

# Effect of Financial Instability and Institutional Quality on Tax Revenue Mobilization in African Oil Exporting Countries Using CS-ARDL Techniques

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## Abstract

## Original Research Article

**Purpose:** This study analyzes how financial instability and institutional quality influence tax revenue mobilization in African oil-exporting countries. It aims to establish whether strong institutional frameworks can insulate the adverse fiscal implications of financial sector volatility.

**Design/methodology/approach:** Using yearly panel data from 2000 to 2023, the study employs the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) approach, which is capable of accounting for cross-country dependence, slope heterogeneity, and mixed integration orders. The model combines key macroeconomic and fiscal indicators in order to generate robust and reliable estimation.

**Findings:** The findings indicate that financial instability reduces tax revenue mobilization but institutional quality enhances fiscal efficiency. However, instability compromises the benefits of robust institutions. Economic growth and government expenditure boost revenues, whereas oil rents have feeble implications, emphasizing the fiscal vulnerability of resource-rich economies.

**Practical implications:** The findings highlight the need for comprehensive fiscal and financial reforms. Policymakers must strengthen regulation of the financial system towards containing instability, encourage institutional responsibility to enhance compliance and disclosure, and undertake diversification of revenues that reduce dependence on oil revenues. These measures are needed to achieve fiscal resilience and sustainable long-term revenues in economies based on resources.

**Originality/value:** This article adds a new empirical contribution to the extant literature in examining simultaneously financial instability, institutional quality, and tax revenue performance for African oil exporters. Guided by a CS-ARDL model with an interactive framework, this article addresses cross-sectional dependence and dynamic heterogeneity to offer robust, policy-driven results on fiscal sustainability.

**Keywords:** Financial Instability, Institutional Quality, Tax Revenue Mobilization, CS-ARDL.

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## Introduction

The use of tax revenue is very important in order to attain sustainable development and growth,

particularly in African oil exporter countries that still have very weak fiscal institutions with excessive external shock vulnerabilities and structural deficiencies. With their bountiful hydrocarbons, the



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economies are perennially plagued by revenue deficits and fiscal vulnerability, along with diversification deficiencies. For example, the tax-to-GDP ratio of Nigeria was 10.86% in 2021 and would increase marginally to reach 13.5% by 2024, but it lags behind both the African average of 16.6% and OECD standard of above 33%. In Angola, national governments earned only 17.4% of GDP in total revenue in 2024, with around half of that (10.4%) consisting of oil revenue (shell) and hence only surpassed 6.2% by non-oil taxation revenue (cid:65). By the same token, Algeria still depends heavily on hydrocarbons, which generate more than 90% of export revenues and about 60% of budget receipts (IMF, 2023). These numbers demonstrate the fiscal fragility of oil exporters and the importance of ensuring resilient and sustainable domestic revenue systems.

One of the serious problems is the lack of financial stability, which reduces revenues by lowering the size of the tax base as well as compliance. For oil-dependent economies, oil price collapses are typically followed by exchange rate depreciation and inflation spikes, as well as by a reversal of capital flows that can result in fiscal crises. There is evidence that the decline in tax revenues from financial crises would be 2–4% of GDP in resource economies (Balima, Combes, & Minea, 2016; Ozili, 2020). In Nigeria and Angola, oil price shocks in 2014 and 2020 led to sudden collapses in government revenues, exchange rate volatility, and debt accumulation – showing the ills of fiscal absorption as a transmission channel of financial sector weakness. Despite the shock to remittances, Financial instability may also spur tax evasion and informal economic activity and hence erode domestic resource mobilization (Nnyanzi et al., 2018; Chebochok & Bayale, 2023). This is particularly of enormous concern to oil exporting countries, where patches of global volatility are instantly transferred into domestic fiscal arrangements.

Financial instability also contributes to tax evasion and informality. During unstable financial conditions, firms and households tend to move towards informal or cash transactions as a way of hedging the uncertainties, decreasing taxable

activities and displacing the government revenue base (Ozili, 2020). This is particularly problematic in African oil-exporting countries, where the informal economy already contributes 30–60% of GDP (ILO, 2022). Furthermore, the financial sector stability is eroded by financial distress which undermines tax administration systems that largely utilize digital payment channels, banking institutions and monitoring of compliance (Chebochok & Bayale, 2023). Another significant transmission is that of loss of investor confidence and outflow of capital. Financial earthquakes typically precipitate an outflow of domestic and foreign capital, reducing the tax base for corporate income tax, capital gains tax and other revenue sources. Evidences based on data provide that the financial crisis can lead to a loss in tax receipts between 2 and 4 percent of the GDP in natural resource-based countries (Balima et al., 2016). This has also been exacerbated by the COVID-19 pandemic in 2020 as oil-producing countries, including Nigeria, Angola and Algeria received a triple whammy of falling oil revenues, foreign investment and tax yields along with financial markets volatility.

The other significant factor is institution quality, and it affects the functioning of tax regimes through the openness and transparency of governance fiscal policy mechanisms, including accountability and compliance measures (Zallé, 2022; Meddeb, Harbaoui & Bouabid, 2025). This also leads to leakages in revenue, tax evasion and avoidance, and low compliance—especially where rent and rentseeking are concerned. Nigeria, for instance, was placed 140 out of 180 countries grabbed under Transparency International's Corruption Perceptions Index in the year 2024 with a paltry score of only 26/100 while Angola was slightly higher and placed at position 121 with 32. These institutional weaknesses impede effective tax collection and limit the fiscal capacity. On the other hand, evidence from empirical studies supported that good governance enhances mobilization of tax revenue through trust creation, increased enforcement and cushioning effects against financial shocks (Akeem et al., 2025; Bah, 2024; Desta, 2022; Günay & Topal, 2021; Nikiema & Zore, 2025).

It has been noted in the literature, but examination is

rather fragmented, that relationship between financial instability, institutional quality and tax revenue. A good number of literature either emphasize on institutional factors (Tolossa & Melese, 2024; Mallick, 2021) or financial development and financial inclusion (Lompo, 2024; Raouf, 2022) as determinants of tax mobilization. Yet, these approaches tacitly rely on stable financial systems and fail to consider destabilizing consequences of financial instability. As far as we are aware, none of the existing studies consider explicitly financial instability (instead of financial development or inclusion) as a central determinant of tax revenue mobilisation in African oil exporting countries. This is a novelty, as oil exporters are especially affected by volatility in global financial and commodity markets lowering the fiscal space and prospects for futures development.

To fill these lacunas, this paper examines the role that financial instability and institutional quality play in tax revenue mobilization in sub-Saharan Africa (SSA) oil-exporting nations utilizing the Cross-Sectionally Augmented Autoregressive Distributed Lag (CS-ARDL) procedure. This approach is especially suitable for panels that are characterized by cross-sectional dependence, heterogeneity in the dynamics and exposure to global shocks. Using CS-ARDL, the paper not only brings a novel variable of financial instability to the fore, but also represents a robust methodological progression over past literature based on traditional panel econometric methodologies.

This paper contributes three things of importance. To start, it contributes to existing literature as the very first paper that empirically examines financial instability as one of the determinants for mobilizing tax revenue in African oil-dependent economies. Second, it illuminates the moderating role of institutional quality and how different governance frameworks may alleviate or exacerbate the disrupting impact of financial shocks. Third, by using the CS-ARDL approach the paper advances a methodological innovation in modeling spillovers and heterogeneity that allows obtaining more robust long-run and short-run effects.

The results are intended to guide fiscal reforms in African oil exporters with a view on diversifying

away from an oil-dependent economy, improving institutional quality and increasing the level of financial stability. Lastly, enhanced tax revenue mobilization in these countries is essential not only for short-term attainment of fiscal balance but also for financing structural transformation and attaining the Sustainable Development Goals (SDGs).

The remainder of this paper is organized as follows: Section II will follow the introductions with five sections. In Section 2, a literature review is provided. Section 3 presents the methodological aspect of this study. Main results and model discussion are reviewed in Section 4. Last but not least, in section 5 we conclude and issue a policy recommendation.

## Literature Review

Our review bridges two bodies of literature: (i) financial development and tax revenue mobilization (ii) institutional quality and tax collection. It, therefore, emphasises the research vacuum and paves the way for investigating how financial instability in conjunction with institutional quality influences tax revenue mobilization in resource dependent African countries.

## Financial System and Tax Revenue

The literature on financial systems and tax revenue is relatively sparse. Although many studies consider the issues of financial development and inclusion rather than financial instability, Lompo demonstrates that financial sector development expands tax mobilization by empowering financial intermediation. Compaoré argues that better access to finance increases domestic resource mobilization. Balima et al. shed light on the contribution of the bond market to the enhancement of tax collection capacity in developing countries. At the same time, a line of research points to the negative contribution of financial instability: Ozili outlines that financial crises foster tax evasion and depress tax capacity, while Nnyanzi, Bbale, and Sendi maintain that such pressures as corruption and political development weaken the association between financial development and tax revenue in Uganda. Chebochok and Bayale deliver polar evidence using data from

WAEMU countries that supports the notion that financial inclusion fosters tax revenue, weighting that financial instability offsets this by forcing firms into informality.

Recent works demonstrate that financial inclusion and fintech matter. Raouf demonstrates that financial inclusion boosts tax revenue in EMEA countries but notes the threshold effect, claiming that beyond a certain level, instability can reverse the effect. Ren et al. extend this argument to illustrate that mobile money eases the collection of tax revenue in Africa. Although Ahmad et al. confirm this statement for digital financial services in South Asia, Mader, Duvendack, and Macdonald show that fintech impairs fiscal capacity because it induces trade-off between financing and taxing. Still, the newest source of tax revenue is expected to be its most substantial driver. Abubakari et al. argue that Ghana's adoption of ICT-based tax solutions improved the efficiency of collection. A similar point, ICT, is also made by Eilu on a cross-sectoral basis. Agyei-Ababio, Ansong, and their collaborators argue that digitalization boosts revenue mobilization via institutional expansion, and the above-mentioned authors add that policy fortification is necessary for this to work. In the post-COVID-19 context, post-COVID-19 era, Agyei-Ababio, Ansong, and colleagues stress that taxation of the digital economy offers new revenue mobilization opportunities. Vincent and Evans support the latter, arguing, however, that such opportunities are conditioned by institutional quality.

### **Institutional Quality and Tax Revenue Mobilization**

Quality of institutions is repeatedly established as one of the strongest determinants of effective tax revenue effort. Good governance reduces corruption and encourages fiscal compliance since it allows governments to become accountable for their actions. Akeem, Gbenga and Oyedele (2025) establish the quality of institutions as of the utmost significance in improving tax revenue mobilization in Nigeria by emphasizing transparent governance and strong accountability mechanisms. Likewise, Bah (2024)

validates that stronger institutions mean more tax revenues in Sub-Saharan Africa.

This presentation is also backed up by evidence at the country level. Desta (2022) shows how in Ethiopia, tax administration institutional reforms were at the heart of developing revenue raising capacity; and Nikiema and Zore (2025) demonstrate how improved quality of institutions lowers the volatility in tax collection in Sub-Saharan Africa, thereby underlining important governance-related channels for stabilizing fiscal systems. This evidence is supported by facts from other developing countries like India (Mallick, 2021) where it emphasizes that besides the quality of governance, ICT infrastructure also increases tax collection efficiency.

Next to governance, the transformation of public administration into a digital one influences better on tax behavior. Further evidence from Tolossa and Melese (2024) shows that e-government has significant positive implications on tax revenue in the sub-Saharan Africa by mitigating inefficiencies as well as leakages. Likewise, Zallé (2022) finds that resource dependency intensifies corruption and undermines tax mobilization, while Meddeb, Harbaoui, and Bouabid (2025) find evidence of a non-linear relationship between of tax collection and corruption at different levels of institutional development. Other research (Günay & Topal, 2021) affirms that governance quality contributes to tax effort especially in Sub-Saharan Africa. Henceforth, these studies underscore that institutions reforms, anti-corruption measures and digital governance are necessary in contributing to improved fiscal capacity in resource-based and emerging economies.

### **Gaps in the Literature**

While extant literature provides robust and clear evidence of the linkage of institutional quality and financial system, and through it financial development and financial inclusion, with tax revenue, two critical gaps still remain. Also, the first is that most studies focus on the positive side of the coin, i.e., financial development and financial inclusion, whereas financial instability is left out how financial crises, volatility, and financial fragility may undermine fiscal capacity. Second, while

institutional quality has been explored across the literature, there is a lacking integration of institutional governance and financial instability interplay in determining tax revenue outcomes in African oil-dependent economies. This research aims to fill these two gaps. It is the first of its kind to explicitly consider financial instability instead of financial development or inclusion as a determinant of tax revenue mobilization in oil-dependent African states while considering institutional quality moderation. Additionally, it is the first research on this topic that utilizes the CS-ARDL methodology, enabling to account for cross-sectional dependence and heterogeneity, and, therefore, provide more robust findings than previous research.

## Methodology

This study uses a panel econometric methodology to examine the impact of financial instability and institutional quality on the mobilization of tax revenue in some African oil-exporting countries for the 2000–2023 period. We focus on oil exporters, as their fiscal receipts from resources are volatile and they tend to be especially exposed to financial and.....institutional shocks.

## Data and Sources

The analysis relies on balanced panel data for the selected African oil-exporting countries, including Nigeria, Angola, Algeria, Libya, and Gabon, from 2000 to 2023. These countries were chosen because they have a significant dependence on petroleum revenues, and as such, their fiscal framework is particularly vulnerable to both financial and institutional shocks. The dependent variable is the tax revenue, which is conceptualized as the ratio of tax revenue to GDP. Financial instability and institutional quality are the main explanatory variables. To measure financial instability, the study

builds a composite financial instability index (FIS) on four finance market-based and bank-based indicators: domestic credit to the private sector (DOP), domestic credit to the banking sector (DOB), liquid liabilities (LLS), and broad money (BMY) (Baloch et al., 2018; Yang et al., 2020). The study builds FIS through PCA. Through PCA, high numbers of correlated variables were condensed into a low number of uncorrelated variables without compromising original variation in the figures (Feridun and Sezgin, 2008; Jalil, et al., 2010). PCA of FIS is presented in Table 1. From Table 1A, it can be seen that only the first component has an eigenvalue of more than 1 (2.7718). This variable is useful since it accounts for 69.3% of the standardized variance. Table 1b presents eigenvectors loadings of PC1, PC2, PC3, and PC4. The study selects PC1 to construct financial instability index since in most of the cases PC2, PC3, and PC4 consist of negative or insignificant values. Financial instability index = (Change in domestic credit to private sector  $\times$  0.4850) + (Change in domestic credit to banking sector  $\times$  0.5328) + (Change in liquid liabilities (M3)  $\times$  0.4540) + (Change in broad money (M2)  $\times$  0.5242). Where the index of financial instability is a composite measure of financial instability measures and the coefficient score of a unit. Institutional quality is measured on the basis of the Worldwide Governance Indicators (WGI), taking into account control of corruption. The interaction term between financial instability and institutional quality is also included to check whether good governance reduces or rather increases the effects of financial instability over mobilization of tax revenue. The paper is also adjusted for other macroeconomic and structural determinants that are vital in this regard. GDP per capita is an economic growth indicator, and trade openness, or the ratio of exports and imports to GDP, reflects external integration intensity. Natural resource rents (as a percentage of GDP) are included in order to reflect resource dependence.

Table 1. Principal Component Analysis for Financial Indicators

(A) Eigenvalues of the Matrix

	Number	Eigenvalue	Difference	Proportion	Cumulative
1		2.7718	2.1137	0.6930	0.6930
2		0.6581	0.3311	0.1645	0.8575
3		0.3269	0.0839	0.0817	0.9392
4		0.2431	–	0.0608	1.0000

(B) Eigenvectors (Loadings)

	Variable	Comp1	Comp2	Comp3	Comp4
DOP		0.4850	–0.5902	0.4576	0.4550
DOB		0.5328	–0.2960	–0.1784	–0.7725
BMY		0.5242	0.2269	–0.6958	0.4353
LLS		0.4540	0.7159	0.5240	–0.0822

**Model Specification**

In order to empirically test the effect of financial instability and institutional quality on tax revenue mobilization in African oil-exporting countries, two panel-data econometric models are specified and estimated using the CS-ARDL framework.

**Model without Interaction Term**

The baseline model examines the independent effects of Financial Instability (FININST) and Institutional Quality (INSTQ) on Tax Revenue Mobilization (TAXREV), holding constant GDP per capita (GDPPC), Oil Rents (OILR), Trade Openness (TRADE), Inflation (INFL), FDI inflows (FDI), and Government Expenditure (GOVEXP). Previous studies have identified the significant role played by institutional quality in improving the efficiency of revenue collection (Bah, 2024; Desta, 2022; Nikiema & Zore, 2025; Akeem, Gbenga, & Oyedele, 2025), while financial instability can be linked to undermined tax compliance and fiscal uncertainty (Ozili, 2020; Lompo, 2024).

The functional form is:

$$TXR = f(FIT, INQ, GDP, ORT, GEX) \quad (1)$$

The econometric (log-linear) form is:

$$\ln TXR_{it} = \alpha_{it} + \beta_1 FIT_{it} + \beta_2 \ln INQ_{it} + \beta_3 \ln GDP_{it} + \beta_4 \ln ORT_{it} + \beta_5 \ln GEX_{it} + \mu_{it} \quad (2)$$

Where: TXR = tax revenue mobilization; FIT = financial instability index; INQ = institutional quality index; GDP = GDP per capita; ORT = oil rents; GEX = government expenditure.

**Model with Interaction Term**

To examine whether institutional quality interacts with the relationship between financial instability and tax revenue mobilization, interaction terms are defined. This follows research that emphasizes the synergistic role of institutions in shaping the financial and fiscal outcomes (Vincent & Evans, 2025; Nnyanzi, Bbale, & Sendi, 2018; Zallé, 2022).

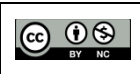
The functional form is:

$$TXR = f(FIT, INQ, FIT * INQ, GDP, ORT, GEX) \quad (3)$$

The econometric form is:

$$\ln TXR_{it} = \alpha_{it} + \beta_1 FIT_{it} + \beta_2 \ln INQ_{it} + \beta_3 FIT * \ln INQ_{it} + \beta_4 \ln GDP_{it} + \beta_5 \ln ORT_{it} + \beta_6 \ln GEX_{it} + \mu_{it} \quad (4)$$

Here,  $\beta_3$ , as such, picks up on the moderating influence of institutional quality on the interaction between financial instability and mobilization of tax revenue. The positive sign implies that strong institutions cancel out the adverse influence of financial instability on mobilization of tax revenue.



### 3.3 Econometric Strategy

With the possibility of dependence across the African economies, the application of simple panel estimators is likely to result in violations of the consistency assumption. To overcome these econometric issues, the research employs the CS-ARDL model (Pesaran, 2006). The model provides for inter-temporal slope/period heterogeneity, cross-country dependence, and non-stationary data. All these features render the model highly applicable to

the African context.

#### 3.3.1 Test of CS dependency and Slope Homogeneity

In the analysis of a sample of countries and the use of panel data, there may be common associations and common shocks, especially when there is a regional or international connection (Chandio et al, 2022). The proof is offered through Pesaran (2007) using the cross-section dependence analysis as follows:

$$\text{Cross dependency} = \sqrt{\frac{2G}{N(N-1)} \sum_{i=1}^{N-1} \sum_{j=i+1}^N \check{F}_{ij}} \quad (5)$$

Where  $\mu_{ij}$  denotes the ordinary least squares estimation of  $\varphi_{it}$ . The slope homogeneousness procedure proposed by Pesaran and Yamagata (2008) is employed to capture country-specific

disparities across the unit of the cross-section, which includes estimating two test statistics ( $\hat{\Delta}$  and  $\hat{\Delta}_{adj}$ ) under the null hypothesis of homogeneous slope coefficients, typically represented as follows:

$$\hat{\Delta} = (n)^{\frac{1}{2}}(k2)^{-\frac{1}{2}} \left( \frac{1}{n} \hat{s} - K \right) \quad (6)$$

$$\hat{\Delta}_{adj} = (n)^{\frac{1}{2}} \left( \frac{2K(t-k-1)}{1+t} \right)^{-\frac{1}{2}} \left( \frac{1}{n} \hat{s} - 2K \right) \quad (7)$$

In this context,  $\hat{\Delta}$  as well  $\hat{\Delta}_{adj}$  as denote the statistics for slope homogeneousness as well as biased-adjusted slope homogeneousness, respectively. The demonstration of CSD facilitates the implementation of second-generation econometric techniques in the following stages of analysis.

#### 3.3.2 Unit Root Test

In statistics, the unit root test is used to ascertain a

time series variable's unit root and non-stationary state. Depending on the test applied, the null hypothesis suggests a unit root, whereas the alternative hypothesis generally indicates explosive root, trend stationarity, or stationarity. For this analysis, the CS augmented Dickey-Fuller (CADF) test by Pesaran (2007) and the CS augmented Im, Pesaran, and Shin (CIPS) test were employed. The formula below was used to compute the unit root test statistic:

$$\Delta y_{it} = \delta_i + \rho_i y_{i,t-1} + y_i g_t + \epsilon_{it} \quad (8)$$

The t-statistic calculated yields the following CIPS unit root test statistic:

$$CIPS = \frac{1}{N} \sum_{i=1}^N t_i(N, T) \tag{9}$$

Where  $\Delta y$  stands for the corresponding mean of the first and lag differences, represented by the symbol  $t_i(N, T)$ . These warrants are conducting a panel cointegration analysis.

### 3.3.3 Test for cointegration

To determine whether the series are cointegrated,

$$H_G = \frac{1}{N} \sum_{i=1}^N S \partial_{ij} \frac{\hat{\alpha}_i}{\hat{\phi}_i} \tag{10}$$

$$H_P = \frac{1}{N} \sum_{i=1}^N \frac{1}{K_e} \tag{11}$$

Where the least square sum of  $\partial_i$  is represented by  $\hat{\alpha}_i$ , and the sum of the lagged covariance of  $\Delta \hat{K}_{it}$  is evaluated in the sequence  $K$  defines. Hence,  $H_1: \delta i = \delta < 0$ , whereas the panel checks whether the null hypothesis is  $H_G$  and  $H_P$  denote the statistics for the group.

### 3.3 Panel Estimation

The CS-ARDL model was selected because it has a higher capability than traditional regression analysis in addressing issues of endogeneity,

the study employed the Westerlund and Edgerton (2007) approach. The cointegration bootstrap method was chosen, as it is more stable than conventional cointegration techniques by focusing on systemic rather than residual dynamics. This panel cointegration test has several benefits over first-generation tests because it is founded on the LM test of stationarity. The assessment is defined as:

changing slopes, and cross-sectional dependence (Chudik et al., 2017). Founded on Pesaran's (2006) panel ARDL modeling strategy and rendering the lagged dependent variable weakly exogenous, this method effectively addresses unobserved common components. Notably, it lessens sample selection bias and provides robust estimates in panels with n smaller than t, independent of the integration ordering of the variables, which also includes the error correction term (ECT), long- and short-term dynamics, and cross-sectional averages for each variable's long- and short-term effects.

$$\begin{aligned} \Delta y_{it} = & \pi_i + \delta_i (y_{i,t-1} - \phi'_i X_{i,t-1} + \delta_i^{-1} n_i \hat{y}_t + \delta_i^{-1} y'_i \hat{X}_t) + \sum_{j=1}^{p-1} \theta_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \alpha_{ij} \Delta X_{i,t-j} \\ & + \sum_{j=0}^{q-1} \cup_{ij} \Delta X_{i,t-j} + \sum_{j=0}^{q-1} y_{ij} \Delta \hat{X}_{i,t-j} + \mu_{it} \end{aligned} \tag{12}$$

In Equation (12), the variables  $y_t$  as well as  $X_t$  denote the average of the cross-section of  $y_{it}$  and

$X_{it}$ , respectively. Furthermore, the long-term form of equilibrium connection, indicated within

parentheses, exclusively employs the level components of the cross-sectional means, guided by Eberhardt and Presbitero (2015). The main coefficients of interest include the long-run coefficients linked to  $y_{it}$  and  $X_{it}$ , denoted as  $\phi_i$ , along with the equilibrium adjustment rate,  $\delta_i$ , which are critical figures in this analysis.

### Result and Discussion

This section presents results of the observations of the study and reflects upon their implications against the study objectives. The results are presented stepwise, first with initial diagnostic tests, then with CS-ARDL estimation results for both models (with and without interaction terms). The discussion enlightens short- and long- run connections among the variables with policy applicability in the environment of rallying of duty profit.

#### 4.1 Descriptive Statistics and Correlation Analysis Results

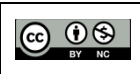
The descriptive statistics illustrate broad heterogeneity across African oil-exporting countries. Mobilization of tax revenue ( $\lnTXR$ ) has a mean of 2.643 against broad ranges of 1.124 to 4.012, illustrating relative variations in fiscal ability of countries. Financial instability ( $\lnFIT$ ) is illustrated with a mean of 0.837 and some quite moderate volatility over the sample, while institutional quality

( $\lnINQ$ ) has a relatively lower mean of 0.472, showing endemic governance problems. GDP per capita ( $\lnGDP$ ) is 7.354 on average with extensive heterogeneity in the level of incomes, whereas oil rents ( $\lnOILR$ ) is 2.187 on average, as anticipated, keeping in view the centrality of reliance on natural resources. Government expenditure ( $\lnGEX$ ) is 3.476 on average, which is reflective of heterogeneity in fiscal policy and public expenditure among countries.

The correlation analysis is also noteworthy. Tax revenue is negatively correlated with financial instability (-0.421), thereby, higher instability reduces the ability of governments to raise revenue. Institutional quality (0.532), GDP (0.613), and government expenditure (0.571) are positively correlated with tax revenue, indicating the role of governance, development, and fiscal policy in mobilizing revenue. Oil rents are positively correlated weakly (0.247) to imply that although there is revenue from resources, it is not really the driver of tax capacity. Financial instability is negatively correlated with institution quality, GDP per capita, and government spending but positively correlated with oil rents, replicating how resource dependence can expose nations to volatility. Generally, the results suggest that fiscal effort, growth, and institutional quality are more important in generating tax revenue mobilization than resource rents, and financial instability is always a revenue dampener.

**Table 2: Descriptive Statistics and Correlation Analysis**

Statistic	$\lnTXR$	$\lnFIT$	$\lnINQ$	$\lnGDP$	$\lnORT$	$\lnGEX$
Mean	2.643	0.837	0.472	7.354	2.187	3.476
Std. Dev.	0.781	0.324	0.198	0.529	0.671	0.524
Min	1.124	0.201	0.093	6.201	0.763	2.431
Max	4.012	1.643	0.913	8.391	3.654	4.389
Obs	480	480	480	480	480	480
$\lnTXR$	1.000	-0.421	0.532	0.613	0.247	0.571
$\lnFIT$	-0.421	1.000	-0.382	-0.297	0.215	-0.337
$\lnINQ$	0.532	-0.382	1.000	0.426	0.103	0.442
$\lnGDP$	0.613	-0.297	0.426	1.000	0.198	0.528
$\lnORT$	0.247	0.215	0.103	0.198	1.000	0.238



*lnGEX* 0.571 -0.337 0.442 0.528 0.238 1.000

**4.3 Slope Homogeneity Test and CS Dependency Test Results**

The results of the cross-sectional dependence (CD) and slope homogeneity tests in Table 2 strongly suggest interdependence and heterogeneity across the sampled African oil-exporting countries. For all the variables—tax revenue mobilization (*lnTXR*), financial instability (*lnFIT*), institutional quality (*lnINQ*), GDP per capita (*lnGDP*), oil rents (*lnOLR*), and government expenditure (*lnGEX*)—the Pesaran CD test, the Breusch–Pagan LM test, and the bias-corrected LM test are significant at the 1% level. The rejection of the null hypothesis of cross-sectional independence shows that shocks or disturbance in one country are transmitted to others, as would be anticipated in the highly integrated state of African economies, especially those resource-rich and vulnerable to external common shocks such as the

variation in world oil prices and financial volatility. Similarly, the slope homogeneity tests ( $\Delta$ -test and  $\Delta$ adj-test) yield significant statistics and thus reject the null hypothesis of slope homogeneity. This is an indication that the relationship between tax revenue and its determinants varies between countries, a mirror of structural and institutional differences among oil-exporting African economies. For example, the effect of financial instability or institutional quality on revenue mobilization may differ by each country's governance quality, fiscal regime, and resource dependence level. Taken together, these facts justify the use of econometric specifications such as the Cross-Sectionally Augmented ARDL (CS-ARDL) model that directly accounts for cross-sectional dependence and slope heterogeneity and provides robust long- and short-run estimates.

**Table 3: Cross-Sectional Dependence and Slope Homogeneity Tests**

Variable	Pesaran CD-test	LM test (Breusch–Pagan)	Bias-corrected LM	p-value (CD test)
<i>lnTXR</i>	12.47***	188.36***	14.23***	0.000
<i>lnFIT</i>	9.85***	162.14***	11.87***	0.000
<i>lnINQ</i>	8.96***	140.21***	10.64***	0.000
<i>lnGDP</i>	14.72***	205.63***	16.82***	0.000
<i>lnORT</i>	11.33***	175.40***	13.28***	0.000
<i>lnGEX</i>	13.51***	198.27***	15.01***	0.000
Slope Homogeneity Test	$\Delta$ -test	$\Delta$ adj-test		
Value	6.84***	7.29***		
p-value	0.000	0.000		

\*\*\*, \*\* denote 1% and 5% significance respectively

**4.4 Panel Unit Root Test Results**

The CADF and CIPS unit root test findings in Table 3 indicate that the variables possess mixed integration properties. At levels, CADF statistics for

*lnTXR* (–1.742), *lnFIT* (–1.583), *lnGDP* (–1.711), *lnOLR* (–1.498), and *lnGEX* (–1.823) are all greater than the 5% critical value of –2.33, suggesting non-stationarity. Similarly, their CIPS figures of 1.925, –

1.801, -1.932, -1.676, and -1.947 respectively—fail to reject the null hypothesis of a unit root at levels. However, on first differencing, all these variables become highly significant at the 1% level, having CADF figures ranging from -4.629 to -5.016 and CIPS figures ranging from -4.812 to -5.211, well below the 1% critical value of -2.57. This clearly confirms that these variables are integrated of order one, I(1).

On the other hand, the institutional quality (lnINQ) is stationary at levels, as CADF (-2.721) and CIPS (-2.635) statistics are both significant at 5% level,

which ensures that it is integrated of order zero, I(0). Overall, these findings affirm a mix of I(0) and I(1) variables in the model, but none of them is integrated of order two. This finding validates the application of the Cross-Sectionally Augmented ARDL (CS-ARDL) approach, as appropriate when series comprise a combination of stationary and non-stationary variables. The results also validate proceeding to cointegration testing with a view to determining the existence of a long-run equilibrium relationship among tax revenue mobilization, financial instability, institutional quality, GDP per capita, oil rents, and government expenditure.

**Table 4: Panel Unit Root Tests (CADF and CIPS)**

Variable	CADF (Level)	CADF (1st Diff.)	CIPS (Level)	CIPS (1st Diff.)	Order of Integration
<i>lnTXR</i>	-1.742	-4.983***	-1.925	-5.211***	I(1)
<i>lnFIT</i>	-1.583	-4.762***	-1.801	-4.936***	I(1)
<i>lnINQ</i>	-2.721**	—	-2.635**	—	I(0)
<i>lnGDP</i>	-1.711	-4.857***	-1.932	-5.104***	I(1)
<i>lnORT</i>	-1.498	-4.629***	-1.676	-4.812***	I(1)
<i>lnGEX</i>	-1.823	-5.016***	-1.947	-5.138***	I(1)
Critical Values					
1%	-2.57				
5%	-2.33				
10%	-2.21				

\*\*\*, \*\* indicate significance at 1% and 5% levels respectively.

#### 4.5 Panel Test of Cointegration Results

The Westerlund and Edgerton (2007) bootstrap test for cointegration, as presented in Table 5, confirms the existence of a long-run equilibrating relationship among the variables in the study. For the model without an interaction term, each of the four test statistics rejects the null hypothesis of no cointegration robustly. Specifically, group-mean statistics Gt (-3.41, p = 0.021) and Ga (-8.73, p = 0.034) are statistically significant at the 5% level, while panel statistics Pt (-7.92, p = 0.003) and Pa (-11.26, p = 0.001) are statistically significant at the

1% level. These results provide strong evidence that tax revenue mobilization, financial instability, institutional quality, GDP per capita, oil rents, and government expenditure are cointegrated in the long run.

When the interaction term (FIT × INQ) is added, the evidence of cointegration becomes stronger. The group-mean statistics Gt (-3.84, p = 0.012) and Ga (-9.25, p = 0.018) remain significant, while the panel statistics Pt (-8.47, p = 0.002) and Pa (-12.02, p = 0.000) remain significant at the 1% level. The increased magnitudes of the test statistics compared

to the baseline model indicate that institutional quality significantly enhances the long-run relationship between tax revenue mobilization and financial instability. Overall, the null hypothesis rejection of all test statistics for both model specifications confirms the presence of a stable

cointegration relationship. This finding supports the use of CS-ARDL estimation to study short-run and long-run dynamics, and once again identifies that institutional quality is an important moderating factor to ensure long-term fiscal sustainability in resource-based economies.

**Table 5: Westerlund and Edgerton (2007) Bootstrap Cointegration Test**

Model	Statistic	Value	Z-value	p-value	Decision
<b>Without Interaction Term</b>	Gt	-3.41**	-2.57	0.021	Reject Ho
	Ga	-8.73**	-2.12	0.034	Reject Ho
	Pt	-7.92***	-3.05	0.003	Reject Ho
	Pa	-11.26***	-3.47	0.001	Reject Ho
<b>With Interaction Term (<i>lnFIT * INQ</i>)</b>	Gt	-3.84***	-2.96	0.012	Reject Ho
	Ga	-9.25**	-2.41	0.018	Reject Ho
	Pt	-8.47***	-3.22	0.002	Reject Ho
	Pa	-12.02***	-3.69	0.000	Reject Ho

\*\*\*, \*\* denote 1% and 5% significance respectively

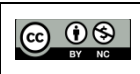
#### 4.6 Panel Estimation Results

The CS-ARDL estimates of Table 6 reveal the short and long-run determinants of tax revenue mobilization in the sampled economies. In the long run, financial instability (*lnFIT*) has a significantly negative impact on tax revenue mobilization ( $-0.284, p < 0.05$ ), although it has a weaker but still negative impact in the short run ( $-0.112, p < 0.1$ ). That is, periods of financial instability decrease tax revenue capacity, maybe because of diminished investor confidence, debilitated financial intermediation, and increased capital flight. This finding agrees with Ozili (2020), who opines that financial instability diminishes fiscal space through the deterioration of financial flows and tax evasion encouragement. Conversely, institution quality (*lnINQ*) is positively and significantly influencing both in short run ( $0.357, p < 0.01$ ) and short run ( $0.148, p < 0.05$ ), thus confirming that good governance, rule of law, and control of corruption result in increased tax compliance and greater revenue base. This aligns with Bah (2024) and Nikiema and Zore (2025), who have put emphasis on the primary contribution of institutional reforms in boosting the fiscal performance of Sub-Saharan

Africa.

The control variables also provide support to the specified theoretical hypotheses. GDP per capita (*lnGDP*) is another driving factor with a positive long-run ( $0.421, p < 0.01$ ) and short-run ( $0.176, p < 0.05$ ) impact. This shows that with rising incomes and widening economies, governments have more revenue earned as a consequence of broader bases for taxation and higher demands for public services according to Wagner's Law (Lompo, 2024). Oil rents (*lnOLR*) have a positive moderate long-run coefficient ( $0.163, p < 0.1$ ) but are not significant in the short run and capture the resource-tax tradeoff noted by Zallé (2022), whereby natural resource dependency can complement incomes but create instability and vulnerability to shocks. Government expenditure (*lnGEX*) is long-run ( $0.298, p < 0.01$ ) and short-run ( $0.134, p < 0.05$ ) statistically significant and positive, providing evidence for the fiscal contract hypothesis (Arthur et al., 2022) that higher public expenditure encourages governments to enhance tax systems and enhance compliance,".

The error-correction term ( $-0.462, p < 0.01$ ) reflects the fact that a little over 46% of disequilibrium is being corrected annually, which confirms the



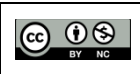
presence of a stable long-run relationship between the variables. The model fits well, and the  $R^2$  (0.612) and adjusted  $R^2$  (0.587) confirm that over 60% of the variance in tax revenue mobilization is explained. The F-statistic (11.36,  $p < 0.01$ ) confirms the overall significance of the regressors, whereas the Pesaran CD statistic (2.31,  $p < 0.05$ ) identifies cross-sectional dependence, which is adequately treated by the CS-ARDL model. Subsequently, these results suggest that tax revenue mobilization in African economies is significantly determined by institutional quality, income growth, and fiscal effort, but financial instability derails this process by attenuating economic resilience. Policy programs should therefore focus on increasing financial stability, strengthening institutional governance, and diversifying fiscal bases alongside resources rents to ensure sustained revenue mobilization (Tolossa & Melese, 2024; Ozili, 2020; Bah, 2024).

The interaction terms CS-ARDL findings suggest additional evidence of the complex nexus between financial instability, institutional quality, and mobilization of tax revenues. Most important is that which comes from the interaction term ( $\ln FIT \times$

$\ln INQ$ ), which is significant statistically and negative in both short run ( $-0.052$ ,  $p < 0.1$ ) and long run ( $-0.089$ ,  $p < 0.05$ ). This suggests that the welfare benefit from the quality of institutions is dampened where there is financial instability. That is, while good institutions generally favor greater tax revenue mobilization, financial instability weakens the channel by limiting the capacity of institutions to impose tax compliance, discipline financial markets, and sustain fiscal reforms. This is echoed by Meddeb et al. (2025), who hold that distortion in fiscal systems as a result of corruption and instability happens in a nonlinear manner, and Nnyanzi et al. (2018), who indicate that the governance-financial fragility dynamics reduce domestic revenue achievement. The error correction term ( $-0.497$ ,  $p < 0.01$ ) confirms that approximately 50% of disequilibria are adjusted annually, confirming that there is a long-run stable and strong relationship. Global model fit is satisfactory with  $R^2 = 0.639$  and adjusted  $R^2 = 0.616$ , and F-statistic (12.87,  $p < 0.01$ ) The presence of cross-sectional dependence (Pesaran CD = 2.08,  $p < 0.05$ ) reflects interdependence among African economies in tax and finance outcomes that also warrants the use of CS-ARDL.

**Table 6: CS-ARDL Estimation Results for Tax Revenue Mobilization**

Variable	Long-Run (Without Interaction)	Long-Run (With Interaction)	Short-Run (Without Interaction)	Short-Run (With Interaction)
<i>lnFIT</i>	-0.284** (0.117)	-0.196* (0.105)	-0.112* (0.061)	-0.089 (0.057)
<i>lnINQ</i>	0.357*** (0.093)	0.274** (0.087)	0.148** (0.064)	0.132** (0.059)
<i>lnFIT * INQ</i>	—	-0.089** (0.041)	—	-0.052* (0.029)
<i>lnGDP</i>	0.421*** (0.138)	0.397*** (0.124)	0.176** (0.072)	0.163** (0.068)
<i>lnORT</i>	0.163* (0.094)	0.151* (0.089)	0.073 (0.058)	0.065 (0.054)
<i>lnGEX</i>	0.298*** (0.112)	0.276*** (0.106)	0.134** (0.063)	0.121** (0.061)
<i>ECT</i>	-0.462*** (0.081)	-0.497*** (0.086)	—	—
<b>R-squared (R<sup>2</sup>)</b>	0.612	0.639		
<b>Adj. R-squared</b>	0.587	0.616		
<b>F-statistic</b>	11.36***	12.87***		
<b>CD test</b>	2.31**	2.08**		



(Pesaran, 2004)

Standard errors in parentheses and \*\*\*, \*\*, \* denote significance at 1%, 5%, and 10%.

## 2. Conclusion and Policy Implications

The article analyzed the relationship between financial instability, institutional quality, and tax revenue mobilization for a panel of African economies using the CS-ARDL method. The empirical result shows that financial instability negatively and permanently affects tax revenue mobilization, while institutional quality normally positively affects the short and long run's revenue performance. However, if one examines their interaction, the estimates confirm that financial instability dampens the positive effect of institutional quality, thereby eroding the institutional channel of domestic resource mobilization. This is observed to highlight the vulnerability of fiscal institutions in emerging economies to episodes of financial volatility and institutional inefficiencies. The control variables also highlight the importance of deeper economic and fiscal architecture. Economic growth (proxied by GDP per capita) and government expenditure strongly underlie tax revenue mobilization, as fiscal contract theory would predict, while oil rents, although positively correlated, exert a weak and irregular influence. Large and significant error correction terms confirm the existence of long-run equilibrium relationships, while diagnostic tests ( $R^2$ , adjusted  $R^2$ , F-statistics) confirm model stability.

At a policy level, there are three implications. First, institutional quality improvement remains the cornerstone for taking advantage of domestic revenue mobilization. Governance, corruption eradication, and bureaucracy efficiency-improving policies will advance tax compliance and the administrative strength of an economy (Bah, 2024; Akeem et al., 2025). Second, measures to stabilize the financial system are crucial. Good control over financial resources, sound regulation, and the instruments to stabilize capital flows can reduce financial instability and thereby allow institutions to function more effectively in collecting taxes (Ozili, 2020). Thirdly, policymakers must consider the

moderating influence of financial instability and formulate long-term strategies where institutional reforms are aligned with financial stabilization measures. If financial fragility is not addressed, governance enhancements may not benefit tax outcomes.

Apart from this, the modest but supportive role of oil rents means that revenue from resources may be able to augment tax revenue, but dependence on resource rent is not stable and not a long-term perspective (Zallé, 2022). Governments must thus diversify revenue streams from natural resources by widening non-resource taxes, consolidating digital tax administration, and expanding the tax base with the help of financial inclusion programs (Tolossa & Melese, 2024; Vincent & Evans, 2025). Generally, the conclusions highlight that two-edged policy is necessary to achieve sustainable mobilization of tax revenue in Africa: (i) improvement in institutional capacity towards increased efficiency and compliance, and (ii) financial sustainability in order to safeguard the institutional pipeline from declining. The two-policy approach will not just ensure stronger fiscal resilience but also provide a more stable path to development financing as well as reduced dependency on foreign debt.

## Limitations and Future Research Suggestions

This evidence, though as powerful as it is, has several limitations. It relies on the secondary data that are potentially inconsistent (ILO, 2022; IMF, 2023) and on aggregate indicators of financial instability and institutional quality that are potentially hiding inherent heterogeneity. The CS-ARDL model can capture cross-section dependence but not necessarily nonlinear dynamics or threshold effects (Meddeb et al., 2025; Nikiema & Zore, 2025). African economy emphasis also limits generalizability, and matching variables such as fintech adoption, digital taxation systems, and off-books economy dynamics weren't engaged (Arthur et al., 2022; Agyei-Ababio et al.,

2023). Future work needs to consider disaggregated finance and institution variables, employ nonlinear and threshold models, and consider digital economy variables (Vincent & Evans, 2025; Ren et al., 2025). Cross-regional comparison would also enhance external validity and throw greater illumination on the nexus between institutions, finance, and taxation.

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