




# Manipulation of transfer prices by multi-national companies in Nigeria



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**Background:** Transfer pricing manipulation diminishes revenue generation by the host countries. The results of the investigations in the literature show divergence to the extent of the impact of transfer pricing on economic growth in both the low- and high-tax countries, especially as this type of investigation is still scanty in the literature.

**Aim:** The study examines the effect of transfer pricing manipulation on economic growth in Nigeria.

**Setting:** Multi-national companies in Nigeria.

**Methods:** The auto-regressive distributed lag (ARDL) approach was applied to data from Nigeria between 1986 and 2019.

**Results:** The findings reveal an insignificant relationship between economic growth and explanatory variables such as transfer pricing manipulation, unemployment rate, government revenue and trade openness. The result also shows a significant negative relationship between the exchange rate and economic growth.

**Conclusion:** The study recommends that the government should implement proper monitoring of multinational companies to check their day-to-day transaction activities. This may help the government to generate more revenue, and serves as an avenue to create more employment opportunities.

**Contribution:** In this study an important aspect is indicated in that multinational companies often misuse revenue to gain undeserved profits, rendering unnecessary costs to market and rendering other companies less competitive, as well as exploiting buyers and consumers. This is an important loophole that law- and policymakers as well as governments should pay attention to and act against.

**Keywords:** transfer pricing manipulation; government revenue; unemployment; economic growth and auto-regressive distributed lag (ARDL); co-integration; analysis

## Introduction

This article examines the effect of transfer pricing manipulation on economic growth in Nigeria by adopting an auto-regressive distributed lag (ARDL) approach to data from 1986 to 2019. Taxation is seen as the main source of government revenue (GR) all over the world. As a revenue-generating instrument, taxation is used to achieve objectives that will ensure the well-being of the country's citizens, such as the maintenance of law and order, provision of securities, and regulation of trades and businesses for social and economic maintenance (Oyunda 2015). Adegbite (2019) is of the view that the reason for the low GR from taxation can be attributed to tax avoidance, record falsification, tax evasion, gross inefficiency, and total leakages. There is a need for the proper monitoring of taxes received from the host and foreign companies.

Multinational corporations (MNCs) are managed separately with different branches globally but have a common corporate objective of generating abnormal profits. The major aims of business with diversification include risk reduction, increasing growth, stabilisation of income or earnings, and discretionary change. Diversification is also a source of revenue and assists to reduce dependence on a particular business segment. This decentralisation may be in a certain country or across borders. Omoye and Okafor (2004) view MNCs as firms with global affiliates and head offices situated in a developed region.

Investments by MNCs are important as it supports economic growth in both host and parent countries. In an effort to maximise profits, MNCs are involved in various branches, which may

involve trade between the parent company and its subsidiaries in other countries, or trade between subsidiaries operating in different countries. The prices they charge during trade are done among the various branches of MNCs and are referred to as 'transfer prices'. Transfer price manipulation (TPM) is the trade between related parties at prices meant to manipulate markets or to deceive tax authorities. It can also be referred to as a process where money, goods, services and other assets are transferred from one business to another; sometimes these operations are done via special intermediary units and not directly through main units called transfer centres (Jensen & Meckling 2016).

Transfer price manipulation by multinational companies limits economic growth when taxes to be paid are manipulated to reduce the revenue to government. In addition, the continuous practice of transfer pricing in Nigeria by foreign investors is fast becoming a concern due to the large of money and the impact on revenue generation in the country. This implies that Nigerian law on transfer pricing was promulgated to ensure that the profit from foreign business activities that exploit natural resources, and other business activities, are retained. This is, however, often manipulated in Nigeria as much of the transfer pricing activities are usually done by over-invoicing of import activity and under-invoicing of export activity (Ajayi 1992).

Over the years, transfer pricing manipulation was of concern in Africa, Nigeria inclusive. It is estimated that the capital flight component amounts to 7% of all the trade in Africa, amounting to approximately \$11 billion annually. The large capital flight could be attributed to about 60% of all the trade transactions in and out of Africa being mispriced by an average above 11% (Kazibwe 2013). Transfer price manipulation has been seen as a major cause of capital flight from Nigeria through tax avoidance and has resulted in the loss of big amounts of money. This is considered one of the systems, or ways, that hinder economic growth. The manipulation of invoices by the MNCs for capital flight and transfer pricing in Nigeria occurred mostly between 1970 and 2004, resulting in an average annual capital outflow of \$385 million and a cumulative total of \$135bn (Ajilore 2010). In addition, between 2005 and 2007, Nigeria lost £502m in transfer pricing through trade miss-invoicing (Christian Aid Report 2009).

Oil companies such as Chevron, Halliburton and Shell International Petroleum have avoided some taxes to domestic and foreign governments using accounting and tax transaction packages. In Nigeria, Shell International Petroleum avoided approximately \$710,506,000 during 1992, Halliburton \$14,285,714.20 in 2002 and Chevron \$17,857,142.86 in 2003 (Bakare 2006). Insufficient information from the parent company's results in transfer pricing and other forms of tax avoidance in Nigeria, leading to various forms of tax avoidance and other capital flight issues. Production in the oil sector is handled by multinational companies with tendencies toward tax avoidance through under-invoicing export or over-invoicing imports (Bakare 2006).

The need to determine the causes for low revenue from taxation, despite the volume of transaction done by the local and foreign companies, has attracted several investigations alike. Various researchers have found that TPM prevents economic growth. Ibitoye (2020), for example, examines transfer pricing manipulation and its effect on the Nigerian economy. It was found that the gross domestic product (GDP) reacted significantly negative to the rise in transfer pricing. Obasi (2015b) also shows a negative relationship between both transfer pricing, unemployment and economic growth in the normalised long-term equilibrium. In contrast to these findings Nguyen (2019) finds an insignificant and even negligible effect of transfer pricing on economic growth in Vietnam which is a low-tax country. Grubert and Mutti (1991) also adopt the augmented Dickey-Fuller (ADF) test on cross-sectional data for US MNCs and stated that taxes and transfer pricing in multinational companies indicate that the reporting of profits in high- and low-tax countries is in line with income shifting behaviour. Income shifting implies that the multinational companies usually intent to move their profit before tax to countries or jurisdictions with low tax in order to reduce the burden from tax. In a nutshell the result implies that the low tax determines the level of attraction of foreign companies which also determines the revenue generated. In the same vein, the authors find that real investment also depends on the effectiveness of the host country's tax rates and tariff strategies. They found evidence of divergence in the results of the investigation from the perspectives of foreign investment in other countries and in host countries on TPMs. Salihu, Annuar and Obid (2015) also find a statistically significant positive relationship between tax avoidance and foreign investors' interest in Malaysia.

Because of the divergence in the result of the investigations on the relationship between transfer pricing, revenue generation and foreign direct investment among MNCs both in high- and low- tax countries and the scantiness of this type of investigation in the literature, it is sought in this study to re-examine the effect of transfer pricing manipulation and economic growth in Nigeria. The intention, therefore, is to answer the question of the effect of transfer pricing manipulation on economic growth in Nigeria. Nigeria has been chosen as the 'laboratory' because of the volume of MNCs in the country and the expected impact of the revenue generated from the tax received from the MNCs on economic growth.

The remaining part of the article is presented as: In the section 'Literature review' the empirical literature is discussed; in the section 'Methodology' the model and methodology employed; in 'Results and discussion of findings' the data and empirical findings are supplied, and finally, the section 'Conclusion and policy recommendations' concludes the article.

## Literature review

The government of countries fix tax to maximise the revenue from taxes collected from the local and MNCs, and they fix it low to maximise sales to attract more MNCs. On the other

hand, the MNCs, in a bid to reduce their tax burden, adopt the income shifting strategy by moving to jurisdiction or countries with low tax and avoiding the high-tax countries. Horst (1971) develops a model from the idea of a multi-plant monopolist by selling in two different countries to analyse how the MNCs maximises their after-tax earning through transfer prices. In the model the firm's earned profit will be the summation of the after-tax profit from the firms in the two countries, in addition to the term that narrates the impact gained from intrafirm trade. This gives the firms the opportunity to choose whether to adopt the highest or lowest possible transfer prices which may be determined by the differentials in taxes between the importing and exporting countries, and the rates of their tariffs.

Horst (1971) and Eden (1998) view transferred price manipulation as the setting of transfer prices to be above or below opportunity costs in order to avoid but not to use the opportunity of evading the control of the government and/or take opportunity of arbitrage differences between countries. The MNCs also adopt the transfer pricing manipulations to avoid government price or tax control. To avoid the problems associated with tax, like double tax and tax avoidance, the government adopts the arm's-length principle.

The arm's-length principle is an international standard for transfer pricing. The arm's-length principle can be referred to as the difference that exist between two separate enterprises on how they relate their financial and commercial activities with the controlled and uncontrolled cases. The arm's-length principle can be achieved for controlled transactions when their transactions are in compliance with the comparability analysis and the best method rule. The best-method rule is the method that the company adopts as the procedure that best suits the tax business policy; on the other hand, the comparability analysis is concerned with a situation in which the company of controlled transitions makes several comparison before finalising the transactions that may achieve the goals of the arm's-length principle (Challoumis 2019). Eden (2003) views transfer pricing as the price that is set for internal or intrafirm transactions of goods, capital flows, services, and intangibles among the MNCs. The impact that the transfer pricing manipulation has on the revenue generation has prompted different controls of transfer pricing and has prompted several empirical investigations.

Solikhah, Aryani and Widiatami (2021) examine the impact that tunneling incentives, foreign operations, corporate governance mechanism, governance, debt covenants, and bonus mechanism on transfer pricing by taking panel data from 24 different companies, with 120 units for the period 2014 to 2018, using panel data regression. The study adopts two transfer pricing variables with proxies Related Party Transaction Asset Liability (RPTAL) and Transfer Pricing Intensity (TPI). The study has two models based on the differences caused by RPTAL and TPI. The first model shows that the tunneling incentives, debt covenants, and

foreign operations show a significant and positive effect on transfer pricing, and the second model shows that a positive relationship exists between tunneling incentives and transfer pricing.

Ibitoye (2020) applied time-series data from 1970 to 2016, obtained from World Bank data base on transfer pricing manipulation in Nigeria. The study employed the ARDL technique, and the results show that real GDP reacted significantly negatively to transfer pricing in Nigeria. If transfer pricing increases by one standard deviation, the average value of real GDP declines in the long term by 0.24 standard deviation units. The error correction model (ECM) showed that approximately 13.9% of disequilibrium in real GDP is due to a one-time temporary shock being corrected within a year.

Amidu, Coffie and Acquah (2019) find that the impact of transfer pricing and the management of earnings affects tax avoidance among some firms in Ghana by adopting a panel data set for the period 2008 to 2015. The results of the study show that almost all the firms reviewed within the period show evidence of transfer pricing strategies and earning manipulations for tax avoidance, but more prominent among the non-financial firms than observed among the financial firms, while the financial firms also utilised the transfer planning strategies but not as frequently as the non-financial firms.

Nguyen (2019) examines the relationship that exist between foreign direct investment, transfer pricing, and earnings in Vietnam in 2007 and 2015. Vietnam operates a very low tax rate compared to other Asian countries like Japan and China. The result of the study shows an insignificant or negligible impact of transfer pricing on revenue.

Ofei et al. (2018) examined two transmission channels of transfer pricing that may result in macro-economic volatility by adopting the EGARCH model, which is a dynamic model that addresses conditional heteroscedasticity from 1980 to 2017. The results indicated that it caused macro-economic instability. They found high and statistically significant shocks from transfer pricing, for both trade and budget policy channels. Salihu et al. (2015) adopt the generalised method of moment (GMM) approach to examine the link between tax avoidance and profit shifting and foreign investors' interest in 100 corporations listed in Malaysia from 2009 to 2011. A statistically significant positive relationship was found between tax avoidance and foreign investors' interest in Malaysia.

Cristea and Nguyen (2016) collected data from Danish exports between 1999 and 2006 with evidence of transfer pricing manipulation by MNCs. The study found that the MNCs reduced the value of their exports by between 5.7% and 9.1%, which amounts to an approximate \$141m shortage in expected export revenue for 2006. This would have formed a tax income of 3.24% from MNCs' tax returns in Denmark.

A study conducted by Mohammad and Simpasa (2012) also examined the effect of transfer pricing manipulations on multinational investment in consideration of 80 recognised companies listed on the Malaysian board, using panel data from 1972 to 2010. The study found transfer pricing to be prominent among companies that are highly diversified to attain higher rates of return, lower risk and growth opportunities. An article published by Argentina's segmental reporting board, which used panel data covering the period of 1932 to 2015, revealed that transfer pricing manipulation restricts economic growth (PWC 2020).

Crivelli, De Mooij and Keen (2015) adopted panel data collected from 173 developed and developing countries and investigated the impact of profit shifting on their economies. They found a negative impact on all countries. KPMG (Uganda) released an article titled *Global transfer pricing review*, based on time-series data covering the period of 2009 to 2012, and revealed that if firms adopt a method of decoupling their internal transfer price strategy from the arm's-length pricing strategy which they adopted for tax valuation purposes, it will affect the preferred internal price by admissible arm's-length price (explained in the methodology section below). This is evidence that intracompany transactions in combination with the tax valuations assist to induce economically relevant cashflows (KPMG 2015).

Bradley (2015) investigated transfer pricing and the existence of increased tension between multinational firms and tax authorities in the host countries by adopting the ECM on panel data for the period 1980 to 2013. The study found evidence of increasing tension between tax haven or tax incentive countries and Organisation for Economic Co-operation and Development (OECD) countries. Ahmed (2010) investigated transfer pricing from the Nigerian perspective using the Granger casualty test on panel data from the period between 1981 and 2018 and concluded that home taxation of foreign profit could reduce mispricing incentives, but the effect depends especially on the degree of compulsory repatriation. Tim, Efobi and Beecroft (1999) used survey data of Ethiopia and analysed the effect of integrating managerial and tax objectives of transfer pricing and concluded that an internal transfer pricing set is equal to the arm's-length theory price, which will result in low intracompany transfers.

## Methodology

### Model specifications

The model used in this study follows the work of Obasi (2015a) among the root of the arm's-length theory. The model specification is that national income (GDP) is a function of TPM and the unemployment rate (UN), expressed as:  $GDP = f(TPM, UN)$ . Transfer pricing manipulation is calculated by subtracting current account balances from foreign direct investment, while the dependent variable, economic growth, is proxied by GDP. The model is specified as:

$$GDP_t = \beta_0 + \beta_1 TPM_t + \beta_2 UN_t + \mu_t \quad [\text{Eqn 1}]$$

With modification to the work of Obasi (2015a), this model can incorporate trade openness (TO), the exchange rate (EXR), and GR, which then becomes:

$$GDP = f(TPM, UN, TO, EXR \& GR) \quad [\text{Eqn 2}]$$

This can be stated explicitly as:

$$GDP_t = \beta_0 + \beta_1 TPM_t + \beta_2 UN_t + \beta_3 TO_t + \beta_4 EXR_t + \beta_5 GR_t + U_t \quad [\text{Eqn 3}]$$

This model was log-linearised and stated as:

$$LN GDP_t = \beta_0 + \beta_1 TPM_t + \beta_2 UN_t + \beta_3 LN TO_t + \beta_4 EXR_t + \beta_5 LN GR_t \quad [\text{Eqn 4}]$$

$$\begin{aligned} \Delta LN GDP_t = & \alpha_0 \sum_{n=1}^k \alpha_1 TPM_t + \sum_{n=1}^k \alpha_2 UN_t + \\ & \sum_{n=1}^k \alpha_3 LN TO_t + \sum_{n=1}^k \alpha_4 EXR_t + \sum_{n=1}^k \alpha_5 LN GR_t + \\ & \beta_1 TPM_{t-1} + \beta_2 UN_{t-1} + \beta_3 LN TO_{t-1} + \beta_4 EXR_{t-1} + \\ & \beta_5 LN GR_{t-1} + \mu_t \end{aligned} \quad [\text{Eqn 5}]$$

Where transfer pricing manipulation is (FDI – CA), trade openness ( $\frac{Export + Import}{GDP}$ ), LN natural logarithms, and  $\mu_t$  are the stochastic variables, with  $\beta_0$  the intercept, while  $\beta_1 - \beta_5$  represent the parameter estimates.

### Auto-regressive distributed lag error correction model

The ECM is utilised to determine the short-term dynamics between the variables before the long-term relationship can be established. The model specification in ECM general form is stated below:

$$LN GDP_L = \beta_0 + \beta_1 TPM_t + \beta_2 UN_t + \beta_3 LN TO_t + \beta_4 EXR_t + \beta_5 LN GR_t + ECM_{t-1} + \varepsilon_t \quad [\text{Eqn 6}]$$

Where L is the lag operator and  $ECM_{t-1}$  represents the error correction term in a year.

### Sources of data

This study examines the effect of transfer pricing manipulation on economic growth in Nigeria between 1986 and 2019. Annual data on unemployment rates, EXR, TO, and GR from Central Bank of Nigeria Statistical Bulletins were collected; while data on the GDP, foreign direct investment, current account balances, exports and imports were sourced from the Federal Bureau of Statistics in Nigeria for empirical investigation.

## Results and discussion of findings

Table 1 summarises the results of the estimated mean value used to examine the nature of the data distribution. The EXR

recorded the highest mean of 107.88, while transfer pricing manipulation has the lowest average value of minus 6.04E+09. A careful assessment of the standard deviation of all the variables shows that the log of GDP (0.999), transfer pricing manipulation (1.23E+10), unemployment (1.436), log of TO (1.375) and the log of GR have a low standard deviation, implying a very low variability away from the mean. Other variables such as EXRs (91.679) have a high variability distant from the mean.

Table 1 further indicates that, apart from transfer pricing manipulation, the log of TO and GR, other variables are positively skewed. The estimated kurtosis statistics of the log of GDP and EXR are below 3. This implies that the variables are platykurtic and the tails of the distribution for these variables were thinner than a normal distribution. The kurtosis statistics of transfer pricing manipulation, unemployment rate, TO and GR are greater than 3. This implies that the variables are leptokurtic, which further means that the tails of the distribution for the variable are thicker than a normal distribution and therefore implies heterogeneity in the data. The Jarque-Bera value for all the variables, except the log of GDP, transfer pricing manipulation

**TABLE 1:** Descriptive statistics.

Variable	LNGDP	TPM	UN	LNTO	EXR	LNGR
Mean	25.583	-6.04E+09	4.307	2.681	107.88	4.525
Median	25.329	-1.71E+09	3.81	3.295	119.572	4.539
Maximum	27.027	1.85E+10	8.53	3.923	306.921	4.635
Minimum	24.047	-3.65E+10	3.58	-1.476	1.7545	4.213
SD	0.999	1.23E+10	1.436	1.375	91.679	0.085
Skewness	0.138	-0.811	2.394	-1.555	0.673	-1.7
Kurtosis	1.362548	3.870615	6.986	4.483	2.751	6.962
Jarque-Bera	3.906	4.800498	54.978	16.809	2.655	38.619
Probability	0.142	0.0907	0	0.0002	0.265	0
Sum	869.827	-2.05E+11	146.45	91.168	3667.919	153.849
Sum sq. dev.	32.944	4.98E+21	68.019	62.415	277363	0.237
Observations	34	34	34	34	34	34

LNGDP, logarithm of national income; TPM, transfer price manipulation; UN, unemployment; LNTO, logarithms of trade openness; EXR, exchange rate; LNGR, logarithms of government revenue; SD, standard deviation.

**TABLE 2:** Unit root.

Stationarity	At levels			At 1st difference			Level of integration
	ADF-test	1% CV	5% CV	ADF-test	1% CV	5% CV	
LNGDP	-0.05	-3.65	-2.95	-4.54	-3.65	-2.96	1(1)
TPM	-2.14	-3.65	-2.95	-5.13	-3.66	-2.96	1(1)
UN	-2.06	-3.71	-2.98	-3.66	-3.68	-2.97	1(1)
EXR	0.99	-3.65	2.95	-4.03	-3.65	-2.96	1(1)
LNTO	-4.21	-3.65	-2.95	-6.90	-3.65	-2.96	1(0)
LNGR	-6.36	-3.65	-0.95	9.13	-3.65	-2.96	1(0)

LNGDP, logarithms of gross domestic product; CV, coefficient of variation; ADF, augmented Dickey-Fuller test; TPM, transfer price manipulation; UN, unemployment; LNTO, logarithms of trade openness; EXR, exchange rate; LNGR, logarithms of government revenue; SD, standard deviation.

**TABLE 3:** Lag length selection criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-974.689	NA	1.21E+20	63.27	63.548	63.361
1	-806.031	261.148†	2.44e+16†	54.712	56.655†	55.345†
2	-771.852	39.692	3.64E+16	54.829	58.437	56.005
3	-731.894	30.935	6.77E+16	54.574†	59.847	56.293

†, Shows the selected lag order by the criterion; the sequential modified likelihood ratio test (LR) at 5% level.

FPE, final prediction error; AIC, Akaike information criterion; SC, Schwarz information criterion; HQ, Hannan-Quinn information criterion.

and EXRs passed the significance test of 1%. This implies that the variables are not normally distributed.

Table 2 shows the results of the ADF test, which indicate that all the variables were not stationary in the same order. The GDP, TPM, unemployment and exchange were stationary at first difference, while TO and GR were stationary at level. This is because the ADF statistics of each of the variables were greater than the 5% critical value of each of the variables in absolute terms. These results show that all the variables under review have a short-term equilibrium relationship.

Concerning the ADF tests, the conditions for the ARDL co-integration tests were met. Therefore, the ARDL bound testing approach for co-integration analysis can be employed.

The lag length is increased to four lags and even more to the point that there is likely no room for improvement or no more options in the lag length choice (see Table 3). The result in Table 4 shows that all criteria suggest a maximum of one lag for the ARDL model.

The *F*-statistic is 1.60 and the values of the critical lower bound and the critical upper bound following Pesaran, Shin and Smith (2001) are presented in Table 4. The *F*-statistics are within the lower and upper bound at a 5% level of significance, which is 1.601757. The study, therefore, concludes that there is no evidence of a long-term relationship between GDP and the set of other independent variables.

The ARDL test shows a negative but insignificant short-term relationship between TPM and the GDP in Nigeria (Table 5). The EXRs and TO is also negative but statistically insignificant. Unemployment and GR are also negative but statistically insignificant. This result is consistent with Obasi (2015b) who also finds a negative relationship between transfer pricing manipulation and unemployment. A year lag between EXR and GR, however, tends to have a significant positive

**TABLE 4a:** Bound test for the presence of co-integration in auto-regressive distributed lag.

Test statistic	Value	K
F-statistics	1.60	5

**TABLE 4b:** Bound test for the presence of co-integration in auto-regressive distributed lag.

Critical value bounds: Significance	I(0) bound	I(1) bound
10% (0.1)	2.26	3.35
5% (0.05)	2.62	3.79
1% (0.01)	3.41	4.68

**TABLE 5:** Unrestricted auto-regressive distributed lag.

Variable	Coefficient	SE	t-statistic	Prob.
LNGDP(-1)	0.855	0.067	12.813	0.0000
TPM	-3.08E-12	2.61E-12	-1.182	0.249
UN	-0.054	0.0543	-1.0006	0.327
LNTO	-0.131	0.094	-1.392	0.177
LNTO(-1)	0.126	0.084	1.505	0.146
EXR	-0.001	0.0017	-0.75	0.461
EXR(-1)	0.004	0.002	2.152	0.042
LNGR	-0.552	0.585	-0.945	0.355
LNGR(-1)	0.304	0.391	0.778	0.445
C	4.93	3.25	1.517	0.143
R <sup>2</sup>	0.986	Mean dependent var		25.609
Adj. R-squared	0.98	SD dep. var		1.003
SE of regression	0.141	Akaike info criterion		-0.841
Sum squared residual	0.455	Schwarz criterion		-0.387
Log-likelihood	23.868	Hannan-Quinn critter.		-0.688
F-statistic	178.314	Durbin-Watson stat		2.07
Prob (F-statistic)	0	-		-

SE, standard error; LNGDP, logarithm of gross national income; TPM, transfer price manipulation; UN, unemployment; LNTO, logarithms of trade openness; EXR, exchange rate; LNGR, logarithms of government revenue; SD, standard deviation.

relationship with GDP. This implies that the variables tend to have a direct relationship with GDP in the long term. The R<sup>2</sup> measures the goodness of fit and is also the coefficient of determination at 0.98587, which implies that 98.6% of the variation in the GDP is explained by other variables. However, because of the significance level of the explanatory variables and the need to know the relevant variables in the model, a parsimonious ARDL is adopted.

## Discussion of findings

The relationship is investigated that exists between TPM and economic growth in Nigeria from 1986 to 2019 by employing an ARDL. The first step was to test for the properties of the time-series variables selected by utilising the ADF unit root tests at a 5% critical value. The unit root test revealed that only the logarithms of trade openness (LNTO) and government revenue (LNGR) were stationary at level, while other variables were stationary at first difference.

The condition for ARDL lag co-integration was met, based on the ADF test. The study also found that the absence of long-term co-integration between the variables as the value of the F-statistics, (1.602) based on Pesaran et al. (2001), is lower than the upper bound critical value (3.79) at a 5% level of significance. The result of ARDL short-term

dynamics revealed a negative short-term relationship between GDP and independent variables such as TPM, unemployment rate, TO, and the EXR and GR. This result is in line with Obasi's (2015b) findings on how transfer pricing affects economic growth in Nigeria. The empirical evidence reveals an indirect link between transfer pricing, unemployment and economic variables in Nigeria. This is in agreement with Ibitoye's (2020) study on TPM and the Nigerian economy for the period 1970 to 2016. Using the ARDL, the results of the regression showed that real GDP reacted significantly negative to a rise in transfer pricing in Nigeria. In addition, the work of Asongu (2016) found that transfer mispricing contributed to the diminishing growth of African nations. Clive and Jorissen (2013) also showed that TPM is negatively related to economic growth in developed countries.

## Conclusion and policy recommendations

In this article the effect is examined of transfer pricing manipulation on economic growth in Nigeria from 1986 to 2019. The study reveals that transfer pricing manipulation limits economic growth, which confirms the conclusion of several researchers in the past like Clive & Jorissen 2013 and Ibitoye 2020. This result implies that TPM inhibited economic growth in Nigeria within the review period. However, in the study a statistically insignificant and negative relationships obtained between transfer pricing manipulation and economic growth. The results also agreed with the previous finding that transfer pricing manipulation could negatively affect the unemployment rate, TO, EXR and GR (Ibitoye 2020; Obasi 2015b; Ofei et al. 2018). This implies that transfer pricing manipulation discourages TO, which could affect the growth in economic output.

It is, therefore, recommended that there should be proper monitoring of multinational companies to gauge their day-to-day transaction activities as this may help governments to generate more revenue and an avenue to create more employment opportunities. Government should, moreover, ensure that penalties are levied on multinational companies that engage in transfer pricing manipulation as a means of earning GR that would have been generated from the import and export of goods and services. There is a clear need to investigate how firms shift profit and the value that the government loses from transfer pricing but there is lack of such empirical investigation. This is due to lack of data set to differentiate the tax considered as ideal by the MNCs and the arm's length price which is the international standard for transfer pricing.

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## Competing interests

The author(s) declare that they have no financial or personal relationship(s) that may have inappropriately influenced them in writing this article.

## Authors' contributions

The authors both contributed to the article. A.A.O. developed the initial concept and analysis, and O.J.I. did the literature study, and empirical analysis and wrote the initial manuscript. E.P.J.L. overviewed and validated the empirical analysis and wrote the final version of the manuscript. A.A.O. is senior lecturer in Nigeria and Uganda, O.J.I. is a post-doctoral fellow and E.P.J.L. is his supervisor.

## Ethical considerations

With regard to this article we declare that all ethical practices have been followed concerning the development, writing, and publication of the article. Although it was not deemed necessary the researchers did obtain an Ethical Clearance Certificate for this research from the Economic and Management Sciences Research Ethics Committee (EMC-REC) of North-West University, South Africa (NWU – 00644-22-A4).

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## Data availability

The data that support the findings of this study are available on request from the corresponding author, E.K.

## Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy, views or position of their affiliated agencies.

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