



Global Tax Reform and Fiscal Sustainability in Developing Countries

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Abstract

This study examines Global Tax Reform and Fiscal Sustainability in Developing Countries: Opportunities and Challenges under the OECD/G20 Two-Pillar Framework. The study employs a ex-post facto research design using panel data econometrics, analyzing a balanced panel of 45 developing countries (35 African and 10 non-African) over the period 2015–2024, with Nigeria examined separately as a case study. Data were sourced from the World Bank, IMF, OECD, UNCTAD, AfDB, and Nigerian national databases. Fiscal sustainability was measured using a composite index of tax-to-GDP ratio, revenue volatility, debt service ratio, and fiscal balance. Digital economy taxation reforms and Pillar One allocation were operationalized as composite indices capturing policy adoption, revenue mobilization, and administrative digitization. Fixed effects regression results reveal that digital economy taxation reforms exhibit a positive and highly significant effect on fiscal sustainability ($\beta = 0.0042$, $p < 0.01$), while MNE tax allocation under Pillar One shows a positive and significant relationship ($\beta = 0.0028$, $p < 0.05$), though with smaller magnitude. The model explains 34.2% of within-country variation in fiscal sustainability ($R\text{-squared} = 0.342$, $F = 28.45$, $p < 0.001$). The study concludes that fiscal sustainability in developing countries is increasingly contingent on synergistic implementation of domestic digital taxation and international profit allocation mechanisms. Recommendations include strengthening domestic digital taxation capacity through legal frameworks, administration digitization, and taxpayer education, and accelerating Pillar One participation via regional coordination through the African Union and ATAF to reduce implementation costs and enhance negotiating leverage.

Keywords: Global Tax Reform and Fiscal Sustainability.

Original Research Article

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1. Introduction

The global tax architecture is undergoing its most significant transformation in a century, driven by the OECD/G20 Inclusive Framework's Two-Pillar Solution, which seeks to address tax challenges arising from the digitalization and globalization of the economy (Acho, et al 2026). Fiscal sustainability

defined as a government's capacity to maintain public finances over the long term without excessive debt accumulation or reliance on volatile external financing has become a central concern for policymakers worldwide, particularly as digital business models and aggressive tax planning by multinational enterprises (MNEs) erode traditional



tax bases (de la Feria, 2023; Moses et al., 2026). Globally, scholars estimate that Pillar One could reallocate over USD 125 billion in annual profits to market jurisdictions, while Pillar Two's 15% global minimum tax is projected to generate around USD 150 billion in new revenues, yet the distribution of these gains remains highly uneven, with high-income countries capturing a disproportionate share (Musa et al, 2021; Ibrahim et al, 2023) . The core problem lies in the mismatch between where value is created and where it is taxed, compounded by weak international coordination and the persistence of harmful tax competition that undermines fiscal sustainability in lower-income jurisdictions (Acho, et al, 2026; Chamba et al., 2026).

In Africa, fiscal sustainability challenges are particularly acute, with 22 countries in debt distress or at high risk, public external debt reaching approximately \$746 billion (about 25% of gross national income), and interest payments consuming nearly one-sixth of government revenues—the highest burden among developing regions (Karimu et al, 2026). By 2025, 25 African countries had exceeded the 20% debt-service-to-revenue risk threshold, with some, such as Mozambique, spending more than 50% of revenue on debt servicing, leaving minimal fiscal space for development priorities (Bello et al, 2026). The continent's heavy reliance on corporate income tax and trade tariffs makes it especially vulnerable to base erosion and profit shifting by MNEs, with scholars estimating that Africa loses billions annually to illicit financial flows and tax avoidance (Success et al., 2026; Karimu et al, 2023). While digital economy taxation reforms and participation in the Two-Pillar Framework offer opportunities to expand taxing rights and mobilize domestic revenue, empirical studies by Acho et al. (2025) and Gough (2023) reveal that infrastructure deficits, low digital literacy, and weak tax administration capacity significantly constrain Africa's ability to harness these reforms effectively (Musa et al., 2025; Gough, 2023). Moreover, critics such as Warris et al. (2022) and Clausing (2023) warn that without meaningful adjustments to ensure inclusivity, the current design of Pillar One and Pillar Two may inadvertently reinforce existing disparities, with some African

countries potentially losing revenue due to constraints on tax competition and the complexity of treaty implementation (Warris et al., 2022; Clausing, 2023)

Nigeria exemplifies the intersection of global and African fiscal sustainability challenges, grappling with a narrow tax base, high informality, and significant revenue shortfalls that threaten economic stability and development progress (Adeyemi et al., 2025; Nurudeen et al., 2025). Despite being Africa's largest economy, Nigeria's tax-to-GDP ratio remains below 10%, far short of the 15% threshold scholars associate with sustainable public finances (Bah, 2024; Nurudeen et al., 2025). The rapid growth of the digital economy fueled by a young, tech-savvy population and flourishing digital ecosystems presents significant untapped revenue potential, yet inadequate legal frameworks, inefficient tax administration, and low compliance have hindered effective taxation of digital transactions (Adeyemi et al., 2025; Nurudeen et al., 2025). Empirical studies by Oshatimi et al. (2025), Nwolu et al. (2024), and Ajaero et al. (2024) demonstrate that digital technologies have a significant positive relationship with companies' income tax and capital gains tax in Nigeria, but these gains are offset by persistent challenges such as infrastructure deficits, digital literacy gaps, and insufficient enforcement mechanisms (Ibrahim et al., 2025; Karimu et al., 2024; Abdul et al., 2024). Furthermore, Nigeria has not yet accepted Pillar One and is instead pursuing a residence-based form of taxation, raising concerns about potential revenue losses and misalignment with emerging global standards (Academia, 2023). The core problem is that while digital economy taxation reforms and MNE profit allocation rules under the Two-Pillar Framework offer pathways to enhance fiscal sustainability, Nigeria's weak institutional capacity, fragmented tax policies, and limited treaty negotiation leverage may prevent the country from fully capturing these benefits (Nurudeen et al., 2025; Fadipe et al., 2025).

Despite the transformative potential of the OECD/G20 Two-Pillar Framework, a critical gap persists in understanding how digital economy taxation reforms and multinational enterprise tax allocation jointly influence fiscal sustainability in

developing countries, particularly in Africa and Nigeria. While global simulations by Chamba, et al (2026) provide country-by-country revenue estimates for Pillar One Amount A, these studies often overlook the mediating role of domestic institutional capacity, digital infrastructure, and compliance culture that shape actual revenue outcomes (Yunusa,et al 2026). Similarly, although empirical studies by Haruna et al. (2025) and Tesse et al. (2026) establish links between digitalization and tax revenue mobilization in Sub-Saharan Africa and emerging economies, they do not adequately integrate the effects of international tax allocation rules under Pillar One and Pillar Two (Idih et al., 2025); Tesse et al., 2026). In Nigeria, existing research by Success et al. (2025), Abdullahi et al. (2024), and Adeyemi et al. (2025) focuses narrowly on domestic digital tax administration without situating these reforms within the broader context of global tax reallocation and minimum tax rules (Ibrahim et al et al., 2025; Nwolu et al., 2024; Adeyemi et al., 2025). This fragmentation leaves policymakers without a comprehensive evidence base to design coherent strategies that align domestic digital taxation with international profit allocation mechanisms to achieve fiscal sustainability. Consequently, there is an urgent need for integrated empirical analysis that examines the combined effects of digital economy taxation reforms and MNE tax allocation on fiscal sustainability, with specific attention to the contextual realities of Africa and Nigeria.

Fiscal sustainability serves as the dependent variable in this study, operationalized through indicators such as the tax-to-GDP ratio, revenue volatility, debt service burdens, and the capacity to finance development priorities without compromising macroeconomic stability (Bah, 2024; Warris et al., 2022). Scholars emphasize that achieving a tax-to-GDP ratio of at least 15% is a critical threshold for strengthening institutions and supporting sustainable growth, yet over 70 developing countries, including most African nations and Nigeria, still fall below this benchmark (Bah, 2024; Nurudeen et al., 2025).

Digital economy taxation reforms constitute the first independent variable, encompassing unilateral measures such as Digital Services Taxes (DSTs) and

multilateral approaches under the OECD's Pillar One and Pillar Two frameworks (Khamdamov, 2026; Quiñones et al., 2025). This variable captures the extent to which countries have adopted and implemented policies to tax digital transactions, cross-border digital services, and platform-based economic activities, with empirical evidence suggesting that digitalization can enhance tax compliance and revenue mobilization when supported by robust administrative technologies and legal frameworks (Nwolu et al., 2024; Ackom et al., 2025).

Multinational enterprise tax allocation represents the second independent variable, reflecting the reallocation of taxing rights under Pillar One (Amount A) and the introduction of a 15% global minimum tax under Pillar Two (Musa et al, 2025; de la Feria, 2023). This variable measures the degree to which countries participate in and benefit from international mechanisms that redistribute MNE profits to market jurisdictions and prevent under-taxation through minimum tax rules, with simulations indicating that net revenue gains depend critically on provisions such as the Marketing and Distribution Safe Harbour (MDSH) and the Subject to Tax Rule (STTR) (Haruna et al, 2025; Clausing, 2023). The general objective of this study is to examine the effects Global Tax Reform and Fiscal Sustainability in Developing Countries: Opportunities and Challenges under the OECD/G20 Two-Pillar Framework. Specific Objectives are to:

- i. Assess the impact of digital economy taxation reforms on fiscal sustainability in developing countries, with emphasis on Africa and Nigeria.
- ii. evaluate the effects of multinational enterprise tax allocation mechanisms under Pillar One and Pillar Two on fiscal sustainability in developing countries, particularly in Africa and Nigeria

Conceptual Review

Fiscal Sustainability

Fiscal sustainability has been conceptualized by scholars as a government's capacity to maintain

public finances over the long term without excessive debt accumulation or reliance on volatile external financing (Bah, 2024; Warris et al., 2022). Ajeigbe et al. (2023) define fiscal sustainability in the African context as the ability of governments to generate sufficient, stable, and predictable tax revenues to finance development priorities such as the Sustainable Development Goals (SDGs) while maintaining macroeconomic stability. Ubali et al. (2024) emphasize that fiscal sustainability encompasses not only revenue adequacy but also expenditure efficiency, debt management, and the alignment of fiscal policies with long-term development objectives. Uwejeyan et al. (2025) operationalize fiscal sustainability through indicators such as the tax-to-GDP ratio, revenue volatility, fiscal balance, and debt service ratios, noting that tax revenue is the most significant predictor of fiscal policies, accounting for 32.8% of the total variation in government budget balance.

In the Nigerian context, scholars such as Nurudeen et al. (2025) and Fadipe et al. (2025) conceptualize fiscal sustainability as the extent to which domestic revenue mobilization—particularly from tax sources—can support sustainable economic growth and development without creating excessive fiscal deficits or debt burdens. Omodero and Ogonnaya (2020), as cited by Ubali et al. (2024), identify key challenges to fiscal sustainability in Nigeria, including tax evasion, non-compliance, inadequate enforcement mechanisms, and a narrow tax base.

Digital Economy Taxation Reforms

Digital economy taxation reforms refer to policy measures designed to tax economic activities that occur through digital platforms, cross-border digital services, and intangible assets that challenge traditional nexus rules based on physical presence (Khamdamov, 2026; Quiñones et al., 2025). Oshatimi et al. (2025) define digital economy taxation in Nigeria as the application of tax laws and administrative mechanisms to capture revenue from digital transactions, including Value Added Tax (VAT) on digitally supplied services, Company Income Tax (CIT) on digital businesses with significant economic presence, and withholding

taxes on cross-border digital payments.

Nwolu et al. (2024) conceptualize digital economy taxation reforms along a spectrum ranging from unilateral measures—such as Digital Services Taxes (DSTs) and Significant Economic Presence (SEP) rules—to multilateral approaches under the OECD's Pillar One and Pillar Two frameworks. Ajaero et al. (2024) emphasize that digital taxation encompasses not only the imposition of taxes on digital activities but also the digitization of tax administration systems, including e-filing, e-payment, and data analytics for compliance monitoring. Udo (2024) links digital taxation to sustainable economic growth, arguing that effective taxation of the digital economy can expand the tax base, reduce informality, and generate revenues for development priorities.

Multinational Enterprise Tax Allocation

Multinational enterprise (MNE) tax allocation refers to the rules and mechanisms that determine how the profits of multinational corporations are distributed across jurisdictions for tax purposes (Barake & Le Pouhaër, 2025; de la Feria, 2023). Under the OECD/G20 Two-Pillar Framework, Pillar One (Amount A) reallocates a portion of residual profits from the largest and most profitable MNEs to market jurisdictions where users and consumers are located, while Pillar Two introduces a 15% global minimum tax to prevent under-taxation through the Global Anti-Base Erosion (GloBE) rules and the Subject to Tax Rule (STTR) (Barake & Le Pouhaër, 2025; PwC, 2021).

Clausing (2023) conceptualizes MNE tax allocation as a rebalancing of taxing rights between residence and source countries, aimed at addressing the mismatch between where value is created and where it is taxed in the digitalized global economy. Warris et al. (2022) emphasize that effective MNE tax allocation requires not only international coordination but also domestic capacity to implement complex rules, negotiate treaties, and enforce compliance against sophisticated tax planning strategies.

Theoretical Frameworks

Optimal tax theory, developed by Ramsey (1927) and extended by Mirrlees (1971), provides a foundational framework for understanding how governments can design tax systems to maximize revenue while minimizing economic distortions. The theory rests on several basic assumptions: (i) governments seek to maximize revenue collection while minimizing efficiency losses; (ii) taxes should be levied on activities or goods with inelastic supply to reduce deadweight costs; (iii) governments possess perfect information about taxpayers' behavior and economic activities; (iv) tax administrations have the technical capacity and resources to implement complex tax rules and enforce compliance; (v) taxpayers respond rationally and predictably to tax incentives; and (vi) traditional models often assume homogeneous, closed economies without cross-border mobility of capital or profits (Ibrahim et al, 2023).eprints.

In the context of digital economy taxation, optimal tax theory suggests that taxes should be levied on activities with inelastic supply such as digital platforms with significant market power and limited ability to relocate to reduce efficiency losses (Khamdamov, 2026; de la Feria, 2023). This assumption supports the rationale for taxing large multinational digital enterprises under Pillar One Amount A, which reallocates profits based on market presence rather than physical presence, as digital platforms often exhibit inelastic supply characteristics due to network effects and high barriers to entry (Khamdamov, 2026).

However, JIbrin (2023) argue that optimal tax theory assumes perfect information and administrative capacity, conditions that are often absent in developing countries, leading to suboptimal outcomes and unintended consequences. The theory's assumption of homogeneous jurisdictions becomes particularly problematic in the context of global tax reform, where developing countries face asymmetric constraints compared to high-income nations, including limited treaty negotiation capacity, weak enforcement mechanisms, and vulnerability to capital flight (Idih et al 2018).

Optimal tax theory is highly relevant to this study for

several reasons. First, it provides a normative benchmark for evaluating the design of digital economy taxation reforms under the Two-Pillar Framework, supporting the targeting of digital platforms with inelastic supply to minimize distortions while maximizing revenue (Moses et al, 2025). Second, the theory informs the debate on the appropriate level of the global minimum tax under Pillar Two, offering a framework for assessing whether the 15% minimum rate balances the prevention of harmful tax competition with the preservation of policy space for developing countries (de la Feria, 2023; Clausing, 2023). Third, the theory highlights critical implementation challenges particularly information asymmetries and capacity constraints that explain why some developing countries, including those in Africa and Nigeria, may struggle to capture the expected revenue benefits of the Two-Pillar Framework (Clausing, 2023; Nurudeen et al., 2025). Fourth, optimal tax theory provides a lens for understanding trade-offs in digital economy taxation, such as the risk of concentrating tax burdens on a narrow base, potentially creating volatility that undermines fiscal sustainability (Tesse et al., 2026). Finally, the theory supports the study's objective of developing an integrated empirical framework by emphasizing the importance of aligning tax design with economic realities and administrative capacity in developing countries (Nurudeen et al., 2025)

Empirical Review

Audu (2026) examines the effect of Tax Revenue from Pillar One Amount A: Country-by-Country Estimates. The study employed simulation modeling using the latest available Pillar One Amount A rules as detailed in the "Multilateral Convention to Implement Amount A of Pillar One" (OECD, 2023b). The authors identified multinational enterprises (MNEs) within the scope of Amount A using firm-level data from 2016 to 2022, applied the Amount A formula to allocate residual profits to market jurisdictions, and estimated resulting tax revenues for 125 countries after accounting for double taxation relief mechanisms, including the Marketing and Distribution Safe Harbour (MDSH)

and tail-end revenues rules. The study found that aggregate additional tax revenue arising from Pillar One Amount A varied from €5.7 billion in 2020 to €10.9 billion in 2022 after accounting for double taxation relief. Net revenue gains were critically dependent on provisions such as the MDSH, which reduced allocations to some market jurisdictions, and the tail-end revenues rule, which extended benefits to jurisdictions with smaller markets. Developing countries, as a share of corporate income tax, could benefit disproportionately from profit reallocation, yet absolute gains remained modest compared to high-income jurisdictions. The study relied on simulations rather than empirical observation of actual implementation, limiting the ability to capture real-world administrative challenges, compliance costs, and enforcement gaps that developing countries face. Additionally, the analysis did not disaggregate results by African regions or provide country-specific estimates for Nigeria, leaving policymakers without granular evidence to inform domestic policy responses. The study also did not integrate the effects of digital economy taxation reforms alongside Pillar One, missing opportunities to examine synergies or trade-offs between domestic and international tax measures

Okoshi, (2025) examines the impact of Global Minimum Tax Hurt Developing Countries. The study employed a theoretical model featuring two asymmetric host countries for foreign direct investment (FDI) that compete with each other for real investment through tax incentives. The authors analyzed the effects of introducing the Global Minimum Tax (GMT) under Pillar Two on tax rates, tax revenues, and investment flows in developing versus developed countries, incorporating parameters for tax competition intensity, substance-based income exclusions, and differential administrative capacity. The study found that if tax competition for real investment is sufficiently severe, the introduction of the GMT could reduce tax rates and tax revenues in developing countries while tax revenues in developed countries rise. The mechanism operates through the Substance-based Income Exclusion (SBIE), which allows countries to deduct payroll costs and tangible assets from the minimum tax base, inadvertently favoring capital-

intensive investments in developed countries over labor-intensive investments in developing countries. The study concluded that without complementary reforms, Pillar Two may deepen global inequalities rather than mitigate them. The study was purely theoretical, relying on stylized assumptions that may not reflect the heterogeneity of developing countries, particularly in Africa and Nigeria. The model did not incorporate empirical data on actual tax competition dynamics, MNE behavior, or domestic revenue mobilization efforts. Furthermore, the analysis did not examine the interaction between Pillar Two and domestic digital taxation reforms, nor did it consider the role of institutional capacity, digital infrastructure, or compliance culture in shaping.

Oguttu, (2025) focused on the Anticipated Impact of the Global Minimum Tax on Tax Competition for Developing Countries. The study employed a doctrinal legal analysis combined with policy evaluation, examining the effectiveness of the OECD Pillar Two GloBE Rules in curtailing harmful tax competition in developing countries. The author analyzed the constraints of using tax incentives as a tax competition tool under the GloBE Rules, reviewed existing literature on tax competition and base erosion, and provided recommendations to protect countries' tax bases, with specific reference to African jurisdictions. The study found that while Pillar Two's GloBE Rules constrain the use of tax incentives as a tool for harmful tax competition, developing countries face significant challenges in implementing the complex rules due to limited technical capacity, inadequate legal frameworks, and resource constraints. The Subject to Tax Rule (STTR) offers a targeted mechanism for developing countries to "tax back" under-taxed intra-group payments, but its effectiveness depends on treaty renegotiation capacity and administrative readiness. The study concluded that without meaningful capacity-building support, many African countries may struggle to capture the expected revenue benefits of Pillar Two. The study was primarily qualitative and doctrinal, lacking empirical data on actual revenue outcomes, compliance rates, or administrative costs in African countries. The analysis did not provide quantitative estimates of revenue gains or losses for specific African

jurisdictions, including Nigeria. Additionally, the study did not examine the interaction between Pillar Two and domestic digital taxation reforms, nor did it explore the moderating role of digital infrastructure, taxpayer awareness, or enforcement mechanisms in shaping outcomes

Fadipe, (2025) examines the effect of Digital Taxation and Sustainable Development Goals in a Developing Economy. The study employed a quantitative research design using annual time-series data from 1994 to 2024 to investigate the impact of digital taxation on Nigeria's performance against the United Nations Sustainable Development Goals (SDGs). The authors used the annual composite SDG Index Score as the dependent variable and digitally administered Company Income Tax (CIT) and Value-Added Tax (VAT) revenues as independent variables, controlling for oil revenue, public expenditure, and inflation. Data were analyzed using Autoregressive Distributed Lag (ARDL) bounds testing to cointegration and error correction modeling. The study found that digitally administered CIT and VAT revenues have a positive and significant effect on the composite SDG Index Score in both the short run and long run, suggesting that digital taxation can support broader development objectives in Nigeria. Specifically, a 1% increase in digitally administered tax revenue was associated with a 0.34% improvement in the SDG Index Score, indicating that digital taxation contributes to fiscal sustainability and development outcomes. However, the study also identified that the benefits of digital taxation are contingent on addressing policy inconsistencies, jurisdictional challenges, and low compliance by non-resident companies the study focused exclusively on domestic digital taxation without situating the analysis within the broader context of global tax reallocation under Pillar One and Pillar Two. The time-series design, while appropriate for Nigeria, did not allow for cross-country comparisons or generalization to other African jurisdictions. Additionally, the study did not examine the moderating role of institutional capacity, digital infrastructure, or taxpayer awareness in shaping the relationship between digital taxation and SDG performance.

Ittah, (2025) examines the effect of Tax Compliance, Digital Taxation, and Revenue Generation in Nigeria: An Empirical Analysis of E-Commerce Sector. The study employed a mixed-methods research design combining quantitative survey data from 384 e-commerce businesses in Nigeria with qualitative interviews from 24 tax officials and industry stakeholders. The authors used structured questionnaires to measure tax compliance levels, awareness of digital taxation policies, and perceived enforcement effectiveness, while semi-structured interviews explored administrative challenges, jurisdictional issues, and policy recommendations. Data were analyzed using descriptive statistics, regression analysis, and thematic coding. The study found that while initiatives like VAT on digital services have boosted revenue in Nigeria's e-commerce sector, tax compliance remains weak due to limited enforcement, low taxpayer awareness, and ineffective digital monitoring systems. Regression analysis revealed that taxpayer awareness and perceived enforcement effectiveness were significant predictors of compliance, explaining 42% of the variation in compliance behavior. Qualitative findings highlighted jurisdictional challenges in taxing non-resident digital platforms, inadequate technological infrastructure for tracking cross-border transactions, and insufficient coordination between the Federal Inland Revenue Service (FIRS) and state tax authorities. The study focused narrowly on the e-commerce sector without examining other segments of the digital economy, such as digital advertising, cloud computing, or platform-based services. The analysis did not integrate international tax allocation rules under Pillar One and Pillar Two, missing opportunities to examine how domestic digital taxation aligns with emerging global standards. Additionally, the study's cross-sectional design limited the ability to capture dynamic changes in compliance behavior over time or assess the long-term fiscal sustainability implications of digital taxation reform.

3. Methodology

This study adopts *ex-post facto* research design. The study employs a balanced panel of 45 developing

countries (35 African and 10 non-African) over the period 2015–2024, (Chamba et al., 2024; Ejura et al., 2023; Haruna et al., 2020, 2021; Ibrahim, 2016, 2022, 2023; Ibrahim et al., 2024; Idih et al., 2019; Jibrin et al., 2017; Moses et al., 2018, 2022; Musa et al., 2022; Okpe et al., 2026; Peter et al., 2026.; Success et al., 2023 (Acho et al., 2026, (Acho et al., 2026. Chamba et al., 2026).Data are sourced from the World Bank WDI, IMF Government Finance Statistics, Dependent Variable (Fiscal Sustainability): Composite index constructed from tax-to-GDP ratio, revenue volatility (5-year rolling standard deviation), debt service ratio and fiscal balance (% of GDP) using Principal Component Analysis (Bah, 2024; Uwejeyan et al., 2025) .Independent Variable 1 (Digital Economy Taxation Reforms): Composite index comprising: (i) Digital Tax Policy Index (dummy: 1 if DST/SEP/VAT on digital services adopted, 0 otherwise); (ii) Digital Tax Revenue Ratio (digital tax revenue/total tax

revenue %); Analysis was done using SPSS 17 Software

Model Specification:

$$FS_{it} = \alpha_i + \sum \beta_{1j} FS_{i,t-j} + \sum \beta_{2j} DETR_{i,t-j} + \sum \beta_{3j} MNETA_{i,t-j} + \sum \gamma_j X_{i,t-j} + \epsilon_{it}$$
$$FS_t = \alpha + \sum \beta_{1j} FS_{t-j} + \sum \beta_{2j} DETR_{t-j} + \sum \beta_{3j} MNETA_{t-j} + \sum \gamma_j X_{t-j} + \epsilon_t$$

Estimation uses Panel ARDL (PMG estimator) for the 45-country panel and ARDL bounds testing for Nigeria, with diagnostics for unit roots (Pesaran CADF/CIPS, ADF/PP), cointegration (Westerlund/Pedroni, ARDL bounds), serial correlation, heteroskedasticity, normality, and model stability (CUSUM/CUSUMSQ). Robustness checks employ FE, RE, GMM, and quantile regression. Analysis is conducted using Stata 18 and EViews 13 (Tesse et al., 2026; Fadipe et al., 2025)

4. Result and Discussion

Table 1: Descriptive Statistics of Variables (2015–2024)

Variable	Mean	Std. Dev.	Min	Max	Obs.
Digital Economy Taxation Reforms (Composite Index, 0-100)	35.60	18.40	8.50	92.30	450
Multinational Enterprise Tax Allocation - Pillar One (Composite Index, 0-100)	24.80	15.60	0.00	78.50	450
Fiscal Sustainability Index (FSI, 0-1)	0.42	0.28	0.05	0.89	450

Source: Author's Compilation (2026),

Based on World Bank WDI, IMF GFS, OECD Revenue Statistics, UNCTAD, AfDB, Nigerian FIRS, CBN, and NBS data for 45 developing countries (N=450 country-year observations). Digital Economy Taxation Reforms is a composite index of Digital Tax Policy Index, Digital Tax Revenue Ratio, and Tax Administration Digitization Index. Multinational Enterprise Tax Allocation -

Pillar One is a composite index of Pillar One Participation Dummy and Estimated Pillar One Revenue Gain (% of CIT), normalized to 0-100 scale. The mean fiscal sustainability index (0.42) indicates moderate fiscal sustainability with substantial variation (Std. Dev. = 0.28) across developing countries. Digital economy taxation reforms average 35.60 out of 100, reflecting moderate adoption and

implementation. Pillar one participation and revenue gains average 24.80 out of 100, indicating limited but growing engagement with international profit allocation mechanisms.

Table 2: Correlation Matrix of Variables

Variable	Fiscal Sustainability Index (FSI)	Digital Economy Taxation Reforms	MNE Tax Allocation - Pillar One
Fiscal Sustainability Index (FSI)	1.000		
Digital Economy Taxation Reforms	0.542	1.000	
MNE Tax Allocation - Pillar One	0.386	0.418	1.000

Source: Author's Compilation (2026)

The correlation matrix reveals positive and moderate relationships among all variables. Digital economy taxation reforms exhibit the strongest correlation with fiscal sustainability ($r = 0.542$, $p < 0.01$), suggesting that countries with more advanced digital taxation policies and administration tend to achieve higher fiscal sustainability. MNE tax allocation under Pillar One shows a positive but weaker correlation with fiscal sustainability ($r = 0.386$, $p < 0.01$), indicating that participation in international profit allocation mechanisms is associated with improved fiscal outcomes, though the relationship is less pronounced than for digital taxation. The moderate correlation between digital economy taxation reforms and Pillar One allocation ($r = 0.418$, $p < 0.01$) suggests these reforms are complementary but not perfectly aligned, supporting the inclusion of both as distinct independent variables in the analysis.

Table 3: Variance Inflation Factor (VIF) Test

Variable	VIF	1/VIF
Digital Economy Taxation Reforms	1.21	0.826
MNE Tax Allocation - Pillar One	1.21	0.826

Mean VIF: 1.21

Source: Author's Compilation (2026)

The VIF test results indicate that multicollinearity is not a concern in this study. Both independent variables have VIF values of 1.21, well below the conventional threshold of 10 (and even the more stringent threshold of 5) suggested by econometric literature. The mean VIF of 1.21 confirms that the

independent variables (digital economy taxation reforms and MNE tax allocation under Pillar One) are sufficiently distinct from each other, validating their inclusion as separate predictors in the

regression model. This supports the theoretical distinction between domestic digital taxation measures and international profit allocation mechanisms under the Two-Pillar Framework.

Table 4: Fixed Effects Regression Results
Dependent Variable: Fiscal Sustainability Index (FSI)

Variable	Coefficient	Std. Error	t-statistic	p-value	95% Conf. Interval
Digital Economy Taxation Reforms	0.0042	0.0012	3.50	0.001	0.0065
MNE Tax Allocation - Pillar One	0.0028	0.0011	2.55	0.011	0.0049
Constant	0.1850	0.0480	3.85	0.000	0.279

R-squared (within):	0.342
R-squared (between):	0.286
R-squared (overall):	0.318
F-statistic:	28.45
Prob > F:	0.000
Number of observations:	450
Number of countries:	45

Source: Author's Compilation (2026)

The fixed effects regression results indicate that both independent variables have positive and statistically significant effects on fiscal sustainability. Digital economy taxation reforms exhibit a positive and highly significant coefficient ($\beta = 0.0042$, $p < 0.01$), implying that a one-unit increase in the digital economy taxation reforms index is associated with a 0.0042 increase in the fiscal sustainability index, holding other factors constant. This supports Objective 1, confirming that digital economy taxation reforms significantly enhance fiscal sustainability in developing countries. MNE tax allocation under Pillar One also shows a positive and

significant effect ($\beta = 0.0028$, $p < 0.05$), indicating that a one-unit increase in Pillar One participation and revenue gains is associated with a 0.0028 increase in fiscal sustainability. This supports Objective 2, suggesting that engagement with international profit allocation mechanisms contributes to improved fiscal outcomes, though the effect is smaller than for domestic digital taxation reforms. The model explains 34.2% of the within-country variation in fiscal sustainability (R-squared within = 0.342), and the overall model is highly significant ($F = 28.45$, $p < 0.001$).

5. Conclusion and Recommendations

This study examined the effects of digital economy taxation reforms and multinational enterprise (MNE) tax allocation mechanisms under Pillar One on fiscal sustainability in developing countries, with emphasis on Africa and Nigeria. The empirical findings from the fixed effects regression model provide robust evidence that both independent variables positively and significantly influence fiscal sustainability outcomes. Digital economy taxation reforms exhibit a strong positive effect on fiscal sustainability ($\beta = 0.0042$, $p < 0.01$), confirming that countries with comprehensive digital tax policies, higher digital tax revenue mobilization, and advanced tax administration digitization achieve better fiscal outcomes. The result validates the theoretical proposition that taxing digital activities with inelastic supply such as platform-based services and cross-border digital transactions can expand the tax base while minimizing economic distortions.

MNE tax allocation under Pillar One also demonstrates a positive and significant relationship with fiscal sustainability ($\beta = 0.0028$, $p < 0.05$), though the magnitude is smaller than for digital economy taxation reforms. This finding supports Acho et al (2026) simulations showing that Pillar One Amount A can generate meaningful revenue gains for developing countries, particularly as a share of corporate income tax. The study concludes that fiscal sustainability in developing countries, particularly in Africa and Nigeria, is increasingly contingent on the synergistic implementation of domestic digital economy taxation reforms and international profit allocation mechanisms. While digital taxation offers more immediate and substantial revenue gains, Pillar One participation provides complementary benefits by addressing cross-border profit shifting and aligning domestic policies with emerging global standards. However, realizing these benefits requires addressing critical bottlenecks, including weak institutional capacity, inadequate digital infrastructure, limited taxpayer awareness, and the need for regional coordination on treaty negotiations and enforcement. Based on the empirical findings and conclusions, this study proposes the following recommendations:

- i. Developing countries in Africa, including Nigeria, should prioritize the comprehensive implementation of digital economy taxation reforms by enacting clear legal frameworks for taxing digital services, including Value Added Tax (VAT) on cross-border digital transactions, Company Income Tax (CIT) on businesses with significant economic presence, and withholding taxes on digital payments.
- ii. African countries should collectively accelerate participation in Pillar One by establishing a regional negotiating platform through the African Union or African Tax Administration Forum (ATAF) to coordinate treaty negotiations, share technical expertise, and reduce transaction costs associated with implementing the Multilateral Convention.

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