



Financial Inclusion, Institutions and Tax Revenue Performance in Middle East and North African (MENA) Countries

Mohammed Aminu Yaru ^{*a} , Umar Faruq Abdullahi^a, Ismail Aremu Muhammed^b and Sikiru Olumuyiwa Ibrahim^c

a. Department of Economics, Faculty of Social Sciences, University of Ilorin, Ilorin Nigeria.

b. School of Business and Economics, Universiti Brunei Darusalam, Brunei Darusalam.

c. Department of Economics, Faculty of Social Sciences, University of Ilorin, Ilorin, Nigeria and Department of Economics, Ladoke Akintola University of Technology, Ogbomoso, Nigeria.

Highlights

- Financial inclusion has positive impact on tax revenue performance in MENA Countries.
- The marginal impact of improved financial inclusion on tax revenue performance diminishes as governance institutions improve, particularly political stability and absence of violence.

Article History

Received: 01 January 2026

Revised: 01 July 2026

Accepted: 26 July 2026

Published: 02 October 2026

JEL Classification

F53, F55, G21, G2, H24, H25

Keyword

Financial Inclusion, Governance Institutions, Tax Revenue, Middle East and North Africa

Abstract

Many countries in the Middle East and North Africa (MENA) are struggling with common problems, particularly low tax revenue performance, financial exclusion and poor quality of governance institutions. Despite the persistence of these challenges, empirical studies on the impact of financial inclusion and institutional quality on tax revenue performance with an exclusive focus on MENA countries are uncommon. This study used a panel dataset of 11 MENA countries for the period from 2004 to 2022 and a dynamic panel model with system GMM estimation technique to examine the effects of financial inclusion and governance institutional quality on tax revenue performance. The findings revealed that financial inclusion has a positive and significant effect on tax revenue performance. However, the positive marginal effect of financial inclusion tends to diminish with improvement in the governance institutional quality. The study concludes that improving institutional quality, particularly those that will enhance political stability and reduce incidences of violence, will help in unlocking the tax revenue potential of MENA countries. This is particularly important in countries where problems of poor institutional quality are more serious. Overall, the study offers insights for policymakers interested in maximizing the potential benefits of financial inclusion in enhancing tax revenue performance.

1. Introduction

Taxes are primary sources of government revenue. The volume of revenue a government can mobilise largely determines the extent to which it can fulfill its fundamental obligations to citizens such as provision of public services, security of life and property, building of physical infrastructures and other public investments

* yaru@unilorin.edu.ng; yaruaminu@yahoo.com

DOI: <https://doi.org/10.22099/ijes.2026.55394.2096>



necessary for economic growth and general wellbeing of the people (Mahdavi, 2008; Abiola & Asiweh, 2012; Appah & Eze, 2013; Kassim, 2016). Despite efforts to bolster taxation and diversify their revenue sources and progress made, most MENA countries are characterised by low tax revenue performance. The Tax-to-Gross Domestic Product (GDP) ratios for many of the countries in the MENA are below the global average. For example, in 2011, total revenue raised from taxes as a percentage of GDP amounted to 16.4% and 23.3% in Lebanon and Morocco, respectively. In 2020, these figures had plummeted to 8.9% and 20%, respectively. And as a region, MENA's tax-to-GDP ratio averaged 10.85%, which is low compared to the EU (35.54%), sub-Saharan Africa (17.01%), and 11.77% for South Asia (Burkhardt & Tosun, 2020).

Most countries in the MENA region are also trailing peers in other regions in financial inclusion (Pengyu et al., 2025). For instance, Fouejieu et al. (2020) showed that in 2017, only 43% of adults in MENA countries held accounts with recognised financial institutions. This figure was low when compared with that of Latin America and the Caribbean (52%) and Emerging and Developing Asia (53%), though higher than sub-Saharan Africa (30%). In Africa, North Africa ranked the lowest in financial inclusion when compared with other sub-regions on the continent, with about 20% of adults having a formal bank account, compared with Southern Africa, with 51% (Pengyu et al., 2025). In addition to low financial inclusion, persistence of poor quality of governance institutions, as suggested by various indicators in the World Development Indicators (WDI) published by the World Bank over the years, is also a matter of serious concern in MENA countries. The quality of governance institutions is gauged by six indicators, which are: government effectiveness, rule of law, control of corruption, regulatory quality, political stability and absence of violence, and voice and accountability (WDI, various Years).

Financial inclusion and quality of governance institutions have identified by both theoretical and empirical studies as important determinants of overall economic performance and tax revenue mobilisation (Schumpeter, 1934; Ajaz & Ahmad, 2010; Acemoglu & Robinson, 2012; Kilishi et al., 2013; Drif & Rawat, 2018; Dramane, 2022; Yaru & Raji, 2022; Anjarwi, 2025; Timba et al., 2026). Thus, the prevalence of low financial inclusion alongside poor governance institutional quality in most of the MENA countries might have some implications for tax revenue mobilisation. Financial inclusion and quality of governance institutions could interact complementarily or counteractively in influencing tax revenue outcomes through multitudes of mechanisms. Financial inclusion can stimulate economic activities, increase formal transactions among individuals and firms, encourage savings, promote business expansion, investment and innovation. It would also ease transaction tracking and monitoring, curtail illicit activities, reduce tax evasion and allow easy tax administration (Raouf, 2022; AL-Tamimi & Daoud-Al-Sharea, 2024; Kamasa et al., 2025). Various combinations of these mechanisms supported by improved quality of governance institutions may reinforce the effect of financial inclusion in stimulating growth and a robust tax system, and increasing

tax collection (Akçay et al., 2016; Kutan, Samargandi & Sohag, 2017). On the contrary, persistence of poor institutional quality could undermine the positive roles of improved financial inclusion in enhancing better tax revenue outcomes.

Unfortunately, the previous empirical works on the effects of financial inclusion on tax revenue did not give credence to how the quality of governance institutions influences the outcome. Moreso, studies in this area with an exclusive focus on MENA are not as common as in other regions in the literature. Some of the recent regional focused studies include Al-Own & Bani-Khalid (2021) which focused on Europe; Khatoon (2021), Asian countries; Khatoon & Shabbar (2022) and Compaoré (2022), Developing countries; and Raouf (2022), Emerging Middle East and Africa (EMEA) countries, while country specific studies include Ebi (2018) and Omojola et al. (2022), Nigeria; Ahmed et al. (2023); Muzdalifah and Qibthiyyah (2023), Indonesia; Taha et al. (2013), Malaysia. Overall, the findings from these studies are mixed. On the other hand, several studies have examined the effects of quality of governance on tax revenue performance, but independent of financial inclusion (e.g., Ajaz & Ahmad, 2010; Epaphra & Massawe, 2017; Dramane, 2022; Yaru & Raji, 2022; Adedeji, Ayorinde & Lipede, 2026; Timba et al., 2026). Most of these studies have found that improving the quality of governance institutions has a positive impact on tax revenue performance, while poor quality of institutions undermines it. But like the other strand, they also did not focus exclusively on the MENA countries as a regional block. Hence, the moderating roles of the quality of the various governance institutions in the relationship between financial inclusion and tax revenue mobilisation in MENA largely remain masked.

This study fills the above gaps identified in the previous studies, particularly Raouf (2022), in two dimensions. One, by focusing exclusively on countries in the MENA region. And two, by investigating the moderating roles of quality of governance institutions, which include government effectiveness, control of corruption, rule of law, political stability and absence of violence, voice and accountability, and regulatory quality in the empirical link between financial inclusion and size of tax revenue. Thus, the current study would contribute to the literature by examining the moderating roles of the quality of different governance institutions on the effects of financial inclusion on tax revenue based on empirical evidence from MENA countries. This study would be relevant to policy development given that many countries in the MENA region are grappling with low tax revenue mobilisation, having a bulk of their adult population financially excluded, and the persistence of poor quality of governance institutions. Insights from the study would help policymakers, government agencies, and international organisations on necessary financial and governance institutional reforms to increase tax revenue mobilisation in the MENA region and other regions such as the SSA that share the same challenges.

The remaining part of the paper is grouped into four sections. Section two covers empirical literature. Section three covers the methodology. Section four presents and discusses the results, and Section five presents the conclusion.

2. Literature Review

Financial inclusion, commonly measured by the degree of accessibility and usage of formal financial services by people and firms, holds significant potential for societal advancements, innovation, income growth, economic development and tax revenue (Demirgüç-Kunt & Singer, 2017; Raouf, 2022). Several empirical studies across different regions have examined the association between financial inclusion and tax revenue (e.g., Al-Own & Bani-Khalid, 2021; Khatoon, 2021; Khatoon & Shabbar, 2022; Compaoré, 2022; and Raouf, 2022). The findings of these studies mostly indicate the existence of a positive association between the two variables. For instance, Al-Own & Bani-Khalid (2021) found that financial inclusion enhanced revenue mobilisation from various components of taxes in European countries between 2011 and 2017, including income tax and corporate income tax. Similarly, Chebochok and Bayale (2023) reported a significant positive effect of financial inclusion on tax revenue mobilisation from a study of the West African Economic and Monetary Union (WAEMU) countries from 2006 to 2019. Also noted by the study is that the extent of the effects of financial inclusion is not the same for direct and indirect taxes. Ogede (2022) and Adeyemo et al. (2023) also highlighted a supportive role of financial inclusion in enhancing domestic revenue mobilisation based on datasets from a sample of sub-Saharan African countries between 2011 and 2017. Oz-Yalaman (2019) found a significant positive impact of financial inclusion on tax revenue from a study involving datasets from 137 countries between 2011 and 2017. Beck et al. (2014) reported that improved access to credit information and bank branch penetration reduced tax evasion across 102 countries, thereby boosting tax revenue outcomes. Also, Pengyu et al. (2025) indicate that more access to financial services, gauged by the proportion of adults aged 15+ in the total population with credit cards, increases government tax revenue in Africa. Apeti and Edoh (2023) show that mobile money increases tax revenue from a study involving 104 developing countries.

However, other strands of studies, such as The et al. (2024) and Raouf (2022), have uncovered a nonlinear relationship between the two variables. Among them is The et al. (2024), which demonstrated that financial inclusion had positive impacts on mobilisation of tax revenue in both low- and high-financial-development countries up to a threshold; after which the effect becomes negative. This suggests potential diminishing returns on the positive role of financial inclusion at higher levels. However, Raouf (2022) shows that at low levels, financial inclusion negatively affected tax collection, but positively at higher levels based on a sample of 45 countries from Europe, the Middle East, and Africa (EMEA). The variation in the findings could be attributed to differences in the nature of financial systems and regulatory environments, particularly governance institutions and levels of financial development across regions. Some studies have contrasted the positive results above and come up with divergent findings. For example, Nur et al. (2022) found no significant effect of financial inclusion on tax revenue on the basis of Islamic banking in OIC countries from 2013 to 2019. Similarly, Ahmad et al. (2024)

found that financial inclusion negatively impacted tax revenue based on sample evidence from six South Asian developing countries from 1991 to 2021.

Country-specific studies also reveal mixed results. For instance, in [Nigeria](#), [Omojola et al. \(2022\)](#) found that Automated Teller Machines (ATM) and mobile payments had negative impacts on direct tax revenue, whereas Point of Sale (POS) and Web Pay positively influenced it. Conversely, POS had a negative impact on indirect tax revenue. Meanwhile, [Ahmed et al. \(2023\)](#) stressed how financial inclusion improved tax revenue in Egypt by expanding financial access for excluded groups, thus supporting sustainable development. Similarly, [Ebi \(2018\)](#) and [Kamasa et al. \(2025\)](#) highlighted the promotional role of financial sector development on tax revenue performance in Nigeria and Ghana, respectively. Other studies in Asia and Africa further illustrate a positive relationship between financial inclusion and tax revenue mobilisation. These include [Muzdalifah & Qibthiyyah \(2023\)](#), which reported a significant positive effect of financial inclusion on local tax revenue in Indonesia between 2011 and 2019. [Taha et al. \(2013\)](#) showed that Malaysia's financial system had a stronger short-term influence on direct taxes than long-term impacts. Additionally, [Mitchell and Scott \(2019\)](#) argued that increased VAT collection was linked to financial inclusion in Argentina, Brazil and Chile from 2002 to 2015.

Overall, the majority of past studies revealed that financial inclusion impacts positively on tax revenue, while a few other studies, such as [Nur et al. \(2022\)](#), [Ahmed et al. \(2023\)](#) and [Ahmad et al. \(2024\)](#), indicated that the former had a negative effect on the latter. The divergence in the findings might have stemmed from differences in methodologies used, regional characteristics such as quality of governance institutions, and measures of financial inclusion used. For instance, studies focusing on Islamic banking (e.g., [Nur et al., 2022](#)) showed that financial inclusion had no significant effect on tax revenue, potentially due to the unique banking practices and limited financial access in these regions. The non-linear impact observed in studies like [The et al. \(2024\)](#) suggests over-saturation of financial services may lead to diminishing tax revenue returns. Differences in the level of quality of governance institutions among countries might also be responsible for mixed findings from the reviewed literature. Unfortunately, the moderating roles of institutional quality were not given adequate attention by the previous studies. Thus, this highlights the need for studies looking into the roles of governance institutional quality in moderating the effects of financial inclusion on tax revenue with a focus on regions like the MENA. Many countries in the MENA are struggling with the problems of low tax revenue, poor quality of government institutions and low financial inclusion.

Meanwhile, studies that have looked into the roles of institutional quality on tax revenue performance independent of financial inclusion are abundant in the literature ([Drif & Rawat, 2018](#); [Dramane, 2022](#); [Yaru and Raji, 2022](#); [Anjarwi, 2025](#); [Timba et al., 2026](#)). Most of these studies showed that governance positively affects tax revenues ([Drif & Rawat, 2018](#); [Dramane, 2022](#); [Anjarwi, 2025](#); [Timba et al., 2026](#)), while corruption hinders tax revenues from increasing ([Thornton,](#)

2008; Ajaz & Ahmad, 2010; Yaru & Raji, 2022). While the two strands of studies support the positive effects of financial inclusion and improved quality of governance institutions on tax revenue performance, the effects of the interaction between the two on tax revenue in MENA countries remains under-explored in the literature. This study attempts to cover this gap by investigating the effect of financial inclusion on tax revenue in MENA countries, with emphasis on the moderating roles of governance institutions.

3.1 Methodology

3.1. Model Specification

The empirical model for this study stems from the ability-to-pay theory of taxation, Schumpeter's theory of business cycle, and insights from previous empirical literature that looked at financial inclusion and taxation (e.g., Schumpeter, 1934; Reisman, 2004; Oz-Yalaman, 2019; Al-Own & Bani-Khalid, 2021; Raouf, 2022; Muzdalifah & Qibthiyyah, 2023). The ability-to-pay theory posits that people with higher incomes or wealth should pay more in taxes than people with lower incomes. Schumpeter's theory of business cycle posits that entrepreneurship and innovation are key triggers of economic growth (Schumpeter, 1934; Reisman, 2004). Financial inclusion provides people and firms with access to financial services and money, which are essential for innovation and entrepreneurship. The consequent rise in entrepreneurial activity results in the development of jobs, greater earnings, and an increased tax base, all of which ultimately help to boost tax revenue accruable to the government (Pengyu et al., 2025).

Therefore, based on the theoretical framework and intuition, a positive relationship between tax revenue and financial inclusion is expected (e.g., Oz-Yalaman, 2019; Al-Own & Bani-Khalid, 2021). In addition to financial inclusion, several previous empirical studies suggest that tax revenue is also influenced by other control variables such as GDP per capita, inflation, population density, etc. (e.g., Oz-Yalaman, 2019; Raouf, 2022). GDP per capita is conceived to be the typical indicator of average income of citizens or tax base in a country, and it is anticipated to have a positive impact on tax revenue, as cited by Raouf (2022). Population density, which is a proxy for urbanisation and industrialisation, is expected to also have a positive influence on tax revenue by expanding the tax base (Muzdalifah & Qibthiyyah, 2023). Based on the insights from above, the general form of the model for this study is presented in equation (1).

$$TR = f(FI, GOVINSTQ, control\ variables) \quad (1)$$

Where TR = Vector of measures of Tax Revenue Performance, FI = A composite measure of Financial Inclusion, GOVINSTQ = Vector of variables representing Quality of Governance Institutions, control variables capturing Tax Base (GDPPC and POD) and Information and Communication Technology (ICT).

In specific terms, the baseline empirical model is specified as:

$$TR_{it} = \delta_0 + \delta_1 GDPPC_{it} + \delta_2 POD_{it} + \delta_3 FI_{it} + \delta_4 ICT_{it} + \beta_j GOVINSTQ_{jit} + \varphi_j (FI_{it} * GOVINSTQ_{jit}) + \mu_{it} \quad (2)$$

Where $i = 1, 2, 3, \dots, N$; $t = 1, 2, 3, \dots, T$. N represents the number of sampled countries; T is the time periods covered; and $j = 1, 2, 3, \dots, 5$. One important problem with equation (2) relates to the endogeneity issue, which might emanate from the characteristics of the error term (μ_{it}). To accommodate this in the model, the error term (μ_{it}) is expressed as follows:

$$\mu_{it} = \tau_i + \varepsilon_{it} \quad (3)$$

If the assumption about μ_{it} in equation (3) holds, estimating equation (2) by way of the ordinary least squares (OLS) estimator will not produce unbiased and reliable outputs (Baltagi, 2005). Therefore, assuming that the country-specific effect remains constant, equation (2) can be expressed as:

$$TR_{it} = \delta_0 + \delta_1 GDPPC_{it} + \delta_2 POD_{it} + \delta_3 FI_{it} + \delta_4 ICT_{it} + \beta_j GOVINSTQ_{jit} + \varphi_j (FI_{it} * GOVINSTQ_{jit}) + \tau_i + \varepsilon_{it} \quad (4)$$

It is imaginable that the current tax revenue may be influenced by its previous year's performance. Therefore, it is necessary to introduce the one-year lag of the dependent variable (TR_{it-1}) into the static model in equation (4) to transform it into a dynamic one as presented in equation (5).

$$TR_{it} = \delta_0 + \alpha TR_{it-1} + \delta_1 GDPPC_{it} + \delta_2 POD_{it} + \delta_3 FI_{it} + \delta_4 ICT_{it} + \beta_j GOVINSTQ_{jit} + \varphi_j (FI_{it} * GOVINSTQ_{jit}) + \tau_i + \varepsilon_{it} \quad (5)$$

Where TR= Vector of measures of tax revenue performance which include share of tax revenue (as a percentage) of a country's Gross Domestic Product (TRGDP), Natural log of total tax revenue (TTR), Natural log of total taxes on goods and services (TTRGS), and natural log of taxes on income, profit and capital gain (TTRIPC); Natural log of GDP per capita (GDPPC); FI is the index of financial inclusion computed through principal component analysis involving indicators of both access and usage of financial services including Number of ATMs (ATM); Commercial bank branches (CBRCH), Deposit Accounts (DACC) and Debit cards (DBCARD), POD = Natural log of Population Density, ICT = Natural log of measure of Information and Communication Technology; GOVINSTQ = Vector of Governance Institutions including Control of Corruption (CCOR), Government Effectiveness (GOVE), Rule of Law (ROL), Political Stability and Absence of Violence (PSAV), and Voice and Accountability (VA). The definitions, interpretations and measurements of the variables are presented in Table 1.

3.2. Data, Sources and Measurement

Table 1 presents descriptions of the variables, measurements and data sources used. The data used are annual panel datasets on the variables in equation 5 and are obtained from secondary sources covering 11 MENA countries, including Egypt, Iraq, Israel, Jordan, Lebanon, Malta, Morocco, Saudi Arabia, Tunisia, the United Arab Emirates, and the West Bank and Gaza, covering the 1990-2022 period. The choice of countries and periods covered was largely due to the availability of data on relevant variables. The data were sourced primarily from the World Development Indicators (WDI) and G20 Financial Inclusion Indicators databases published by the World Bank.

Table 1. Description of Variables, Measurements and Data Sources

Definition of Variables	Variable Notation in the Models		Measurement	Source(s) of data
Tax Revenue Performance (TR)	<i>TRGDP</i>	Total Tax Revenue Performance relative to GDP	measured as percentage share of tax revenue in the country's gross domestic product, i.e., (Tax revenue as % of GDP)	World Bank (2024)
	<i>TTR</i>	Total Tax Revenue in million US Dollars	Natural log of Total Tax Revenue	
	<i>TTRGS</i>	Taxes on goods and services (in million US Dollars)	Natural log of Total taxes on goods and services	
	<i>TTRIPC</i>	Tax Revenue from income, profits and capital gains taxes (in million US Dollars)	Natural log of Total taxes on income, profit and capital gains respectively	
	<i>(ATM, CBRCH, POS)</i>	<i>Access to Financial Services</i>	Number of ATMs per 100,000 adults Commercial bank branches (per 100,000 adults) POS terminals per 100,000 adults	
Financial Inclusion	<i>(DACC, DBCARD)</i>	<i>Usage of Financial Services</i>	Deposit accounts per 100,000 adults Debit cards per 1,000 adults	Authors, 2025
	<i>FI</i>	<i>A composite index accounting for both financial services accessibility and usage</i>	Computed from ATM, CBRCH, POS, DACC; DBCARD using Principal Component Analysis (PCA)	
Tax Base	<i>GDPPC</i>	Gross Domestic Product per capita	Natural log of Annual Gross Domestic Product per capita	World Bank (2024)
	<i>POD</i>	Population Density	measured as natural log of the midyear population divided by the land area in square kilometres (KM)	
Information and Communication Technology	<i>ICT</i>		Natural log of Mobile cellular subscriptions (per 1000 people)	
Governance Institutions	<i>GOVINSTQ</i>	Control of Corruption (CCOR)	Figures represent the country's score on each of	

Government Effectiveness (GOVE)	the aggregate indicators, in units of a standard normal distribution ranging from approximately -2.5 (worst performance) to 2.5 (best performance).
Rule of Law (ROL)	
Political Stability and Absence of Violence (PSAV)	
Voice and Accountability (VA)	

Source: Research Findings

4. Empirical Results

This section presents the results, and it’s in two sub-sections. The first sub-section contains the results of the preliminary data analysis, and the second sub-section presents the results of the estimated panel data models

4.1. Results of Preliminary Data Analyses

Tables 2 and 3 present the descriptive statistics of each variable and pairwise correlations between the variables in the model, respectively. The descriptive statistics include mean, standard deviation, and the minimum and maximum values for each variable. These statistics portray the characteristics of each variable, while the results of the pairwise correlations are to show the nature and extent of linear association between the variables. In Table 2, tax revenue as a percentage of GDP (*TRGDP*) of the sample countries ranged between 0.04 and 62.63, with an average of 14.08, indicating that a low tax revenue performance in the region. The per capita income (*GDPPC*) shows very wide disparity among countries in the region, ranging between 1.3 thousand US Dollars and 99.8 million US dollars, with an average of 2.18 million US dollars. This indicates a very wide variance in average welfare between the citizens of poor and rich countries in the region. Population density (*POD*) also exhibited a similar pattern. The number of persons per square KM ranged from 9 to 1661 persons, with an average of 320 persons per square KM. The low population densities among countries suggest a low level of urbanisation and industrialisation in the region.

The statistics on governance institutions did not indicate impressive performance. For instance, the average score on control of corruption (*CCOR*) stood at 0.08, government effectiveness, 0.04; political stability and absence of violence (*PSAV*), -0.72; rule of law, -0.03 and voice and accountability, 0.57; and the highest scores for any country in any of the indicators ranged between 1.37 and 1.50, compared to the maximum score. The low average and maximum scores suggest that many countries in the region are struggling with problems of poor quality of governance institutions.

The statistics on the individual indicators of financial inclusion, including ownership of Automated Teller Machines (*ATM*), *POS* and debit cards (*DBCARD*), and number of Commercial Bank branches (*CBRCH*) in the countries show low financial inclusion. On average, only about 1,087 and 594 people have access to ATM and POS terminals per 100,000 adults, while 17,588 per 100,000 adults own deposit bank accounts. All these indices suggest that the bulk of the people are

excluded from the formal bank financial system of these countries. Low financial inclusion constrains entrepreneurship and innovation. It may also make tax administration a little more challenging as it will be difficult to track flows of income and expenditures of citizens for tax administration purposes. Overall, these statistics confirm the prevalence of low tax base, high level of financial exclusion, poor quality of governance institutions and low tax revenue-GDP ratio in MENA countries. Thus, making further investigation into the association between tax performance and each of these variables necessary.

Table 2. Descriptive Statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
<i>TTR*</i>	209	1270	2980	0.226	15500
<i>TRGDP</i>	209	14.08	10.62	0.04	62.63
<i>TTRGS*</i>	209	485	1340	134	6700
<i>TTRIPC*</i>	209	508	1010	0.0107	4820
<i>FI</i>	209	0.00	1.038	-1.071	3.28
<i>GDPPC*</i>	209	0.00218	0.00828	0.000138	0.0998
<i>POD**</i>	209	320.09	403.29	9.15	1660.97
<i>ICT**</i>	209	99.70	43.27	2.06	221.31
<i>CCOR</i>	209	0.08	0.74	-1.27	1.49
<i>GOVE</i>	209	0.04	0.81	-1.73	1.50
<i>PSAV</i>	209	-0.72	1.04	-2.18	1.38
<i>ROL</i>	209	-0.03	0.79	-1.84	1.61
<i>VA</i>	209	-0.57	0.83	-1.91	1.37
<i>ATM</i>	209	1087.35	3497.17	0.24	15491.93
<i>CBRCH</i>	209	158.88	457.04	0.17	1784.20
<i>DACC</i>	209	17587.66	5195.01	18.41	27325.39
<i>DBCARD</i>	209	31.21	24.50	3.31	89.13
<i>POS</i>	209	593.71	614.93	2.73	2342.5

* Figures are in billions, not in natural logs; ** Figures are in their original values and not in logs.

Source: Authors' Computation (2026).

Source: Research Findings

Table 3 presents the results of the correlation analysis. The results in Table 3 show some insights into the realities of the relationships between the different measures of tax revenue and the respective independent variables in the model. The results indicate that weak and positive correlations exist between total tax revenue (TTR) and three of the five individual indicators of financial inclusion, including ATM terminals (ATM), number of commercial bank branches (CBRCH) and ownership of deposit bank accounts (DACC), respectively. Negative associations are found with DBCARD and POS, respectively. However, the reverse is the case with total tax revenue as a percentage of GDP (TRGDP). For instance, the correlation coefficient between total tax revenue (TTR) and ATM terminals (ATM)

is 0.07, commercial bank branches (CBRCH), 0.06; and deposit bank accounts (DACC), 0.12, whereas when total tax revenue is expressed as a percentage of GDP (TRGDP), the respective correlation coefficients are -0.27, -0.28 and -0.29. Overall, the correlation coefficients measuring relationships between the composite financial inclusion index (FI) and the respective measures of tax revenue performance range between -0.12 and -0.07. This suggests a rather negative and weak association between FI and Tax revenue performance.

Similarly, except for control of corruption, there is a negative correlation between the respective governance institutions and total tax revenue (TTR), where all the institutions are positively related to total tax revenue as a percentage of GDP (TRGDP), except control of corruption. The coefficients of correlation for total volume of taxes on goods and services (TTRGS) are largely similar to the total tax revenue (TTR). The same pattern is observable for total taxes on income, profit and capital gain (TTRIPC), but contrary relationships with the total tax as a percentage of GDP (TRGDP).

Looking at correlation results in Table 3, it is obvious that the relationships between tax revenue and the other variables are sensitive to how tax performance is measured. Total tax revenue measures the size of tax performance in absolute terms, while total tax as a percentage of GDP measures tax in relation to the size of the economy. The majority of governments in the sampled countries rely mainly on economic rent from the extraction of mineral resources, and the size of their respective economies is dictated by the volume of natural resources they produce and export. So total tax as a percentage of GDP may be low in such countries even when tax revenue is higher in absolute terms than in others that are less dependent on natural resources. The observed negative relationship between total tax revenue and primary determinants such as population density also confirms the paradox.

More so, control of corruption (CCOR) is negatively associated with tax revenue as a percentage of GDP (TRGDP), but positively related to total tax revenue (TTR). This appears to suggest that improved quality of institutions for control of corruption increases absolute tax revenue performance. And it might not necessarily mean the tax to GDP ratio will rise. These results indicate some of the prevailing peculiar fiscal and institutional challenges facing many countries in the MENA region.

Table 3. Results of Pairwise Correlation

Variables	TTR	TRGDP	TTRGS	TTRIPC	GDP	POD	ICT	CCOR	GOVE	PSAV	ROL	VA	ATM	CBRCH	DACC	DBCARD	POS	FI
TTR	1																	
TRGDP	-0.11	1																
TTRGS	0.99	-0.09	1															
TTRIPC	0.82	-0.27	0.83	1														
GDPPC	0.82	-0.32	0.81	0.86	1													
POD	-0.17	0.45	-0.16	-0.19	0.02	1												
ICT	-0.16	0.05	-0.12	0.06	-0.05	-0.09	1											
CCOR	0.61	-0.28	0.53	0.29	0.40	-0.15	-0.50	1										
GOVE	-0.39	0.36	-0.31	-0.08	-0.21	0.20	0.52	-0.93	1									
PSAV	-0.54	0.32	-0.48	-0.22	-0.36	0.03	0.42	-0.75	0.74	1								
ROL	-0.56	0.51	-0.48	-0.36	-0.45	0.25	0.43	-0.92	0.92	0.78	1							
VA	-0.14	0.71	-0.14	-0.14	-0.07	0.71	0.14	-0.44	0.52	0.32	0.57	1						
ATM	0.07	-0.27	0.08	-0.06	0.04	-0.58	0.20	-0.08	0.03	0.07	0.07	-0.42	1					
CBRCH	0.06	-0.28	0.07	-0.07	0.04	-0.61	0.19	-0.07	0.02	0.08	0.07	-0.42	0.97	1				
DACC	0.12	-0.29	0.13	-0.02	0.09	-0.58	0.18	-0.03	-0.01	0.02	0.00	-0.42	0.97	0.94	1			
DBCARD	-0.34	0.09	-0.29	-0.05	-0.01	0.11	0.45	-0.64	0.65	0.78	0.64	0.25	0.35	0.35	0.33	1		
POS	-0.09	0.09	-0.03	0.10	0.11	0.31	0.35	-0.67	0.71	0.17	0.59	0.40	0.03	0.01	0.00	0.32	1	
FI	-0.12	-0.10	-0.07	-0.01	0.07	-0.20	0.45	-0.57	0.56	0.42	0.53	0.01	0.77	0.75	0.74	0.75	0.55	1

Source: Research Findings

4.2. Pre-Estimation Tests and Estimation

After the descriptive and pairwise correlation analyses, the stationarity properties of variables were examined using the Im–Pesaran–Shin (IPS) panel unit root test. The IPS Panel unit root test is appropriate for heterogeneous panel datasets (Im, Pesaran, & Shin, 2003). In all, thirteen (13) variables are considered; four (4) appear as I(0), while nine (9) are I(1). The I(0) variables include *ICT*, *CCOR*, *PSAV* and *VA*.

Table 4. Results of Panel Unit Root Test

Variable	Level series		First difference series		Integration
	Stat	p-value	Stat	p-value	
<i>TTR</i>	2.439	0.992	-6.213***	0.000	I(1)
<i>TRGDP</i>	-0.727	0.233	-6.777***	0.000	I(1)
<i>TTRGS</i>	0.96	0.831	-7.224***	0.000	I(1)
<i>TTRIPC</i>	3.554	0.999	-6.166***	0.000	I(1)
<i>GDPPC</i>	1.652	0.951	-5.218***	0.000	I(1)
<i>POD</i>	4.148	1.000	-2.049**	0.020	I(1)
<i>ICT</i>	-3.157***	0.000			I(0)
<i>CCOR</i>	-1.894**	0.029			I(0)
<i>GOVE</i>	-0.171	0.432	-6.877***	0.000	I(1)
<i>PSAV</i>	-3.325***	0.000			I(0)
<i>ROL</i>	-1.231	0.109	-6.718***	0.000	I(1)
<i>VA</i>	-2.623***	0.004			I(0)
<i>FI</i>	6.142	1	-4.68	0	I(1)

Source: Research Findings

Consequently, to ascertain the existence of a long-run equilibrium relationship among the variables, a panel cointegration test was conducted using [Westerlund \(2007\)](#). Table 5 presents the Westerlund ECM cointegration test results, which suggest at least one of the *Gt*, *Ga*, *Pt* and *Pa* statistics was statistically significant at 5 or 10% in the four (4) models. This provides a sufficient condition for rejecting the null hypothesis of no cointegration among the variables. A significant *Gt* or *Ga* test indicates the existence of individual cointegration, while significant *Pt* or *Pa* suggest group cointegration among the variables. The implication is that the variables in the model have some long-run relationships. Given the possibility of dynamic pattern of tax performance in the selected countries and the potential for endogeneity, the study employed the two-step System Generalised Method of Moments (System GMM) estimator proposed by [Arellano and Bover \(1995\)](#) and [Blundell and Bond \(1998\)](#). System GMM is well suited for panel data when the goal is addressing unobserved heterogeneity, endogeneity, and dynamic persistence in the dependent variable ([Roodman, 2009](#); [Baltagi, 2021](#)). The validity and

consistency of the estimated models were evaluated using the Sargan test of over-identifying restrictions and the Arellano–Bond tests for serial correlation.

Table 5. Westerlund ECM Panel Cointegration Tests

Statistic	Value	p-value	value	p-value	Value	P-value	value	P-value
Gt	-1.729**	0.042	-1.702**	0.044	-1.662**	0.048	-0.949	0.171
Ga	2.89	0.998	3.158	0.999	2.547	0.995	2.752	0.997
Pt	-4.797***	0.000	0.685	0.753	-5.058***	0.000	-1.308*	0.096
Pa	1.647	0.950	0.985	0.838	1.62	0.947	0.418	0.662

Source: Research Findings

4.3 Results of Panel Data Model

This sub-section presents and discusses the results of the dynamic panel GMM estimations of the tax models. Each of the models examines the impact of financial inclusion, governance institutional quality and some control variables on tax revenue performance in MENA countries. The results of the estimated dynamic panel data models are presented in Tables 6 and 7, and are discussed variable-by-variable with emphasis on the signs, magnitudes, and statistical significance of the estimated coefficients.

Across all the estimated models in Tables 6 and 7, the coefficients of the lagged dependent variables are largely positive and statistically significant irrespective of whether tax revenue was measured as logarithm of total tax revenue (TTR), total tax as percentage of GDP (TRGDP) or taxes on goods and services (TTRGS), or taxes on income, profit and capital gains (TTRIPC) was used. For instance, in the Total Tax Revenue Models in Table 6, the coefficients of TTR_{t-1} , range between 0.841 and 0.888 (Models 1-5). This means that a 1 percent increase in previous tax revenue would increase current tax revenue by about 0.841 to 0.888 percent. Thus, showing a very strong path-dependence of tax revenue performance in MENA countries. In other words, past performance in tax revenue generation strongly influences current tax outcomes, reflecting rigidities in the tax system, long-term revenue structures, and the dominance of existing fiscal frameworks. This result aligns with theoretical expectations and is consistent with earlier studies on developing countries such as Yaru and Raji (2022). This suggests that tax systems, especially in developing countries with heavy reliance on natural resources, tend to adjust slowly due to administrative and structural challenges.

The coefficients of the financial inclusion (FI) variable are consistently positive and statistically significant, indicating that FI improves tax revenue performance as measured by the logarithm of Total Tax Revenue (TTR) and the Tax–GDP ratio (TRGDP) in Table 6, and Taxes on Goods and Services (TTRGS) in Table 7. In these models, the positive and significant coefficients of FI suggest that improvements in financial access and usage help to expand the tax base, increase the visibility of financial transactions, and support better tax administration across MENA countries. For instance, in the Total Tax Revenue models presented in column/Model 1-5 in Table 6, FI has a coefficient of 0.113 (Model 1), which

suggests that a 1-unit increase in the financial inclusion index results to about a 0.113 percentage point increase in total tax revenue. Similarly, in the Tax–GDP ratio model presented in columns 5–10 of Table 6, FI has a stronger coefficient, i.e., 3.138 (Model 2). This implies that improvement in financial inclusion significantly raises the share of tax revenue in GDP, suggesting that as more people have access to and use financial services, government authorities to expand the tax net, monitor transactions and administer more taxes in the economy. The findings are consistent with some of the previous ones, including [Al-Own & Bani-Khalid \(2021\)](#) based on a sample of European countries; [Khatoon \(2021\)](#), Asian countries; [Khatoon and Shabbar \(2022\)](#), and [Compaoré \(2022\)](#), developing countries.

Similarly, in Table 7, the results of the taxes on goods and services (TTRGS) Models 11–15, FI coefficients have positive signs in all five, but three are statistically significant. However, the results of models 16–20, which are on taxes on income, profits and capital gains (TTRIPC), are mixed, with two out of the five models with statistically significant coefficients of FI showing negative signs and only one with a positive sign. Though consistent with [Ahmad et al. \(2024\)](#) for sample South-South Asian countries, the mixed results suggest that income-related taxes in MENA countries may not be as strongly related to financial inclusion as taxes on goods and services are. More so, the rather counterintuitive results may also be due to the large size of the informal sector, where the majority of the workforce in these countries is engaged. Transactions in the sector are usually outside the formal financial system. Insights from [Chebochok and Bayale \(2023\)](#) showed that financial inclusion has greater positive effects on revenue from indirect taxes than direct taxes based on evidence from WAEMU countries. A likely explanation is that countries in these regions rely more on the financial system for indirect taxation than for personal income taxes. Overall, the findings largely support the hypothesis that financial inclusion enhances tax mobilisation.

The institutional variables (CCOR, GOVE, PSAV, ROL and VA) mostly appear with insignificant or negative coefficients across the estimated models. For example, in the Total Tax Revenue models in Table 6, Control of Corruption (CCOR) has a coefficient of -0.010, which is negative but statistically insignificant. Similarly, Political Stability (PSAV) shows a negative coefficient of -0.179 (Model 3), also insignificant. These findings are largely consistent with [Yaru and Raji \(2022\)](#), where none of the governance institutions, except corruption, was found to have had a significant impact on tax revenue performance in SSA. These counterintuitive findings may be suggestive that only significant improvements in the governance institutions will have substantial effects on tax revenue performance. Unfortunately, persistence of poor quality of governance institutions is a common feature of many countries in MENA and SSA. The estimated coefficients of interaction between Financial Inclusion (FI) and the institutional variables are largely statistically insignificant and negative in all the models, except the coefficients of interaction of FI and Political Stability (PSAV*FI), which are consistently negative and statistically significant across a few of the tax revenue models. For example, in the Total Tax Revenue model, PSAV*FI has a coefficient

of -0.276 in model 3, while in the Tax's share in the GDP model, the coefficient becomes even larger in magnitude at -1.407 in model 8 in Table 6. The coefficients of other interaction terms between financial inclusion and institutional variables such as $CCOR*FI$, $GOVE*FI$, $ROL*FI$ and $VA*FI$ are also mostly negative and statistically insignificant. For instance, the $GOVE*FI$ coefficient is around -0.127, while $ROL*FI$ is about -0.015, but both are insignificant. Basically, the negative signs of the coefficients of interactive terms between FI and the governance institutions suggest that the marginal beneficial effect of financial inclusion on tax revenue diminishes with improvement in the quality of governance institutions. Thus, the complementary roles of governance institutions in the financial inclusion-tax nexus depend strongly on the strength of the broader institutional environment, such as rule of law, control of corruption, political stability, and effectiveness of the government.

Regarding the control variables, the coefficient of GDP per capita ($GDPPC$) is mostly negative and statistically insignificant in the total tax revenue and share of tax in GDP models in Table 6. For example, in the $TRGDP$ model, $GDPPC$ has a coefficient of -0.489 (Model 6) and -1.028 (i.e., Model 7) in Table 6, both insignificant. In the income, profit and capital gain tax models (i.e., Models 16-20) in Table 7, $GDPPC$ was negative and weakly significant, with coefficients ranging between -0.210 and -0.147. This negative relationship contrasts with theoretical expectations that rising income should expand tax revenue performance. Instead, it reflects the structure of many economies in MENA, where GDP is largely driven by oil outputs and a huge part of the population earns incomes from the informal sector rather than formal and broad-based taxable economic activities. As a result, higher GDP per capita may not necessarily translate into increased tax revenue. Similarly, population density (POD) displays mixed and weak effects across the models. For instance, in the total tax revenue model, POD shows a positive coefficient of 0.295 (Model 3), while in the tax-to-GDP models, the coefficient is negative, as in Model 9 in Table 6. These inconsistent results suggest that simply having more people concentrated in specific areas may not be due to industrialisation and thus may not be associated with a high tax revenue-to-GDP ratio, as shown in the results. The results are largely in tandem with [Yaru and Raji \(2022\)](#), and [Timba et al. \(2026\)](#). [Timba et al. \(2026\)](#) showed that structural variables have negative and significant effects on tax revenue mobilisation based on a panel of 30 African Countries and also pointed out that the effects of the structural variables depend on the quality of governance institutions. Again, this counterintuitive finding might not be unconnected with the persistence of weak institutions that define most of the countries in MENA.

Similarly, ICT indicators are statistically insignificant across all models, with coefficients such as -0.017, 0.009, and -0.118. Many MENA countries are lagging in fully adopting modern digital tax systems. Thus, the current level of ICT development in the region may be too low to have a significant effect on tax revenue mobilisation.

Table 6. Results of Estimated Total Tax Revenue Models

	Dependent Variable: Log of Total Tax Revenue (TTR)					Dependent Variable: Share of Total Tax Revenue in GDP (TRGDP)				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model	Model 9	Model 10
<i>L.TTR</i>	0.888*** (0.049)	0.864*** (0.058)	0.841*** (0.037)	0.871*** (0.059)	0.888*** (0.066)	0.811*** (0.049)	0.847*** (0.058)	0.873*** (0.053)	0.815*** (0.048)	0.919*** (0.045)
<i>GDPPC</i>	-0.001 (0.145)	-0.044 (0.170)	0.019 (0.177)	-0.036 (0.069)	-0.017 (0.175)	-0.489 (1.159)	-1.028 (1.202)	-0.453 (1.334)	-0.471 (0.888)	-0.320 (1.316)
<i>POD</i>	0.159 (0.155)	0.170 (0.184)	0.295* (0.155)	0.189 (0.132)	0.109 (0.204)	-0.336 (1.800)	-0.393 (1.606)	-0.266 (1.513)	-0.297 (1.581)	0.771 (1.827)
<i>ICT</i>	-0.008 (0.102)	0.008 (0.091)	-0.017 (0.114)	0.000 (0.093)	0.005 (0.129)	0.009 (1.275)	0.287 (1.073)	-0.118 (1.188)	0.028 (1.394)	-0.317 (1.399)
<i>FI</i>	0.113*** (0.030)	0.312*** (0.076)	-0.033 (0.068)	0.186*** (0.033)	0.254 (0.175)	1.038 (0.892)	3.138*** (0.748)	0.382 (0.833)	1.650*** (0.524)	0.673 (1.793)
<i>CCOR</i>	-0.010 (0.139)					-0.132 (1.209)				
<i>CCOR*FI</i>	-0.069 (0.096)					0.304 (1.309)				
<i>GOVE</i>		-0.112 (0.120)					-2.405* (1.355)			
<i>GOVE*FI</i>		-0.127 (0.088)					-1.482 (1.121)			
<i>PSAV</i>			-0.179 (0.109)					-0.658 (1.268)		
<i>PSAV*FI</i>			-0.276*** (0.074)					-1.407* (0.794)		
<i>ROL</i>				-0.128 (0.292)					-1.124 (2.995)	
<i>ROL*FI</i>				-0.015 (0.092)					-1.774 (1.489)	
<i>VA</i>					0.013					-0.144

VA*FI					(0.071) 0.068 (0.103)					(1.125) -0.070 (1.312)
Observations	198	198	198	198	198	198	198	198	198	198
Wald Chi-squared	1199.0***	1364.9***	420.3***	1721.7***	1655.5***	1083.2***	58400.0***	1165.2***	1478.7***	4486.6***
Sargan test	0.223	2.755	2.217	1.231	1.689	4.397	1.659	1.925	4.368	1.615
AR(2) test	0.170	-0.634	0.149	-0.433	0.586	0.397	1.256	1.830	1.414	1.053

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; Source: Authors' Computation (2026)

Table 7. Results of Estimated Indirect and Direct Taxes Models

	Dependent Variable: Log of Taxes on Goods and Services (TTRGS)					Dependent Variable: Log of Taxes on Income, Profits and Capital Gains (TTRIPC)				
	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20
L.TTRGS	0.874*** (0.040)	0.859*** (0.054)	0.828*** (0.039)	0.858*** (0.060)	0.871*** (0.065)	0.954*** (0.037)	1.045*** (0.027)	1.049*** (0.028)	0.898*** (0.042)	1.043*** (0.024)
GDPPC	0.040 (0.192)	-0.014 (0.232)	0.041 (0.224)	-0.006 (0.090)	0.010 (0.182)	-0.147** (0.073)	-0.179* (0.106)	-0.177** (0.082)	-0.108*** (0.021)	-0.210** (0.087)
POD	0.071 (0.157)	0.030 (0.168)	0.169 (0.137)	0.044 (0.143)	-0.001 (0.211)	0.898*** (0.086)	0.213 (0.157)	0.192 (0.125)	0.151 (0.101)	0.300** (0.129)
ICT	-0.024 (0.126)	-0.007 (0.128)	-0.033 (0.134)	-0.011 (0.115)	-0.008 (0.147)	0.030 (0.061)	0.029 (0.061)	0.035 (0.067)	0.034 (0.056)	0.038 (0.072)
FI	0.130*** (0.044)	0.367*** (0.091)	0.022 (0.065)	0.282*** (0.039)	0.308 (0.206)	-0.331*** (0.025)	-0.112 (0.086)	-0.086** (0.040)	0.079** (0.033)	-0.074 (0.087)
CCOR	-0.095 (0.195)					-0.076 (0.053)				
CCOR*FI	-0.129 (0.128)					0.047 (0.057)				
GOVE		-0.081					0.017			

		(0.137)					(0.078)			
<i>GOVE*FI</i>		-0.107					0.025			
		(0.105)					(0.048)			
<i>PSAV</i>			-0.240*					0.089		
			(0.126)					(0.067)		
<i>PSAV*FI</i>			-0.323***					-0.034*		
			(0.103)					(0.019)		
<i>ROL</i>				-0.093					-0.191	
				(0.357)					(0.151)	
<i>ROL*FI</i>				-0.035					0.029	
				(0.101)					(0.093)	
<i>VA</i>					0.006					0.022
					(0.094)					(0.046)
<i>VA*FI</i>					0.052					0.033
					(0.131)					(0.055)
Observations	198	198	198	198	198	198	198	198	198	198
Wald Chi-squared	98.57***	73.32***	895.3***	189.7***	25.46***	8999.2***	8265.7***	8187.2***	8388.5***	8212.9***
Sargan test	3.133	0.727	4.703	0.495	1.132	4.370	4.921	4.863	4.382	4.752
AR(2) test	0.384	-0.444	-0.278	-0.725	-4.338	-1.394	-1.381	-1.386	-1.416	-1.372

Standard errors in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; Source: Authors' Computation (2026)

4.4. Post Estimation GMM Diagnostics

Several diagnostic tests were conducted on the estimated models in Tables 6 and 7, primarily to test for the validity of the models, instruments and absence of second-order serial correlation. These include the Wald Chi-squared test, the Sargan/Hansen test for over-identifying restrictions (instrument validity), and a test for second-order serial correlation (AR (2)) based on Arellano–Bond. The results of the tests are provided in the lower panels of the respective model outputs in Tables 6 and 7. The respective Wald Chi-squared were significant, indicating that all the models are statistically significant. Insignificant Sargan tests support the validity of the over-identifying restriction for all the models, while an insignificant Arellano–Bond Autocorrelation (AR (2)) test indicates the absence of second-order serial correlation. In all the models, the Sargan tests and Arellano–Bond Autocorrelation (AR (2)) were insignificant. These suggest the validity of the instruments and that second-order serial correlation problems are not significant.

5. Conclusion

This study examined the impact of financial inclusion and governance institutions on tax revenue performance in selected MENA countries. Using a dynamic panel GMM framework, the study assessed both the direct effects of financial inclusion and the moderating roles of governance institutional quality on tax revenue performance. The findings show that financial inclusion, measured as a composite index comprising various indicators of access and usage of formal financial services, generally exhibits a positive and significant effect on the size of total tax revenue, tax-to-GDP ratio, and total taxes on goods and services. The findings are in line with previous studies such as [Al-Own & Bani-Khalid \(2021\)](#), [Khatoon \(2021\)](#), [Khatoon and Shabbar \(2022\)](#), [Compaoré \(2022\)](#), [Raouf \(2022\)](#), [Apeti and Edoh \(2023\)](#) and [Kamasa et al \(2025\)](#).

However, the direct effects of quality of governance indicators such as government effectiveness, rule of law, control of corruption, and political stability and absence of violence on tax revenue were generally weak or negative. Only the interaction between financial inclusion and political stability and absence of violence (PSAV*FI) was consistently significant, indicating that the marginal benefits of financial inclusion on tax revenue mobilisation tend to diminish as countries experience a more stable political environment and a reduction in violence. Overall, the study concludes that financial inclusion is a powerful tool for enhancing tax revenue mobilisation in the MENA region. Strengthening institutions that will enhance financial inclusion therefore remains a very important key to unlocking tax revenue potential in the MENA countries, especially those struggling with relatively more serious challenges of governance and institutional quality.

Author Contributions: Conceptualization, all authors; methodology, M.A.Y., U.F.A., and I.A.M.; validation, S.O.I, M.A.Y., and U.F.A.; formal analysis, all authors; resources, M.A.Y. and S.O.I.; writing—original draft preparation, M.A.Y., U.F.A and S.O.I; writing—review and editing, all authors; supervision, M.A.Y. All authors have read and agreed to the published version of the manuscript.

Funding:

This research received no external funding.

Conflicts of Interest:

The authors declare no conflict of interest.

Data Availability Statement:

The data used in the study are available on request from the corresponding author.

Acknowledgements

We acknowledge that artificial intelligence tools, particularly, Grammarly were used solely for English language editing in this article.

References

- Abiola, J., & Asiweh, M. (2012). Impact of tax administration on government revenue in a developing economy-a case study of Nigeria. *International Journal of business and social science*, 3(8), 99-113.
- Acemoglu, D & Robinson, J. A. (2012). *Why Nations Fail: The origin of power, prosperity, and poverty*. Crown Publishers, New York.
- Adedeji, A. A., Ayorinde, A & Lipede, O. M. (2026). Governance quality and tax revenue mobilization in Africa: Evidence from micro-level data. *Journal of Public Affairs*, 26, (2), e70132. <https://doi.org/10.1002/pa.70132>.
- Adeyemo, K. A., Adeyanju, I. T., Ekundayo, G., Adegboye, A., & Ali, S. (2023). Financial inclusion and information communication technology on tax performance in sub-Saharan Africa. *International Journal of Professional Business Review* 8(12), 1-22.
- Ahmad, N., Nafees, B., Azeem, M., Kamran, H., & Mumtaz, F. (2024). Impact of Financial Inclusion and Digital Financial Services on Tax Revenue in South Asian Countries. *Journal of Excellence in Management Sciences*, 3(1), 119-134.
- Ahmed, A. E. W. A., Mousa, S. K., El Wahed, F. Z. A., & El-Kharbotly, M. M. (2023). The impact of applying financial inclusion on improving tax revenue in the context of achieving the goals of sustainable development. *Journal of Environmental Science*, 52(6), 17-39.
- Ajaz, T. & Ahmad, E. (2010). The effect of corruption and governance on tax revenue. *The Pakistan Development Review* 49(4), 405-417.
- Akçay, S., Sağbaş, İ., & Demirtaş, G. (2016). Financial development and tax revenue nexus in Turkey. *Journal of Economics and Development Studies*, 4(1), 103-108.
- Al-Own, B., & Bani-Khalid, T. (2021). Financial inclusion and tax revenue: Evidence from Europe. *International Journal of Financial Research*, 12(2), 27-42.
- AL-Tamimi, Z. H. A. A., & Daoud-Al-Sharea, I. H. (2024). The role of financial inclusion in expanding the tax base. *Edelweiss Applied Science and Technology*, 8(3), 490–510. <https://doi.org/10.55214/25768484.v8i3.1674>
- Anjarwi, A. W. (2025). Corruption, governance, and tax revenue: pathways to fiscal independence in EAGLE countries. *Policy Studies*, 1–22. <https://doi.org/10.1080/01442872.2025.2542326>
- Appah, E. & Eze, G. P. (2013). A Causality Analysis between tax audit and tax compliance in Nigeria. *European Journal of Business and Management*, 5(2), 107-120.
- Apeti, A. E & Edoh, E. D. (2023). Tax revenue and mobile money in developing countries. *Journal of Development Economics*, 161, 103014. <https://doi.org/10.1016/j.jdevco.2022.103014>
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29–51.

- Baltagi, B. H. (2005). *Econometric Analysis of Panel Data* (3rd ed.) John Wiley & Sons.
- Baltagi, B. H. (2021). *Econometric Analysis of Panel Data* (6th ed.). Springer.
- Beck, T., Lin, C., & Ma, Y. (2014). Why do firms evade taxes? The role of information sharing and financial sector outreach. *The Journal of Finance*, 69(2), 763-817.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143.
- Burkhardt, C., & Tosun, M. (2020). Tax composition in MENA: Composition, trend and policy options. *Economic Research Forum*. Retrieved from: <https://theforum.erf.org.eg/2020/11/24/taxation-mena-composition-trends-policy-options/> on December 20, 2025.
- Chebochok, M. C., & Bayale, N. (2023). Effects of financial inclusion on tax revenue mobilization: Evidence from WAEMU countries. *African Development Review*, 35(2), 226-238.
- Compaoré, A. (2022). Access-for-all to financial services: Non-resource tax revenue-harnessing opportunities in developing countries. *The Quarterly Review of Economics and Finance*, 85, August (2022), 2, 36-245.
- Demirgüç-Kunt, A., & Singer, D. (2017). Financial inclusion and inclusive growth: A review of recent empirical evidence. *World Bank Policy Research Working Paper*, No. 8040. The World Bank, Washington D.C., USA.
- Dramane, A. (2022). Tax revenues effects of corruption and governance in WAEMU countries. *Journal of Economic Development*, 47 (4), 143-164.
- Drif, I., & Rawat, A. S. (2018). Corruption, governance and tax revenue: Evidence from EAGLE countries. *Journal of Transnational Management*, 23(2-3), 199 133.
- Ebi, B. O. (2018). Financial sector development and tax revenue in Nigeria. *International Journal of Economics, Commerce and Management*, 6(6), 93-109.
- Epaphra, M., & Massawe, J. (2017). Corruption, governance and tax revenues in Africa. *Business and Economic Horizon*, 13 (4). 439-467.
- Fouejieu, A., Ndoeye, D. A., & Sydorenko, T. (2020). Financial inclusion and development in the Middle East and North Africa. *IMF Working Paper*, 20/120.
- Ghura, D. (1998). Tax revenue in sub-Saharan Africa: Effects of economic policies and corruption. IMF Working Paper WP/98/135. Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=882694. Retrieved 19/06/2026.
- Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53–74. [https://doi.org/10.1016/S0304-4076\(03\)00092-7](https://doi.org/10.1016/S0304-4076(03)00092-7)
- Kamasa, K., Korsah, E., Bonuedi, I & Forson, P. (2025). Financial development as a catalyst for tax revenue generation in Ghana: exploring the channels.

- Scientific African, 28 (2025), e02715.
<https://doi.org/10.1016/j.sciaf.2025.e02715>
- Kassim, L. 2016. The revenue implication of trade liberalization in sub-Saharan Africa: Some new evidence. *University of Kent Discussion Paper KDPE 1605*: University of Kent.
- Khatoon, A. (2021). Does financial inclusion create tax revenue for the government? (a panel study on Asian countries). CBER Conference. Retrieved from <https://ir.iba.edu.pk/esdcber/2021/day3/26> on 21-12-2025.
- Khatoon, A., & Shabbar, S. (2022). Does financial inclusion create tax revenue for the government? A Panel study on developing countries. *Pakistan Journal of Economic Studies (PJES)*, 5(2), 389-406.
- Kilishi, A. A., Mobolaji, H.I., Yaru, M. A., & Yakubu, A.T. (2013). Institutions and economic performance in Sub-Saharan Africa: A dynamic panel data analysis. *Journal of Africa Development*, 15(2), 91-119. DOI: <https://doi.org/10.5325/jafrideve.15.2.0091>
- Kutan, A.M., Samargandi, N. and Sohag, K. (2017). Does institutional quality matter for financial development and growth? Further evidence from MENA Countries. *Australian Economic Papers*, 56: 228-248. <https://doi.org/10.1111/1467-8454.12097>
- Levin, A., Lin, C. F., & Chu, C. S. J. (2002). Unit root tests in panel data: Asymptotic and finite-sample properties. *Journal of Econometrics*, 108(1), 1–24. [https://doi.org/10.1016/S0304-4076\(01\)00098-7](https://doi.org/10.1016/S0304-4076(01)00098-7)
- Mahdavi, S. (2008). The level and composition of tax revenue in developing countries: Evidence from unbalanced panel data. *International Review of Economics and Finance*, 17 (4), 607-617.
- Mawejie, J. (2019). Natural resources governance and tax revenue mobilization in Sub-Saharan Africa: The role of EITI. *Energy Policy*. 62, 176-183.
- Mitchell, K., & Scott, R. H. (2019). Public revenue, financial inclusion and value-added tax in Argentina. In: *Pesos or Plastic? Financial Inclusion, Taxation, and Development in South America*, 33-58. Palgrave Pivot, Cham. https://doi.org/10.1007/978-3-030-14876-8_2
- Muzdalifah, M., & Qibthiyyah, R. M. (2023). The Financial inclusion and local tax revenue in Indonesia. *Jurnal Perencanaan Pembangunan: The Indonesian Journal of Development Planning*, 7(1), 1-24.
- Nur, M. A., Febriyanti, A. R., Rusgianto, S., & Herianingrum, S. (2022). Islamic banking, financial inclusion and tax revenue in OIC Countries: To what extent do they correlate?. *Shirkah: Journal of Economics and Business*, 7(3), 302-317.
- Ogede, J. S. (2022). Does financial inclusion impact tax revenue in Sub-Saharan African Countries? A panel data analysis. *African Journal of Management Research*, 29(1), 80-95.
- Omojola, O., Adebogun, O., & Audu, S. (2022). Financial inclusion and tax revenue in Nigeria. *Research Journal of Business and Economic Management*, 5(2), 32-37.

- Oz-Yalaman, G. (2019). Financial inclusion and tax revenue. *Central Bank Review*, 19(3), 107-113.
- Pengyu, R., Moumbark, T., Appiah, E., & Koudalo, Y. M. A. (2025). Financial Inclusion, Mobile Money, and Tax Revenue in Africa, *SAGE Open*, January-March 2025, 1-20. DOI: <https://doi.org/10.1177/21582440251315222>
- Raouf, E. (2022). The impact of financial inclusion on tax revenue in EMEA countries: A threshold regression approach. *Borsa Istanbul Review*, 22(6), 1158-1164.
- Reisman, D. (2004). *Schumpeter's market: enterprise and evolution*. Edward Elgar Publishing, Inc., Northampton.
- Roodman, D. (2009). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics*, 71(1), 135–158.
- Schumpeter, J. A. (1939). *Business cycles: A theoretical, historical, and statistical analysis of the capitalist process*. McGraw-Hill Book Company Inc., New York.
- Taha, R., Colombage, S. R., Maslyuk, S., & Nanthakumar, L. (2013). Does financial system activity affect tax revenue in Malaysia? Bounds testing and causality approach. *Journal of Asian Economics*, 24, 147-157.
- The, B. N, Oanh, T. T. K., Le, Q. D., & Nguyen, T. H. H. (2025). Nonlinear impact of financial inclusion on tax revenue: evidence from the Monte-Carlo simulation algorithm under the Bayesian approach. *Journal of Economic Studies*, 52(2), 393-411.
- Thornton, J. (2008). Corruption and the composition of tax revenue in Middle East and African economies. *South African Journal of Economics*, 76: 316-320. <https://doi.org/10.1111/j.1813-6982.2008.00176.x>
- Timba, G.T., Mekanda Eto'o, J.S., & Meka'a, C.B. (2026). Quality of governance and tax revenue mobilization in Africa. *African Journal of Economic and Management Studies*, 17 (3), 405–421, doi: <https://doi.org/10.1108/AJEMS-10-2023-0391>
- Yaru, M. A., & Raji, A. S. (2022). Corruption, governance and tax revenue performance in Sub-Saharan Africa. *African Journal of Economic Review*, 10(1), 234-253.
- Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, 69(6), 709–748.
- World Bank, (2024). *World development indicators (WDI)*, World Bank, Washington DC.