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EFFECT OF TRANSFER PRICING REGULATIONS ON MULTINATIONAL CORPORATIONS' TAX BURDEN OF QUOTED INDUSTRIAL GOOD FIRMS IN NIGERIA.

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Abstract
This study evaluated the effect of transfer pricing regulations on the tax burden of quoted industrial good firms in Nigeria between 2014 and 2023. It employed a panel regression model to examine the relationships between related party transactions (RPT), effective tax rate (ETR), cash effective tax rate (CETR), and the tax-to-GDP ratio. Findings reveal that RPT significantly increased both ETR and CETR, indicating that stricter regulations have compelled firms to align intra-company transactions with arm's length principles. However, RPT did not have a statistically significant effect on the tax-to-GDP ratio. Firm size had no significant impact on ETR and CETR but exhibited a marginally positive influence on the tax-to-GDP ratio. These results suggest that while transfer pricing regulations have improved tax compliance and burden distribution among multinational corporations, their broader macroeconomic impact remains inconclusive.

Introduction

Transfer pricing, a tool for determining the prices of goods, services, and intellectual property traded within multinational corporations (MNCs), has evolved into a critical area of international tax discourse. While initially designed to ensure efficient resource allocation within corporate structures, it is often exploited to achieve tax advantages, particularly in developing economies like Nigeria. By shifting profits to low-tax jurisdictions and attributing expenses to high-tax locations, MNCs reduce their overall tax liabilities, significantly eroding the revenue bases of host countries (Nkechinyere, 2018; Davies., 2018, as cited in Kalra & Afzal, 2023). This practice undermines the capacity of governments in developing nations to fund essential socio-economic programs, worsening challenges such as poverty, infrastructure deficits, and public debt (Ogidiaka , 2022).

Nigeria, as a host to numerous MNCs, has been particularly affected by these profit-shifting practices. Between 2013 and 2021, the country's public debt skyrocketed from ₦8.32 trillion to ₦36.3 trillion, driven in part by

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significant revenue losses attributed to transfer pricing abuses (Ogidiaka et al., 2022). For instance, MTN Nigeria made unauthorised payments of over ₦37.6 billion to its Dubai affiliate between 2010 and 2013, a move that highlighted the sophistication of the profit-shifting mechanisms employed by multinational firms (Ogidiaka et al., 2022). Such practices compel the Nigerian government to resort to loans, further increasing the country's debt profile and limiting its ability to invest in critical infrastructure and social services (Hohmann, Riedel & Zinke, 2024).

In response to these challenges, the Nigerian government introduced the Income Tax (Transfer Pricing) Regulations in 2012, later revising them in 2018. These regulations aim to curb tax evasion by enforcing compliance with the arm's length principle, which is a guideline that ensures that intra-company transactions are priced comparably to those conducted between independent entities (OECD, 2010, as cited in Adeyeye et al., 2022). The 2018 amendments incorporated international best practices, such as the United Nations and Organisation for Economic Co-operation and Development (OECD) guidelines, to address base erosion and profit shifting (BEPS) and strengthen Nigeria's tax administration framework (Agbo, 2024). These changes introduced stricter compliance measures, including documentation requirements, penalties for non-compliance, and provisions for advanced pricing agreements (Adeyeye et al., 2022).

However, the enforcement of these regulations poses significant challenges. The complexity of monitoring intra-company transactions, particularly those involving intangible assets such as patents, trademarks, and royalties, complicates tax audits (Muhammadi et al., 2016). Additionally, the limited network of double tax treaties in Nigeria increases the risk of economic double taxation, further discouraging compliance (Ogidiaka et al., 2022). Studies reveal that profit-shifting practices persist globally, often enabled by gaps in enforcement capacities and weaknesses in the tax systems of developing countries (Sebele-Mpofu et al., 2021; Choi et al., 2020). The complexity of monitoring intangible assets and intra-company transactions, coupled with Nigeria's limited double tax treaties, hampers the effectiveness of these regulations (Adeyeye et al., 2022). Furthermore, Muhammadi et al. (2016) noted that tax auditors face significant difficulties in evaluating the compliance of MNCs, particularly regarding intangible assets like patents and royalties.

While the existing literature underscores the adverse effects of transfer pricing on tax revenues, there is a paucity of empirical studies examining the effectiveness of Nigeria's transfer pricing regulations in mitigating these challenges. Studies such as those by Sebele-Mpofu et al. (2021) and Choi et al. (2020) have called for more focused research to evaluate regulatory frameworks in developing countries, emphasising the need for tailored policies to address unique fiscal and administrative constraints. Similarly, Ogidiaka et al. (2022) highlighted the lack of comprehensive analyses on the implementation challenges and outcomes of Nigeria's revised transfer pricing regulations. This gap in the literature necessitates an in-depth investigation into the effects of transfer pricing regulations on the tax burdens of multinational industrial good firms in Nigeria. By analysing the effects of these regulations, the study aims to provide actionable insights for policymakers and stakeholders in improving Nigeria's fiscal framework, reducing tax base erosion and ensuring equitable tax contributions from multinational corporations.

Hypotheses of the Study

The following null hypotheses were tested in this study:

HO1: Transfer pricing regulations have no significant effect on the effective tax rate of quoted industrial good firms in Nigeria.

HO2: Transfer pricing regulations have no significant effect on the cash effective tax rate of quoted industrial good firms in Nigeria.

HO3: Transfer pricing regulations have no significant effect on the tax-to-GDP ratio of quoted industrial good firms in Nigeria.

LITERATURE REVIEW

Conceptual Clarification

Overview of the Transfer Pricing Regulations

Transfer pricing regulations govern the pricing of goods, services, and intangible assets exchanged within multinational corporations (MNCs). Based on the arm's length principle, these rules ensure that intra-company transactions are comparable to those agreed upon by independent entities in open market conditions, curbing profit shifting to low-tax jurisdictions (OECD, 2017). Nigeria introduced transfer pricing regulations in 2012 and revised them in 2018, aligning with the OECD guidelines and the Base Erosion and Profit Shifting (BEPS) framework. These regulations require detailed documentation to demonstrate compliance and ensure that MNCs allocate income and expenses fairly across jurisdictions (FIRS, 2018).

The regulations aim to prevent tax base erosion by addressing manipulative related-party transactions, which reduce taxable income in high-tax countries like Nigeria (Aliyu, Kumai & Mustapha, 2022). Despite their benefits, compliance can be costly, requiring investments in documentation and advisory services. Industrial goods firms face additional challenges due to the complexity of cross-border transactions involving raw materials, intermediate goods, and finished products (Cobham & Janský, 2017). Nevertheless, transfer pricing rules enhance transparency and equity in the global tax system, ensuring that MNCs contribute fairly to the economies where they operate (FIRS, 2018).

Related Party Transactions (RPTs) and Compliance

RPTs are financial dealings between entities within a corporate group, such as the exchange of goods, services, and intellectual property. While these transactions are essential for operational efficiency, they can distort pricing and shift profits to low-tax jurisdictions, eroding tax bases (OECD, 2017). Nigeria's Federal Inland Revenue Service mandates disclosure and documentation of RPTs, ensuring compliance with arm's length principles and international standards like the OECD guidelines and BEPS framework (FIRS, 2018; PwC, 2018). However, challenges such as transaction complexity, information asymmetry, and documentation burdens limit regulatory effectiveness (Cobham & Janský, 2017; UNCTAD, 2018). Addressing these issues is crucial for securing fair tax contributions and ensuring the success of transfer pricing regulations.

Tax Burden defined

The tax burden represents the financial obligations imposed on individuals, businesses, or corporations by government authorities in the form of taxes. For multinational corporations (MNCs), it serves as a measure of the proportion of income or revenue allocated to taxes, providing insight into the economic impact of taxation on their operations. This metric is crucial in fiscal policy and corporate financial management, influencing decisions regarding investment, profitability, and compliance strategies (Hanlon & Heitzman, 2010).

In the corporate sector, the tax burden is often measured by the effective tax rate (ETR), which calculates actual taxes paid as a percentage of pre-tax income, offering a clearer picture than statutory tax rates (OECD, 2017). Factors influencing the tax burden include statutory rates, tax policies and incentives, and compliance costs. Transfer pricing, a significant determinant, ensures that profits are appropriately allocated to jurisdictions based on value creation, preventing profit shifting and base erosion (FIRS, 2018). In Nigeria, the Companies Income Tax Act (CITA) sets a corporate tax rate of 30%, with additional levies like the Tertiary Education Tax, while adherence to transfer pricing regulations critically shapes MNCs' tax obligations (FIRS, 2018).

For MNCs, a high tax burden can reduce profitability, influence investment decisions, and increase administrative compliance costs. While adhering to tax regulations like transfer pricing rules mitigates the risks of penalties and reputational damage, aggressive tax planning can attract scrutiny, affecting corporate reputation (Cobham & Janský, 2017). Metrics such as the effective tax rate (ETR), cash effective tax rate (CETR), and tax-to-GDP ratio offer valuable insights into the scale and implications of taxation on both corporate and national levels (UNCTAD, 2018).

Effect of Transfer Pricing Regulations on the Effective Tax Rate (ETR)

Transfer pricing regulations shape the effective tax rate (ETR) of multinational corporations (MNCs) by enforcing the arm's length principle, which ensures that intra-group transactions reflect market prices. This principle prevents profit shifting to low-tax jurisdictions, aligning tax liabilities with economic activities and value creation. Consequently, ETRs, which are calculated as taxes paid relative to pre-tax income, tend to increase in high-tax jurisdictions where operations are significant (OECD, 2017).

Adjusting related-party transactions is a primary mechanism through which these regulations affect the ETR. Without robust rules, MNCs could misprice transactions to minimise tax liabilities. Frameworks like the OECD's BEPS guidelines and Nigeria's 2018 transfer pricing regulations ensure that transactions adhere to market conditions, enhancing transparency and discouraging aggressive tax planning. Measures like country-by-country reporting under BEPS Action 13 provide tax authorities with critical data to monitor and adjust profit allocations (OECD, 2017; Cobham & Janský, 2017).

Transfer pricing rules also mitigate tax disputes and reduce the misuse of tax havens, even though compliance imposes documentation and administrative costs. Evidence shows that stricter enforcement correlates with higher ETRs, as firms report more profits in jurisdictions with higher tax rates. By aligning tax liabilities with economic substance, these regulations promote equity and integrity in international tax systems (Hanlon et al., 2015; Beer, de Mooij, & Liu, 2020).

Effect of Transfer Pricing Regulations on the Cash Effective Tax Rate

Transfer pricing regulations significantly affect the Cash Effective Tax Rate (CETR), which measures cash taxes paid as a percentage of pre-tax income, offering a practical view of a firm's tax burden. By enforcing the arm's length principle, these regulations ensure accurate pricing of related-party transactions, preventing profit shifting to low-tax jurisdictions and aligning taxable income with economic activities (OECD, 2017; FIRS, 2018).

A key impact of these regulations is seen in the pricing of intra-group transactions involving goods, services, or intellectual property. Frameworks such as the OECD's BEPS initiatives and Nigeria's 2018 transfer pricing rules compel firms to adhere to market-based pricing, increasing cash tax payments and curbing tax avoidance (Cobham & Janský, 2017). Although compliance raises administrative costs, it reduces the risks of penalties, disputes, and reputational damage, ensuring that firms report higher taxable income in relevant jurisdictions (Beer, de Mooij, & Liu, 2020).

Research confirms that robust enforcement of transfer pricing regulations correlates with higher CETR, reflecting increased transparency and fairness in international tax systems. By aligning tax liabilities with economic substance, these regulations promote equitable contributions and reduce opportunities for aggressive tax planning (Hanlon et al., 2015).

Effect of Transfer Pricing Regulations on the Tax-to-GDP Ratio

Transfer pricing regulations significantly impact the tax-to-GDP ratio by curbing tax avoidance strategies like profit shifting, which erodes the domestic tax base. These rules ensure that multinational corporations (MNCs) align intra-group transactions with economic activities in the host country, thereby enhancing revenue collection (Beer, de Mooij, & Liu, 2020; OECD, 2017). Empirical evidence suggests that such regulations can increase corporate tax revenue by 5%–8%, positively influencing the tax-to-GDP ratio (de Mooij & Liu, 2020).

In Nigeria, the Federal Inland Revenue Service (FIRS) has strengthened its tax framework through the 2018 transfer pricing regulations and alignment with international standards like the OECD's BEPS Action Plans, enhancing efforts to boost revenue collection (FIRS, 2018). However, enforcement challenges, including administrative capacity and transaction complexity, limit effectiveness. Addressing these issues through improved regulatory frameworks and capacity-building for tax authorities can maximise the benefits of transfer pricing regulations, ensuring better revenue outcomes and a higher tax-to-GDP ratio (UNCTAD, 2020; KPMG, 2021).

Theoretical Framework

The theoretical framework for this study provides the foundation for understanding the dynamics between corporate tax strategies, regulatory policies, and economic outcomes. This study is underpinned by three main theories: the Agency Theory, the Tax Avoidance Theory, and the Institutional Theory. Each theory contributes to explaining how transfer pricing regulations influence corporate behaviour and taxation outcomes, ultimately providing a lens to analyse their implications.

Agency Theory

Agency theory examines the conflicts of interest between principals (e.g., shareholders) and agents (e.g., managers) within a corporation. Managers are incentivized to firm value, which often leads to aggressive tax planning strategies, including transfer pricing manipulation, to reduce the overall tax burden. Such practices, while beneficial for reducing tax liabilities, may expose the firm to regulatory risks and penalties (Meckling & Jensen, 1976; Hanlon & Heitzman, 2015). Transfer pricing regulations serve as mechanisms to align the interests of all stakeholders by limiting profit-shifting opportunities and ensuring compliance with tax laws. In this context, agency theory highlights the necessity for oversight and robust governance to mitigate the risks associated with profit shifting and tax base erosion (Desai & Dharmapala, 2006).

Tax Avoidance Theory

Tax avoidance theory provides a framework for understanding how firms strategically navigate tax regulations to minimise liabilities. Multinational corporations often exploit differences in tax systems across jurisdictions to achieve tax savings through transfer pricing adjustments. However, stringent transfer pricing regulations disrupt these practices by mandating adherence to the arm's length principle and requiring comprehensive documentation (Ftouhi & Ghardallou, 2020). This theory also addresses the trade-offs that MNCs face between reducing taxes and the potential costs of non-compliance, such as reputational damage and increased scrutiny from tax authorities (de Mooij & Liu, 2020). The tax avoidance theory underscores the role of transfer pricing regulations in balancing the need for tax efficiency with the obligations of transparency and fairness in taxation.

Institutional Theory

Institutional theory posits that organisational practices, including tax strategies, are influenced by institutional frameworks such as legal, regulatory, and social norms. In the context of transfer pricing, institutional pressures from international organisations (e.g., OECD) and local tax authorities shape corporate behaviour (Scott, 2013). Countries with robust transfer pricing regulations tend to reduce profit-shifting practices because firms are compelled to comply with local institutional requirements. Institutional theory emphasises the role of policy harmonisation, such as the OECD's BEPS project, in creating a standardised approach to addressing transfer pricing issues (OECD, 2017). By aligning institutional frameworks with global standards, transfer pricing regulations enhance tax compliance and contribute to revenue mobilisation.

Anchoring the Study

Among these theories, Institutional Theory provides the most relevant framework for anchoring this study. The influence of transfer pricing regulations on multinational corporations' tax burden in Nigeria is heavily mediated by institutional frameworks that dictate compliance and enforcement. Nigeria's adoption of transfer pricing regulations in line with the OECD's guidelines exemplifies how institutional pressures shape corporate tax practices. The study, therefore, draws on institutional theory to explain how regulatory frameworks and international norms influence the tax behaviour of multinational corporations, particularly in the industrial goods sector.

Empirical Reviews

Awotomilusi et al. (2024) analysed how transfer pricing affects the financial performance of listed multinational manufacturing firms in Nigeria, using data from 12 companies (2013–2022). The study employed an ex post facto design, census sampling, and panel data regression. Findings showed that board size negatively impacted ROA, board independence had an insignificant positive effect, and related party transactions had a significant positive effect. For Tobin's Q, board size showed an insignificant negative effect, board independence had a significant positive effect, and related party transactions had an insignificant negative impact. The study concluded that transfer pricing significantly influences financial performance and recommended its strategic use to enhance corporate growth.

Al-Hamadeen et al. (2023) assessed tax professionals' awareness and early-stage application of transfer pricing (TP) regulations using a quantitative approach and a 29-item questionnaire. Results revealed strong TP awareness but limited implementation experience due to inadequate training. Digital systems improved filing efficiency, and TP reduced tax burdens and curbed evasion, enhancing compliance. Perceptions of TP awareness and application did not differ by demographics. Practical recommendations for improving TP practices were provided.

Nwoye, Obiorah, and Chidiebere (2023) investigated the effects of illegal taxation and tax holidays on SMEs' performance in Awka South, Anambra State. Using a survey of 119 finance staff from 11 SMEs and regression analysis, the study found that tax holidays significantly improved SME performance, while illegal taxation negatively impacted it. The authors concluded that tax incentives encourage reinvestment, expansion, and job creation but recommended curbing illegal taxes and increasing tax holidays to support SME growth.

Osho and Ogedengbe (2023) explored the impact of transfer pricing and social factors on the financial performance of 18 listed universal companies in Nigeria, using agency theory to address investor-executive conflicts. The study employed panel regression, with return on assets as the dependent variable and board size, board independence, and related party transactions as independent variables. Firm size and leverage served as the control variables. Results indicated that related party transactions had no significant effect on financial performance, while the overall model was significant. The authors recommended enhanced corporate governance and stricter regulations for improved transfer pricing practices.

Kalra and Afzal (2023) reviewed 29 studies on transfer pricing (2014–2022), highlighting key findings, gaps, and future research opportunities. They identified areas such as the impact of regulations on multinationals, tax evasion prevention, and economic outcomes. The review emphasised the need for transfer pricing research to explore its role beyond tax compliance, offering insights for graduate students pursuing advanced studies in this field.

Tarmidi, Fadjarenie, and Oktris (2023) examined transfer pricing's role in tunnelling incentives and debt covenants on corporate tax policy among Indonesian manufacturing firms. Using 398-panel data, they found that tunnelling incentives influenced transfer pricing activities, while debt covenants were used in tax policy management. However, transfer pricing did not mediate the indirect effects of these factors on the tax policy. The study concluded that transfer pricing and debt covenants are commonly employed in tax management strategies.

Adeyeye, Bale, Iredele, and Adeyeye (2022) evaluated the effectiveness of Nigeria's 2018 transfer pricing regulations in curbing tax evasion. Using a survey design, the study sampled 151 Federal Inland Revenue Service staff in Lagos State and analysed data with descriptive and inferential statistics, including a one-sample t-test.

Results showed the regulations were effective, with recommendations for enhanced strategies and regular training to minimise tax evasion through transfer pricing.

Fasita, Firmansyah, and Irawan (2022) explored the links among transfer pricing aggressiveness, thin capitalisation, political connections, and tax avoidance in Indonesian multinational firms. Analysing 244 firm-years (2016–2019) via regression, they found that transfer pricing and political connections reduced tax avoidance, while thin capitalisation increased it. Corporate governance weakened these effects, prompting recommendations for stricter tax inspections on firms with high-interest debt structures.

Ogidiaka, Agbi, and Mustapha (2022) examined the influence of transfer pricing on Nigeria's revenue and debt profile using a qualitative document review. Findings highlighted challenges with revised regulations and how debt servicing hindered infrastructural development. The study advised clearer regulatory guidance and careful debt/revenue analysis before securing loans.

Gunawan and Surjandari (2022) analysed the impact of transfer pricing, capital intensity, and earnings management on tax avoidance among 66 manufacturing firms listed on the Indonesia Stock Exchange from 2015 to 2019, using 330 data points. E-views 9 software was used for analysis, with tax avoidance measured by the cash effective tax rate, transfer pricing by the ratio of related party sales to total sales, capital intensity by the percentage of fixed assets to total assets, and earnings management by the modified Jones model. The study found that all three variables significantly influenced tax avoidance both individually and collectively.

Victory and Rufus (2021) explored strategies to enhance tax administration in Nigeria through transfer pricing (TPT). Using theoretical and empirical methods, they reviewed the literature on TPT prospects, challenges, and government initiatives. Data from the surveys and descriptive research designs were analysed with SPSS. While the demographic data were summarised descriptively, T-tests assessed the variable influence, and Cronbach's alpha confirmed the instrument reliability. Findings showed stakeholders' uncertainty about the adequacy of tax laws on transfer pricing, highlighting issues such as evasion, avoidance, and administrative capacity. Recommendations for improvement were provided.

Irawan, Kinanti, and Suhendra (2020) examined the effects of transfer pricing, accrual, and real earnings management on tax avoidance in 63 IDX-listed manufacturing firms (2014–2017). Using multiple linear regression, they found that transfer pricing negatively affected tax avoidance, showing that it was not used for tax evasion. Conversely, accrual earnings management positively influenced tax avoidance, while real earnings management had a negative impact, suggesting reduced tax avoidance through real operational activities.

Osho, Efuntade, and Jemiseye-Dav (2020) analysed the impact of taxation on transfer pricing in Nigeria, employing the Augmented Dickey-Fuller Unit Root Test and Johansen co-integration to assess variable integration and long-term relationships. Data from the Central Bank of Nigeria, FIRS, World Bank, and NBS revealed that company and personal income taxes negatively influenced transfer pricing. The study advised cautious tax policy implementation to minimise adverse effects on transfer pricing rates.

Nadhifah and Arif (2020) explored the effects of transfer pricing, thin capitalisation, financial distress, earnings management, and capital intensity on tax avoidance, moderated by sales growth. Using data from 32 Indonesian manufacturing firms (2016–2018), the panel data regression showed that transfer pricing, financial distress, and earnings management reduced tax avoidance, while thin capitalisation increased it. Sales growth strengthened or weakened these effects depending on the variable.

Amidu, Coffie, and Acquah (2019) investigated how transfer pricing and earnings management influenced tax avoidance in Ghana (2008–2015). Findings indicated widespread use of transfer pricing and earnings manipulation, with non-financial firms favouring earnings management and financial firms relying more on transfer pricing. The study highlighted a declining sensitivity of tax avoidance to transfer pricing as earnings management increased, emphasising policy implications for transfer pricing laws.

METHODOLOGY

This study adopted an *ex post facto* research design, which is suitable for analysing data collected across multiple firms and time periods, combining cross-sectional and time-series elements. The study population consists of all 12 industrial good companies listed on the Nigerian Exchange Group (NGX) as of December 31, 2023. Table 1 provides the list of industrial good companies listed on the Nigerian Exchange Group as of December 31, 2023, along with their corresponding share values.

Table 1: Listed Industrial Good Firms as of 31st December, 2023

SN	Name	Category	Share Price (₦)
1	Dangote Cement Plc	Building Materials	328.00
2	Lafarge Africa Plc	Building Materials	27.20
3	Tripple Gee and Company Plc.	Packaging/Containers	2.38
4	Notre Chemical Ind Plc	Agro-Allied & Chemicals	62.50
5	Berger Paints Plc	Building Materials	13.20
6	Bua Cement Plc	Building Materials	107.00
7	Chemical And Allied Products (Cap) Plc	Building Materials	21.00
8	Meyer Plc.	Building Materials	2.74
9	Premier Paints Plc	Building Materials	10.00
10	Austin Laz & Company Plc	Electronic and Electrical Products	2.03
11	Cutix Plc.	Electronic and Electrical Products	2.29
12	Beta Glass Plc.	Packaging/Containers	60.30

Method of Data Collection

The data for this study are secondary and sourced from the audited annual reports and financial statements of the sampled firms from 2014 to 2023. Additional data were obtained from the NGX, FIRS, and the World Bank's economic and regulatory databases. The sampling technique employed was purposive, focusing on multinational corporations with consistent data availability across the study period. At the end of the selection process, 9 out of the 12 quoted firms were used in the study.

Variable Measurement

Table 2 shows the measurement of the variables used in the study.

Table 2: Variable Measurement

Variable	Measurement	Source
Dependent variable		
Effective Tax Rate (ETR)	Calculated as the ratio of total tax expense to profit before tax.	Gunawan and Surjandari (2022)
Cash Effective Tax Rate (CETR)	Measured as the ratio of cash taxes paid to operating cash flows	Gunawan and Surjandari (2022)
Tax-to-GDP Ratio (TGR)	Measured as the contribution of the industrial good sector's tax payments to Nigeria's GDP	Al-Hamadeen et al. (2023)
Independent variables		
Related Party Transactions (RPT)	Measured as the total monetary value of reported transactions between related parties	Gunawan and Surjandari (2022), Clausing (2003)
Control variables		
Firm Size (FSZ)	Natural logarithm of total assets	Osho and Ogedengbe (2023)

Method of Data Analysis

The data for the study variables were analysed using the Panel Data Regression model, specifically employing both fixed effects and random effects models to assess the relationships between transfer pricing regulations and the tax burden of multinational industrial goods firms. The analysis was conducted using EViews version 13 software. The results from the regression analysis are presented in tables for clarity and easy interpretation.

Model Specification

The following regression models were developed in this study (in their generic form) to capture the variables of the study:

$$ETR = f(RPT, FSZ) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (1)$$

$$CETR = f(RPT, FSZ) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (2)$$

$$TGR = f(RPT, FSZ) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (3)$$

The econometric form or testable form are given as

$$ETR_t = \beta_0 + \beta_1 RPT_t + \beta_2 FZ_t + e_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (4)$$

$$CETR_t = \beta_0 + \beta_1 RPT_t + \beta_2 FZ_t + e_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (5)$$

$$TGR_t = \beta_0 + \beta_1 RPT_t + \beta_2 FZ_t + e_t \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (6)$$

Where:

ETR = **Effective Tax Rate**

CETR = **Cash Effective Tax Rate**

TGR = Tax-to GDP Ratio

RPT = Related Party Transactions

FZ = Firm Size

e = Error Term

β0 = Intercept

β1 – β2 = Coefficients of the regression

Note that Firm Size was introduced in the modelling of the variables as a control variable.

RESULTS AND DISCUSSIONS

Descriptive statistics

Table 3 provides a summary of the descriptive statistics for the variables under study, revealing their central tendencies, dispersion, and distribution. The Effective Tax Rate (ETR) has a mean of 22.07% and a median of 22.25%, with values ranging from 14.1% to 29.8%. This indicates moderate variability, as confirmed by a standard deviation of 4.75%. Similarly, the Cash Effective Tax Rate (CETR) has a mean of 18.46% and a median of 18.40%, ranging from 9.4% to 26.6%, with a standard deviation of 4.92%. Both variables exhibited slight left skewness and flatter distributions compared to the normal curve, as indicated by their skewness and kurtosis values. The Tax-to-GDP Ratio has a mean of 0.27%, reflecting a relatively consistent contribution of the industrial goods sector's tax payments to Nigeria's GDP, with values ranging from 0.05% to 0.48%. In terms of Related Party Transactions (RPT), the mean value is ₦782.22 million, ranging widely from ₦47.00 million to ₦1,447.00 million, indicating significant variability. Lastly, Firm Size, measured as the natural logarithm of total assets, shows minimal dispersion with a mean of 3.03 and values ranging narrowly from 2.94 to 3.12.

Table 3: Descriptive statistics

Statistics	Effective Tax Rate (%)	Cash Effective Tax Rate (%)	Tax-to-GDP Ratio (%)	Related Party Transactions (₦ million)	Firm Size (Natural Log of Total Assets)
Mean	22.067	18.462	0.273	782.222	3.032
Median	22.250	18.400	0.285	790.000	3.030
Maximum	29.800	26.600	0.480	1447.000	3.122
Minimum	14.100	9.400	0.050	47.000	2.939
Std. Dev.	4.746	4.915	0.135	414.988	0.045
Skewness	-0.072	-0.090	-0.159	-0.053	0.003
Kurtosis	1.790	1.792	1.730	1.886	1.973
Jarque-Bera	5.565	5.593	6.424	4.693	3.958
Probability	0.062	0.061	0.040	0.096	0.138
Sum	1986.000	1661.600	24.550	70400.000	272.915
Sum Sq. Dev.	2004.820	2149.652	1.613	15327119.556	0.183
Observations	90	90	90	90	90

Effect of Transfer Pricing Regulations on the Effective Tax Rate

Hausman Test

Table 4 shows the Hausman Test results on the effect of transfer pricing regulations on the effective tax rate. With a chi-square of 3.964 and an insignificant p-value (>5%), the test supports using the random-effects model.

Table 4: Hausman Test

Correlated Random Effects-Hausman Test			
Equation: Untitled			
Test period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d. f.	Prob.
Period random	3.964	2	0.138

Regression Analysis

The results presented in Table 5 demonstrate the effect of transfer pricing regulations on the effective tax rate of quoted industrial good firms in Nigeria from 2014 to 2023. The coefficient for Related Party Transactions (RPT) is positive (0.498) and statistically significant at the 1% level, indicating that an increase in related party transactions is associated with a higher effective tax rate. This suggests that stricter transfer pricing regulations, which monitor and regulate RPTs, have influenced multinational corporations to adopt less aggressive tax minimisation strategies, thereby increasing their tax liability. However, Firm Size is statistically insignificant, with a p-value of 0.822, implying that the variable does not have a significant effect on the effective tax rate in this study. Previous studies support this finding. For instance, the study by Awotomilusi et al. (2024) observed a significant relationship between RPTs and financial performance metrics, emphasising the role of transfer pricing in influencing tax and financial outcomes. Similarly, research by Gunawan and Surjandari (2022) demonstrated that transfer pricing impacts tax avoidance, further underscoring its role in corporate tax strategies. These findings also align with studies like those by Adeyeye et al. (2022), which highlight the effectiveness of transfer pricing regulations in curbing tax evasion but suggest room for improved enforcement. However, the insignificance of Firm Size and the overall model suggests that other factors not included in this study might play a role in shaping the effective tax rate. The adjusted R-squared value of 0.295 suggests that approximately 29.5% of the variation in the effective tax rate is explained by the model’s variables.

Hypothesis Testing

In testing the null hypothesis that transfer pricing regulations have no significant effect on the effective tax rate, the significance of the Related Party Transactions variable rejects the null hypothesis.

Table 5: Regression Analysis

Dependent Variable: Effective Tax Rate (%)				
Method: Panel EGLS (Period random effects)				
Date: 12/24/24 Time: 06:33				
Sample: 2014 2023				
Periods included: 10				
Cross-sections included: 9				
Total panel (balanced) observations: 90				
Swamy and Arora estimator of the component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Related Party Transactions (₦ million)	0.498***	0.135	3.689	0.000
Firm Size	2.532	11.194	0.226	0.822
C	13.899	33.975	0.409	0.683
	Effects Specification			
			S.D.	Rho
Period random			0.000	0.000
Idiosyncratic random			4.786	1.000
	Weighted Statistics			
R-squared	0.400	Mean dependent var		22.067
Adjusted R-squared	0.295	S.D. dependent var		4.746
S.E. of the regression	4.792	Sum squared resid		1997.750
F-statistic	87.678	Durbin-Watson stat		1.953
Prob(F-statistic)	1.38E-16			
	Unweighted Statistics			
R-squared	0.308	Mean dependent var		22.067
Sum squared resid	1997.750	Durbin-Watson stat		1.953

*** is significant at 1%.

Effect of Transfer Pricing Regulations on the Cash Effective Tax Rate

Hausman Test

Table 6 shows the Hausman Test results on the effect of transfer pricing regulations on the cash effective tax rate. With a chi-square of 3.087 and an insignificant p-value (>5%), the test supports using the random-effects model.

Table 6: Hausman Test

Correlated Random Effects-Hausman Test			
Equation: Untitled			
Test period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d. f.	Prob.
Period random	3.087	2	0.214

Regression Analysis

The results in Table 7 indicate that the effect of transfer pricing regulations on the cash effective tax rate (CETR) of quoted industrial goods firms in Nigeria is mixed. The coefficient for Related Party Transactions (RPT) is 0.152 and is statistically significant at the 1% level (p = 0.000), suggesting that an increase in RPT significantly increases CETR. This implies that multinational corporations engaging in related party transactions tend to incur higher tax burdens under the regulatory framework, aligning to reduce tax evasion. Conversely, Firm Size does not significantly affect CETR, as indicated by a t-statistic of 0.062 and p-value of 0.950, suggesting that the size of the firm does not influence its tax burden under the regulations. With an R-squared value of 0.443 (adjusted R-squared = 0.329), the model explains approximately 32.9% of the variance in CETR, indicating moderate explanatory power. Previous studies support these findings. For instance, Awotomilusi et al. (2024) found that related party transactions significantly affect financial performance, emphasising the regulatory impact on multinational corporations' internal dealings. Similarly, Adeyeye et al. (2022) highlighted the effectiveness of transfer pricing regulations in curbing tax evasion, affirming the relevance of these frameworks in influencing tax outcomes. In contrast, Al-Hamadeen et al. (2023) noted the challenges in implementing transfer pricing regulations due to insufficient experience and training, which could explain the lack of significant results for firm size. Additionally, Gunawan and Surjandari (2022) found that transfer pricing significantly affects tax avoidance, which aligns with the significant relationship observed for related party transactions in this study.

Hypothesis Testing

The null hypothesis states that transfer pricing regulations have no significant effect on the cash effective tax rate of quoted industrial good firms in Nigeria. Given the statistically significant coefficient for related party transactions (p = 0.000), we reject the null hypothesis at the 1% significance level.

Table 7: Regression Analysis

Dependent Variable: Cash Effective Tax Rate (%)				
Method: Panel EGLS (Period random effects)				
Date: 12/24/24 Time: 06:44				
Sample: 2014 2023				
Periods included: 10				
Cross-sections included: 9				
Total panel (balanced) observations: 90				
Swamy and Arora estimator of the component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Related Party Transactions (₦ million)	0.152***	0.021	7.238	0.000
Firm Size	0.726	11.650	0.062	0.950
C	15.674	35.360	0.443	0.659
	Effects Specification			
			S.D.	Rho
Period random			0.000	0.000
Idiosyncratic random			4.981	1.000
	Weighted Statistics			
R-squared	0.443	Mean dependent var		18.462
Adjusted R-squared	0.329	S.D. dependent var		4.915
S.E. of the regression	4.961	Sum squared resid		2140.969
F-statistic	40.649	Durbin-Watson stat		1.991
Prob(F-statistic)	5.64E-11			
	Unweighted Statistics			
R-squared	0.364	Mean dependent var		18.462
Sum squared resid	2140.969	Durbin-Watson stat		1.991

*** is significant at 1%.

Effect of Transfer Pricing Regulations on the Tax-to-GDP Ratio

Hausman Test

Table 8 shows the Hausman Test results on the effect of transfer pricing regulations on the tax-to-GDP ratio. With a chi-square of 0.931 and an insignificant p-value (>5%), the test supports using the random-effects model.

Table 8: Hausman Test

Correlated Random Effects-Hausman Test			
Equation: Untitled			
Test period random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d. f.	Prob.
Period random	0.931	2	0.628

Regression Analysis

The results in Table 9 reveal the effect of transfer pricing regulations on the tax-to-GDP ratio of quoted industrial good firms in Nigeria. The results show that related party transactions (RPTs) have a positive but insignificant coefficient of 0.001 (p = 0.611), suggesting that RPTs do not significantly influence the tax-to-GDP ratio. Firm size, on the other hand, has a positive coefficient of 0.548 and a p-value of 0.091, indicating a marginally significant influence on the tax-to-GDP ratio at a 10% significance level. The model's goodness of fit, as indicated by an R-squared value of 0.327, shows that approximately 32.7% of the variations in the tax-to-GDP ratio are explained by the independent variables. Studies like Adeyeye et al. (2022) emphasise the effectiveness of transfer pricing regulations in reducing tax evasion, which indirectly influences tax compliance and GDP contributions. Similarly, Al-Hamadeen et al. (2023) underlined the role of transfer pricing in lowering tax burdens and improving compliance among multinational corporations. Despite these observations, the weak statistical significance of RPTs in the present study suggests that transfer pricing regulations alone may not adequately capture tax impacts, necessitating further examination of other influencing factors such as firm characteristics or compliance frameworks.

Hypothesis Testing

The null hypothesis states that transfer pricing regulations have no significant effect on the tax-to-GDP ratio of quoted industrial good firms in Nigeria. Given the statistically insignificant coefficient for related party transactions, we reject the null hypothesis at the 1% significance level.

Table 9: Regression Analysis

Dependent Variable: Tax-to-GDP Ratio (%)				
Method: Panel EGLS (Period random effects)				
Date: 12/24/24 Time: 06:49				
Sample: 2014 2023				
Periods included: 10				
Cross-sections included: 9				
Total panel (balanced) observations: 90				
Swamy and Arora estimator of the component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Related Party Transactions (₦ million)	0.001	0.001	0.511	0.611
Firm Size	0.548	0.320	1.711	0.091
C	-1.367	0.972	-1.406	0.163
	Effects Specification			
			S.D.	Rho
Period random			0.000	0.000
Idiosyncratic random			0.137	1.000
	Weighted Statistics			
R-squared	0.327	Mean dependent var		0.273
Adjusted R-squared	0.203	S.D. dependent var		0.135
S.E. of the regression	0.133	Sum squared resid		1.545
F-statistic	19.256	Durbin-Watson stat		1.716
Prob(F-statistic)	3.15E-9			
	Unweighted Statistics			
R-squared	0.229	Mean dependent var		0.273
Sum squared resid	1.545	Durbin-Watson stat		1.716

Conclusion and Recommendations

The study concludes that transfer pricing regulations significantly influence the tax compliance behaviour of multinational corporations, particularly in increasing the effective and cash tax rates. These regulations ensure adherence to international standards, reduce opportunities for tax avoidance, and enhance revenue collection in Nigeria. However, the regulations' limited effect on the tax-to-GDP ratio indicates the need for complementary fiscal strategies to strengthen the overall tax framework. Based on the results of the study, the following recommendations are made:

i. The Federal Inland Revenue Service (FIRS) should focus on enforcing transfer pricing compliance among multinational corporations by ensuring that related party transactions (RPT) are accurately priced. The significant positive impact of RPT on the effective tax rate (ETR) and the cash effective tax rate (CETR) in the study suggests that improved enforcement could further reduce tax avoidance.

ii. Multinational Corporations (MNCs) should align their pricing mechanisms with arm's length principles, as the study shows that stricter transfer pricing regulations increase ETR and CETR.

iii. Government policy makers should introduce capacity-building programs to address the enforcement challenges highlighted in the study, such as difficulties in assessing complex transactions.

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