


Assessment of the Impact of Direct Taxes on Public Investment in Agriculture in Nigeria

C. O. Omodero  

Covenant University Ota,
Ota, Ogun State, Nigeria

 onyinyechi.omodero@covenantuniversity.edu.ng

Abstract. This study investigates the impact of direct taxes on agricultural funding. For this analysis, the petroleum profit tax, personal income tax, and corporate income tax were employed as direct taxes. These are the three largest direct taxes chosen for this analysis. Agricultural finance has long been a cause of concern, forcing the entire country to suffer from acute hunger as a result of unnecessary apathy. Furthermore, Nigeria now has a high degree of hunger index at 28.3, placing the country 103rd out of 116 countries in the 2021 Global Hunger Index record. This research considers all of these problems and aims to assess the extent to which direct taxes may alleviate the load by providing more direct tax revenues to agricultural enterprises. The evaluation is carried out by collecting secondary data from the Organization for Economic Cooperation and Development (OECD) on chosen direct taxes and agricultural spending from the Central Bank of Nigeria's Statistical Bulletin. The study period runs from 2010 to 2020. The study used a multiple regression technique to present real evidence that all of the direct tax types analyzed had a minor impact on agricultural finance, with the exception of personal income tax, which has a positive and considerable impact on agricultural growth. This leads to the request that Nigerian tax rules be altered to allow for significant use of tax revenue for agricultural loans. The insignificance of petroleum profit tax and corporate income tax to agricultural funding necessitates more effective tax processes and a crackdown on malfeasance among tax authorities.

Key words: direct tax; personal income tax; business tax; energy tax; agricultural finance.

JEL H20, H24, H25, Q14

1. Introduction

Tax is an obligatory payment given to the government by corporations, individuals, and other organizations in accordance with the applicable legislation. Although the fundamental goal of taxation is to generate money, it is also a fiscal policy tool used by the government to manage the economy. The government uses taxation as a weapon to manage individuals by redistributing money and requiring compliance with civic responsibilities. Companies' operations, on the other hand, are checked by effective

taxation of their income. As a result, any smart tax policy is likely to stimulate economic growth on both sides of an economy. When assessing the impact of taxation on productivity expansion, it is important to remember that taxation can only be incorporated into growth models through its influence on human growth variables [1–2].

A smart tax policy should take into account all aspects of the economy and its sectors. As a result, a taxation system is commonly divided into two parts: direct tax and indirect tax. A direct tax is

one that is levied directly on the taxpayers who must pay the tax. As a result, it cannot transfer its tax burden to others. In the event of an indirect tax, the government gets money from middlemen [3]. The ultimate bearer of economic misfortune is not the taxpayer. The impact of indirect and direct taxes on the economy varies due to differences in collection tactics, income sources, and the transfer of economic tax burden. The reasonable balance of direct and indirect taxes will maximize tax advantages [3].

Agriculture is an essential part of the economy and has the ability to alleviate unemployment, food shortages, and hunger in the majority of developing nations, including Nigeria. Crop farming has been identified as a potential source of sustenance for both children and adults in an economy. Agriculture in Nigeria has yet to cover the critical gaps as envisaged, but appropriate money to reach this goal remains a fantasy. During the COVID-19 pandemic, food scarcity had a significant impact on the amount of compliance with the lockdown procedures in place to prevent the pandemic from spreading. The food supply was insufficient, which resulted in violations of government directives in many parts of the country. However, it is unclear if Nigeria's tax regime is designed to encourage agricultural investment.

Prior research [4] attempted to examine the reaction of agricultural output to tax income but did not take into account the structural components of taxation in Nigeria. The study of [5] explored the effect of tax income on public service delivery, but government responsibility for agricultural growth through direct taxation was not considered.

The current study is an extension of prior research, with the goal of examining the influence of direct taxation on government investment in agriculture. According to [3] a strong tax policy must assist all sectors of the economy, with agriculture being

one of the most important. This study is critical at this time because it will act as a reference for policymakers in terms of suitable priority allocation when it comes to government spending obligations. As a result, the primary goal of this research is to investigate the influence of direct taxes on agricultural finance in Nigeria. The following are the precise goals:

- i.* to evaluate the influence of corporate income tax on agricultural finance;
- ii.* to investigate the effect of petroleum profit tax on agricultural investment;
- iii.* to assess the impact of personal income tax on agricultural spending.

To pursue the specific objectives as stated above, the following null hypotheses are formulated:

HO_1 : Corporate income tax has no discernible impact on agricultural finance.

HO_2 : Petroleum profit tax has no noticeable impact on agricultural investment.

HO_3 : Personal income tax has no apparent impact on agricultural expenditure.

2. Literature review

Canavire-Bacarreza et al. [6] used vector autoregressive methods and panel data estimations to investigate the impact of various tax instruments on growth in Latin American nations. Contrary to popular belief, they discovered that the personal income tax had no detrimental influence on economic progress. In terms of corporate income taxes, their findings indicated that lowering tax evasion and increasing dependence on collection may increase regional economic growth.

Phiri [7] used quarterly data from 1990 to 2015 to assess the influence of direct and indirect taxes on South African economic development. The findings revealed, among other things, that direct taxes hampered South Africa's economic progress.

Tanchev [8] used the OLS technique in an econometric analysis from 2004 to

2012 to analyze the influence of taxation on Bulgarian economic advancement. He observed that income taxes that are progressive enhance economic growth.

Stoilova [9] used panel data from EU-28 member nations from 1996 to 2013 to analyze the impact of tax structure on economic development. Among other factors, the study revealed that taxes on individual income and assets contributed significantly to economic growth.

Bazgan [10] investigated the impact of direct and indirect taxes on Romanian economic development using the Vector Autoregressive Model. The research, which lasted from 2009 to 2017, revealed, among other things, that a positive variation in the structure of direct taxes had a detrimental impact on Romanian economic development.

Gashi et al. [11] assessed the influence of Kosovo's tax structure on economic development from 2007 to 2015 using both primary and secondary data. According to the data, all taxes had a positive impact on Kosovo's economic growth.

Nguyen [3] used least-squares regression to examine the impact of direct and indirect taxes on Vietnam's economic performance from 2003 to 2017. According to the data, whereas direct taxes had minimal influence on the Vietnamese economy, indirect taxes had a significant impact.

Korkmaz et al. [12] used the autoregressive distributed lag (ARDL) technique to study the influence of direct and indirect taxes on economic development in Turkey. The research' findings demonstrated that indirect taxes had a positive and considerable influence on economic growth, but direct taxes had a considerably negative impact.

Other studies [13] did additional research from 1992 to 2016 on the impacts and implications of direct and indirect taxes on economic development and total tax collection in 51 countries. The dynamic panel generalized technique of moments

was used to estimate the data (GMM). Direct taxes were shown to be substantial and adversely related with economic growth, while indirect taxes proved to have a positive but minor influence on the dependent variable. A tax structure centered on direct taxes, such as income, profit, and capital gains taxes, may be deleterious to economic growth, according to the study.

Neog and Gaur [14] used panel data to evaluate the long-run and short-run relationship between taxes and state-level economic performance in 14 Indian states from 1991 to 2016. The findings demonstrated a 'U' shaped relationship between the tax structure and economic progress.

From 2006 through 2016, Rexha et al. [15] assessed the influence of Kosovo's tax structure on economic development. The study found a strong long-term relationship between the variables, but no significant impact of direct taxes on economic progress.

Sanjeeb [16] investigated the impact of the new taxation system on indirect tax collection in India, specifically in Odisha. The research was analytic in nature, relying on publicly available data. Revenue collection under the goods and services tax was supposed to start in July 2017 and cease in March 2021. The figures demonstrate a growing trend of indirect tax in India as a result of the adoption of a new tax, with the exception of a few months due to administrative issues and the current Corona outbreak.

Okolo et al. [17] examined whether corporate taxes had an impact on combined federally collected tax revenues and economic growth using quarterly time-series data derived from the official websites of the Federal Inland Revenue Service, the National Bureau of Statistics (NBS), and the Central Bank of Nigeria (CBN) Statistical Bulletin for the period 2015–2020. According to the findings of the Multivariate Vector Auto Regression,

business taxes had a substantial impact on the cumulative government's total tax collection; commercial income tax (CIT) and wealth creation were statistically significant, however fuel profits tax had no effect on the economy.

Nwanakwere [18] investigated the link between tax and economic growth (GDP) in Nigeria using secondary data from 1981 to 2014, applying the Auto-Regressive Distributed Lag (ARDL) bound test technique. The ARDL results showed that there was no co-integration of the variables. Surprisingly, the short-term data revealed that while the aggregate tax was small, the decomposed taxes were significant. Petroleum profit and consumption taxes showed positive relationships with GDP, but corporate income tax, excise, and customs duties had negative relationships.

Onaolapo et al. [19] investigated the impact of petroleum profit tax on Nigerian economic growth using OLS. The study found that PPT and tax income from other sources had a substantial beneficial influence on Nigerian economic growth.

Omodero and Dandago [5] examined the influence of tax income on public service delivery in Nigeria from 1981 to 2017 using the ordinary least squares approach. The goal was to determine how much tax money affected critical service delivery metrics in the country, such as access to essential services. According to the data, tax money had a positive and significant impact on education and medical services.

Oladipo et al. [4] investigated the influence of total tax income on agricultural output in Nigeria. The study used co-integration with the Engel and Granger techniques to determine long- and short-run behavior. Although labor and overall tax produced were not effective in the short term, it was determined that there was a positive and strong relationship between agricultural income, agricultural capital, usually denoted by loan, and agricultural

productivity. Agricultural output was statistically significant for employment, capital, and total income over a longer time, but tax was not. According to the findings, the tax did not have the expected impact on Nigeria's agriculture industry.

Ilahoya and Mgbame [20] were interested in the relationship between the direct tax element and Nigeria's industrial progress when seen in the context of the worldwide migration from direct to indirect taxation. The study lasted 32 years (1980 to 2011), utilizing data acquired from the CBN, the Federal Inland Revenue Service, and the African Statistical Bulletin. Using the «Augmented Dickey Fuller» test, «Co-integration test, and Engle Granger two step» process, it was revealed that direct tax components and economic growth were positively and substantially connected with a co-efficient of (4.1007) and t-value of (2.480169).

Ilahoya and Ofiafor [21] explored the correlation between the petroleum profit tax and economic growth in Nigeria, employing a combination of co-integration and error correction statistical approaches as an analytical method, and discovered that the petroleum profit tax has a beneficial connection with Nigeria's real GDP growth rate. As a result, the study indicated that petroleum profit tax had a beneficial influence on Nigerian economic growth, whereas openness was shown to have a negative but negligible impact on Nigerian economic growth.

Etimet al. [22] evaluated the long-run link between petroleum profit and corporate income taxes and Nigerian economic development from 1980 to 2018. Augmented Dickey Fuller (ADF) unit root test, Engle Granger Procedure co-integration test, Parsimonious Error Correction Mechanism (ECM), Durbin-Watson statistic, and over parameterized model were the analytical techniques used. The findings of the research demonstrated a statistically

significant relationship between the examined variables and (0.9844) and (0.9471) co-efficients for petroleum profit tax and corporate income tax, respectively, when independent variables merge with the dependent variable at first order. This suggests a long-term relationship. Furthermore, the parsimonious findings reveal positive coefficients of (3.6344), (2.7644), and (2.7629) for CIT and PPT t-values on economic growth.

Aminu et al. [23] investigated the influence of petroleum profit tax on Nigerian economic development from 1985 to 2019. The analysis proved the presence of a long-run link between the petroleum profit tax and Nigerian economic development. Furthermore, the analysis discovered that the petroleum profit tax had a favorable influence on Nigeria's economic growth.

Mdanat et al. [24] use an error correction mechanism to discover that income tax, company tax, and personal tax all have a negative influence on growth in Jordan. They argue that, regardless of tax collecting, the government's primary priority should be on people's social fairness.

Dladla and Khobai [25] find comparable results in South Africa, where income taxes are negative.

Federici and Parisi [26] analyzed data from 880 enterprises in Italy to show that corporation tax is harmful for investments when both effective average and marginal tax rates are considered.

The investigation of [27; 28] revealed the negative relationship between income and corporate tax and growth performance.

Vartia et al. [29] discover that company tax has a detrimental influence on OECD nations. When comparing the average and marginal tax rates, the marginal tax rate has a greater influence on investment decisions and labor supply than the average tax rate.

Aamir et al. [30] used panel data on direct and indirect taxes from 2000 to 2009 in their study in India and Pakistan. They

discovered that direct taxes had a considerable influence on overall revenue in the Indian economy but not in Pakistan. They found an R² value of (0.923), indicating that the explanatory variables explained 92.3 percent of the variation in total income in India, but Pakistan only had an R-square value of (0.231), accounting for 23.1 percent of the variation in the model's results.

Ayuba [31] used OLS to examine the influence of non-oil tax income on Nigerian economic development from 1993 to 2012. The findings revealed that non-oil tax income had a favorable influence on Nigeria's economic growth.

Okoh et al. [32] investigated the impact of a petroleum profit tax on Nigerian economic development. The study used OLS to demonstrate that PPT had a beneficial influence on Nigerian GDP.

Khadijat and Taophic [33] used FMOLS to investigate the effect of petroleum profit tax and company income tax on Nigeria's economic growth. They discovered that petroleum profit tax (PPT) and company income tax (CIT) had a positive and significant influence on Nigeria's real gross domestic product (RGDP).

Ngu [34] investigated the impact of the petroleum profit tax on the performance of Nigerian listed oil and gas enterprises. Secondary data were gathered from the annual reports of six publicly traded oil and gas companies in Nigeria operating in the upstream sector from 2012 to 2018. The data was analyzed using Eviews using a simple linear regression approach to assess the influence of the independent variable (Petroleum Profit Tax) on the dependent variables (Return on Assets and Earnings per Share). According to the findings, the petroleum profit tax has a strong beneficial influence on profits per share of Nigerian listed oil and gas corporations. However, the petroleum profit tax has a negligible beneficial effect on the return on assets of Nigerian listed oil and gas enterprises.

3. Methodology

The study looked at the effects of direct taxation on state investment in agriculture in Nigeria. Petroleum profit tax (PPT), personal income tax (PIT), and corporate income tax (CIT) are the explanatory factors used in this study. The dependent variable is the government’s investment in agriculture (AGR). Secondary data comprises both extrinsic and intrinsic factors. The data on PPT, PIT, and CIT were collected from the OECD’s online database, while the figures on AGR were obtained from the Central Bank of Nigeria’s Statistical Bulletin. The research runs from 2010 through 2020. Due to the use of several currencies, we provided all data sets in logarithmic form.

The study employed the multiple regression method, and the significance level was set at 5%. The e-views analytical program is used to obtain empirical results. As a result, the multiple regression model is defined as follows:

$$LOGAGR = f (LOGPPT, LOGPIT, LOGCIT), \tag{1}$$

where LOGAGR – Public Investment in Agriculture; LOGPPT – Petroleum Profit Tax; LOGCIT – Companies Income Tax; LOGPIT – Personal Income Tax.

We express the model in econometric form as follows:

$$LOGAGR = \beta_0 + \beta_1 LOGPIT + \beta_2 LOGPIT + \beta_3 LOGCIT + \epsilon, \tag{2}$$

where AGR – Investment in Agriculture; PPT – Petroleum Profit Tax; PIT – Personal Income Tax; CIT – Company Income Tax; β_0 – Coefficient of the parameter estimate; $\beta_1 - \beta_3$ – Intercept; ϵ – Error term.

4. Results and discussion

The regression outcome of this experiment is shown in Table 1. According to Table 1, the Durbin-Watson is 2, indicating that there is no autocorrelation, and the

Table 1. Regression result

Таблица 1. Результаты регрессии

Dependent Variable: LOG_AGR

Method: Least Squares

Sample: 2010 2020

Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_CIT	0.094543	0.192515	0.491092	0.6384
LOG_PIT	0.687784	0.140320	4.901549	0.0018***
LOG_PPT	0.183215	0.125409	1.460942	0.1874
C	-4.048623	1.335551	-3.031425	0.0191
R-squared	0.839269	Mean dependent var		1.641871
Adjusted R-squared	0.770385	S.D. dependent var		0.130442
S.E. of regression	0.062505	Akaike info criterion		-2.431842
Sum squared resid	0.027348	Schwarz criterion		-2.287153
Log likelihood	17.37513	Hannan-Quinn criter.		-2.523048
F-statistic	12.18371	Durbin-Watson stat		2.167505
Prob (F-statistic)	0.003625			

Significant @ 1% level

standard error of regression is 0.06, which is less than 1, indicating that the model prediction is error-free. The R² reveals that the independent factors account for up to 83.9 percent of the variance in the dependent variables.

The outcome illustrates why direct tax income can aid agricultural growth. Similarly, the F-statistic with a p-value of 0.00 is 12.18. Looking at this finding, the independent factors confirm their considerable and favorable influence on agricultural growth. The outcome also demonstrates that the model utilized in this investigation is a good match.

Hypothesis analysis:

H₀₁: Corporate income tax has no discernible impact on agricultural finance.

We hypothesized in this study that corporate income tax had no major influence on agricultural funding in Nigeria. In Table 1, the null hypothesis is tested using the t-statistic, which indicates that the t-statistic is 0.49 and the p-value is 0.64. As a result, the conclusion suggests that corporate income tax has little influence on agricultural funding. As a result, the H₀₁ is approved and the alternative is rejected. These findings corroborate those of [4] and [18].

H₀₂: Petroleum profit tax has no noticeable impact on agricultural investment.

The study also suggested that petroleum profit tax does not have a noteworthy influence on agricultural development in Nigeria. From the result in Table 1, the t-statistic of PPT is 1.46 while the p-value is 0.19 which is above the threshold of 0.05. Therefore, the H₀₂ is accepted and the alternative rejected. This result is consistent with the findings of [4], however it contradicts the findings of [18] study.

H₀₃: Personal income tax has no apparent impact on agricultural expenditure.

The first hypothesis that personal income tax has no effect on agricultural finance is tested, and the outcome is shown in Table 1 with a t-statistic of 4.90 and a p-value of 0.0005. As a result, personal income tax has a favorable and large impact on agricultural financing. As a consequence, the H₀₃ is rejected and the option is chosen.

The above-mentioned Figure 1 is utilized to assess the model's normality. The p-value of 0.84 from the Jarque-Bera result is larger than 0.05, indicating that the data distribution is normal. Figure 2 shows that the blue line forming between the two red lines indicates that the model for this study is stable. The blue line staying between the

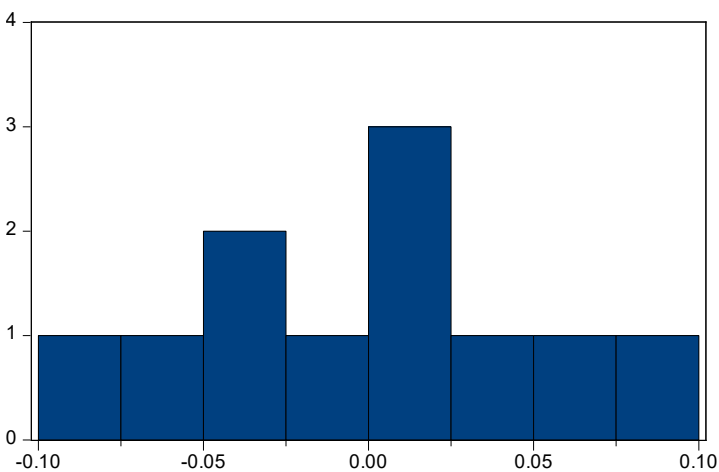


Fig. 1. Histogram Normality test

Рис. 1. Гистограмма теста нормальности

Series: Residuals	
Sample	2010 2020
Observations	11
Mean	-1.19e-16
Median	0.009490
Maximum	0.084104
Minimum	-0.085293
Std. Dev.	0.052296
Skewness	0.002524
Kurtosis	2.133967
Jarque-Bera	0.343768
Probability	0.842077

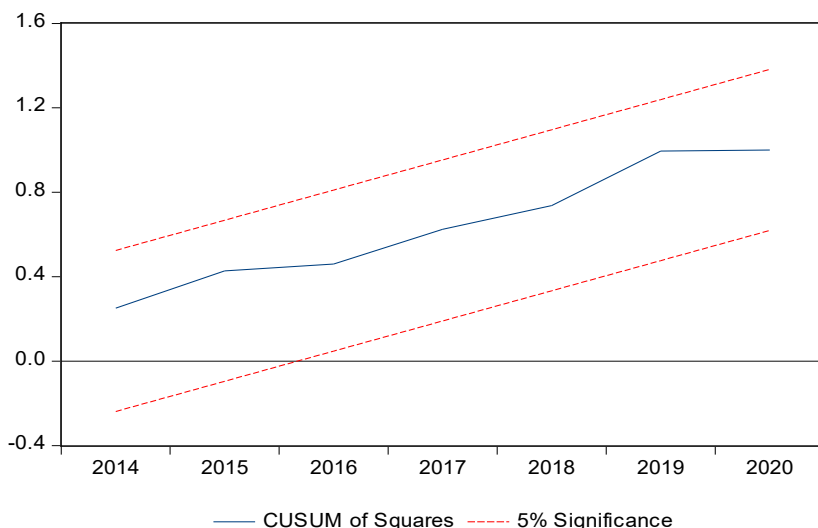


Fig. 2. Model Stability test

Рис. 2. Тест стабильности системы

two dotted red lines without crossing their frontiers is a sign that the study's model is unwavering and produces reliable outcomes.

Table 2 offers information regarding the requirements that were met, resulting in the acceptance of the study model. At the 5% level of significance, the diagnostic tests help determine if the model is stable, free of serial correlation, and heteroskedastic.

Table 2 offers information regarding the requirements that were met, resulting

in the acceptance of the study model. At the 5% level of significance, the diagnostic tests help determine if the model is stable, free of serial correlation, and heteroskedastic. If any of these occur, the outcome of the multiple regression model would be deceiving; hence, the absence of all confirms the veracity of the findings. There is no multi-collinearity, either, with the VIF reading 1.36, 1.41 and 1.04 for CIT, PIT and PPT respectively. These values are less than the benchmark value of 10 [35].

Table 2. Diagnostic test result

Таблица 2. Результаты диагностического теста

Type	P-value	Level of significance	Remarks
Ramsey Reset test for stability of model	0.21	5%	Model is stable
Breusch-Godfrey Serial Correlation LM Test	0.94	5%	No serial correlation
Heteroskedasticity Test	0.11	5%	No Heteroskedasticity
Variance Inflation Factor (VIF):			
– CIT	1.36	10	No multi-collinearity
– PIT	1.41	10	“
– PPT	1.04	10	“

5. Conclusion

The purpose of this study is to assess the impact of direct taxes on agricultural finance in Nigeria. A wise tax policy should try to strengthen all sectors of the economy. Policies must be reevaluated if there is a gap in this expectation. The conclusions of the study have triggered a flurry of policy disputes about how to prioritize the use of tax revenues. The country's whole tax money has not been utilized to enhance agriculture. Due to the incapacity of direct taxes to have an impact on the agricultural sector, this study has provided insight and added another dimension to this perspective. Direct

taxes, in particular, have the potential to increase agricultural sector productivity if properly administered. The challenge in Nigeria is that priorities are misaligned and funds are misapplied. This is a significant policy issue that must not be ignored. As a consequence, the current study recommends that Nigeria's tax policy be enhanced. According to the plan, a significant portion of direct taxes should be dedicated for agricultural funding. As part of the Sustainable Development Goals (SDG), especially Goals 1 and 2, this will enable for enough job creation, a boost in sufficient food production, and poverty reduction in the country.

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INFORMATION ABOUT AUTHOR

Omodero Cordelia Onyinyechi

PhD, ACA, Lecturer, Department of Accounting, College of Management and Social Sciences, Covenant University Ota, Ota, Ogun State, Nigeria (Km. 10 Idiroko Road, Canaan Land, Ota, Ogun State, Nigeria); ORCID 0000-0002-8758-9756; e-mail: onyinyechi.omodero@covenantuniversity.edu.ng.

ACKNOWLEDGMENTS

I would like to convey my heartfelt appreciation to the editors and independent reviewers of the Journal of Applied Economic Research for their insightful comments that improved the overall quality of this research.

FOR CITATION

Omodero C. O. Assessment of the Impact of Direct Taxes on Public Investment in Agriculture in Nigeria. *Journal of Applied Economic Research*, 2022, Vol. 21, No. 1, 6–20. DOI: 10.15826/vestnik.2022.21.1.001.

ARTICLE INFO

Received December 27, 2021; Revised January 22, 2022; Accepted February 20, 2022.

Оценка влияния прямых налогов на государственные инвестиции в сельское хозяйство Нигерии

К. О. Омодеро  

Университет Ковенанта в Ота,
Ота, штат Огун, Нигерия
onyinyechi.omodero@covenantuniversity.edu.ng

Аннотация. В этой статье исследуется влияние прямых налогов на финансирование сельского хозяйства. Для исследования в качестве прямых налогов использовались налог на нефтяную прибыль, подоходный налог с населения и корпоративный подоходный налог. Это три крупнейших прямых налога в Нигерии. Финансирование сельского хозяйства уже давно вызывает беспокойство, заставляя всю страну страдать от острого голода в результате инвестиционной апатии. Кроме того, Нигерия в настоящее время имеет высокий индекс голода 28,3, что ставит страну на 103-е место из 116 стран в рекорде Глобального индекса голода 2021 года. Данное исследование рассматривает проблемы налогового влияния на размер государственных инвестиций в сельское хозяйство Нигерии. Исследование направлено на оценку того, в какой степени прямые налоги могут облегчить налоговую нагрузку, предоставляя больше прямых налоговых поступлений (кредитов, вычетов) сельскохозяйственным предприятиям. Оценка проводится путем сбора вторичных данных Организации экономического сотрудничества и развития (ОЭСР) об уплачиваемых прямых налогах и расходах на сельское хозяйство и данных из Статистического бюллетеня Центрального банка Нигерии. Период исследования – с 2010 по 2020 год. Для анализа использовался метод множественной регрессии. С его помощью мы получили реальные доказательства того, что все проанализированные виды прямых налогов оказали незначительное влияние на финансирование сельского хозяйства, за исключением подоходного налога с населения, который оказывает положительное и значительное влияние на рост сельского хозяйства. Полученные результаты приводят к необходимости изменить нигерийские налоговые правила, чтобы позволить использование налоговых поступлений для выдачи сельскохозяйственных кредитов (вычетов). Ничтожность влияния налога на нефтяную прибыль и корпоративного подоходного налога на сельскохозяйственное финансирование требует организации более эффективных налоговых процессов и борьбы с должностными преступлениями среди сотрудников налоговых органов.

Ключевые слова: прямой налог; подоходный налог с населения; налог на предпринимательскую деятельность; энергетический налог; финансирование сельского хозяйства.

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ИНФОРМАЦИЯ ОБ АВТОРЕ

Омодеро Корделия Онъиничи

Ph.D, ACA, преподаватель кафедры бухгалтерского учета, Колледж менеджмента и социальных наук, Университет Ковенанта в Ота, Ота, штат Огун, Нигерия (Км. 10 Idiroko Road, Canaan Land, Ota, Ogun State, Nigeria); ORCID 0000-0002-8758-9756; e-mail: onyinyechi.omodero@covenantuniversity.edu.ng.

БЛАГОДАРНОСТИ

Я выражаю свою искреннюю признательность редакторам и независимым рецензентам Journal of Applied Economic Research за их пронцательные комментарии, которые позволили улучшить общее качество данного исследования.

ДЛЯ ЦИТИРОВАНИЯ

Омодеро К. О. Оценка влияния прямых налогов на государственные инвестиции в сельское хозяйство Нигерии // Journal of Applied Economic Research. 2022. Т. 21, № 1. С. 6–20. DOI: 10.15826/vestnik.2022.21.1.001.

ИНФОРМАЦИЯ О СТАТЬЕ

Дата поступления 27 декабря 2021 г.; дата поступления после рецензирования 22 января 2022 г.; дата принятия к печати 20 февраля 2022 г.

