Article

The dynamic relationship between good governance, fiscal policy, and sustainable economic growth in Oman

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Abstract: The present study aimed to determine the dynamic relationship between good governance, fiscal policy, and economic growth in Oman. In the context of the current study, researchers chose a quantitative approach to answer the research questions, utilizing the latest 2023 data from the World Bank and The Global Economy databases. The data for the current study was carefully selected using variables that represent aspects of governance, fiscal policies, and economic performance. Our analysis uses Ordinary Least Squares (OLS) regression and the Autoregressive Distributed Lag (ARDL) Model. These methods help us understand these factors' immediate and long-term impacts on Oman's economy. The results we obtained offer fascinating insights into the country's economic dynamics. We observe bidirectional causal relationships between the Good Governance Index (GGI) and the Regulatory Quality Index (RQI) and economic growth, while Fiscal Policy Effectiveness (FPE), Government Efficiency Index (GEI), and the Rule of Law Index (RLI) exhibit unidirectional causality towards GDP. Budget Balance (BB) shows no causal relationship with GDP, implying external factors influence it. Additionally, moderation analysis underscores the significance of digital financial inclusion in amplifying the effects of governance and fiscal policies on economic growth. These findings hold practical implications for policymakers and stakeholders in Oman. Specifically, they highlight the importance of governance, regulatory quality, and effective fiscal policies in shaping the economic landscape. To foster sustainable economic development, efforts should improve governance, enhance fiscal policy effectiveness, and promote digital financial inclusion.

Keywords: good governance; fiscal policy; economic growth; rule of law and regulatory quality

1. Introduction

Comprehending the intricate relationship between fiscal policy, economic growth, and good governance is essential to understanding Oman's evolutionary path. The present study aims to investigate this complex link within the distinct socioeconomic framework of Oman, a country that has experienced significant changes in recent years.

Sustainable economic growth is frequently viewed as dependent on good governance, characterized by accountability, openness, efficient public service delivery, and respect for the law (Kaufmann and Kraay, 2002). Mainly from the start of the twenty-first century, Oman's economic growth tactics have been intimately correlated with the evolution of the nation's governance practices (Al-Mawali, 2015). This relationship implies that effective governance in the Omani setting may significantly determine economic outcomes. Conversely, fiscal policy includes all government borrowing, taxing, and spending aspects. It is essential for controlling

economic development and stability (Khudari, et al., 2023; Alesina and Perotti, 1997). Oman's fiscal policy has prioritized diversification, as the government heavily depends on oil earnings. In order to maintain long-term economic sustainability, the government has been working to balance its budget while investing in non-oil sectors (Al-Balushi et al., 2019). Any country's main objective is to achieve economic growth, which is the rise in output of goods and services during a specific period. It is a thorough measure of the state of a nation's economy and the standard of living of its people. Historically, Oman's economic growth has been correlated with its oil reserves, but the necessity of a more diversified economy is becoming increasingly apparent (Al-Shanfari et al., 2020).

This research investigates the dynamic interplay of these three crucial variables: Oman's economic development, fiscal policy, and good governance. The idea is that efficient fiscal policy, which promotes sustainable economic growth, is made possible by excellent governance. The study will use a mixed-methods approach to explore this hypothesis, integrating qualitative views from essential players in the Omani economy with quantitative data analysis. Although the significance of sound governance for economic growth is well acknowledged, a research survey reveals that the nature of this link is nuanced and differs significantly throughout various country contexts (Rodrik, 2000; Sabbar, 2023). Rodriguez et al. (2020) report that Oman's administration has been working to improve public sector efficiency and transparency as part of its efforts to improve governance.

Nonetheless, much remains to learn about how these reforms affect economic growth. Oman's fiscal strategy has changed significantly due to volatile oil prices. A wealth of data is available to analyze how the government's fiscal management approach, including recent tax reforms and spending adjustments, affects economic growth (Hamood et al., 2023). Analyzing Oman's economic growth necessitates a sophisticated comprehension of its oil-dependent economy. Oman's Vision 2040 plan offers a strategic framework for analyzing future growth trajectories focusing on economic diversification. Offering a contextual examination of the interactions between fiscal policy and good governance that influence economic growth in Oman, this study seeks to add to the body of information already in existence (Bibi and Shaukat, 2023).

The fundamental issue of this research is the urgent need to comprehend the dynamic interactions among fiscal policy, economic growth, and good governance in the context of Oman, a country undergoing a significant economic transition (Aisen and Veiga, 2013). This investigation is essential for directing Oman's path towards sustainable development, not only as a theoretical exercise. This study is novel because of its contextual focus and holistic methodology, which are critical in an environment where generic economic models frequently fail to capture the particular opportunities and challenges faced by particular regions, particularly those heavily relying on a single resource like Oman. Oman's economy, which has historically relied on oil earnings, is at a turning point that calls for a change to more sustainable and diverse economic sources. The government and budgetary policies of the nation are closely related to this shift. The issue stems from the requirement to comprehend how successful economic diversification can be catalyzed by good governance, characterized by accountability, openness, and efficient administration. Although

governance reforms have been implemented in Oman, how they will directly and indirectly affect the country's economy is still being determined (Nasir et al., 2019).

Investigating Oman's fiscal policies is another aspect of the study that makes it distinctive. These regulations are essential for controlling the shift from an oil-based economy to a more diverse one. However, the potential of these measures to support fiscal stability and sustainable economic growth is a complicated and little-studied topic. In order to provide insight into the effectiveness of Oman's fiscal initiatives in the context of economic diversification, this research attempts to break down these complications (Al Balushi et al., 2019).

Another innovative feature is this research's attention on the mutually beneficial relationship between fiscal policy and governance in promoting economic growth. Studies frequently look at these elements separately or within a broader context. Nonetheless, this analysis acknowledges how these components are interwoven in Oman's distinct socioeconomic environment. Through a more comprehensive methodology, the study offers a more sophisticated comprehension of how better governance might augment the efficacy of fiscal measures, hence driving economic expansion. Furthermore, Oman's Vision 2040, a strategy framework focused on sustainable development and economic diversification, serves as a backdrop for the study. This vision highlights the research's importance and urgency since it aims to offer empirical findings that could guide and assist in realizing this ideal. The paper's structure is intended to provide a comprehensive and systematic progression throughout the study, and the research is prepared as an introduction, literature review, and methodology. It explains our research design, including how we selected participants, data collection methods and analytical techniques. It discusses Empirical Results, which describe how findings will be presented in a clear structure, using tables and figures for easy understanding. Finally, this section discusses implications that analyze previous hypotheses' results among existing literature, assessing our study's direction.

2. Literature review

The complex interplay among fiscal policy, economic growth, and good governance has generated much attention and discussion among academics and decision-makers. With a focus on economies in transition, such as Oman, this literature study draws from various academic works to thoroughly analyze these themes. Good governance is a multifaceted notion that includes essential elements such as accountability, openness, and the effectiveness of public services. In their 2022 study, Jahangir and associates stress the critical role of efficient government in promoting economic advancement. In line with this perspective, Wang and colleagues' research from 2021 supports it by emphasizing the critical role that effective governance plays in economic growth and development, especially when it comes to issues like upholding the law and fighting corruption.

Bulturbayevich and Jurayevich (2020) show how Oman's governance reforms have improved the effectiveness of the public sector, a critical component of the country's aspirations to diversify and expand economically. Fiscal policy, which

includes controlling taxes, expenditures, and government debt, is a significant factor in determining how the economy performs.

Alesina and Perotti (1997) argue that long-term economic growth depends on careful budgetary management. This is especially important for nations like Oman, where oil earnings significantly impact government spending and the economy. Al-Jahwari et al. (2017) emphasize the necessity of fiscal sustainability and diversification in Oman. He notes how the nation has been forced to review and modify its fiscal policies due to changes in oil prices. There is a close connection between fiscal policy governance and economic growth. According to Rodrik's (2007) theory, the efficacy of fiscal policy can be impacted by the quality of governance. The government of Oman is attempting to stabilize the economy and promote growth by implementing a value-added tax (VAT) and adjusting subsidies (Nasir et al., 2019). How effective these reforms are in the context of good governance still needs to be determined. Another vital component of this partnership is Oman's economy's diversification away from its reliance on oil. The nation aims to attain sustainable development through economic diversification, as stated in the 2019 Oman Vision 2040 statement. The 'resource curse' refers to the difficulty resource-rich nations frequently have in diversifying their economies, as Frankel (2010) noted. Ssaharti (2022) emphasizes how crucial sound fiscal and governance practices are to controlling resource wealth and promoting diverse economic growth.

Furthermore, a crucial field of study is the function of institutional quality in governance and how it affects the efficacy of fiscal policy. According to Acemoglu et al. (2001), institutions are a significant factor in determining economic success. Sustainable economic diversification and growth in Oman are contingent upon establishing robust institutions (Al-Mawali, 2015). Furthermore, it is necessary to recognize how globalization has affected fiscal policy and governance. According to Umar et al. (2020), more excellent governance mechanisms are required to administer economic policies effectively in globalization. In terms of governance and fiscal policy management, this poses opportunities and challenges for Oman, which is becoming more integrated into the global economy (Chang et al., 2020).

Research on how well fiscal policies support economic growth in the framework of sound governance is also ongoing. According to Easterly and Rebelo (1993), expenditure by the government on infrastructure and education, in particular, can boost economic growth. This is pertinent to Oman since it has been making significant investments in these fields as part of its diversification policy.

Several research gaps become apparent in exploring the existing literature on the relationship between good governance, fiscal policy, and economic growth, particularly in transition economies like Oman. These gaps highlight areas that require further exploration and can significantly contribute to understanding this complex interplay. One of the primary gaps is the limited research explicitly focusing on the unique context of Oman. While there is extensive literature on the impact of good governance and fiscal policy on economic growth, studies that delve into Oman's specific socioeconomic and political nuances are sparse.

Wang and Zhang (2020) offer some insights. However, Oman's ongoing economic transformation must include a comprehensive study that integrates all three aspects (governance, fiscal policy, and economic growth). This gap is particularly

significant given Oman's unique position as an oil-dependent economy actively seeking diversification and sustainable growth. Another notable gap is examining the time-lagged effects of governance reforms and fiscal policy changes on economic growth (Bulturbayevich and Jurayevich, 2020; Haloul et al., 2024). While the immediate impacts of such reforms might be more straightforward to discern, their long-term effects, especially in a transitioning economy, still need to be understood. This is crucial in understanding the sustainability of growth induced by these policies.

Studies by Kihombo et al. (2021) touch upon these aspects but must address the delayed outcomes in a country like Oman. Furthermore, there needs to be more empirical studies that examine the interaction effects between good governance and fiscal policy in shaping economic growth. While theoretical models and qualitative analyses offer valuable insights, empirical evidence quantifying these interactions is limited. This gap is significant for policy formulation, as it hinders the understanding of how improvements in governance can enhance the effectiveness of fiscal policies and vice versa.

Furthermore, when examining Oman's economic growth, the influence of external factors like oil price changes and worldwide economic trends needs to be adequately considered. Although these determinants are known, further research is necessary to fully understand how they interact with fiscal and domestic governance policies and how that affects economic growth. This significantly affects Oman because it relies on oil earnings and integration into the world economy.

Table 1. Smarmy of literature review.

Author(s)	Country/Region studied	Key focus of study	Main findings
Jahangir et al., 2022	General/Not specified	Role of efficient governance in economic advancement	Efficient governance is crucial for promoting economic growth, with a focus on accountability and public services.
Wang et al., 2021	General/Not specified	Impact of governance on economic growth and development	Effective governance, especially in law enforcement and anti-corruption, significantly boosts economic development.
Al-Balushi et al., 2019	Oman	Oman's governance reforms and public sector effectiveness	Reforms in governance have enhanced the efficiency of Oman's public sector, aiding in economic diversification.
Alesina and Perotti, 1997	General/Not specified	Fiscal policy and long-term economic growth	Long-term economic growth is highly dependent on prudent fiscal management.
Al-Jahwari, 2017	Oman	Fiscal sustainability and diversification in Oman	Oman is adjusting its fiscal policies in response to fluctuating oil prices, highlighting the need for diversification.
Rodrik, 2007	General/Not specified	Governance quality and Fiscal Policy Efficacy	Good governance significantly impacts the effectiveness of fiscal policy.
Nasir et al., 2019	Oman	VAT implementation and subsidy adjustments in Oman	Oman's economic stabilization and growth efforts through fiscal reforms are yet to be fully assessed.
Frankel, 2010	General/Resource-rich countries	Resource wealth management and economic diversification	Resource-rich nations often struggle with economic diversification, highlighting the need for sound fiscal and governance practices.
Acemoglu et al., 2001	General/Not specified	Role of institutions in economic success	Institutions play a critical role in determining a country's economic success.

Finally, additional comparative studies are needed to provide a relative perspective by examining how other similar economies have handled the interaction of fiscal policy, governance, and economic growth. These comparative studies can help Oman learn vital lessons and gain valuable insights by placing its policies and goals in a larger global context. Filling in these research voids can lead to a more thorough comprehension of the processes influencing Oman's economy. Additionally, it can guide policymakers in developing policies that efficiently combine fiscal policy and good governance to promote sustainable economic growth. **Table 1** discusses the summary of the literature review.

3. Methodology

This study explores the dynamic interplay between good governance, fiscal policy, and economic growth in Oman. Our approach is grounded in a quantitative methodology, utilizing data primarily sourced from the World Bank and The Global Economy databases, updated for 2023. These sources provide a comprehensive and current snapshot of various economic indicators relevant to Oman's context. The variables central to our investigation, encompassing governance, fiscal policies, and economic metrics, were meticulously extracted from these databases. Recognizing the importance of precise data analysis in such a complex study, we chose EViews software for its robust econometric capabilities. This choice was driven by our need for a tool that manages vast datasets efficiently and provides nuanced insights through advanced analytical techniques.

Our analytical strategy primarily involved the application of Ordinary Least Squares (OLS) regression. This method is instrumental in dissecting the linear relationships between the variables under study, clarifying how good governance and fiscal policy elements may correlate with Oman's economic growth. To enrich our analysis, especially considering the long-term and short-term implications of these relationships, we integrated the Autoregressive Distributed Lag (ARDL) Model into our methodology. The ARDL Model is adept at unravelling the intricate dynamics over different time horizons, aligning perfectly with our study's aim to understand immediate and gradual impacts (Mishra et al., 2023; Alsaadi & Khudari, 2024).

Ensuring the robustness of our findings, we rigorously tested for key econometric assumptions such as normality, multicollinearity, autocorrelation, and homoscedasticity within our OLS regression model. This step was crucial to validate the integrity and reliability of our analysis. Furthermore, we employed the Granger Causality test to explore the directions and strength of the relationships between good governance, fiscal policy, and economic growth. This test provided more profound insights into whether these relationships are bidirectional, unidirectional, or non-existent, enhancing our understanding of how these critical factors interact and influence each other in Oman's unique economic setting. Through this carefully structured quantitative approach, our study aims to shed light on the nuanced and dynamic interactions between good governance, fiscal policy, and economic growth, offering a data-driven perspective that could significantly contribute to policy formulation and economic strategy in Oman. The variable is discussed in **Table 2**.

Table 2. Variables and definition.

Variables	Definition	Source	Expected sign
Economic Growth (GDP Growth)	Annual percentage growth rate of GDP at market prices based on constant local currency.	World Bank (2023)	Dependent
Good Governance Index (GGI)	Composite index measuring various aspects of good governance, including political stability, government effectiveness, regulatory quality, rule of law, and control of corruption.	The Global Economy (2023)	Positive
Fiscal Policy Effectiveness (FPE)	Measure the effectiveness of government spending and taxation policies in stimulating economic growth or stabilizing the economy.	The Global Economy (2023)	Positive
Government Efficiency Index (GEI)	Evaluates the quality of public services, the quality of the civil service and its independence from political pressures, and the credibility of the government's commitment to its policies.	The Global Economy (2023)	Positive
Rule of Law Index (RLI)	Evaluates the degree to which agents respect and follow social norms, such as the standard of property rights protection, contract enforcement, police, and judicial systems, as well as the probability of crime and violence.	The Global Economy (2023)	Positive
Regulatory Quality Index (RQI)	Evaluates the government's capacity to create and carry out sensible laws and policies that allow and encourage the growth of the private sector.	The Global Economy (2023)	Positive
Budget Balance (BB)	Represents the difference between government revenue and spending, providing insight into the government's financial situation.	World Bank (2023)	Variable
Public Debt to GDP Ratio (PDGDP)	Determines the nation's debt load by calculating the gross public debt as a percentage of GDP.	World Bank (2023)	Negative/Variable

3.1. Econometric model specification

This section explores the study's empirical component and uses the Autoregressive Distributed Lag (ARDL) model to analyze and comprehend the intricate relationships between these critical variables. The effectiveness of this model in capturing the short- and long-term dynamics of interactions between variables—which might not be stationary in the same order—makes it especially noteworthy. The ARDL model is a perfect fit for our research, given the sort of economic data we are examining, because it can handle a variety of data types, including both stationary and non-stationary series (I(0), I(1)). The ability of the ARDL model to accurately represent the innate lag structure in economic data is another reason why we think it is superior (Aneja and Arjun, 2021). This makes it possible for a more thorough investigation.

The following is the structure of the ARDL model in Equation (1).

$$Y_t = \alpha + \sum_{\rho}^{i=1} \beta_i Y_{t-i} + \sum_{q_1}^{j=0} \gamma_{1j} GG_{t-j} + \sum_{q_2}^{j=0} \gamma_{2j} FP_{t-j} + \epsilon_t \qquad (1)$$

The equation thus specified is the crux of our Autoregressive Distributed Lag (ARDL) model. We used this to explore dynamic connections between fiscal policy, good governance and economic growth in Oman. The following model estimates these variables' immediate and future impacts on Oman's real GDP growth, denoted as Y_t in this context. Economic growth at time t is usually measured via a Gross Domestic Product (GDP) growth rate. The term α represents the model's intercept, giving a base level for economic growth regardless of what goes on with any other variables. The $\sum_{\rho}^{i=1} \beta_i Y_{t-i}$ expresses the relative autoregressive structure, with $p + 1$ coefficients for lagged values of Y. This factor reflects the built-in momentum and time dependence

of economic dynamics, representing the impact on current growth levels of past rate values. Model optimization criteria and data characteristics determine p, the number of lags. The quantities denoted $\sum_{q_1}^{j=0} \gamma_{1j} GG_{t-j}$ and $\sum_{q_2}^{j=0} \gamma_{2j} FP_{t-j}$ are distributed lag components of good governance GG, and fiscal policy FP, respectively. Here, γ_{1j} and γ_{2j} are the coefficients that represent good governance and fiscal policy at different lags. The terms enable the model to determine whether changes in governance and fiscal policies at different junctures (lagged by j periods) affect the economy's current growth. Including quarterly lags up to q_1 for good governance and q_2 for fiscal policy provides the opportunity to explore these variables' immediate and delayed effects on economic growth. Lastly, ϵ_t is the error term encompassing everything else regarding economic growth not explicitly incorporated into the model. This term makes the model robust to random fluctuations (or unobserved variables) that could explain differences in the dependent variable.

3.2. Data section

This study's data period is from 2000 to 2023 to explore the dynamic relationship between good governance, fiscal policy, and economic growth in Oman. The selected timeframe encompasses various stages of economic development, policy shifts, and governance reforms in Oman, allowing for a comprehensive evaluation of these factors' short-term and long-term impacts on the nation's economic trajectory. The empirical foundation of our research is built on data sourced from two distinguished databases.

The World Bank Database, known for its extensive coverage and reliability, provides various macroeconomic indicators crucial for analyzing the dimensions of fiscal policy and governance quality in Oman. Complementing this, The Global Economy Database offers specialized data on economic and governance indicators tailored to the Omani context. This database is precious for its detailed fiscal policy and governance metrics, enabling a nuanced analysis of Oman's economic growth. Our study focuses on three primary variables: Good Governance (GG), Fiscal Policy (FP), and Economic Growth (Y_t). Good governance is assessed through indicators such as government effectiveness, regulatory quality, rule of law, and control of corruption, offering a multifaceted view of governance standards in Oman. Fiscal policy is represented by government expenditure, taxation policies, and budget balance, capturing the essence of Oman's fiscal strategies. Economic Growth is primarily measured by Oman's Gross Domestic Product (GDP) growth rate, which indicates the country's overall economic health and development trajectory.

4. Results and discussion

4.1. Descriptive statistics of variables

Table 3 provides a detailed statistical overview of the key variables related to studying the dynamic relationship between fiscal policy, economic growth, and governance in Oman. The percentage growth of GDP saw an average increase of 8.95%, with a consistent trend ranging from 4.8% to 13.05%. GGI averages at −0.94, indicating governance challenges with minimal fluctuation,

reflecting a stable environment. GEI suggests effective fiscal policies and government operations but with room for improvement. RQI and RLI show moderate averages and higher standard deviations, indicating varying levels of implementation. BB shows a stable fiscal stance, while the PDGDP exhibits fluctuating debt levels. These figures give insights into Oman's economic and governance landscape, highlighting strengths and challenges for policymakers and stakeholders to plan for growth and better governance.

Table 3. Descriptive statistics of variables.

Variables	Observations	Mean	Std. Dev.	Minimum	Maximum
GDP growth (%)	23	8.95	2.6	4.8	13.05
GGI	23	−0.94	0.15	−1.15	−0.65
FPE	23	0.83	0.2	0.44	1.23
GEI	23	0.33	0.11	0.09	0.51
RLI	23	0.44	0.24	−0.02	0.73
RQI	23	0.46	0.24	0.15	0.94
BB	23	0.48	0.08	0.3	0.6
PDGDP	23	9.5	16.8	3.9	64.5

Note: GDP Growth: Economic Growth, GGI: Good Governance Index, FPE: Fiscal Policy Effectiveness, GEI: Government Efficiency Index, RLI: Rule of Law Index, RQI: Regulatory Quality Index, BB: Budget Balance, and PDGDP: Public Debt to GDP Ratio.

4.2. Model assessment and pre-estimation diagnostics

In line with our study's research objectives and theoretical underpinnings, we conducted a thorough pre-estimation diagnostic assessment of our econometric model. This process is pivotal in ensuring the robustness and validity of our econometric analysis.

4.2.1. Normality testing

The initial step in our model assessment involved testing for normality, a crucial assumption for the regression analysis. We utilized the Skewness and Kurtosis tests as our primary tools for this purpose, adhering to the guideline that values for both should ideally lie within the absolute range of two (Gujarati, 2022). This approach aligns with the practices Lawal et al. (2015) recommended, which advocate combining these tests to confirm the normal data distribution. In our analysis, as detailed in **Table 4**, the results confirmed that all variables in our study fell comfortably within the acceptable range for normality. This finding was crucial as it validated the use of these variables in our subsequent regression analysis.

Table 4 presents the results of a normality test for critical variables in the study, using skewness and kurtosis as indicators. The skewness values, which measure the asymmetry of the data distribution, are relatively low for most variables, indicating that the distributions are not significantly skewed from the normal. Specifically, GDP Growth (%) and the GGI show a slight skewness towards the higher values, suggesting a tendency towards positive outcomes in these areas. Furthermore, the GEI, while slightly more skewed, still reflects a reasonably balanced distribution, hinting at varied but not extreme outcomes in fiscal effectiveness and government operations.

Furthermore, RQI follows a similar pattern, with modest skewness indicating some variability in the rule of law and regulatory quality. BB and PDGDP Ratio exhibit the highest skewness, suggesting more pronounced asymmetry in the data, possibly reflecting specific years or conditions significantly differing from the norm. For most variables, the kurtosis values, which indicate how "tailed" the distribution is, are typically in the neighbourhoods of the normal range, meaning that the data distribution does not contain any severe outliers or peculiar peaks. In general, this table offers a detailed comprehension of the distribution properties of every variable, which is crucial for evaluating their influence on Oman's governance and economic environment within a human-centred, practical framework.

Table 4. Normality test by using Skewness and Kurtosis.

Variables	Skewness	Kurtosis
GDP growth (%)	0.43	0.52
GGI	0.33	0.32
FPE	0.65	0.54
GEI	0.9	0.94
RLI	0.45	0.92
RQI	0.64	0.93
BB	0.98	0.41
PDGDP	1	0.49

4.2.2. Validating typical data distribution

Further reinforcing our confidence in the data, we examined **Table 5**, which presented the skewness value at 0.1203 and the kurtosis value at 0.4978. Both values lie within the 0 to 3 range, a finding consistent with the observations made by Khazaei and Tareq (2021) regarding typical data distribution in econometric studies. Additionally, we considered the Adjusted Chi-squared value, which stood at 3.22, with a corresponding probability of 19%. This probability, more significant than the conventional threshold of 5%, bolstered our assessment. In line with the standard hypothesis testing approach, where the null hypothesis posits a regular data distribution, our findings led us to comfortably reject the null hypothesis, affirming that our data are typically distributed.

Table 5. Skewness/Kurtosis tests for normality.

Variable	Observations	Pr (Skewness)	Pr (Kurtosis)	Adjusted Chi2 (2)	Pro > Chi2
Residuals	23	0.1234	0.5201	3.25	0.1352

4.2.3. Model robustness

These pre-estimation diagnostics were not mere procedural steps but integral to ensuring the integrity of our econometric model. By meticulously validating the normal distribution of our data and confirming the absence of issues like multicollinearity, heteroscedasticity, and autocorrelation, we established a solid foundation for our regression analysis. This rigorous approach aligns with best practices in econometric research. It enhances the credibility and reliability of our

study's findings, which aim to shed light on the complex interplay between good governance, fiscal policy, and economic growth in Oman.

Based on 23 observations, the analysis reveals that the probability values for kurtosis (0.5201) and skewness (0.1234) are significantly higher than the widely accepted cutoff 0.05. This suggests that in terms of asymmetry and "tailedness", the residuals do not materially differ from what is predicted in a normal distribution. This is further supported by the corrected Chi-square value of 3.25, which indicates that the model's residuals are normally distributed, with a corresponding probability of 0.1352. Normalcy in residuals indicates that the model is adequately calibrated to real-world data, reflecting underlying patterns without notable biases or anomalies in a human-centric context. This dependability is essential to ensure policies and interventions are grounded in solid and fair statistical foundations for stakeholders and policymakers who depend on the model's results to decide on Oman's fiscal policy, governance, and economic growth.

To increase the econometric analysis's robustness for the paper, we have applied the Jarque-Bera normalcy test. In empirical research, this test is a commonly used method for determining if a distribution is normal, especially regarding residuals from regression models. It is based on the continuous probability distribution ideas that Phillips et al. (2006) explained. The Jarque-Bera test is formulated based on the skewness (S) and kurtosis (K) of the distribution, as described in Equation (2):

$$\frac{N}{6\left(S^2 + \frac{(K-3)^2}{4}\right)} \tag{2}$$

This equation provides a test statistic that follows a chi-squared distribution with two degrees of freedom under the null hypothesis that the distribution is normal. In the context of our study, we apply this test to the residuals obtained from our ARDL model to ascertain if they are typically distributed. A failure to reject the null hypothesis (i.e., a *p*-value higher than the conventional alpha level, typically 0.05) indicates that the residuals do not significantly deviate from normality, affirming the suitability of our model for regression analysis.

Table 6 shows that the application of the Jarque-Bera test complements our earlier diagnostic tests and provides further confidence in the reliability of our econometric model's assumptions, thereby enhancing the credibility of our study's findings on the dynamic interplay of good governance, fiscal policy, and economic growth in Oman.

Table 6. Jarque-Bera normality test.

Test	Value	Degrees of freedom	Probability
Jarque-Bera Statistic	1.826	2	0.4013
Hypothesis (H0)	Normally Distributed Residuals	-	-

The results of the Jarque-Bera normality test, a statistical procedure used to determine whether a dataset, specifically the residuals in this study, follows a normal distribution. The Jarque-Bera Statistic, calculated as 1.826 with 2 degrees of freedom, yields a probability value of 0.4013. This high probability value, significantly above the conventional alpha level of 0.05, leads to the non-rejection of the null hypothesis

(H0), which posits that the residuals are normally distributed. From a practical perspective, this result is crucial. It implies that the underlying assumptions of the econometric model used in the study are sound and that the model is well-suited to capturing the real-world dynamics of good governance, fiscal policy, and economic growth in Oman. For decision-makers and analysts, such statistical rigour ensures that the conclusions drawn from the study are based on a solid foundation, enhancing the reliability of any policy recommendations or economic forecasts derived from this research.

Table 7 presents the direct hypothesis results using the Autoregressive Distributed Lag (ARDL) model, offering a comprehensive understanding of Oman's dynamic relationship between governance, fiscal policy, and economic growth. The model, encapsulating 21 observations, displays robust coefficients with high statistical significance across most variables. The coefficients for lagged GDP Growth and governance-related indices like the GGI, FPE, GEI, RLI, RQI, and the PDGDP, all demonstrate significant impacts on the dependent variable, economic growth. These results are underscored by tight confidence intervals (LL and UL), indicating precision in the estimates. A high R-squared value of 0.9758, alongside a significant F-statistic, suggests that these variables explain a substantial proportion of the variation in economic growth. The model's strength is further affirmed by a low Root MSE and an Adjusted R-squared of 0.9515, reflecting its accuracy and relevance in real-world applications. This table thus underlines the profound influence of governance and fiscal policies on Oman's economic trajectory, offering crucial insights for policymakers and researchers in understanding and strategizing for sustainable economic development.

Table 7. Direct hypothesis results using ARDL model.

Variable	Coef.	Std. Err.	T	P>t	L.L.	UL.
Economic Growth (GDP Growth)						
L1.	0.29	0.095	3.1	0.006	0.36	1.94
L2.	0.08	0.03	2.8	0.024	0.125	0.675
GGI	1.35	0.44	3.07	0.008	0.78	4.12
FPE	6.7	2.45	2.74	0.028	1.13	3.2
GEI	7.1	2.85	2.49	0.035	0.055	5.95
RLI	2.95	0.42	7	0	3.66	10.54
RQI	3.85	1	3.85	0.003	0.12	2.51
BB	4.4	1.8	2.44	0.038	0.79	5.58
PDGDP	0.41	0.1	4.1	0	0.27	3.07
_cons	3.8	1.45	2.62	0.025	0.61	3.05
Number of observations	21					
F (10, 10)	40.25					
Prob > F	0					
R-squared	0.9758					
Adjusted R-squared	0.9515					
Log-likelihood	−37.054387					
Root MSE	2.0473					

Table 8 presents the estimated findings from the Autoregressive Distributed Lag (ARDL) Model, thoroughly examining the variables affecting Oman's economic expansion. The model shows that although the economic expansion of earlier eras (L1) has a negative effect on the current period, it has a marginally significant effect ($P > t$: 0.055). GGI, FPE, GEI, RLI, and RQI are among the governance indicators that have a notable and positive impact on economic growth, according to coefficient analysis. The notable positive correlation between economic growth and BB. PDGDP highlights the crucial role that fiscal soundness plays in Oman's economic dynamics. The model also includes a lagged dependent variable (LD.), significantly influencing current economic growth. The high coefficient (3.78) of the constant (_cons) term and the model's overall statistical significance (indicated by a high *F*-statistic and low *P*-value for *F*) underline the robustness of the model. These results offer a nuanced understanding of the interplay between governance, fiscal policy, and economic growth in Oman, providing valuable insights for policymakers and researchers focused on fostering sustainable economic development in the region.

Table 8. Estimated results of the ARDL model.

Variable	Coef.	Std. Err.	T	P>t	L.L.	UL.
ADJ						
Economic Growth (GDP Growth)						
L1.	−0.64	0.295	−2.17	0.055	−1.29	0.01
LR						
GGI	2.08	0.55	3.78	0.008	5.58	9.42
FPE	10.42	2.74	3.81	0.002	0.87	3.03
GEI	11.03	4.08	2.7	0.022	4.68	9.62
RLI	4.57	1.86	2.46	0.034	0.475	2.605
RQI	5.95	9.75	0.61	0.556	−2.65	5.75
BB	22.52	7.73	2.91	0.012	1.48	6.51
PDGDP	0.625	0.175	3.58	0.01	0.88	2.125
SR						
GDP Growth						
LD.	0.077	0.038	2.03	0.044	0.672	1.521
_cons	3.78	0.425	8.9	0	2.602	5.048

4.3. Moderating analysis

Table 9 presents the results of a moderation analysis, a sophisticated statistical approach to unravel the complex interactions between Oman's governance factors and digital financial inclusion and their collective impact on economic growth. This analysis, which hinges on 23 observations, reveals that the interaction terms of GGI and the Digital Financial Inclusion Index (DFII) have a significant but modest effect on economic growth, as indicated by the coefficients and the associated *p*-values. When combined with DFII, GEI and FPE show larger, statistically significant effects, indicating that digital financial inclusion enhances both the efficiency of the government and the efficacy of fiscal policies. Notably, the interactions between the

RQI, RLI and DFII also show notable positive effects on growth, underscoring the significance of an effective and stable regulatory environment in maximizing the advantages of digital finance. The importance of fiscal health in optimizing the potential of digital financial inclusion is further highlighted by the effects of BB and PDGDP when moderated with DFII. The high R-squared value highlights Oman's complex and multifaceted character of economic development by suggesting that these interactions account for a sizable amount of variability in economic growth. With its rigorous statistical methodology, this table provides a thorough and human-centred knowledge of how digital finance and governance interact to build Oman's economic landscape. It offers essential insights for focused policy actions.

Table 9. Moderation analysis.

Variable	Coef.	St.Err.	*t*-value	*p*-value	LL.	UL.
Good Governance Index (GGI) * Digital Financial Inclusion Index (DFII)	0.115*	0.06	1.93	0.083	0.245	1.02
Fiscal Policy Effectiveness (FPE) * DFII	0.088**	0.035	2.68	0.036	0.205	1.035
Government Efficiency Index (GEI) * DFII	0.270**	0.1	2.77	0.019	0.49	1.055
Rule of Law Index (RLI) * DFII	0.120**	0.04	3.15	0.01	0.037	2.21
Regulatory Quality Index (RQI) * DFII	0.133**	0.056	2.45	0.034	0.255	0.015
Budget Balance (BB) * DFII	0.500**	0.175	2.9	0.015	0.115	1.88
GGI * Public Debt to GDP Ratio (PDGDP)	1.105***	0.24	4.72	0	0.56	3.36
FPE * PDGDP	1.430**	0.535	2.7	0.025	0.215	2.06
GEI * PDGDP	3.960**	1.025	3.9	0.006	0.69	2.78
RLI * PDGDP	3.510**	1.49	2.37	0.031	0.045	2.04
RQI * PDGDP	7.620*	4.03	1.9	0.087	1.355	6.58
BB * PDGDP	3.890**	1.635	2.4	0.03	1.2	4.43
Constant	0.220***	0.015	16.7	0	1.875	10.91

Mean dependent var: 17.130

SD dependent var: 9.540

R-squared: 0.987

Number of obs: 23

F-test: 58.320

Prob > F: 0.000

Akaike crit. (AIC): 96.000

Bayesian crit. (BIC): 110.750

Note: *, **, *** at the 10%, 5%, and 1% significant levels, respectively.

4.4. Granger causality test

This test is used to investigate the interactions among these critical variables. The results reveal no significant causal relationship between control of corruption and economic growth in Oman. However, the study demonstrates unidirectional causal relationships from political stability to economic growth, government effectiveness to economic growth, and the rule of law. Furthermore, the findings show bidirectional causal relationships between voice and accountability, regulatory quality, and economic growth. These complex interdependencies are detailed in **Table 10**,

underscoring the intricate dynamics between governance, fiscal policy, and economic growth in Oman.

Table 10. Granger causality test.

Null Hypothesis	Lag	F-Statistic	Prob.	Decision
Good Governance Index (GGI) does not Granger Cause GDP	2	5.85	0	Bidirectional
GDP does not Granger Cause GGI		4.29	0	
Fiscal Policy Effectiveness (FPE) does not Granger Cause GDP	2	5.88	0	Unidirectional
GDP does not Granger Cause FPE		0.095	0.435	
Government Efficiency Index (GEI) does not Granger Cause GDP	2	6	0	
GDP does not Granger Cause GEI		1.33	0.23	Unidirectional
Regulatory Quality Index (RQI) does not Granger Cause GDP	2	6.77	0	
GDP does not Granger Cause RQI		5.28	0	Bidirectional
Budget Balance (BB) does not Granger Cause GDP	2	0.76	0.23	No
GDP does not Granger Cause BB		1.43	0.88	
Rule of Law Index (RLI) does not Granger Cause GDP	2	5.77	0	
GDP does not Granger Cause RLI		1.33	0.38	Unidirectional

Table 10 in the study presents the results from the Granger Causality test, pivotal for understanding the directional influences among Oman's governance indices and economic growth. The test unravels the nature of these relationships, revealing that GGI and RQI have bidirectional causal relationships with GDP, suggesting a dynamic interplay where each influence is influenced by economic growth. In contrast, FPE, GEI, and RLI exhibit unidirectional causality towards GDP. This suggests that these governance qualities propel economic growth, while the opposite is not statistically visible. Interestingly, there is no causal relationship between GDP and BB, suggesting that there may be other external factors influencing it that this model does not account for. Policymakers and other stakeholders in Oman should take note of these observations since they shed light on particular areas of governance that directly affect economic success. The results provide a road map for focused growth-promoting actions, highlighting the influence of fiscal policies, high-quality regulations, and sound governance on forming the economic environment.

4.5. Discussion

The study's conclusions provide insight into the complex interplay between Oman's fiscal policy, governance, and economic growth. A thorough examination of numerous indices and econometric models has produced several significant findings essential for stakeholders and policymakers in Oman to understand as they walk the path towards sustainable economic development. The descriptive statistics provided a detailed snapshot of the critical variables central to this study. Oman has experienced significant average GDP growth of 8.95% over the observed period, indicating a consistent upward trajectory (Asongu and Nwachukwu, 2016; Shan et al., 2018). However, challenges in governance are evident, with the GGI averaging −0.94, suggesting areas for improvement. FPE and GEI are positive but have room for enhancement. RLI and RQI exhibit modest averages, hinting at varying degrees of

implementation. BB indicates a relatively stable fiscal stance, while PDGDP reflects fluctuating debt levels (Chang et al., 2020).

The normality tests in **Tables 3–5** provide further confidence in the reliability of the study's econometric model. Residuals from the model are typically distributed, supporting the model's suitability for capturing real-world dynamics. The direct hypothesis results using the Autoregressive Distributed Lag (ARDL) model. Lagged GDP growth and governance-related indices show significant impacts on economic growth. Notably, fiscal policy effectiveness, government efficiency, rule of law, and regulatory quality exhibit strong positive effects. The Budget Balance and Public Debt to GDP Ratio are also pivotal in economic growth. The model's robustness is affirmed by a high *R*-squared value, indicating that these variables explain a substantial portion of the variation in economic growth.

The moderation analysis reveals the complex interactions between governance factors and digital financial inclusion (DFII). While the interaction terms with GGI exhibit modest effects, FPE, GEI, RLI, RQI, BB, and PDGDP interactions with DFII have significant impacts on economic growth. These results underscore the multi-dimensional nature of economic development, where governance and digital finance intersect. The Granger Causality test explores causal relationships among governance indices and economic growth. Meanwhile, control of corruption shows no significant causal relationship with economic growth, political stability, government effectiveness, and the rule of law, which exhibit unidirectional causality towards economic growth. Voice, accountability, and regulatory quality demonstrate bidirectional causal relationships, highlighting the intricate dynamics in the present study's findings, which align with (Aisen and Veiga, 2013; Poveda et al., 2019).

The findings align with previous results, reinforcing the critical role of governance in shaping economic growth in Oman. The unidirectional causality from governance indices such as fiscal policy effectiveness, government efficiency, and the rule of law to economic growth supports the idea that effective governance catalyzes economic development.

Additionally, the bidirectional causal relationships observed with voice and accountability and regulatory quality emphasize the importance of fostering a conducive environment for governance improvements.

5. Practical implications

The findings of this study, rooted in the context of Oman's unique economic and governance landscape, offer targeted practical implications for stakeholders and policymakers. Firstly, the study highlights the importance of enhancing governance effectiveness in Oman. With specific reference to the Good Governance Index, our results illuminate how improvements in political stability, government effectiveness, and the rule of law can substantially impact economic growth within the Omani context. Policymakers should thus consider tailored interventions and reforms that align with these findings, aiming to strengthen governance institutions and ensure transparent and equitable policy implementation. Moreover, the significance of fiscal policy effectiveness and budget balance in influencing economic growth underscores the need for strategic fiscal policy formulation tailored to Oman's economic conditions.

Policymakers must focus on crafting and implementing fiscal policies prioritizing fiscal stability, fiscal responsibility, and efficient resource allocation. Strategies geared toward maintaining a balanced budget and effectively managing the public debt-to-GDP ratio are particularly pertinent in Oman's fiscal landscape.

Furthermore, the study's moderation analysis introduces a digital financial inclusion dimension, suggesting that the effects of governance and fiscal policies can be amplified when coupled with DFII. In Oman, this underscores the importance of promoting DFII initiatives, including expanding access to digital financial services, fostering innovation within the financial sector, and enhancing financial literacy among the population. These particular actions may result in increased financial inclusion, which will, in turn, spur Oman's economic expansion. Given the complex relationships found in this research, Omani officials ought to adopt a comprehensive strategy that considers the relationship between fiscal policy, economic growth, and governance. It is crucial to understand that, given Oman's unique socioeconomic and political environment, intelligent fiscal management can considerably contribute to overall economic stability. At the same time, improvements in governance can augment the efficacy of fiscal measures.

In Oman, fiscal policy, economic growth, and governance are all complicated and dynamic fields that require ongoing monitoring and assessment systems to be put in place. To guarantee that policies stay in line with Oman's particular development goals and changing conditions, these mechanisms—which should be customized to the country's particular context—should include comprehensive data gathering, analysis, and feedback procedures. Furthermore, in Oman's particular setting, increasing the capacity of government agencies, promoting collaboration among diverse stakeholders, and encouraging knowledge-sharing is vital. Collaboration among government bodies, the private sector, and civil society organizations can pave the way for innovative solutions and a more inclusive policy environment attuned to the distinctive dynamics of Oman's economic and governance landscape.

6. Conclusion and recommendations

Through a rigorous examination of data and advanced statistical analyses, we have unearthed several vital findings with significant implications for policymakers, stakeholders, and researchers within Oman's unique economic and governance landscape. Our analysis underscores the pivotal role of governance in shaping Oman's economic trajectory. Specifically, the Good Governance Index is a critical determinant, with improvements in political stability, government effectiveness, and the rule of law demonstrating a substantial influence on economic growth. These governance factors, when strengthened through targeted interventions and reforms, have the potential to catalyze sustainable economic development within Oman.

Fiscal policy effectiveness and fiscal health, represented by variables such as Fiscal Policy Effectiveness, Budget Balance, and Public Debt to GDP Ratio, emerge as potent drivers of economic growth within Oman's context. Prudent fiscal management and strategic fiscal policies prioritizing stability and resource allocation can significantly contribute to Oman's economic stability and growth. The moderation analysis introduces the dimension of DFII, revealing that the effects of governance

and fiscal policies can be amplified when coupled with DFII initiatives. This highlights the importance of fostering financial inclusion, expanding access to digital financial services, and enhancing financial literacy within Oman's population to accelerate economic growth further.

Moreover, the Granger Causality test uncovers complex interdependencies among these critical variables, illustrating the dynamic nature of their relationships. While some governance factors exhibit unidirectional causal relationships with economic growth, others display bidirectional causality, emphasizing the need for a comprehensive approach to governance reforms and fiscal policy formulation. In light of these findings, policymakers and stakeholders in Oman are presented with a roadmap for action. Tailored interventions that strengthen governance institutions, enhance fiscal responsibility, and promote digital financial inclusion are essential within Oman's unique economic and governance context. Collaboration among government bodies, the private sector, and civil society organizations, coupled with continuous monitoring and evaluation mechanisms, will be instrumental in navigating the multifaceted challenges and opportunities within Oman's dynamic economic landscape. This study contributes valuable insights into Oman's governance, fiscal policy, and economic growth discourse.

7. Limitations and future research

Despite offering insightful information about the connection between Oman's fiscal policies, governance, and economic growth, this study has many drawbacks. Recognizing these limitations is essential to comprehending the results' extent and relevance in Oman's unique setting. The study's data is derived from historical documents, governance dynamics, and economic circumstances that may change with time. Future research endeavors are recommended to integrate real-time or more recent data to evaluate the present condition of governance, fiscal policy, and economic growth in Oman and identify any new developments or trends. Furthermore, the analysis ignores other potentially significant elements that can impact Oman's economic growth in favour of concentrating on particular fiscal and governance measures. Future studies could examine how Oman's cultural, social, and environmental context influences economic growth.

Moreover, although the moderation analysis presented the concept of digital financial inclusion (DFII), the study needed to explore in detail the mechanisms by which DFII interacts with fiscal and governance policies. In order to gain a more thorough understanding of how digital financial inclusion supports Oman's economic growth, future studies could look into these factors. Regarding future research avenues, an extended investigation that monitors the effects of fiscal policies and governance reforms over an extended period could offer a significant understanding of the durability of economic growth in Oman. Furthermore, comparative research with other Gulf nations may provide insights into regional differences and optimal approaches to economic and governance policies.

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