance and a significant increase in public debt, while health expenditure does not exhibit a statistically significant change. These findings highlight the fiscal pressures associated with the pandemic and the challenge of maintaining essential public services during periods of fiscal stress. The increase in public debt may also create potential intergenerational fiscal pressures through future debt-servicing obligations and reduced fiscal space. However, the study does not directly measure the distribution of fiscal costs and benefits across generations and therefore does not establish intergenerational injustice

conclusively. Instead, the findings underscore the importance of intergenerational responsibility as a normative consideration in the design of sustainable fiscal policies.

The policy implications below distinguish between conclusions directly supported by the empirical analysis and recommendations informed by the broader literature and the Islamic economics framework. The empirical results provide evidence on the dynamic fiscal and macroeconomic relationships among public debt, health expenditure, the primary balance, economic growth, and government revenue. They do not directly test the effectiveness of specific Islamic financing instruments or individual fiscal interventions. Accordingly, the following recommendations combine the empirical findings with insights from the broader literature, Maqasid al-Shariah, and principles of public financial management.

First, OIC countries should improve the efficiency of public expenditure and debt management by prioritising projects with high economic and social returns, reducing inefficient spending, and strengthening debt sustainability and refinancing-risk management. Second, drawing on the broader Islamic finance and Islamic social finance literature, Islamic financial instruments. However, these instruments should not automatically be regarded as debt-free or fiscally costless alternatives. In particular, sukuk may create repayment obligations and other financial liabilities depending on their contractual structure and the nature of the issuing entity, and may therefore affect public-sector indebtedness and fiscal risk. Accordingly, sukuk issuance should be incorporated into comprehensive debt sustainability and fiscal-risk assessments. Waqf may provide non-debt-based support for healthcare infrastructure and services in specific institutional contexts, while zakat may support healthcare-related needs only for beneficiaries who meet the relevant Shari'ah eligibility requirements. Zakat should therefore not be treated as a general source of government revenue for financing the entire public healthcare system. Its potential contribution depends on the applicable Shari'ah interpretations, national legal frameworks, and the institutional capacity of zakat organisations to collect, administer, distribute, and monitor funds transparently. Appropriate regulatory frameworks, transparency mechanisms, and Shari'ah-compliant governance structures are therefore necessary to ensure that these instruments are used effectively and that their long-term fiscal implications are properly assessed.

It is also important to distinguish the roles of these financing mechanisms rather than treating them as interchangeable alternatives. Government borrowing is a general fiscal financing instrument that enables the state to mobilise resources for public expenditure, but it creates repayment obligations and may increase public-sector debt and future debt-servicing costs. Social sukuk is a market-based financing instrument that can mobilise private and institutional capital for socially beneficial projects, including healthcare, but may also involve periodic payments, principal repayment, and other financial obligations depending on its contractual structure. Waqf represents a charitable endowment mechanism that may provide long-term, non-debt-based support for healthcare infrastructure and services, subject to its institutional governance. Zakat, by contrast, is primarily a redistributive mechanism subject to Shari'ah-defined beneficiary categories and therefore cannot generally be treated as unrestricted government revenue. In healthcare, zakat may support the medical needs of eligible beneficiaries, whereas waqf may support longer-term healthcare assets and services. These mechanisms should therefore be viewed as institutionally distinct and potentially complementary, with their appropriate use depending on the nature of the expenditure, beneficiary eligibility, contractual obligations, and the applicable legal and Shari'ah frameworks.

Third, fiscal policy should incorporate an intergenerational responsibility perspective by balancing immediate social and health needs with the preservation of long-term fiscal space. The objective should not be to eliminate all borrowing, but rather to ensure that borrowing is

used productively and remains consistent with long-term fiscal dynamics. Fourth, based on established principles of fiscal risk management and the broader literature on crisis financing, strengthening fiscal buffers and developing effective emergency financing mechanisms may help governments maintain essential public services during future crises without generating excessive fiscal instability. Islamic financial mechanisms may potentially contribute to such crisis-response frameworks.

Finally, transparency, accountability, and effective public financial management remain essential for sustainable fiscal governance. Strengthening fiscal reporting, expenditure monitoring, and institutional oversight can improve the efficiency of resource allocation, reduce opportunities for mismanagement and corruption, and enhance public confidence. Overall, the empirical findings, together with the broader literature and the Islamic economics framework, support the need for a balanced fiscal approach that protects essential social priorities while maintaining long-term fiscal dynamics and reducing the risk of excessive fiscal pressures being transferred to future generations.

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## **DECLARATION**

### **Credit Authorship Contribution Statement**

The authors contributed equally and collaboratively to this research. Both authors were involved in all stages of the study including conceptualization, literature review, methodology design, data analysis, results interpretation, writing, and revision of the manuscript. The work represents a fully joint effort, and both authors approve the final version of the paper.

### **Declaration of Competing Interests**

The authors declare that they have no known competing financial interests or personal relationships that could have influenced the work reported in this paper.

### **Ethical Statement**

The authors confirm that they understand the publication ethics and malpractice statement and have fully adhered to all ethical requirements. This study is original and has not been published or submitted for publication elsewhere.

### **Data Availability**

Not Applicable

### **Disclaimer**

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