pISSN: 2971-6195 eISSN: 2971-6209

EFFECT OF E-COMMERCE TRANSACTION ON TAX REVENUE IN NIGERIA

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ABSTRACT
The study investigated how e-commerce transactions influence tax revenue in Nigeria. It mainly relied on secondary data from the CBN Bulletin and utilized ordinary least squares for multiple regression analysis. Findings showed that ATM services have no significant impact on tax revenue performance in Nigeria. In contrast, point-of-sale systems and mobile banking significantly affect tax revenue, whereas web transfers do not. The study advised management to ensure ATM services are readily available, allowing taxpayers easy, 24/7 access.

Keywords: e-commerce transaction, Automated teller machine, point of sale (POS), mobile phone, web transfer, tax revenue
JEL: E21, F62, H03

INTRODUCTION
In recent years, information and communication technology has gained dominance in modern-day commerce, making e-commerce an important characteristic of the modern world economy. Most recently, several transactions have been consummated online, in line with the Central Bank of Nigeria (CBN) policy, 'cashless policy', with the intention of driving development and modernizing Nigeria's payment system. Information and Communications Technology (ICT) has developed rapidly worldwide. Such developments have had the greatest influence on society. Beyond this, the Global System for Mobile Communications (GSM) and the advent of the Internet and its related infrastructure over the past twenty years have been responsible for radical shifts and restructuring in the way business is transacted across the universe.

Globalization has generally accelerated world trade, and the internet has particularly driven its recent growth. The latter has not only altered how companies, customers, and sellers interact but also restructured firms' internal operations. In addition, it has impacted the nature, basis, and intensity of competition across industries worldwide. E-Commerce or Electronic Commerce is the purchase and sale of goods, products, or services over the internet. E-commerce is the use of the internet to conduct business transactions. Further, the definition of stamp was expanded by the Finance Act 2019 to include an electronic stamp or electronic acknowledgement, while the meaning of instrument includes every written document, including electronic documents. Here, a

significant percentage of commercial activities are already conducted electronically (Susilowati & Mappanyukki, 2021). The specific objectives include:

1. Determine the effect of Automated Teller Machine (ATM) on tax revenue generation in Nigeria.
2. Ascertain the effect of point-of-sale (POS) on tax revenue generation in Nigeria.
3. Assess the effect of mobile phones on tax revenue generation in Nigeria.
4. Examine the effect of web transfer on tax revenue generation in Nigeria

LITERATURE REVIEW

Theoretical framework

Voluntary Exchange Theory

This theory argues that individuals make voluntary payments to the government in exchange for services, based on their assessment of the value of those services. The voluntary exchange theory is based on the idea that public service involves the transfer of resources from the private sector for use in the public sector. The public sector that takes and uses private resources must give value in return, usually in the form of public goods and services (Lindahl, 1919). Other principles related to the taxation of electronic commerce include that the mode of commerce should not influence how taxes are applied, nor should it lead to double taxation or exempt it from taxes; Efficiency: The tax system should be cost-effective for both the government and businesses. Higher compliance costs can lead to tax evasion or slow down the growth of electronic commerce.

Literature review

E-Commerce or Electronic Commerce is the purchase and sale of goods, products, or services over the internet. E-commerce is the use of the internet to conduct business transactions. It is a business conducted over the internet and is also known as e-commerce. E-commerce is the online meeting of buyers and sellers. This involves the transaction of goods and services, the transfer of funds, and the exchange of data. Under the e-commerce platform, services are provided online. Transactions of money, funds, and data are also regarded as E-commerce. The Organization of Economic Community for Development (OECD) defines an e-commerce transaction as “the sale or purchase of goods or services, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders”. OECD asserts that payment and delivery need not be conducted online for a transaction to qualify as e-commerce (Ajala & Adegbie, 2020).

Effect of Automated Teller Machine (ATM) on tax revenue

The effects of ATM transactions on tax revenue in Nigeria are multifaceted. Research suggests that ATM transactions have an inverse effect on direct tax revenue, meaning that as ATM transactions increase, direct tax revenue tends to decrease. This could be attributed to the fact that more transactions are being conducted digitally, potentially reducing the need for physical cash and altering tax compliance dynamics. ATM transactions have been shown to negatively impact direct tax revenue in Nigeria, with a study reporting a coefficient of -0.174. This implies that for every increase in ATM transactions, there is a corresponding decrease in direct tax revenue. Point of Sale (POS) transactions have a positive effect on direct tax revenue, with a coefficient that suggests POS transactions may be more taxable or easier to track for tax purposes. ATM transactions have been found to decrease the amount of currency in circulation, with a coefficient of -36.610935. This indicates that as ATM transactions increase, the amount of physical cash in circulation decreases. The shift towards digital transactions, including ATM and POS transactions,

highlights the need for effective digital taxation strategies to capture revenue from these transactions. The inverse relationship between ATM transactions and direct tax revenue suggests that tax authorities may need to adapt their compliance strategies to account for changing transaction patterns. Tax authorities in Nigeria could leverage technology to improve tax compliance and revenue generation, such as through electronic tax payments and digital tax administration systems. Closely monitoring digital transactions, including ATM and POS transactions, could help tax authorities identify potential tax evasion and avoidance strategies.

Mobile Communication (GSM) on tax revenue

The effect of Mobile Communications on tax revenue in Nigeria is indirect, as GSM itself is not a direct source of tax revenue. However, the digital economy enabled by GSM has significant taxation implications. The digital economy, facilitated by GSM and mobile technologies, has increased economic activity, creating new opportunities for generating tax revenue. Nigeria has implemented policies to capture digital economic activities, including taxing non-resident companies with significant economic presence. Mobile technology has enabled electronic tax payments, improving tax compliance and revenue generation. Regular use of electronic tax payment systems can increase tax collection and revenue generation. Digitalization, facilitated by GSM, has transformed tax administration in Nigeria. The Federal Inland Revenue Service (FIRS) has implemented digital technologies, such as e-filing and e-payment, to streamline tax processes and improve taxpayer compliance. Ensuring tax compliance in the digital economy remains a challenge. Nigeria needs to strengthen its tax administration to capture revenue from digital economic activities effectively. Nigeria can explore digital taxation policies to capture revenue from non-resident digital companies and improve tax revenue generation. Studies have shown that digitalization and tax reforms can increase revenue generation in Nigeria. The implementation of digital technologies has resulted in a 15% increase in tax revenue collection in 2020. Digitalization has been found to have a positive effect on company income tax (CIT) but a negative effect on value-added tax (VAT) revenue in the short run

Effect of web transactions on tax revenue

Web transactions significantly impact Nigeria's tax revenue. The country's tax authorities have implemented various measures to capture revenue from online transactions, including electronic taxation and value-added tax (VAT) collection. Electronic tax payments have a positive and statistically significant impact on revenue generation in Nigeria. Studies have shown that e-taxation can enhance revenue generation, particularly for companies' income tax. Digital platforms provide a trail of transactions, making it easier for tax authorities to track and collect taxes. This can lead to improved tax compliance and increased revenue generation. The Federal Inland Revenue Service (FIRS) is enforcing VAT collection on online transactions, which can help increase revenue. Nigeria has introduced regulations to tax non-resident companies with significant economic presence (SEP) in the country, including those engaged in digital economic activities. Tax evasion and avoidance can reduce tax revenue. Implementing effective digital taxation systems can help mitigate these challenges. There is a risk of double taxation for non-resident companies, which can create challenges for tax authorities and businesses. Nigeria can leverage digital taxation to capture revenue from the growing digital economy. This can include taxing non-resident digital companies with a significant economic presence in the country. Effective tax administration is crucial to harnessing the potential of web transactions to generate tax revenue.

Tax revenue

According to Adegbite and Ogundipe (2020), tax has been defined in several ways by different individuals. Tax is a financial charge or levy imposed by a government on an individual or legal entity, with failure to pay, evasion, or resistance to collection punishable by law. Many administrative divisions also impose taxes. The National Tax Policy for Nigeria defines tax as a monetary charge on a person's or entity's income, property, or transaction, usually collected by a defined authority at the Federal, State, or local level. For some others, it is an obligatory levy which the government or any recognized authority of the state imposes on the property, goods, services, and people living in an area for revenue generation in order to offset the expenses incurred by the government or the authority on behalf of the citizens; a fiscal policy tool employed to redistribute wealth or to achieve other macroeconomic objectives. As many as the definitions above and other similar definitions may be, there exist some common basic elements in them. For instance, they all consider tax as a compulsory levy imposed by the government on its citizens and business entities to raise funds utilized to finance government operations. Tax revenues are the revenues collected from income taxes, social security contributions, value-added tax, payroll taxes, and other items. Social security payments, fines, and penalties are usually excluded from its calculations. They are a major source of government revenue that serves not only as a means of financing expenditure needs. Tax revenues are generated from direct and indirect taxes. Ajala and Adegbie (2020) explain that electronic commerce encompasses the outward-facing processes that touch customers, suppliers, and external partners, including sales, marketing, order taking, delivery, customer service, purchasing raw materials, and procurement of indirect operating expense items such as office supplies. In many developing economies, the informal sector constitutes a significant portion of economic activity, yet it remains largely untaxed due to its unstructured nature and the difficulty of tracking taxable transactions (Ibrahim & Dauda, 2023; Ekpenyong & Udoh, 2022; Ocheni, 2020).

Empirical literature

Eze and Nwankwo (2021) investigated the relationship between tax administration and revenue performance in Nigeria and found that weak enforcement mechanisms and inadequate taxpayer education contribute to persistent revenue shortfalls. They emphasized that countries with strong tax enforcement systems tend to experience better revenue performance. To address this challenge, they recommended increasing transparency and building public trust in tax administration, as higher levels of trust encourage greater tax compliance and sustainable revenue growth.

Ofori (2020) investigated revenue mobilization strategies in Ghana and found that when taxpayers perceive government spending as transparent and beneficial to society, they are more willing to comply with tax obligations. The study concluded that improving transparency in public finance management not only strengthens revenue collection but also fosters a stronger social contract between the government and its citizens. Olaleye and Adegoke (2022) explored the relationship between public trust and tax compliance in sub-Saharan Africa. They found that when taxpayers perceive government spending as transparent and beneficial, they are more likely to comply voluntarily. Conversely, high levels of corruption and mismanagement of public funds lead to increased tax evasion. Ofori (2020) studied the impact of digital tax administration on compliance in Ghana and found that automated tax systems, such as e-filing and digital payment platforms, significantly reduced tax evasion by making tax processes more accessible and reducing opportunities for corruption. The study concluded that governments should invest in digital

infrastructure to enhance tax collection efficiency and promote seamless compliance. The informal sector presents a significant challenge to tax compliance, particularly in developing economies.

Bassongui and Houngbédji (2023) extended this discourse by conducting a systematic review on the effects of tax digitalization on revenue generation in Sub-Saharan Africa. In their review, they synthesized existing studies to demonstrate that digital tax systems positively influence tax morale, compliance, and e-governance, thereby boosting tax revenue. Despite these promising findings, they underscored the need for additional research to understand the long-term dynamics between digitalization and revenue generation in the region, thus highlighting the gap between short-term benefits and long-term sustainability. Awodun et al. (2024) also addressed the Nigerian context by investigating the role of digital transformation in optimizing tax administration using Agency Theory. Their study found that digitalizing tax systems simplifies operations, reduces complexity, and standardizes various tax processes nationwide. As a result, they argued for greater investment in digital infrastructure and the development of refined tax policies to fully exploit the potential of digital tools, thereby reinforcing the connection between comprehensive digital strategies and improved administrative efficiency.

Ajimbe (2021) further reinforced this perspective by studying the effect of tax administration on revenue generation in selected local government areas of Kaduna State using the Congruence Model of Taxation. His findings demonstrated that effective tax administration significantly increases the revenue-generating capacity of local governments and stressed that efficient tax management is vital for ensuring fiscal sustainability at the local level. This study establishes a direct link between the quality of tax administration and improved fiscal outcomes. Ogbeta and Oluwadare (2024) applied the UTAUT theory to examine the potential of digitalization in The Gambia Revenue Authority's tax administration, amid concerns about the practical application of digital tools and their underutilization, which have hindered improved revenue mobilization and efficient tax processes in The Gambia. They found that it establishes a significant correlation between digitalization and GRA effectiveness, underscoring the importance of digital transformation for revenue mobilization and fiscal probity.

Opeyemi et al (2022) investigated the impact of digital technologies on tax revenue in Nigeria using the Theory of Optimal Taxation, with a focus on corporate income tax. Their research showed that digital technologies substantially improve revenue collection by streamlining tax processes and enhancing compliance. They recommended that the government continue investing in digital tax systems and provide targeted training for tax officials, thereby connecting technological investment with revenue optimization. Digitalization is transforming tax collection and revenue management.

Ajetunmobi (2022) examines Nigerian tax reforms, finding that amendments to CIT and VAT boosted federal revenue but harmed state revenue in the long run. Using Autoregressive Distributed Lag models, the research calls for inclusive, bottom-up fiscal reforms to ensure balanced revenue distribution. While tax digitalization enhances collection, policies must be carefully designed to prevent disparity. Ogbeta and Oluwadare (2024) examined the Gambia Revenue Authority (GRA) and found a significant correlation between digitalization and organizational performance, using Spearman’s rank-order correlation. Despite challenges in the tool utilization, digital transformation was shown to improve revenue mobilization and fiscal

transparency. The study, based on the Unified Theory of Acceptance and Use of Technology (UTAUT), recommended staff training, public awareness, and better e-payment systems.

METHODOLOGY

This study adopted an ex-post facto design. The ex-post facto design was adopted on the basis that it does not provide the study with an opportunity to control variables, as they have already occurred and cannot be manipulated. The study primarily used secondary data sources. These data were time-series data collected using the desk survey approach from textbooks, journals, the internet, the CBN statistical bulletin, and other relevant government publications. The study covers the period from 2009 to 2024.

Model specification

The functional relationship between e-commerce transactions and tax revenue in Nigeria is expressed thus:

TAX = f (ATM, POS, MOB, WB) . . . ----------I

Obtaining the OLS model from the above expression,

TAX = a0+ a1ATM + a2POS + a3MOB + a4WB + et . . . .----------2

Where: TAX = Tax Revenue
ATM = Automated Teller Machine
POS= Point of sales
M0B= Mobile phone
WB = Web

Regression parameters

et = Stochastic error

To analyze the data, a regression model was used to assess the effect of the independent variables on the dependent variable.

DATA ANALYSIS, RESULTS, AND DISCUSSIONS

Results and findings

Regression result

Table 1 (Regression result)

Dependent Variable: TAXR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LATM	-0.094786	4.219773	-0.022462	0.9825
LPOS	-13.14850	6.179785	-2.127663	0.0593
LMOB	12.97879	3.534893	3.671623	0.0043
LWEB	-3.141304	3.009479	-1.043803	0.3212
C	19.89913	26.52531	0.750194	0.4704

R-squared	0.826608	Mean dependent var	0.346667
Adjusted R-squared	0.757251	S.D. dependent var	7.792926
S.E. of regression	3.839539	Akaike info criterion	5.789783
Sum squared resid	147.4206	Schwarz criterion	6.025800
Log likelihood	-38.42337	Hannan-Quinn criterion.	5.787269
F-statistic	11.91820	Durbin-Watson stat	1.557429
Prob(F-statistic)	0.000804		

R^2	=	0.8266, R^2 (Adj)	=	0.757251
SER	=	3.839539, F-stat	=	11.91820
DW	=	1.557429		

Source: Author's computation

The coefficient of multiple determination (R^2) is 0.8266 and an adjusted R^2 of 0.757251. The latter indicates that 76 percent of the variation in TAXR's observed behaviour is jointly explained by the independent variables, namely ATM, POS, MOB, and WEB. This shows that the model fits the data well and has a tight fit. Also, the f-statistic is used to test the significance of such a good or tight fit. The model reports an effective high f-statistic value of 11.91, which, when compared with the table value, indicates a significant result. This indicates that the high adjusted R^2 value is better than would have occurred by chance, and the model is statistically robust. The adjusted R-squared indicates a good fit of the model to the data. The total variation in observed tax generation is used as a measure of performance. The a priori expectations about the signs of the parameter estimates are consistent with economic theory.

Discussion of findings

The study examined the effect of e-commerce transactions on tax revenue Generation in Nigeria, to achieve four specific objectives. The finding is consistent with the work of Duke et al. (2013), who posited that the effects of ATM transactions on tax revenue generation in Nigeria are multifaceted. Research suggests that ATM transactions have an inverse effect on direct tax revenue, meaning that as ATM transactions increase, direct tax revenue tends to decrease. Further analysis of the regression results revealed a non-significant negative relationship between POS

and tax revenue generation in Nigeria. The finding is consistent with Scupola (2003), who posited that the effects

of Point of Sale (POS) transactions on tax revenue generation in Nigeria are multifaceted. POS transactions contribute to tax revenue through the Electronic Money Transfer Levy (EMTL), which is charged on transactions.

Further analysis of the regression results revealed a significant positive relationship between mobile and tax revenue Generation in Nigeria. The finding is in line with the work of Bayrakdar et al. (2015), who posited that the effects of the Global System for Mobile Communications (GSM) on tax revenue generation in Nigeria are indirect, as GSM itself is not a direct source of tax revenue. Further analysis of the regression results revealed a non-significant negative relationship between web transfer and Tax revenue generation. The finding is not consistent with Bristol's (2001) work, which posited that Web transactions have a significant impact on tax revenue generation in Nigeria. The country's tax authorities have implemented various measures to capture revenue from online transactions, including electronic taxation and value-added tax (VAT) collection.

Summary of findings

The major findings of the study include;

1. No significant effect of ATM on the performance of tax revenue in Nigeria.
2. There is a significant effect of the point of sales on the performance of tax revenue in Nigeria.
3. There is a significant effect of mobile banking on the performance of tax revenue in Nigeria.
4. There is no significant effect of web Transfer on the performance of tax revenue in Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between e-commerce transactions and tax revenue in Nigeria. The study revealed that there is no significant effect of ATM on the performance of tax revenue in Nigeria, there is a significant effect of point of sales on the performance of tax revenue in Nigeria, there is a significant effect of mobile banking on the performance of tax revenue in Nigeria, there is no significant effect of web Transfer on the performance of tax revenue in Nigeria. Success in electronic commerce requires that all players in the supply chain be fully equipped with the Internet and other facilities. The contribution of e-commerce tax collection to the Nigerian economy has demonstrated to be a vibrant source of economic growth in developed countries.

Recommendations

The following recommendations are in line with the findings;

1. Management should also ensure the availability of ATM services so that taxpayers can have seamless and round-the-clock access. Adequacy and availability of ATM services are essential elements of performance.
2. Management should ensure the adequacy of POS services, regardless of location, to enhance taxpayers' access.
3. Management should focus more on boosting the benefits of mobile transactions by providing taxpayers with more ease through user friendliness, a fast network, payment alternatives, etc.

4. Management should upscale their investments in information and communication technology (ICT) infrastructure to enhance internal capacity to provide uninterrupted services, as well as develop capacity resolve taxpayer complaints in real time.

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