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Effect of real earnings management on tax planning of listed manufacturing firms in Nigeria

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Abstract
Purpose: This study examines the effect of real earnings management on corporate tax planning of listed manufacturing firms in Nigeria.
Method: The study used secondary data of 41 listed manufacturing firms in Nigeria extracted from the annual reports and accounts of the sampled firms for the period 2012 to 2022. The data collected for the study were statistically analyzed using dynamic panel data from the generalized moment method (GMM).
Results: The study found that abnormal production has positive and significant effect on tax planning, the study also revealed that abnormal discretionary expense has positive and significant effect on tax planning. The study also documents a positive and significant influence of abnormal production on tax planning. The study also reveals that real earnings management has a positive and significant impact on tax planning.
Limitations: The study is limited to real earnings management and tax planning; it is limited to 41 listed manufacturing firms in Nigeria and covers 12 years, from 2012 to 2022.
Contribution: This study contributes to the existing literature by providing empirical evidence on the relationship between real earnings management and tax planning, specifically within the context of Nigerian manufacturing firms. The findings will inform policymakers and regulatory bodies regarding the effectiveness of current tax regulations and practices in Nigeria's manufacturing sector.
Novelty: This study's focus on Nigerian manufacturing firms adds a novel dimension to the existing literature, as there may be unique factors and challenges specific to this context. In addition, the study provides a novel approach by employing dynamic panel data of GMM.
Keywords: *real earnings, management, tax planning*
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1. Introduction

Tax planning is a crucial aspect of financial management for any business organization. Consequently, tax planning plays a pivotal role in the financial management of manufacturing firms, particularly in emerging economies, such as Nigeria. Effective tax planning enables firms to optimize their tax liabilities while ensuring compliance with relevant regulations (Oyenike, Olayinka, & Emeni, 2016). This involves the strategic management of financial attributes to optimize tax liability and minimize the tax burden on the firm. Effective tax planning can significantly contribute to a firm's financial performance and enhance its market competitiveness. In the context of manufacturing firms in Nigeria, tax planning assumes even greater significance due to the complex tax regulations and the dynamic business environment (Ogbeide, Anyaduba, & Akogo, 2022). In Nigeria, where tax regulations can be complex and subject to change, effective tax planning becomes crucial for firms to optimize their financial performance.

On the other hand, real earnings management involves deliberate actions taken by management to manipulate financial statements to meet certain objectives, such as achieving earnings targets or influencing stakeholders' perceptions of the company's performance (Adegbite & Nakajima, 2020; Adeyemi, Oyelere & Adegbite, 2020). Real earnings management practices include discretionary expenses, timing of revenue recognition, and asset valuation adjustments. Real earnings management refers to the deliberate manipulation of financial statements by management to meet specific financial goals (Maigoshi, Latif, & Kamardin, 2016). Real earnings management involves discretionary use of accounting policies and techniques to alter reported earnings, which can have implications for tax planning. Real earnings management may help firms achieve short-term objectives, distort financial statements, misrepresent their true financial health, and undermine the integrity of financial reporting (Maigoshi & Tanko, 2023; Trisnawati & Nugroho, 2011). In addition, over the past 20 years, manipulating earnings has emerged as a significant concern in financial reporting (El Mokrani & Alami, 2021; Aladesanmi & Nzewi, 2021). The questionable actions of management in large corporations have sparked widespread discussion in economic and financial circles following various scandals (El Mokrani & Alami, 2021; Iyoha & Ayanwale, 2021).

Additionally, in the realm of financial management, tax planning plays a crucial role in enhancing profitability and sustainable growth (Eje & Salaudeen, 2018). It involves strategy to minimize tax liabilities and optimize financial resources (Tanko, Waziri, & Yusuf, 2022). However, tax planning dynamics can be influenced by various factors, including real earnings management. In addition, the tax planning decisions of listed manufacturing firms in Nigeria are influenced by several factors, including the real earnings management law (Lawal, Akeke, & Adegbite, 2021). Understanding the role of real earnings management in tax planning is crucial for policymakers, managers, investors, and other stakeholders to make informed decisions regarding tax planning strategies (Maigoshi & Tanko, 2023). Consequently, real earnings management and tax planning are key financial strategies employed by companies to manipulate their financial statements and optimize their tax liabilities. These practices can have significant implications for firms’ financial health and the overall economic landscape.

Furthermore, the Finance Acts introduced by the Nigerian government in 2019, 2020, 2021, and 2023 have significantly impacted the regulatory landscape concerning taxation and financial reporting. These Acts have introduced changes to tax rates, allowances, and incentives, thereby reshaping the tax planning strategies adopted by Nigerian firms, particularly those in the manufacturing sector. Against the backdrop of evolving tax regulations, tax planning has become increasingly complex for manufacturing firms in Nigeria. With each Finance Act introducing new provisions and amendments, firms must navigate these changes strategically to optimize their tax positions while ensuring compliance with the latest regulations. Nigerian manufacturing firms may engage in real earnings management practices to manipulate financial statements in response to changing tax laws and financial reporting requirements. Understanding the motivations behind such actions and their implications are essential for assessing the integrity and reliability of financial information.

In addition, listed manufacturing firms in Nigeria face a significant tax burden, which impacts profitability and competitiveness. Tax planning strategies offer potential benefits in reducing this burden; however, concerns exist about the ethical and legal implications of aggressive tactics. Real earnings management (REM), which manipulates accounting accruals to influence reported earnings, is a potential tool for tax planning that raises questions about its effectiveness and potential abuse. However, the specific impact of REM on tax planning within Nigerian and manufacturing sectors remains unclear.

Consequently, past research suggests a link between REM and tax planning, it offers conflicting and inconclusive results (Iyoha & Ayanwale, 2021; Okoye, Nwanji & Ilo, 2020). Existing theories, such as positive accounting theory and agency theory, provide frameworks for understanding these relationships, but the specific context of Nigerian manufacturing firms with their unique institutional and business environment requires further investigation. Understanding how REM interacts with tax-planning strategies within this context can contribute to the refinement and expansion of existing theories.

Moreso, existing literature on REM and tax planning primarily focuses on developed economies, neglecting the specific circumstances of emerging markets like Nigeria (Almashaqbeh, Abdul-Jabbar, & Shaari, 2018; Kaldonski & Jewartowski, 2020). Moreover, studies within Nigeria predominantly explore discretionary accruals (DA) as a measure of earnings management, overlooking the potential significance of REM (Aladesanmi & Nzewi, 2021; Okoye et al. 2020). Consequently, there is a gap in our understanding of how REM, as a more nuanced and potentially less detectable form of manipulation, influences tax planning strategies within Nigerian manufacturing firms.

While the Generalized Method of Moments (GMM) offers a robust approach for addressing endogeneity concerns in studies involving REM and tax planning, its application in the Nigerian context presents specific challenges. Limited data availability, potential issues with instrumental variable selection, and the need for efficient estimation techniques require careful consideration and adaptation within the research design. Addressing these methodological challenges is crucial to ensuring the accuracy and reliability of the findings of the study.

Therefore, this study aims to address the critical need for a comprehensive understanding of the effect of REM on tax planning within the Nigerian manufacturing sector. By addressing the practical, theoretical, literature, and methodological problems outlined above, this study seeks to provide valuable insights for both businesses and policymakers to promote ethical and sustainable tax planning practices in Nigeria. This study examines the effect of real earnings management on the tax planning of listed manufacturing firms in Nigeria. Other specific objectives include to Examine effect of abnormal production on tax planning of listed manufacturing firms in Nigeria Evaluate effect of abnormal cashflow on tax planning of listed manufacturing firms in Nigeria investigate impact of abnormal discretionary expenses on tax planning of listed manufacturing firms in Nigeria
Examine influence of real earnings management on tax planning of listed manufacturing firms in Nigeria

Hypotheses
H0$_1$: Abnormal production does not have significant effect on tax planning of listed manufacturing firms in Nigeria
H0$_2$: Abnormal cashflow does not have significant effect on tax planning of listed manufacturing firms in Nigeria
H0$_3$: Abnormal discretionary expenses do not have significant impact on tax planning of listed manufacturing firms in Nigeria
H0$_4$: Real earnings management does not have significant influence on tax planning of listed manufacturing firms in Nigeria

2. Literature review

2.1 Concept of Tax Planning

Tax planning involves legitimate strategies employed by companies to minimize their tax burdens within the boundaries of tax laws and regulations. These strategies often exploit the available tax incentives, exemptions, and loopholes to optimize tax efficiency. In the Nigerian manufacturing sector, tax planning plays a crucial role because of the complexity of the tax system and its impact on firm profitability (Knuutinen, 2014; Okwoli Orabule, 2021).

Ogundipe et al. (2021) revealed that tax planning is widely practiced by listed manufacturing firms in Nigeria. The research found that companies engage in various tax planning techniques such as profit shifting, transfer pricing, and the use of tax havens to reduce their tax liabilities. This study underscores the need for robust tax regulations and effective enforcement mechanisms to ensure that companies engage in responsible tax planning practices that contribute to economic growth and development.

Moreover, taxes are a vital and major source of revenue for the government to meet its constitutional responsibilities. The survival of any government is highly dependent on revenue (Oladipupo et al. 2020). Therefore, when taxes are levied, taxpayers are expected to pay taxes in the manner provided by the law authorizing assessment and collection (Assfaw & Sebhat, 2019). However, tax laws are characterized by a high degree of loopholes. Loopholes in the tax laws give room for the tax planning but such tax planning can create challenges for compliance (Klassen, Lisowsky, & Mescall, 2016). Tax planning is legal but not desirable by the government, since it tends to reduce government revenue generation and is ordinarily not punishable. Tax planning must be within the provisions of the tax laws. Corporate taxpayers comply with tax laws when engaging in tax planning.

2.2 Concept of Real Earnings Management

Real earnings management refers to firms' deliberate actions to manipulate reported earnings through operational decisions such as revenue recognition, cost manipulation, and discretionary spending (Elmadhoun & Reddy, 2022). The goal is to present a distorted picture of financial performance, either to meet earnings targets, manage market expectations, or enhance a firm's market value. Recent research has shown that real earnings management is prevalent among manufacturing firms in Nigeria and is often associated with aggressive revenue recognition practices, inventory manipulation, and discretionary accruals (Maigoshi & Tanko, 2023; Tanko, 2023). Also, management holds a greater depth of knowledge regarding a company compared to investors, which could allow them to leverage this understanding by providing financial reports that may not truthfully represent the company's performance (Alvindra, Hutagalung, & Sutiyoso, 2023; Ishak, 2024).

Furthermore, real earnings management involves the strategic manipulation of a firm's operational activities to impact reported earnings. It encompasses legitimate actions taken by management to influence stakeholders' perceptions of a firm's financial performance. Real earnings management techniques may include timing revenue recognition, adjusting discretionary expenditures, and engaging in income-smoothing practices (Maigoshi et al., 2016). It is important to note that while real earnings management can be employed within legal boundaries, unethical or illegal practices should be avoided. In addition, previous studies have shown that firms have moved from Accrual-based Earnings Management (AEM) to REM (Almashaqbeh, Abdul-Jabbar, & Shaari, 2018; Tanko, 2023) (Roychowdhury (2006) as cited; Lin & Chien (2016)). Moreover, REM often occurs in manufacturing companies, where most activities are operational and involve the production of products (Maigoshi & Tanko, 2023). In this regard, REM was described by Cohen and Zarowin (2010), as cited in Maigoshi et al. (2016), as the procedures used by a manager to deviate from the usual activities of transactions. Roychowdhury (2006), as cited in Tanko (2023), provides the best definition of REM. He considered REM as a management act that deviates from the usual firm practices, which is performed with the primary objective of achieving certain earnings.

REM may also mean the violation of normal operational activities aimed at misguiding stakeholders and obtaining approval of certain financial reporting objectives. Following this concept, such strategies may be used to manipulate the earnings by actual operations, including discretionary spending reduction, announcing a major percentage of discounts on sales, optimally under certain economic circumstances (Bayunanda, Ompusunggu, & Ak, 2018). Based on a study by Maigos Andi et al. (2016); Tanko (2023), REM encompasses techniques such as minimizing spending on R&D, transfer price management, lax credit conditions, sale cuts, general and admin expenditur, discount poli,cy adjustment,s, and many more as cited in Maigoshi et al. (2016).

According to a study conducted by Tanko (2023), listed manufacturing firms in Nigeria engage in real earnings management to mitigate the negative effects of poor economic conditions, regulatory constraints, and competition. They found evidence of income-increasing practices such as premature revenue recognition and inventory overvaluation. This study also highlights the role of corporate governance mechanisms in shaping the extent of real earnings management, emphasizing the importance of effective oversight and accountability.

2.3 Review of Empirical Studies

The relationship between real earnings management and tax planning is a topic of significant interest among researchers. Both practices involve financial manipulation, albeit with differing objectives. Evidence suggests that firms engaging in real earnings management also tend to employ aggressive tax planning strategies to further optimize their financial outcomes. Frequently, conflicts arise between agents and principals, potentially influencing earnings integrity. Agents may resort to earnings management tactics, such as utilizing REM, to pursue their objectives. It is widely acknowledged in the literature that one prevalent motivation behind corporate management engagement in earnings management practices is tax, as highlighted by Scott (2015) and Kurniasih and Suranta (2017).

Furthermore, Prastiwi (2017) suggests that companies can reduce their tax expenses by adjusting the fiscal benefit value, which may be influenced by accounting profits derived from earnings management. Engaging in earnings management to lower tax costs provides managers with an incentive to manipulate their profits. Additionally, according to the theory of political costs proposed by Watts and Zimmerman (1990), larger firms are subject to increased scrutiny and, therefore, seek to reduce regulatory and political expenses by managing earnings downward. This implies that taxation is influenced by government regulations (Almashaqbeh et al., 2018), suggesting that reducing a firm's income could potentially lead to lower tax liabilities. Moreover, companies with lower taxes have fewer reasons to seek further tax reduction.

Pettersson and Wu (2015) delved into whether tax evaders engage in earnings management to a greater extent. Their quantitative investigation focused on exploring the interplay between tax avoidance and earnings management in Sweden from 2009 to 2014, culminating in the conclusion that DA exhibits a favorable association with ETR. By contrast, Kurniasih and Suranta (2017) explored the impact of earnings management and corporate governance on tax avoidance in Indonesia from 2014 to 2016. Using a sample of 871 non-financial companies, the study employed Ordinary Least Squares (OLS) analysis on data gleaned from firms' annual reports and accounts, revealing a significant positive influence of DA on ETR, thus implying that DA does not exert an impact on tax planning endeavors. Similarly, Prastiwi (2017) investigates whether corporate governance moderates the influence of earnings management on tax aggressiveness. Employing purposive sampling techniques, this study encompassed 756 Indonesian companies from 2011 to 2015. Multiple regression analysis was applied to scrutinize the data, with the study documenting a positive correlation between DA and Book-Tax Differences (BTD).

However, according to the research conducted by Bayunanda et al. (2018), there is evidence to suggest that the presence of discretionary accruals (DA) exerts a detrimental influence on effective tax rates (ETR), thereby implying that companies may engage in tax planning activities. This observation aligns with the conclusions drawn by Kałdoński and Jewartowski (2020), who investigated the extent to which firms employing responsible real earnings management (REM) strategies prioritize tax considerations based on a thorough analysis spanning from 2005 to 2017 and encompassing 99 publicly listed companies in Poland. The study employs pooled OLS regression techniques, incorporating fixed effects for both industry and year. The outcomes of their study revealed a statistically significant, albeit inverse, correlation between REM and generally accepted accounting principle (GAAP)-based ETR. Onaolapo and Abiodun (2022) found that manufacturing firms in Nigeria that engage in real earnings management also engage in aggressive tax planning activities. The research revealed a positive relationship between earnings management and tax planning, indicating that firms employing one strategy are more likely to adopt another strategy. This finding suggests that firms exploit financial flexibility to achieve their objectives, which can have implications for financial reporting quality and tax revenue collection.

3. Research Methodology

Considering the goals of this study, the study employed a quantitative research design because the data were quantitative in nature. Under quantitative design, Creswell (2019) describes three types of design as part of quantitative research: experimental, correlational, and survey designs. This study adopted a correlational design (Soje and Tanko, 2024). This study aims to elucidate and forecast the interrelation among various factors by employing a research framework that explores the connections between two or more variables. Given the study's focus on assessing the impact of real earnings management (REM) on tax planning, a correlational research design is deemed the most suitable. Moreover, this design sheds light on fluctuating REM factors and their implications for tax-planning uncertainty.

This study encompasses all manufacturing firms listed on the Nigerian Exchange Group (NGX) as of December 31, 2022. As of 2021, there were 58 such companies (2021). The sample selection process involved a two-step filtration process. First, firms had to be listed on the NGX by December 31, 2012, and second, they must not have been delisted in 2022. Based on these criteria, 41 manufacturing companies were selected as the study sample. The study employed Purposive sampling techniques were used to determine the final sample size.

The utilization of secondary data sources was integral to this study primarily because of its quantitative nature. The data extracted encompassed various facets, such as tax planning, REM, firm age, and tangibility, sourced from comprehensive income statements, financial position statements, cash flow statements, and accompanying notes within the published annual reports and accounts of the selected firms. Within the context of this study, the dependent variable was tax planning among manufacturing firms listed on the NGX floor. The Residual of Book Tax Difference (BTD), as proposed by Desai and Dharmapala (2006) and cited by Maigoshi and Tanko (2023), is the measurement of tax planning, which serves as a pivotal tool for analysis, thereby minimizing potential biases associated with earnings management, as highlighted by Musa (2018) and Siyanbola and Samaila (2022). Moreover, the choice to utilize BTD residuals as a proxy for tax planning stems from the prevalent managerial inclination in publicly traded entities to reveal diminished profits to alleviate tax liabilities. Control over accruals is imperative to disentangle any potential impact of earnings manipulation on BTD, as articulated by Santana and Rezende (2016). Consequently, this study delved into tax planning dynamics through the lens of residual BTD within a regression model framework.

$$Total\ BTD_{it} = \beta_1\ total\ accruals_{it} + \mu_1 + \varepsilon_{it}$$

Where BTD is the book-tax-difference measured as $\{Profit\ before\ tax - \frac{current\ tax\ expenses}{statutory\ tax\ rate}$ divided by total assets.

The difference between the profit before extraordinary items and tax and the net cash flow from operating activities was calculated to determine the total accrual. The symbol μ represents the residual and ε represents the error term. Moreover, a larger residual of the BTD indicates a higher frequency of tax planning, as discussed by Santana and Rezende (2016) and Siyanbola and Samaila (2022). In this study, the independent variable is Real Earnings Management (REM). REM activities are measured using the combined value of three factors outlined by Roychowdhury (2006) as cited in Bassey, Amobi, and Okorie (2022): abnormal levels of cash flow from operations (ABCFO), abnormal levels of production costs (ABPROD), and abnormal levels of discretionary expenses (ABDISEXP). These factors were incorporated into the following equations:

$$\frac{PROD_{it}}{Assets_{it-1}} = \alpha_0 + \beta_1\left(\frac{1}{Assets_{it-1}}\right) + \beta_2\left(\frac{Sale}{Assets_{it-1}}\right) + \beta_3\left(\frac{\Delta Sales}{Assets_{it-1}}\right)\beta_4\left(\frac{\Delta\Delta Sales}{Assets_{it-1}}\right) + \varepsilon_t$$

ABPROD

$$\frac{CFO_{it}}{Assets_{it-1}} = \alpha_0 + \beta_1\left(\frac{1}{Assets_{it-1}}\right) + \beta_2\left(\frac{Sale}{Assets_{it-1}}\right) + \beta_3\left(\frac{\Delta Sales}{Assets_{it-1}}\right) + \varepsilon_t \text{..............ABCFO}$$

$$\frac{DISEXP_{it}}{Assets_{it-1}} = \alpha_0 + \beta_1\left(\frac{1}{Assets_{it-1}}\right) + \beta_2\left(\frac{Sale}{Assets_{it-1}}\right) + +\varepsilon_t \text{................................ABDISEXP}$$

The residual estimation, known as REM, originates from Roychowdhury's (2006) framework, as cited in Maigoshi and Tanko's (2023) framework, where PROD signifies the production cost of firm i during year t, computed by adding the cost of goods sold to inventory. Sales and Δsales denote current and changes in sales, respectively. Additionally, ΔΔsales, represented by β3, refers to the change in sales from the previous year's change. CFO stands for cash flow from operations, whereas DISEXP represents the cumulative expenses of R&D, advertising, selling, general, and administrative costs. Lagged total assets are standardized across all variables, except for the intercept.

The coefficients and εit for each equation were estimated using Ordinary Least Squares (OLS). ABCFO, ABPROD, and ABDISEXP were used to derive the residuals. Notably, research indicates that firms engaging in earnings manipulation tend to exhibit low ABCFO, high ABPROD, and/or low ABDISEXP. Hence, the values of ABCFO and ABDISEXP were negated to maintain consistency among the variables (Haji-Abdullah & Wan-Hussin, 2015). Subsequently, the equation below is utilized to aggregate ABCFO, ABDISEXP, and ABPROD values, reflecting total abnormal real earnings management (ABREM).

$REM = ABPROD + ABCFO^{*-1} + ABDISEXP^{*-1}$ Tabassum et al., 2014).

Table 1. Summary of Variables and Measurement

Variables	Types	Measurements/Source(s)	**Sources**
Tax planning	Dependent	Residual of Book Tax difference. $Profit\ before\ tax - \frac{current\ tax\ expenses}{statutory\ tax\ rate}$ divided by total assets	Siyanbola and Samaila (2022); Desai and Dharmapala (2006).
Real earnings management	Independent	The aggregate of abnormal production cost, abnormal cashflow from operations and abnormal discretionary expenses residuals	Maigoshi and Tanko (2023).
Firm age	Control	Age of the firms from the date of listing.	Mohammed (2017).
Tangibility	Control	The ratio of PPE to book value of total assets.	Edwards, Schwab, and Shevlin (2016); Siyanbola and Samaila (2022).

Note. Literature reviewed.

Techniques for Data Analysis

The study employed the Generalized Method of Moments (GMM), which is chosen as the primary method of analysis in this study because of its ability to handle issues related to endogeneity, which is common in studies involving financial data. In addition, the research on tax planning in Nigerian manufacturing firms utilizes a dynamic panel GMM estimator to assess the impact of exogenous variables. This choice is based on the understanding that past values influence tax planning. To address endogeneity, a panel dynamic model GMM, proposed by Arellano and Bond (1991), as cited in Bassey et al. (2022), is employed to control for potential biases with various instrumental variables. However, the differenced GMM estimator may have limitations, particularly when using small sample sizes and highly persistent data. To counter this, a system GMM is adopted, offering efficiency gains but also increasing the risk of finite sample bias. Bassey et al. (2022) caution that this approach may lead to false positive results and inflated pass rates in key specification tests like the Hansen J-test. To mitigate these issues, researchers adjust the system GMM model by collapsing the instrument matrix, aligning with Bassey et al. 's(2022) propositions.

$$TP_{it} = \beta_0 + \beta_1\ L.TP_{it} + \beta_2 ABPROD_{it} + \beta_3 ABCFO_{it} + \beta_4\ ABDISEXP_{it} + \beta_5 REM_{it} + \beta_6 FA_{it} + \beta_7 TAN_{it} + \varepsilon_{it}$$

Where:

TP	= tax planning
L.TP	= lag of tax planning
ABPROD	= abnormal production cost
ABCFO	= abnormal cashflow from operation
ABDISEXP	= abnormal discretionary expenses
REM	= real earnings management
FA	= Firm Age;
TAN	= Tangibility;
i	= firms 1 – 41;
t	= Financial years 2012 – 2022
$\beta 0$	= the intercept;
$\beta 1{-}7$	= the slope coefficient of explanatory variables; and
εit	= error term.

4. Results and Discussions

This section presents the pre- and post-estimation tests and GMM results using STATA 14.

Table 2. Pre and Post Estimation Test

Variables	TP lagged Coefficient
Fixed effect	0.2805
Ordinary Least Square	0.4785
One step difference GMM	0.2641
Two step difference GMM	0.2802
One step System GMM	0.4785
Two step system GMM	0.4880
Hettest	0.342
Arellano-Bond test for AR(1)	0.415
Arellano-Bond test for AR(2)	0.601
Hansen	0.415
Sargan	1.000

To choose between the system GMM and difference GMM, the study uses bond (2001) two-thumb rules. The rules state that if the difference GMM estimates of the lagged dependent variable obtained are close to or below the fixed effects estimates, this suggests that the difference GMM estimate is also downward-biased because of weak instrumentation. Therefore, the system GMM estimator is preferred.

Table 3 indicates that the fixed effect coefficient is 0.2805, which is higher than both the one-step and two-step difference GMM of 0.2641 and 0.2802, respectively. This suggests diminishing lag tax planning effects. The choice of the two-step system GMM is supported, indicating a more appropriate model specification for an improved estimation.

AR(1) and AR(2): Probability values of 0.415 and 0.601 indicate that there is no autocorrelation in the first and second differences of the dependent variable. This implies that the models adequately address autocorrelation issues.

Sargan test over-identification: The probability value of 1.000 suggests that the instruments used in the analysis do not over-identify the model. This indicated that the instruments were valid for the specified model.

Hansen Test: The probability value of 0.415 indicates that the model is not suffering from overfitting. This suggests that the instruments used in the analysis were valid and did not lead to model overfitting.

Heteroscedasticity Test (hettest): A significant chi2(1) statistic and p-value of 0.342 indicate the absence of heteroskedasticity. This implies that the varied levels of variability in the error term across observations may not affect the efficiency of the coefficient estimates.

Table 3. Dynamic panel-data estimation, two-step difference GMM

Variables	Coefficient	t-value	p>/t/
Lagged TP	0.2829	15.36	0.000
ABPROD	0.3094	3.76	0.001
ABCFO	-0.3380	-4.49	0.000
ABDISEXP	0.0797	3.40	0.002
REM	0.4135	5.49	0.000
FA	-0.0017	-1.25	0.219
TAN	0.3311	3.45	0.001

Source: STATA 14 Output

Table 3 shows that lagged tax planning has a negative and significant effect on tax planning at a coefficient value of 0.2829 and significance level of 1 %. The results imply that a unit increase in lagged tax planning increases tax planning by 0.2829 units. A positive and significant effect exists, indicating that past tax planning efforts influence current decisions, potentially because of learning or momentum effects. The study also documents that abnormal production (ABPROD) has a positive and significant effect on tax planning. This result means that 1 unit increase in production would increase tax planning by 0.3094 units. This finding aligns with those of Kałdoński and Jewartowski (2020). This finding documents enough evidence to reject the null hypothesis, which states that abnormal production does not have a significant effect on the tax planning of listed manufacturing firms in Nigeria. A positive and significant effect suggests that firms use production manipulation (e.g., overproduction) to defer income and reduce current tax burden the study also aligned with positive accounting theory.

The results further show that abnormal cash flow from operations (ABCFO) has a negative and significant effect on tax planning at a coefficient value of -0.338, which indicates that 1 unit increase in abnormal cash flow from operations would decrease tax planning by 0.3380 units. A negative and significant effect implies that cash flow fluctuations (e.g., increased receivables) may not lead to tax avoidance strategies to smooth earnings. This finding documents enough evidence to reject the null hypothesis, which states that abnormal cash flow does not have a significant effect on the tax planning of listed manufacturing firms in Nigeria.

In addition, the results show that abnormal discretionary expenses have a positive and significant effect on tax planning at a coefficient value of 0.0797 and significance level of 1 %. These results imply that ~~an ₦~~1 increase in abnormal discretionary expenses would increase tax planning by ~~₦~~0.0797. A significantly positive effect suggests that discretionary expenses can be a primary tool for tax planning in this context. The study documents sufficient evidence to reject the null hypothesis, which states that abnormal discretionary expenses do not have a significant effect on the tax planning of listed manufacturing firms in Nigeria.

The results show that real earnings management (REM) has a positive and significant effect on tax planning at a coefficient value of 0.4135, and is significant at the 1% level of significance. This finding is in line with previous findings (Maigoshi & Tanko, 2023; Siladjaja, Gunawan, & Dwimulyani, 2018; Tanko, 2023) but disagrees with the findings of Kałdoński and Jewartowski (2020). A positive and significant effect confirms that REM, through accrual manipulation and other tactics, effectively reduces tax liability. This finding documents enough evidence to reject the null hypothesis, which states that real earnings management does not have a significant effect on the tax planning of listed manufacturing firms in Nigeria.

The study also shows an insignificant negative effect of firm age on tax planning, suggesting that firm age may not be a major driver of tax planning among manufacturing firms in Nigeria. On the other hand, tangibility has positive and significant influence on tax planning. A significantly positive effect indicates that asset tangibility may play a significant role in the tax planning strategies employed by these firms.

The findings are in line with positive accounting theory, which supports the findings of income smoothing, opportunistic earnings management, and tax planning as value-maximizing strategies. In addition, the findings are in line with agency theory, which supports the notion that managers act in their own interests using REM and tax planning to minimize tax liabilities and potentially entrench their positions. The implications of the study also confirm the use of various strategies (e.g., production manipulation and accruals management) to minimize tax burdens and achieve tax efficiency.

5. Conclusion

The study concludes that abnormal production has a positive and significant effect on tax planning. This finding suggests that firms strategically manipulate their production levels to defer income recognition and reduce short-term tax burdens. Abnormal cash flows from operations have a negative and significant effect on tax planning. This implies that higher operating cash flows translate into increased taxable income, leading to less aggressive tax-planning strategies. Abnormal discretionary expenses positively and significantly affect tax planning. Companies appear to utilize discretionary expenses such as marketing, research, and development to decrease taxable income and lower their tax obligation. Overall, real earnings management has a positive and significant effect on tax planning. This confirms that firms in the Nigerian manufacturing sector actively engage in REM practices to manipulate reported earnings and achieve desired tax outcomes.

Managers should be aware that increasing production beyond normal levels can be a strategic tool for tax planning. However, they must balance this with the risk of overproduction, which can lead to an excess inventory and increased holding costs. Develop production strategies that optimize production levels to effectively manage taxable income without negatively affecting operational efficiency. Managers need to understand that manipulating cash flows to manage earnings can have detrimental effects on tax planning. Ensuring smooth and consistent cash flow management is crucial. Implement robust cash flow management practices that align with both operational needs and tax-planning strategies.

Managers can use discretionary expenses (e.g., R&D, advertising, and maintenance) as tools for managing taxable income. Appropriate timing and adjustment for these expenses may be beneficial. In addition, it plans and adjusts discretionary spending strategically to optimize tax planning while supporting long-term business goals. Managers should carefully leverage real earnings management techniques to enhance their tax planning. They must ensure that such practices fall within legal boundaries and do not compromise financial integrity. Continuously monitor and assess the impact of earnings management practices on tax obligations, ensuring compliance with tax laws and regulations.

These findings have significant implications for stakeholders in Nigeria's business landscape. For policymakers, this study highlights the need for robust regulatory frameworks to curb excessive REM practices and promote transparency in financial reporting. For investors, understanding the link between REM and tax planning can inform investment decisions by providing insight into the potential risks and returns associated with companies engaging in such strategies. Finally, for manufacturing firms, the findings emphasize the importance of balancing tax optimization with ethical considerations and long-term sustainability.

Firms should consider building on past tax planning success while adapting to changing tax regulations and economic conditions. While effective for tax reduction, managers should be mindful of potential negative consequences such as increased production costs and inventory management challenges.

Smooth income fluctuations through strategic tax planning while maintaining transparency and compliance with regulations. Although effective for tax reduction, REM should be used ethically and within legal boundaries to avoid legal repercussions and reputational damages.

Overall, the findings highlight the complex interplay between real earnings management, tax planning, and various theoretical frameworks. Managers of listed manufacturing firms in Nigeria should carefully consider the implications of their tax planning strategies and balance their desire to minimize tax burdens with ethical considerations, transparency, and long-term financial sustainability.

5.1 Recommendations for Future Studies

Future researchers should explore the long-term effects of using production levels and discretionary expenses for tax planning on firm performance and market perceptions. Researchers should investigate the underlying causes and broader implications of the negative effects of abnormal cash flows on tax planning. To examine the impact of cash flow management on financial stability and investor confidence. Future research should focus on the interplay between real earnings management and various tax-planning strategies across different industries. Study the effectiveness of regulatory measures in curbing aggressive earnings management practices and their impact on tax compliance.

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