

## Foreign Direct Investment and Information Communication Technology Taxation Effects on Tax Income Growth



Cordelia Onyinyechi Omodero<sup>1\*</sup>, Promise Iheanyichukwu Ujah<sup>2</sup>, Francis Odianonsen Iyoha<sup>1</sup>

<sup>1</sup> Department of Accounting, College of Management and Social Sciences, Covenant University Ota, Ogun State 110001, Nigeria

<sup>2</sup> Department of Accounting, Faculty of Management and Social Sciences, Michael Okpara University of Agriculture, Umudike, Umuahia, Abia State 440221, Nigeria

Corresponding Author Email: [onyinyechi.omodero@covenantuniversity.edu.ng](mailto:onyinyechi.omodero@covenantuniversity.edu.ng)

<https://doi.org/10.18280/ria.360306>

### ABSTRACT

**Received:** 18 January 2022

**Accepted:** 5 June 2022

#### Keywords:

*tax policy, general tax income, ICT, artificial intelligence, FDI*

The necessity to confirm the effectiveness of ICT tax and FDI to government income from tax in Nigeria. The policy to levy ICT-based enterprises appears to raise firms' tax burdens, however it requires rigorous analysis to determine if this policy should be amended or supported. The purpose of this study is to look into the boost that ICT taxes and FDI inflows have brought to tax revenue collection in Nigeria. The study employs descriptive and inferential statistics, different diagnostic tests, and ordinary least squares techniques to analyze the efficacy of ICT taxes and FDI in increasing general tax income. The analysis shows that ICT tax has a positive and considerable impact on tax revenue, whereas FDI inflows have a somewhat favorable impact but have no effect on tax revenue. The global growth of ICT and the accompanying tax in Nigeria has certain economic and financial ramifications that have not been examined. Several researches on ICT and FDI have been published, however this unusual taxing feature has yet to be explored in the current studies.

## 1. INTRODUCTION

Foreign direct investment (FDI) has created the most favorable environment for the entrance of information and communication technology (ICTs) in most developing economies. The birth of modern technology which has led to information and communication technologies (ICTs) becoming a driving factor in encouraging socioeconomic progress, digitalization and the usage of artificial intelligence (AI) consequently become a new way of life. This is made possible through the FDI attractions by host communities. The emergence of international investment in various remote nations brought to the limelight the obvious benefits of using modern technologies in communication and dissemination of information. Thus, ICT application in all spheres of life become automatic with the incoming of FDI. The emergency of the 4<sup>th</sup> industrial revolution ushers in internet services in major global business economies. Fourth Industrial Revolution involves the incorporation of World Wide Web devices into our daily life, straddling the line between the real and digital worlds. The Digitalization, as well as virtualization, big data, robots, and intelligent systems, are examples of these innovations. Modern technological breakthroughs are on track to have a big impact on all businesses and nations, as well as all spheres of life.

These developments have eventually resulted in a fundamental transformation in the human race, akin to past technology transformations. Industry 4.0 is identified by burgeoning technologies such as big data, virtualization, intelligent systems, machine learning, the Wireless sensor networks, 5G, robotic process automation, machine-to-machine (M2M) information exchange, and enterprise

application integration, with the quantity of goods, mechanisms, and utilities being digitally mastered [1]. This has significantly enhanced productivity, compelling significant international countries to invent and pivot, resulting in experience and understanding societies. Artificial intelligence and internet technology have proven effective in a variety of fields. Modern innovations not only have the ability to make our job more productive and many parts of our lifestyles easier, but they also have the capacity to raise the standard of living for people all over the world. These innovations have the power to contribute to a zero-carbon, stable world. They might be used to trace an item's lifespan in a resource efficiency, assist in the delivery of crucial medical equipment and supplies in hostile locations like as battlegrounds, or even forecast and avoid weather events.

Information and communication technology systems are defined by Pradhan et al. [2] as "electronic phone system, cell devices, Apply social, networking devices and internet connectivity, and other innovations." For a myriad of purposes, the explosive growth of ICT is vital for economic growth: the use of this advanced technologies enables involved parties in economy and society to have quick and inexpensive access to learning resources [3]; ICT enables companies to connect quicker and better, greatly reducing costs and enhancing efficiency [4]; ICT also permits expansion of the business and lower initial expenses of branding and marketing [2]. One of the distinguishing features of high-performing emerging economies is the widespread use of information and communication technology across the economy [5]. Despite the fact that creating ICT infrastructure has been a huge problem, there has been a significant increase in the number of Internet and mobile users in several Asian developing nations

[5].

Information societies, as defined by the Organization for Economic Cooperation and Development (OECD), characterize an ecosystem in which technologies and the use of intelligence are critical components in gaining a competitive advantage and preserving some financial prosperity [6]. The ability of a knowledge-based economy to develop via invention is its strength [7]. In emerging countries, a modern telecommunications network is required to compete in global markets and to attract new resources from other nations [8]. Several theories and empirical findings indicate that FDI and ICT are connected in a variety of ways. Foreign Direct Investment (FDI) is seen as a key avenue for technological diffusion, which in turn boosts productivity development in the host economy [9].

Aside from the substantial economic implications of FDI inflows, established evidence shows that development in ICT plays a critical role in boosting quality and performance, especially for developing countries, during the current period, indicating that ICT should be integrated in a widely discussed FDI and economic growth interaction as needed [10]. FDI has long been seen as an efficient means of transferring technology and stimulating prosperity in poorer nations. Foreign direct investment (FDI) clearly fosters the use and commercialization of indigenous resources, incorporates innovative strategies, enhances technological knowledge, foreign capital flows to enable funding macroeconomic imbalances [11]. Financial streams in the form of FDI do not produce reimbursement of interest and principal (as opposed to external debt), multiplies the level of human capital through on-the-job training, and provokes Investment in research and development [11]. Foreign Direct Investment (FDI) was regarded as an essential avenue for technological dissemination, among other things. Global corporations have advanced technologies and managerial skills, some of which are absorbed by domestic enterprises when multinationals establish themselves in a certain economy [12].

According to cost-effective notion, erudition via global economic activity may be very beneficial for all societies, specifically those falling behind the most advanced societies. The constantly rising degree of fiscal mixing, fueled by developments in data transmission knowhow, makes technology acquisition from overseas developed nations critical for trade and industry progress and throughput improvement [9]. On the other side, the new 'information economy' of recent decades has been connected with increasing diffusion of ICTs, which are predicted to result in stronger productivity increases and accelerated growth [9]. In Nigeria ICT has not only led to economic productivity, but has also attracted technology development tax which invariably is improving tax revenue collection in the country. Earlier studies have expanded the benefits of ICT and FDI to economic productivity of many nations [10, 13-15]. Shehzad et al. [16] looked at their consequences on climate change.

## 2. LITERATURE REVIEW

An econometric technique was used in study [16] to determine the non-linear impact of FDI and ICT on CO<sub>2</sub> emissions in Pakistan. The study uncovered the influence of inhabitants, occupation, and ICT ingress and creation on Pakistan's conservational excellence. According to the inspection findings, adverse (affirmative) shocks in ICT

growth (decline) the amount of CO<sub>2</sub> emission. Furthermore, positive FDI shocks expressly increase CO<sub>2</sub> emissions. However, negative shocks demonstrated insignificant influence on CO<sub>2</sub> emissions. The study discovered that manufacturing ICT devices at home enhances environmental quality more than importing from foreign countries. Furthermore, the population was shown to have a direct relationship with CO<sub>2</sub> emissions, although the coefficient of commerce revealed a negative influence on Pakistan CO<sub>2</sub> secretions. By evaluating yearly data from 1991 to 2019, Nayak and Sahoo [14] investigated the influence of overseas unswerving asset influxes and information dissemination innovative mechanism on India's commercial strength. According to the findings, the partial elasticity's of India's per-capita GDP in relation to overseas' business, peripatetic concentration, and network compactness appeared tangible. The constructive and substantial measurement of the interface among them demonstrates the relevance of ICT infrastructure in getting the most out of foreign ventures.

Sapuan and Roly [17] looked at the relationship involving Internet proliferation, Investments, and sustainable growth in ASEAN-8 countries. Taking data from 2003 to 2017, dynamic panel analysis was used to examine these associations. The findings suggested that Digitalization and Capital proliferation were critical and had a positive influence on the ASEAN-8 nations' wealth creation. Shirazi and Hajli [1] investigated the effectiveness of information innovations, intellectual resource, institutional arrangements, societal, and environmental elements on advances in technology from 2008 to 2017. Through the use of a regression analysis study approach to analyze factors impacting SI on a worldwide scale, it was shown that when paired with social and political features, computing parameters including ICT access and broadband service had a positive effect on achieving sustainability.

Considering regional differences in Computers and the internet, improvement of living standards, and academic achievement, Digitalization are indeed key drivers of long-term opportunities and business advancement. The study identified an increasing digital divide among regions in the framework of the knowledge-based society and the rise of digital e-commerce, particularly in LDCs and Africa, a phenomenon that is impeding long-term inventive success. Wang and Rukh [18] evaluated the influence of ICT availability on attracting oversea investment to the D8 countries. The investigation used cross sectional data from 1997 to 2018, and the fixed effect model specified by the Hausman specification check was used. In conjunction with other moderating factors like market strength and trade openness, the findings demonstrated a favorable connection between Internet connectivity and Capital inflows. The currency rate, an economic and financial parameter, has a detrimental but considerable impact on FDI inflows.

Chowdhury et al. [13] aimed to comprehend the impact of digital technology on social prosperity and clean energy consumption in India and China. The oversimplified approach and aggregated regression equations, effect model, and random effect concepts were adapted to annual data set of participants using online services as Information technology, social progress, rechargeable energy usage, and overseas investment to meet the targets. The researchers reported that ICT had a considerably favorable influence on rechargeable oomph consumption while having a negative and minor impact on India and China's economic advancement. Afroz et al. [19] explored the relationship between electrical and

electronic engineering and productivity expansion in Asian countries with high and intermediate incomes of 25 Asian countries from 2000 to 2018. The stability results were reported in the paper by using panel cointegration and estimate methodologies to account for endogeneity and cross-sectional dependency concerns. The findings demonstrated that increased Internet connectivity had resulted in good and considerable industrial prosperity in high-income Asian nations. Furthermore, middle-income nations have begun to reap the benefits of ICT Internet. Giving to the findings, telephone line and mobile cell phone permeation can significantly strengthen the economy in middle-income Asian nations.

Samir and Mefteh [15] looked at the link between ICT, transportation, and FDI across countries with varying economic levels from 2000 to 2016. The study considered how ICT and transportation affected the geographical attractiveness of FDI in host nations. Three sub-panels were formed from a worldwide panel comprising 63 nations. The study discovered that these factors impacted each other in the long term using GMM estimators. The direction of causation changed among panels with varying degrees of importance. The results demonstrated the enormous influence of transportation and ICT facilities on economic growth in host nations by making a significant contribution to improving FDI attractiveness. Furthermore, the findings showed the favorable effect of transportation and ICTs in promoting economic growth by boosting nations' economic openness and involvement in international commerce. Adedoyin et al. [20] investigated the causal and long-term relationship between air travel and productivity expansion. It was carried out to test the tourism-led growth hypothesis for the United States (US) from 1981 to 2017, and it incorporates ICTs and coal prices in the tourism-led development hypothesis. The study provided a fresh route for future research by examining the significance of the fourth industrial revolution (Industry4.0), notably the United States. To reach the aforementioned assumption, the research assessed ICTs as an extra explanatory variable that showed ICTs mitigate the influence of FDI on GDP. The empirical conclusion established a link between the Industry 4.0 era and the function of ICTs in promoting significant changes in lifestyle and productivity.

Sinha and Sengupta [10] empirically evaluated the cyclical interconnections between FDI inflows, ICT growth, and productivity expansion in Asia-Pacific developing nations from 2001 to 2017. In this regard, 30 Asia-Pacific emerging economies were chosen to perform sophisticated panel data econometric tests utilizing the World Bank and World Telecommunication Indicators datasets. Econometric analysis using the panel fully modified ordinary least square, dynamic ordinary least square, pooled mean group estimator, mean group estimator, and dynamic fixed effect methods revealed that both FDI and ICT had significant and positive effect on economic growth, and that ICT advancement also had a good impact on FDI inflows in those regions of the world. Yoon [21] estimated the influence of ICT goods imports on economic development in the 13 Asia-Pacific nations from 2005 to 2016 using a static panel-data approach. According to the results obtained, ICT products import had a considerable positive influence on economic growth, but ICT goods export had a positive but statistically negligible effect on it.

Sepehrdoust and Ghorbanseresht [3] utilized a group data approach to measure the effects of Internet and finance system advancement on the growing economies of the oil producing

countries during 2002 to 2015. As per statistical model output, rising financial growth drivers and ICT parameters by one basis point improved economic expansion by .048 and .050 percentages, accordingly. Moreover, the impact of macroeconomic indicators, strong labour force growth, increase velocity, and capital accumulation growth on the societies' industrial prosperity was more consistent with model projections. From 2001 to 2012, Pradhan et al. [2] explored specific long-run connections postulated to emerge between per capita real GDP, Internet connectivity, rate of inflation, level of employment, and physical capital creation visible in G-20 countries. Employing panel co-integration, the researchers observed that the characteristics were co-integrated and did not move apart with time. Improved Information technology infrastructure - an evident necessity in an economy's computer technology strategy design - for both internet connectivity and web users led in a rise in per capita GDP, according to technique based on vector error correction mechanisms.

Wamboye et al. [22] examined the link between information and communication technologies (ICTs) and worker productivity growth in Sub-Saharan Africa from 1975 to 2010. The findings revealed that once penetration rates reached a critical mass, fixed-line and mobile telecommunications had a favorable and considerable influence on growth. Nonparametric approaches were used to determine the thresholds. Increased returns were triggered by penetration rates of between 20% and 30% for telephones and 5% for internet usage. FDI and openness had been demonstrated to promote productivity and aid in the expansion of ICTs. Financial development might act as a conduit for the growth-enhancing benefits of ICTs. Osano and Koine [23] examined the impact of foreign direct investment on knowledge transfer and economic growth in Kenya, concentrating on the energy industry in Nairobi between 2001 and 2014. A descriptive and inferential survey approach was used in this investigation. The study's target demographic consisted of 60 top managers from Kenya Power and Kengen, including directors and managers. Primary data was gathered through questionnaires. The study discovered a link between infrastructure, technology diffusion, trade facilitation, knowledge management, and technology transfer and economic growth through foreign direct investment factors. According to the report, investment in the energy industry resulted in new technologies in the country.

Yazdan and Hossein [12] evaluated the impact of FDI and ICT on productivity development. The study was based on panel data from Middle Eastern nations from 1990 to 2010. According to the growth accounting statistics, ICT and FDI contributed very little to the growth of these countries. The econometric results demonstrated that ICT and FDI had a favorable and substantial influence in these nations. From 1996 to 2005, Shirazi [24] evaluated the influence of FDI and trade openness on ICT spread in the Asia-Pacific and Middle East regions. While there were differences in the economies covered in this study in terms of socioeconomic and political development, the results showed that education and GDP growth had a beneficial influence on ICT dissemination in both areas. However, although FDI had a typically favorable and large influence on ICT spread in Asia-Pacific economies, it had a negative impact on Middle Eastern economies. This study's findings also revealed that trade openness in general had a favorable and significant influence on ICT spread.

Dimelis and Papaioannou [9] investigated the influence of FDI and digital infrastructure on increased productivity. The

analysis was based on panel data obtained between 1993 and 2001 from 42 industrialized and emerging regions. According to growth accounting estimates, ICT contributed greatly to the affluence of both advanced and emerging market economies. The FDI contribution, on the other hand, was rather minimal. The econometric results revealed that ICT has a favorable and significant influence on all categories, with emerging economies benefiting the most. Positive and substantial FDI impacts were identified in the industrialized countries, whereas positive but negligible effects were reported in the underdeveloped nations. Shirazi et al. [25] investigated the impact of foreign investment and trade openness on the growth of technology in the Asia-Pacific and Middle East regions between 1996 and 2005. The results of the study revealed that, while there were disparities in sociopolitical development across the economies used in the study, qualities such as trade liberalization, literacy, and Productivity growth had a positive impact on their Industry 4.0. While foreign investment aided ICT growth in Asia-Pacific countries, the consequence on Middle Eastern countries was statistically negligible. The findings also indicated that government participation in economic activity had a detrimental influence on ICT expansion in both areas. Regional turmoil in the Middle East had a further detrimental influence on FDI inflows, trade openness, and, as a result, ICT advancement. According to the regression results, nations that liberalized their ICT segment were able to not only close the digital divide with other industrialized economies, but also grow their businesses in both indigenous and worldwide arcades.

Hassan [11] evaluated the major elements that led to FDI and economic growth in the globe and correlated them to those of MENA nations using panel data from 95 countries and 8 MENA countries from 1980 to 2001. According to the study, FDI delivered cash, production facilities, new technology, and contemporary managerial know-how to host nations. Information and communication technology (ICT) is critical to growth because it allows a nation to enhance its economic potential in all areas of the economy, connects a country to the globalized trade, and assures competitiveness. The study discovered that growth and FDI were both connected to a slew of macroeconomic, ICT, and globalization factors. Gholami et al. [26] explored the concurrent causal link between ICT investments and FDI flows, with a focus on the consequences for wealth creation. For the empirical research, the study analyzed data from 23 major nations with varying levels of economic development from 1976 to 1999. The findings of our causality test indicated that there was a causal association between information dissemination innovative techniques and foreign assets in advanced economies. ICT may indirectly assist to pecuniary evolution by drawing additional oversea investment. In contrast, we found no substantial connection between ICT and FDI in poor nations. The study found some evidence of an opposing causality link. The influx of FDI resulted in increased ICT innovation and manufacturing capability.

### 3. METHODOLOGY

The descriptive statistics and ordinary least squares analysis were used in this study to explore the impact of ICT tax and FDI on total tax earnings in Nigeria. Inferential analytics make it easier to compile facts and figures and use deductive approach to make sense of data. The time series data used

ranged from 2010 to 2020. The information was acquired from the Federal Inland Revenue Service (FIRS) and OECD database. The data are gathered on the National Information Technology Development Levy/tax and FDI inflows which are the predictor factors and total tax revenue which is the dependent factor. In analyzing and interpreting the data, descriptive and inferential statistics are applied. To evaluate and analyze the numerical data acquired for this investigation, the multiple regression approach is used. To get inferential statistics, all explanatory factors are regressed against the dependent variable. Furthermore, the multiple regression approach assists in defining the presence of a significant association. This approach is adopted as part of the study's uniqueness support to simplify and simply elucidate the effect of the independent factors on the response variable. The threshold of significance for this study is set at 5%; so, for any independent variable to be considered significant, it must be less than 5% where the result specifies; else, it becomes irrelevant. Diagnostic tests and unit root test are done to ensure the model and dataset are fit for this investigation.

The econometric model used for this study is specified as shown below:

$$TRN = f(ICT, FDI) \tag{1}$$

$$LOGTRN = LOGICT + LOGFDI \tag{2}$$

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \varepsilon_t \tag{3}$$

where:

$Y$  = dependent variable - Total Tax Revenue (TRN).

$X_1$  = Information Communication Technology Tax (ICT).

$X_2$  = Foreign Direct Investment (FDI).

$\beta$  = parameters to be estimated, while  $\beta_1, \beta_2$  are the coefficients of the independent variables.

$\beta_0$  = persistent (interruption).

$\varepsilon_t$  = error term (presumed to be customarily dispersed with mean zero and perpetual adjustment).

### 4. RESULTS AND DISCUSSION

Table 1 provides summary statistics that produce measurements of central trends such as averages, maximums, and medians, as well as measures of dispersion of the researched variables. The major characteristic of descriptive statistics is that they validate that the dataset is properly allocated. As a consequence, the Kurtosis and Jarque-Bera results supplied the necessary validation. The Jarque-Bera in Table 1 represents the individual variable result, but the one in Figure 2 represents the combined result. Remarkably, both results show that the dataset used for study is flawless.

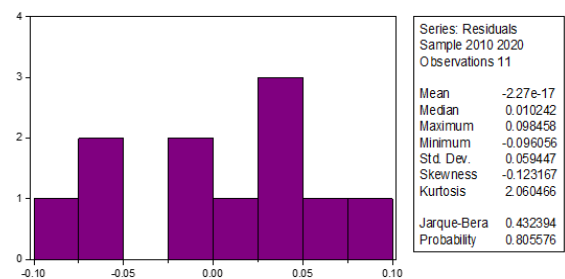


Figure 1. Normality test

Figure 1 depicts the histogram normal distribution, which is commonly used to validate that the dataset has been appropriately apportioned and to demonstrate that the model used for a research is not anomalous. Figure 1 verifies the outcome of the summary data in Table 1.

**Table 1.** Descriptive statistics

	TRV	ICT	FDI
Mean	3.637569	3.999001	6.627737
Median	3.673482	3.995986	6.648360
Maximum	3.725993	4.255610	6.946452
Minimum	3.453165	3.769820	6.301030
Std. Dev.	0.088942	0.131222	0.195240
Skewness	-0.947735	0.060298	-0.010265
Kurtosis	2.654945	2.995849	2.082515
Jarque-Bera	1.701272	0.006674	0.386008
Probability	0.427143	0.996669	0.824479
Sum	40.01325	43.98901	72.90510
Sum Sq. Dev.	0.079107	0.172193	0.381188
Observations	11	11	11

Author's calculation, 2022

**Table 2.** Unit root test

Variables	Phillips-Perron Test Statistic	Critical Values @ 5% level	P-value	Stationarity
LOGTRV	-3.34	-3.26	0.04	I(1)
LOGICT	-4.70	3.26	0.01	I(1)
LOGTFDI	-8.54	3.26	0.00	I(1)

Author's calculation, 2022

The unit root experiment is shown in Table 2 to confirm that the datasets are stationary or static. The results reveal that the datasets are stationary at order 1 (first difference). The Phillips-Perron test statistic yields values greater than the critical values, and the p-values for all variables are less than the 5% level of significance. This finding demonstrates that the regression results are not a fluke.

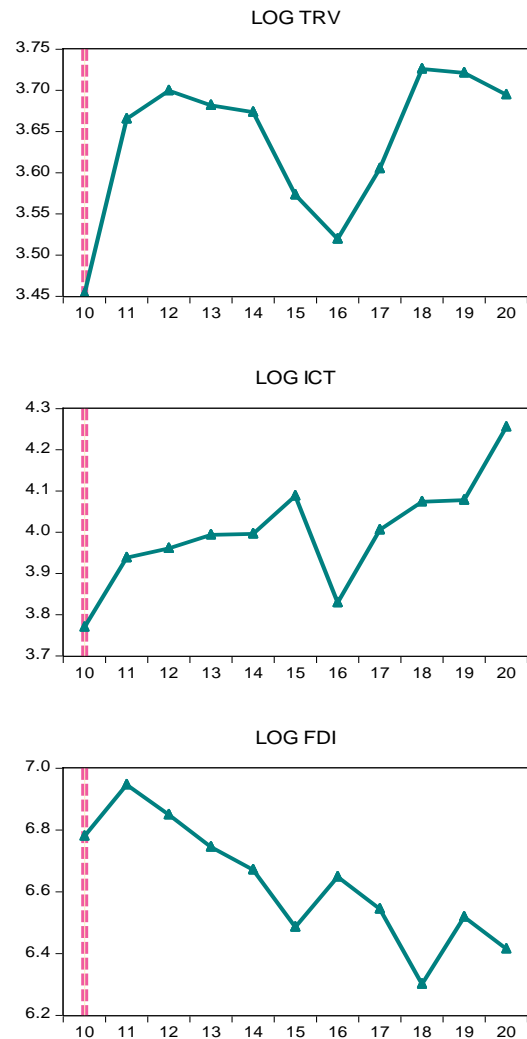
**Table 3.** Diagnostic test

Type	P-value	Predictor Variables	Variance Inflation Factor (VIF)
Ramsey RESET Test	0.09	LOGFDI	1.75
Breusch-Godfrey			
Serial Correlation LM Test	0.61	LOGICT	1.75
Heteroskedasticity Test: Pagan-Godfrey	0.10		

Author's calculation, 2022

Table 3 displays the results of the multi-collinearity, stability, serial correlation, and heteroskedasticity assessments. In statistics, heteroskedasticity (or heteroscedasticity) arises when the variances of a predictors are non-constant when watched across volatile values of a determinant or as related to prior timeframes. Heteroskedasticity can appear in two forms: contingent and absolute. Probabilistic variance of the error term demonstrates strong seasonal variability in comparison to preceding season instability (e.g., daily). Intrinsic variance of the error term refers to a large variety of oscillation transformations that are unconnected to volatility in earlier periods. Free and open variance is used when estimating of high and low fluctuation are anticipated. In terms of the multi-

collinearity test, the VIF of 1.75 is less than 4 [27] and less than 10 [28]. As a consequence of the findings in Table 3, there is no connection of predictor factors in this study. Ramsey RESET, Serial correlation, and Heteroskedasticity tests have p-values of 0.09, 0.61, and 0.10, respectively. As a result, the model is stable, there is no serial correlation, and it is homoscedastic because the p-values are below the value of 0.05 significant level.



**Figure 2.** Trend of data

Data Sources: Federal Inland Revenue Service (FIRS) and World Bank Economic Indicators

Figure 2 shows that total tax revenue declined considerably in 2016, exactly one year after the present administration took office. The trend increased significantly and remained consistent in 2018 and 2019, until the onset of the COVID-19 pandemic in 2020, which will have an impact on tax revenue collection owing to the pandemic's negative impact on companies and individuals. The ICT tax gained traction and reached its peak. This demonstrates how ICT in Industry 4.0 has overtaken the realm of socioeconomic activity. It is also worth mentioning that FDI in Nigeria is quite low and has to be addressed.

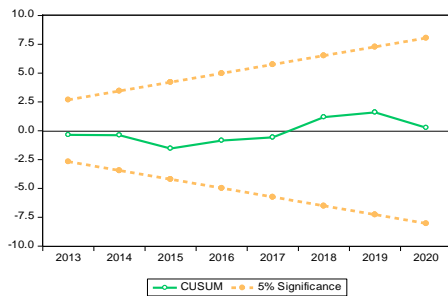
The regression results of this investigation is shown in Table 4. The results reveal that ICT tax has a large beneficial influence on overall tax income collected in Nigeria between 2010 and 2020. This result is consistent with the results of other scholars, including [10, 13-15]. FDI, on the other hand, has a negligible impact on TRV. This conclusion is consistent

with the trend analysis in Figure 2, which shows that FDI inflows to Nigeria are decreasing. Table 4 shows that the predictor factors have a combined significant and positive influence on TRV, with an F-statistic p-value of 0.03 (less than 0.05). The outcome validates the model's suitability, and our forecast is error-free, as demonstrated by the Standard Error of Regression, which is 0.06 1. The Durbin-Watson in this study is 1.7, which is close to 2. The coefficient of determination reveals that the explanatory variables account for 55.3 percent of the changes in TRV, whereas the remaining 44.7 percent is due to additional factors not included in this study. The Figures 3 and 4 gives evidence that the regression model is stable and valid.

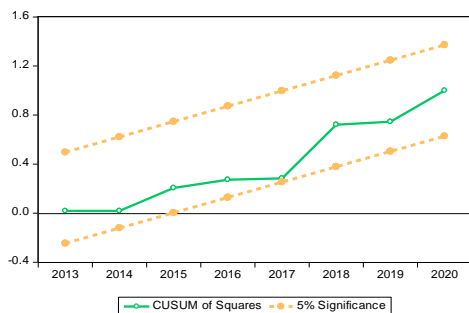
**Table 4.** Regression result (Dependent Variable: LOG\_TRN)

Method: Least Squares				
Sample: 2010 2020				
Included observations: 11				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG_FDI	0.17	0.14	1.23	0.25
LOG_ICT	0.63	0.21	2.99	0.02***
C	-0.07	1.63	-0.04	0.96
R-squared	0.55			
Adjusted R-squared	0.44			
Standard Error of regression	0.06			
F-statistic	4.95			
Prob(F-statistic)	0.03			
Durbin-Watson stat	1.74			

\*\*\* Significant @ 1% level  
 Author's calculation, 2022



**Figure 3.** Stability test



**Figure 4.** Validity test

## 5. CONCLUSION AND RECOMMENDATION

Modern dynamic is different among economies and performs an important role in economic growth. ICT (information and communication technology) has changed the way people network, do commerce, and study. Furthermore, with the increasing adoption of COVID-19, digital technology

and connection have emerged as a critical tool and the greatest replacement to analog equipment and systems. As a result of the move to online services during this catastrophic time, Web usage has increased globally and is becoming an accepted norm in everybody's routine life. When analyzing the benefits of ICT, it is vital to remember that in most developing nations, ICT is primarily a product of FDI. The study [26] gives verdict to this claim. Despite the low rate of FDI in certain countries, the broad use of ICT in this industry 4.0 has extended across nations. ICT aids Nigeria in a variety of ways, including the usage of internet services, sophisticated contemporary phones, digital banking services [29], online tax filing [30], remote employment options, online marketing and advertisement, and so on. In the middle of all of these technical advancements, the Nigerian government thought it would be prudent to tax enterprises substantially involved in telecommunications, internet services, banking, and financial services individually on the technological advancements brought into the country.

Based on the above assumption, this study investigates the contribution of ICT tax and FDI inflows to the country's overall tax income. The analysis spans the years 2010 to 2020, which are the most effective relevant years in which this type of taxation has thrived thus far. The findings indicate that Nigeria requires greater FDI inflows, and the ICT tax is a desirable policy move. This study suggests that the government should make greater efforts to establish programs such as research and development that will attract more FDI. Collaborations with international investors and firms are needed, particularly in the development of resources that the country lacks the capacity to handle. It is also critical that the government include more ICT-based enterprises in the payment of technology development taxes in order to increase tax income for government expenditures.

It is worth noting that this study suffered dearth of empirical investigations, leaving this examination a new field of study. Thus, this study suggests other research projects. As a result, experts are inspired to examine the influence of international investment and communications technologies on the increase of tax income in both emerging and affluent nations.

## ACKNOWLEDGMENT

Covenant University Ota, Ogun State, Nigeria, supports unrestricted access to this article.

## REFERENCES

- [1] Shirazi, F., Hagli, N. (2021). IT-Enabled sustainable innovation and the global digital divides. *Sustainability*, 13(17): 1-24. <https://doi.org/10.3390/su13179711>
- [2] Pradhan, R.P., Mallik, G., Bagchi, T.P. (2018). Information communication technology (ICT) Infrastructure and economic growth: A causality evinced by cross-country panel data, *IIMB Management Review*, 30(1): 91-103. <https://doi.org/10.1016/j.iimb.2018.01.001>
- [3] Sepehrdoust, H., Ghorbanseresht, M. (2019). Impact of information and communication Technology and financial development on economic growth of OPEC developing economies. *Kasetsart Journal of Social Sciences*, 40(3): 546-551. <https://doi.org/10.1016/j.kjss.2018.01.008>

- [4] Meijers, H. (2014). Does the internet generate economic growth, international trade, or both? *International Economics and Economic Policy* 11: 137-163. <https://doi.org/10.1007/s10368-013-0251-x>
- [5] Das, A., Khan, S., Chowdhury, M. (2016). Effects of ICT development on economic growth in emerging Asian countries. In *ICTs in Developing Countries*, pp. 141-159. [https://doi.org/10.1057/9781137469502\\_9](https://doi.org/10.1057/9781137469502_9)
- [6] OECD. (1996). *The Knowledge-Based Economy*. Organisation for Economic Co-Operation and Development: Paris, France.
- [7] ERBD. (2017). *The knowledge economy and innovation*. European Bank for Reconstruction and Development. Available online at: <http://www.ebrd.com/what-we-do/sectors-and-topics/ebd-knowledge-economy-innovation.html>.
- [8] Bon, A., Akkermans, H., Gordijn, J. (2016). Developing ICT services in a low-resource development context. *Complex Syst. Informatics Model.* 9: 84-109.
- [9] Dimelis, S.P., Papaioannou, S.K. (2010). FDI and ICT effects on productivity growth: A Comparative analysis of developing and developed countries. *European Journal of Development Research*, 22: 79-96. <https://doi.org/10.1057/ejdr.2009.4>
- [10] Sinha, M., Sengupta, P.P. (2019). FDI Inflow, ICT expansion and economic growth: an empirical study on Asia-Pacific developing countries. *Global Business Review*, pp. 1-18. <https://doi.org/10.1177/0972150919873839>
- [11] Hassan, M.K. (2005). FDI, information technology and economic growth in the Mena region. 10th ERF paper. In *Economic Research Forum*. <http://citeseerx.ist.psu.edu/showciting?doi=10.1.1.458.7841>.
- [12] Yazdan, G.F., Hossein, S.S. (2013). FDI and ICT effects on productivity growth. *Procedia-Social and Behavioural Science* 93: 1710-1715. <https://doi.org/10.1016/j.sbspro.2013.10.104>
- [13] Chowdhury, E.K., Abdullah, M.N., Tooheen, R.B. (2021). Role of information and communication technology in economic progress and increasing demand for renewable energy: evidence from China and India. *Asian Journal of Technology Innovation*, pp. 1-21. <https://doi.org/10.1080/19761597.2021.1961090>
- [14] Nayak, S., Sahoo, D. (2021). FDI inflow, ICT and economic performance of India: An empirical Investigation. *International Journal of Emerging Markets*. <https://doi.org/10.1108/IJOEM-01-2021-0094>
- [15] Samir, S. Meftah, H. (2020). Empirical analysis of the dynamic relationships between transport, ICT and FDI in 63 countries. *International Economic Journal*, 34(3): 448-471. <https://doi.org/10.1080/10168737.2020.1765186>
- [16] Shehzad, K., Xiaoxing, L., Sarfraz, M. (2021) Envisaging the asymmetrical Association among FDI, ICT, and climate change: A case from developing country. *Carbon Management*, 12(2): 123-137. <https://doi.org/10.1080/17583004.2021.1890449>
- [17] Sapuan, N.M., Roly, M.R. (2021). The impact of ICT and FDI as drivers to economic growth in ASEAN-8 Countries: A panel regression analysis. *International Journal of Industrial Management*, 9(1): 91-98. <https://doi.org/10.15282/ijim.9.0.2021.5958>
- [18] Wang, P., Rukh, B.G. (2021). The Effect of Information Communication Technology (ICT) Infrastructure availability on FDI inflow in D8 Countries. In *E3S Web of Conferences*, 235: 02052. <https://doi.org/10.1051/e3sconf/202123502052>
- [19] Afroz, R., Muhibbullah, M., Morshed, M.N. (2020). Impact of information and communication technology on economic growth and population health in Malaysia. *The Journal of Asian Finance, Economics and Business*, 7(4): 155-162. <https://doi.org/10.1108/JABES-07-2020-0082>
- [20] Adedoyin, F.F., Bekun, F.V., Driha, O.M., Balsalobre-Lorente, D. (2020). The effects of air Transportation, energy, ICT and FDI on economic growth in the industry 4.0 era: Evidence from the United States. *Technological Forecasting & Social Change*, 160(1): 1-19. <https://doi.org/10.1016/j.techfore.2020.120297>
- [21] Yoon, S. (2019). The impact of ICT goods imports on economic growth: Evidence from Asia-Pacific Countries. *Journal of Korea Trade*, 23(7): 1-12. <https://doi.org/10.35611/jkt.2019.23.7.1>
- [22] Wamboye, E., Tochkov, K., Sergi, B.S. (2015). Technology adoption and growth in Sub-Saharan African Countries. *Comparative Economic Studies*, 57: 136-167. <https://doi.org/10.1057/ces.2014.38>
- [23] Osano, H.M., Koine, P.W. (2016). Role of foreign direct investment on technology transfer and Economic growth in Kenya: A case of the energy sector. *Journal of Innovation and Entrepreneurship*, 5(31): 1-23. <https://doi.org/10.1186/s13731-016-0059-3>
- [24] Shirazi, F. (2008). The Impact of foreign direct investment and trade openness on ICT expansion. *PACIS 2008 Proceedings*, 148.
- [25] Shirazi, F., Gholami, R., Higón, D.A. (2010). Do foreign direct investment (FDI) and trade openness explain the disparity in ICT diffusion between Asia-Pacific and the Islamic middle eastern countries? *Journal of Global Information Management (JGIM)*, 18(3): 59-81. <http://doi.org/10.4018/jgim.2010070103>
- [26] Gholami, R., Lee, S., Heshmati, A. (2005). The Causal Relationship between ICT and FDI, *WIDER Working Paper Series RP2005-26*, World Institute for Development Economic Research (UNU-WIDER). <https://ideas.repec.org/p/unu/wpaper/rp2005-26.htm>.
- [27] Garson, G. (2012). *Testing statistical assumptions*. Asheboro, NC: Statistical Associates Publishing.
- [28] Gujarati, D.N., Porter, D.C. (2009). *Basic Econometrics* (5th Ed.). Boston: McGraw-Hill Irwin. ISBN: 978-0-07-337577-9.
- [29] Omodero, C. (2021). Fintech innovation in the financial sector: Influence of e-money products on a growing economy. *Studia Universitatis "Vasile Goldis" Arad - Economics Series*, 31(4): 40-53. <https://doi.org/10.2478/sues-2021-0018>
- [30] Omodero, C.O., Okafor, M.C. (2021). Digital financing and taxation in the 4th industrial revolution: Evidence from Nigeria. *Universal Journal of Accounting and Finance*, 9(6): 1594-1601. <https://doi.org/10.13189/ujaf.2021.090636>