An Analysis of Firm Complexity and Tax Aggressiveness of Listed Deposit Money Banks in Nigeria and South Africa

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Abstract
The study examined the influence of firm complexity on tax aggressiveness of Listed Deposit Money Banks in Nigeria and South Africa. The study employed the longitudinal research design in a cross-country comparative analysis approach. The sample size consists of an equal sample of the 13 listed deposit money banks quoted on the Nigerian Exchange Group (NGX) and 13 listed deposit money banks quoted on the Johannesburg Stock Exchange, South Africa. Secondary data was used for the study as extracted from the annual reports and financial statements of the selected banks for a nine-year period of 2012-2020. The panel data were analyzed using a descriptive statistic, correlation and panel data regression technique which was dually estimated to capture the samples of both countries. The outcome of the Nigerian model showed that firm complexity asserted significant negative impacts on tax aggressiveness in Nigeria, and in model ii, it showed that firm complexity has an insignificant negative impact on tax aggressiveness in South Africa. The study recommends, among others, that the notion that highly diversified banks engaged in less tax aggression was upheld in the Nigerian sample. Since most diversified Nigerian companies had subsidiaries and cross-border affiliations with South Africa, there is a need for both governments to simplify the tax laws and focus more on creating a tax culture in order to foster voluntary compliance among multinationals.

Keywords: *Firm complexity, Tax aggressiveness, Nigeria and South Africa*

1.0 INTRODUCTION

One of the major challenges faced by most developing countries is the diversification of their sources of revenue. Nigeria is no exception. Although richly endowed with crude oil among other solid mineral resources, her age-long dependence on oil revenue as a major source of government revenue at the expense of other possible non-oil sources of revenue has left much to be desired (Obi, 2018). Moreover, the unsustainable nature of the crude oil sales became glaring due to the unstable oil prices at the international market coupled with the periodic attacks on oil pipelines and production facilities by different militant groups which decreased the volume of oil production (Musa, Saad, and Ibrahim, 2017).

Unfortunately, not every national government, especially in developing countries, is able to effectively achieve an optimal tax compliance level. In many cases, a large proportion of the informal sector of the economy escapes the tax net entirely (Oladipupo and Obazee, 2016), while companies in the formal sector try to avoid taxes by engaging in tax planning activities in order to minimise their tax burden (Hutchens, Rego and Williams, 2019).

Tax aggressiveness has been described "as a wide range of operations with the sole aim of reducing the total tax debt or tax liability of an entity" (Martinez, Reinoso, Antonio and Santos, 2019). According to Martinez and Martins (2019), tax aggressive companies are those that adopt adequate tax avoidance mechanisms in order to reduce income tax expenses. For organisations, a tax is considered as a significant cost because it removes part of their earnings without apparent and immediate compensation, while tax avoidance increases net cash flows which can be used to boost corporate investment, fulfil debt obligations, or be distributed to shareholders in the form of dividends or share buy-backs (Jihene and Moez, 2019). However, government considers tax avoidance as a major problem because it threatens the economy of any nation. For this reason, studies on tax aggressiveness and its possible determinants have continued to attract massive research interest among academic researchers.

There are several reasons to be concerned about the tax aggressive behaviours of the DMBs as well as their possible determinants. Among them is the fact that the economy of every nation largely depends on a robust and effective banking system which serves as a vehicle for funds allocation among the various subsectors of the economy (Boateng, 2018). Thus, sustaining the financial health of DMBs is considered paramount just as governments desire to maximise their full tax potential. To this extent, most previous studies (Ilaboya, Obasi and Izevbekhai, 2017; Martinez and Rodrigues, 2019; Ogbeide, 2017; Zemzem and Ftouhi, 2013) suggested that varying firm attributes (such as firm size, firm age, profitability, leverage, liquidity, auditor type, firm complexity and ownership structure) played important roles in determining firms' tax management strategies as well as the level of firms' tax aggressiveness.

Concerning the above mentioned firm attributes of deposit money banks (DMBs) in the two countries, there are staggering noteworthy heterogeneities. For example, in terms of firm size, our preliminary evaluation of Nigerian and South African DMBs showed that as at year ended 2020, the current listed thirteen (13) DMBs in Nigeria had average (joint) total assets of ₦4,626,974,608 (N'000) (about US$ 11 billion) while the joint average total assets of the six key DMBs in South Africa stood at R1, 100,281,014 (R'000) which was equivalent to about US$ 80 billion. There was also a disparity in the level of profitability at 0.015 (1.5%) and 0.086 (8.6%) average ROA (return on assets) for Nigerian and South African DMBs respectively. Although the Nigerian DMBs were jointly older in terms of the year of incorporation (averaged 39 years compared to 33 years for the South African banks), the South African DMBs had a more proportion of institutional ownership (for ownership structure) than the Nigerian DMBs at 39.9% and 49.5% respectively. However, the reverse was the case on debt-ratio (leverage) at 94% for Nigerian DMBs and 75% for the South African DMBs.

In relation to auditor type, all the local DMBs in South Africa, as per year 2020, were audited by the Big4 audit firms comprising Ernst and Young, PricewaterhouseCoopers, Deloitte and Touche and KPMG, with two of the banks (Ned bank and RMB Holdings) having retained their respective external audit firms for 45 and 30 years respectively. For the same period 2020, all the current 13 DMBs in Nigeria (except Unity Bank) engaged the Big 4 audit firms. However, unlike their South African counterparts, the currently operational Nigerian Code of Corporate Governance (2018) demands that an audit firm tenure should not exceed ten (10) years at a stretch. Therefore, there is the likelihood that the behaviours of the above mentioned firm attributes on the variability of tax aggressiveness would differ between both nations based on the

individual firm's peculiarities and other country-specifics. The researchers were thus motivated to embark on the comparative study between Nigeria and South Africa to develop the existing knowledge on the cross-country determinants of tax aggressiveness from the firm-specific attributes' perspective.

On the other hand, after a critical search in most local and international accounting and taxation journals, there was no discoverable empirical study on firm complexity and tax aggressiveness which focused on South Africa and Nigeria. The unavailability of this study in both countries was considered a huge gap in the literature which this proposed comparative study intended to fill.

A cross-country analysis is becoming indoctrinated into mainstream accounting research but it is largely sparse in the area of the drivers of tax aggressiveness. Thus, in addition to closing the earlier observed gap in previous studies, this study equally proposed the adoption of a cross-country comparative approach between Nigerian and South African banks to expand the existing horizons on tax aggressiveness research. The objective of the study therefore is to comparatively evaluate the impact of firm complexity on tax aggressiveness of listed deposit money banks in Nigeria and South Africa.

2.0 REVIEW OF RELATED LITERATURE

2.1 Tax aggressiveness

Tax aggressiveness is generally the legal exploitation of the tax system to one's advantage in an attempt to reduce the amount of tax that is payable by means that are within the law while making a full disclosure of the material information to the tax authorities (Desai and Dharmapala, 2009). Desai and Dharmapala (2009) also defined tax aggressiveness as a transfer of value from the state to shareholders. They went further to assert that tax avoidance strategies were designed by creating information asymmetry between tax authorities and the firm so as to prevent its detection by tax authorities. According to Pasternak and Rico (2008), tax aggressiveness is defined as the legal utilization of the tax regime to one's own advantage, to reduce the amount of tax that is payable by means that are within the law. Annuar, Salihu and Sheikh Obid (2014) simply defined corporate tax aggressiveness as a reduction in the explicit corporate tax liabilities.

Due to its nature, tax aggressiveness is extremely difficult to measure (Desai and Dharmapala, 2009). There were several measures of corporate tax aggressiveness used in the prior literature. The measures were mostly based on the estimates from the financial statements and could be classified into three groups. The first group includes those measures that consider the multitude of the gap between book and taxable income. These comprise total book-tax gap, residual book-tax gap and tax-effect book-tax gap. The second group has to do with those constructs that measure the proportional amount of taxes to business income. These include effective tax rates (this comes in several variants like accounting ETR, current ETR, cash ETR, long-run cash ETR, ETR differential, ratio of income tax expense to operating cash flow and the ratio of cash taxes paid to operating cash flow). The third group involves other measures such as discretionary permanent differences

In summary, tax aggressiveness is simply said to take place within the legal context of the tax system, that is, individuals or firms take advantage of the tax code and exploit loopholes, and engage in activities that are legal but run counter to the purpose of the tax law. Usually, tax avoidance encompasses special activities with the sole purpose of reducing tax liabilities. An example of tax aggressiveness is strategic tax planning where financial affairs are arranged in such a way to minimize tax liabilities, for example, using tax deductions and taking advantage of

tax credits.

2.2 Book-tax difference

According to Rego (2003), tax aggressive activities can create book-tax differences which are either temporary or permanent differences between a company's financial accounting and taxable income. Thus, the numerator is based on taxable income and the denominator is based on financial accounting income to accommodate book-tax differences. The book-tax difference (BTD) is also used as a proxy for the measurement of tax avoidance activity. It focuses on the magnitude of the difference between the accounting income and taxable income (book-tax gap). Although the causes of book-tax gap (BTG) are many and usually classified as permanent and temporary differences, the size of the gap suggests the presence of tax avoidance practices (Kim, Li and Zhang, 2011). To buttress the argument, Mills (1998) found a positive relationship between BTG and larger audit adjustment and tax audit among US firms. There are two commonly used measures of BTG to capture tax avoidance: total book-tax gap and residual book-tax gap. There are a number of studies which suggested that book-tax differences could be used as a signal for tax planning activities (Badertscher, Katz and Rego, 2010). The book-tax difference was developed by Manzon and Plesko (2002) and followed by Desai and Dharmapala (2009). Book-tax differences are differences between incomes reported to capital markets and tax authorities. The literature on taxation for example, on tax avoidance, tax planning and tax sheltering, holds the view that the positive book-tax differences and a low effective tax rates reflect the behaviour of tax avoidance (Plesko, 2004).

Desai (2003) posited that the growing difference between book and taxable income in the US during the 1990's was caused by increased levels of tax sheltering. In addition, Wilson (2009) found that book-tax differences were positively associated with actual cases of tax sheltering. Despite evidence that large positive book-tax differences are associated with tax avoidance activity, the measure has limitations. Manzon and Plesko (2002) and Hanlon (2003) identified firm specific characteristics associated with book-tax differences that were not necessarily reflective of corporate tax planning. Additionally, results by Hanlon (2005); Phillips, Pincus and Rego (2003) suggested that temporary book-tax differences were associated with earnings management activities to the extent that earnings management and innate firm characteristics unrelated to tax avoidance are the primary determinants of book-tax differences.

Manzon and Plesko (2002) developed a model for measuring total BTG and Chen, Chen, Cheng, Q. and Shevlin (2010) used the model for the measurements of tax aggressiveness among US companies. As total BTG could also be affected by the firm's earning management practices, Desai and Dharmapala (2006) tried to capture the unexplained portion of the total BTG, otherwise known as "abnormal total BTG" (Hanlon and Heitzman, 2010), and thus develop the residual BTG. The model was used to measure tax avoidance in Chen *et al.* (2010), Desai and Dharmapala (2009) and Kim *et al.* (2011). Another form of BTG developed by Tang and Firth (2011) was termed Tax-Effect BTG. It is argued that commonly used BTG is an income-effect BTG, and it uses the general company income tax rate. As for tax-effect BTG, it is based on the difference between income tax expense and current tax expenses, and thus relevant in a business setting where firms are subjected to different tax rates.

The general equation of corporate tax avoidance components using book-tax difference (BTD) is stated below;

$$BTD_{it} = FI_{it} - TI_{it}$$

BTD_{it} – book-tax difference for firm i in year t;
FI_{it} – financial income;
TI_{it} – taxable income.

It should be noted that financial income in the above equation is the income reported to capital markets, and it is the firm`s pre – tax income given in the income statement.

2.3 Firm Complexity

According to Wahba and Elsayed (2010), firm complexity refers to what extent the firm's operations and activities are diversified and interrelated. It is among the firm-specific attributes that usually influence several organisational outcomes. In the context of this study, the premise of existing literature (Chen *et al*., 2010; Chen, Ge, Louis and Zolotoy, 2019; Pratama, 2017) is that the more complex the firm is, the greater the tax burden should likely be. In line with the economies of scale, the potential influencing effect of firm complexity on tax aggressiveness is more likely to be valid since complex firms are characterised by larger subsidiaries and business segments, especially conglomerates or cross-border financial institutions with foreign affiliations. Researchers like Barinov, Park and Yıldızhan (2016) suggest that earnings reporting behaviours of conglomerates and single-segment firms differ significantly, and this most likely transcends to tax aggressive behaviours since there is likelihood that complex firms have higher tax burden.

Markarian and Parbonetti (2007) classified firm complexity into two: internal and external complexity. Internal complexity refers to the sophistication of internal work processes, production technologies, and the work processes of employees (proxied by firm R&D expenditures, and the amount of invested capital), while external complexity relates to the external competitive structure (proxied by the number of business subsidiaries and geographic segments, and industrial). The latter category is the focus of this study since it is practically observable that majority of the banks in both Nigeria and South Africa are highly complex and diversified. In previous studies, proxies for external firm complexity have included the number of subsidiaries, the number of industries in which the company participates and the number of different company locations and branches, both locally and internationally. Firm with foreign subsidiaries have to abide by a variety of legislative and proficient requirements for disclosures in those countries, hence, the tax avoidance strategies of complex firms are likely to differ. The issue of firm complexity has been a major focus of attention in prior academic studies on firms' tax planning behaviour (Mills, Erickson and Maydew, 1998; Rego, 2003) and thus constitutes one of the independent variables in this study.

2.4 Theoretical Framework

2.4.1 Agency theory

For the purpose of this study, two fundamental theories (agency theory and political economy theory) are adopted in explaining the firm attributes and tax aggressiveness among deposit money banks in Nigeria and South Africa. Slemrod (2004) was one of the first papers to highlight the agency problems inherent in corporate tax avoidance decision. Desai, Dyck and Zingales (2007), along that line, built a model that contributed to the growing literature on the cross-sectional variation in corporate tax avoidance. They however, went further to state that tax avoidance was a three-party game involving the shareholders, insiders/manager and the State, therefore, there was bound to be a conflict of interest between those three parties. According to the agency-view of tax avoidance, conflicts between a firm's owners and its management may arise because managers who are generally expected to make tax-effective decisions may, in fact, behave opportunistically and divert corporate wealth for their private benefit (Jensen and Meckling, 1998; Desai and Dharmapala, 2006).

Slemrod (2004); Chen and Chu (2005) were among the first to view corporate tax avoidance within an agency framework. Tax avoidance is related to agency problem, that is, tax avoidance is perceived as a tool for the creation of a shield for managerial opportunism and diversion of

rents. According to this view, theoretically, corporate tax avoidance can create a shield for expedient activities of managers and diversion of rents (Desai and Dharmapala, 2006). An emerging literature in financial economics, however, emphasizes agency cost implications of tax avoidance and suggests that tax avoidance may not always increase the wealth of outside shareholders. In accordance with this alternative view, tax aggressiveness may contribute to managerial rent extraction, which ranges from theft of corporate earnings and earnings manipulation to excessive executive compensation in various forms. Tax aggressiveness may potentially reduce the after-tax value of the firm since the combined costs of a company which include costs directly related to tax planning activities, additional compliance costs and non-tax costs; for example, agency costs may surpass the tax benefits for shareholders (Wang, 2012). Desai and Dharmapala (2006) suggested an agency-view on tax avoidance by stating that agency costs in the form of managerial rent extraction could result from a complementary relationship between tax avoidance and managerial diversion. Self-interested managers might use tax avoidance strategies to mask the opportunistic extraction of rents (Desai, Dyck and Zingales, 2007).

On the other hand, the agency theory is equally relevant to the study because, in the first place, the opportunity for management to engage in tax planning activities on behalf of the shareholders (business owners) is embedded in the concept of the agency relationship. Thus, based on the agency-view of tax avoidance, conflicts between a firm's owners and its management may arise because managers who are generally expected to make tax-effective decisions may, in fact, behave opportunistically and divert corporate wealth for their private benefit. The conjecturing of the framework of the study's analysis is that the degree of tax management may likely be influenced by the size of the firm, profitability level, the size of institutional investors and other firm-specific characteristics.

2.5 Empirical Review

Akintoye, Adegbie and Onyeka-Iheme (2020) examined the impact of tax planning strategies on the profit performance of listed manufacturing companies in Nigeria. They used the Taro Yamani Formula in arriving at a sample of 46 manufacturing firms from 2008 to 2017. They made use of descriptive and inferential statistics in analysing the secondary data. Their result showed that there was no significant effect of tax planning on the profitability (proxied using ROA) of manufacturing firms in Nigeria. They recommended that tax managers and finance officers should reduce thin capitalization and capital intensity to balance the source of the income of manufacturing firms. Yahaya and Yusuf (2020) examined the impact of firm characteristics on tax aggressiveness in Nigerian listed insurance firms. The focused on firm size, firm age, profitability and leverage as independent variables and measures of firm characteristics. Their sample consisted of twenty (20) insurance firms quoted on the Nigerian Stock Exchange from 2010 to 2018. They did their analysis using the two-step system GMM panel regression model and found that firm size and leverage affected tax aggressiveness positively while firm age and profitability asserted negative significant impacts on tax aggressiveness. They recommended that firm size should be formulated in line with the regulatory provisions. Onatuyeh and Ukolobi (2020) examined the measures of tax aggressiveness as a proxy for effective tax rate (ETR) and cash tax rate (CTR), as well as corporate governance mechanisms as a proxy for board gender diversity, audit committee diligence and board independence, and the implication of those variables on the changes in external audit fees. Using a sample of one hundred and seven (107) firms quoted on the Nigerian Stock Exchange from 2009 to 2018, the study revealed that cash tax rate, audit committee diligence and board independence all exerted a positive and significant effect on audit fees.

Surprisingly, the study revealed a positive but statistically insignificant link between board gender diversity and audit fees. In a related study, Onatuyeh and Odu (2019), in their study on corporate board characteristics and tax aggressiveness on manufacturing firms in Nigeria for the period 2011-2016, used proxies such as board size, board gender diversity, and board independence as board characteristics; and cash effective tax rate (CTR) as a proxy for tax aggressiveness. The result showed that both board size and board independence exerted negative and significant impacts on tax aggressiveness in manufacturing firms in Nigeria, while board gender exerted no significant effects. They opined that the insufficient number of women on corporate board membership in the firms was assumed to be a plausible reason for the insignificant effect of board gender diversity on tax aggressiveness. Amrie and Reza (2019) investigated the effect of financial constraints, investment opportunity set and financial reporting aggressiveness on tax aggressiveness. Using a sample of 88 non- financial companies listed on the Indonesian Stock Exchange for the period 2011-2015, the regression data revealed that financial constraints were positively associated with tax aggressiveness, the investment opportunity set was negatively associated with tax aggressiveness and financial reporting aggressiveness was not associated with tax aggressiveness. In China, Chen, Ge, Louis and Zolotoy (2019) investigated the effect of liquidity on corporate tax avoidance. They documented that firms with higher liquidity engaged less in extreme (that is, either overly aggressive or overly conservative) tax avoidance. The effect of liquidity on tax avoidance was economically meaningful and robust across alternative measures of tax avoidance and stock liquidity. They further documented that the effect of liquidity on tax avoidance was amplified for firms with a high proportion of activist shareholders, and attenuated for firms with high levels of stock price informativeness. The entirety of the findings was consistent with the view that stock liquidity mitigated extreme tax avoidance by enhancing shareholders' control over firm management. Atu, Uniamikogbo and Atu (2018) examined the effect of firm attributes on tax aggressiveness in Nigeria using secondary data which comprised fifteen (15) DMBs from 2013-2017. They deployed the use of the OLS regression technique. Their result showed that firm size, leverage and liquidity had significant impacts on tax aggressiveness in Nigeria while profitability had a non-significant impact on tax aggressiveness. They recommended that the initial focus of tax authorities should rather be on creating a tax culture among the people, and not on maximizing revenue or enforcing stringent tax compliance measures. Salaudeen and Eze (2018) examined the Corporate Effective Tax Rates (ETRs) of non-financial firms listed on the Nigerian Stock Exchange. The study also measured the neutrality of taxation within the Nigerian economic sectors and established the relationships between ETRs and firm specific characteristics of size, leverage, profitability, capital intensity, inventory intensity, labour intensity and auditor type. Data were extracted from the financial statements of sampled firms in respect of the variables and subjected to analyses in ordinary least square (OLS), random effect and fixed effect models. The results showed that ETRs were lower than the statutory tax rate during the period of the study, and that there were differences in ETR from one sector of the economy to the other. The study further revealed that larger and more profitable firms were faced with a high tax burden while firms with high leverage were faced with a lower ETR. Also, Salaudeen and Ejeh (2018), in their study, examined the effect of ownership structure on corporate tax aggressive activities of 40 listed non- financial firms in Nigeria for the period 2010-2014. The study revealed that ownership concentration had a positive but an insignificant effect on tax aggressiveness while the effect of managerial ownership was found to be significantly negative. Further results showed that leverage was negatively related with tax aggressiveness while return on assets was positively related. Size had no significant relation with tax aggressiveness Ogbeide's (2017) study examined firm characteristics and tax aggressiveness of listed firms in Nigeria using pool

and panel data for the period 2012 to 2016. The data used were sourced from the annual reports of the selected firms. Both the panel and dynamic panel methods were used to analyse the data generated. The findings from the study revealed that firm size exerted positive and significant effects on tax aggressiveness. Leverage was significant and exerted a negative relationship with tax aggressiveness. Irianto, Sudibyo and Wafirli's (2017) study aimed to examine the factors that affected company's tax avoidance. They used several factors such as size, leverage, profitability and capital intensity. The purpose of the study was to determine the influence of firm size, leverage, profitability and capital intensity ratio on tax avoidance in manufacturing companies listed on the Indonesian Stock Exchange from 2013-2015. The population taken as the object of observation amounted to 156 manufacturing companies listed on the Indonesian Stock Exchange in the period 2013-2015. The determination of the sample was made through purposive sampling method and it obtained a sample of 36 manufacturing companies based on certain criteria. The results showed that size positively influenced the effective tax rate while leverage, profitability and capital intensity ratio did not significantly influence the tax avoidance. Dharma and Ardiana (2016) examined the effects of the leverage, the fixed asset intensity, the size, and the political connections in the manufacturing companies listed on the Indonesian Stock Exchange. The results showed that leverage and fixed asset intensity had a positive effect on tax avoidance. Size negatively affected tax avoidance and political connections negatively affected tax avoidance but they were not significant.

The only study among the log that sampled the Nigerian banking sector was that by Atu *et al* (2018) but the variables used were limited to firm size, profitability, liquidity and leverage excluding institutional ownership, firm complexity and firm age which were proposed in this present study. Also, among available published studies, the researchers were not aware of any published research which used firm complexity as an independent variable among the firm attribute determinants of tax aggressiveness. Therefore, this study intended to fill those gaps in literature by investigating the impact of firm attributes on tax aggressiveness as it related to firm size, profitability, leverage, liquidity, institutional ownership, firm complexity and firm age (to be controlled by auditor type) in Nigerian firms with special reference to the Nigerian DMBs. It further analysed comparatively with the South African DMBs.

3.0 METHODOLOGY

3.1 Research Design

The study employs a longitudinal research design because it involves the evaluation of the behaviour of the same variables over an extended period of time. The panel nature of the data implies that the cross sectional research design is also applied because the sample objects of the study cover different firms for various years in order to determine their relationships and how significant one variable affects another.

3.2 Population of the Study

The population of the study comprised all deposit money banks in both Nigeria and South Africa. As at year ended December 2020, there were a total of thirteen (13) deposit money banks listed under the financial sector on the Nigeria Exchange Group (NGX). Similarly and at the same period, there were a total of seventeen (17) local deposit money banks listed on the Johannesburg Stock Exchange (JSE).

3.3 Sample Size and Sampling Technique

Considering the limited number of deposit money banks in both countries and the need to adopt an equal sample size for the purpose of the comparative analysis, the census sampling method

was employed in choosing the entire thirteen (13) deposit money banks in Nigeria as the benchmark sample size, matched with an equal sample size of 13 purposively selected South African deposit money banks as shown in Table 3.1 below.

Table 3.1: Sample Size

s/n	Nigeria	South Africa
1.	Access Bank	ABSA bank
2.	Eco Bank	African Bank
3.	Fidelity Bank	Bidvest bank
4.	First Bank Holding	Capitec Bank
5.	First City Monument Bank	First Rand
6.	Guaranty Trust Bank	Grindrod Bank
7.	Stanbic Ibtc Holding	HBZ Bank
8.	Sterling Bank	Investec Bank
9.	Union Bank Of Nig	Mercantile bank
10.	United Bank For Africa	Nedbank
11.	Unity Bank	Rand Merchant Bank
12.	Wema Bank	Sasfin Bank
13.	Zenith Bank	Standard bank

Source: Researcher's compilation (2021)

3.4 Methods and Sources of Data

The study made use of secondary data which were sourced from the various annual reports of the sampled Deposit money banks deposited in the libraries and website of the NGX (www.ngxgroup.com) and JSE (www.jse.co.za). The research covered a period of nine (9) financial years (2012-2020). The nine-year period was used for the estimations in order to use information from the same accounting reporting regime (that is, IFRS) – especially since Nigeria adopted IFRS in 2012 while South Africa fully commenced in 2010.

3.5 Model Specification

The econometric models of the study were adapted from the studies by Ilaboya *et al.* (2017), Ogbeide (2017) and Atu *et al.* (2018). The models of Ilaboya *et al.* (2017) and Ogbeide (2017) specified that tax aggressiveness was a function of firm size, audit quality, leverage, and interest charges, while the model used by Atu *et al.* (2018) specified tax aggressiveness to be a function of firm size leverage, profitability and liquidity. The above models were thus modified with the introduction of firm complexity and auditor type as earlier justified in the first chapter.

Thus, in order to ascertain the effect of firm attributes on tax aggressiveness of the Deposit money banks listed on both the NGX and JSE, the study adopted the following models in a bid to provide answers to the null hypotheses of the study:

The model was functionally expressed as:

Tax Aggressiveness $= f$ (complexity,)……..i

Introducing the control variable, we had:

Tax Aggressiveness $= f$ (, complexity, auditor type)……ii

The general econometric model for the study was specified thus;

$BTD_{it} = \alpha + \beta_1 CPX_{it} + \beta_2 BIG4_{it} + \varepsilon_{it}$ …… ……iii

Where;

CPX = Firm complexity measured as the number of subsidiaries.
BIG4 = Audit firm size/auditor type
α = constant.
β_1 to β_2 = the coefficient of the parameter estimate.
ε = the error term or residual.
i = ith firm for cross-section
t = time period
The model for the Nigerian banks was given as:

$$BTD_{itNGA} = \alpha + \beta_1 CPX_{itNGA} + \beta_2 BIG4_{itNGA} + \varepsilon_{itNGA} \quad \text{.....iv}$$

Where; NGA = Country code for Nigeria
Model for the South African banks was given as:

$$BTD_{itRSA} = \alpha_0 + \beta_1 CPX_{itRSA} + \beta_2 BIG4_{itRSA} + \varepsilon_{itRSA} \quad \text{.....v}$$

Where; RSA = Country code for the Republic of South Africa

3.7 Method of Data Analysis

The data were analysed comparatively via both univariate and multivariate analyse. The descriptive statistics was first conducted in order to gain understanding of the sample characteristics of both countries as regards the selected variables. The influence of the selected firm attributes on tax aggressiveness was tested using panel regression techniques. Inferences from the hypotheses were based on the model considered the most appropriate (between fixed and random effects models) based on the outcome of the Hausman's test for endogeneity. Other conventional diagnostics such as tests for multicollinearity, and heteroskedasticity were also conducted to ensure that the basic regression analysis assumptions were not violated.

4.0 RESULTS AND DISCUSSION

4.1 Data Analysis

Table 4.1 ***Descriptive Statistics***

NIGERIA	**D_BTD**	**CPX**	**BIG4**
Mean	-1.01E-18	13.128	0.9316
Median	0.00173	8.0000	1.0000
Maximum	0.03554	53.000	1.0000
Minimum	-0.17957	1.0000	0.0000
Std. Dev.	0.02195	13.182	0.2535
Skewness	-5.79377	1.9209	-3.420
Kurtosis	44.9409	5.2428	12.699
Jarque-Bera	9229.90	96.479	686.66
Probability	0.00000	0.0000	0.0000
Observations	117	117	117
SOUTH AFRICA	**D_BTD**	**CPX**	**BIG4**
Mean	-0.00047	21.667	0.9487
Median	0.02150	9.0000	1.0000
Maximum	0.86154	95.000	1.0000
Minimum	-4.92519	2.0000	0.0000
Std. Dev.	0.47820	23.647	0.2215
Skewness	-9.4567	1.4912	-4.069

Kurtosis	98.0132	4.5181	17.554
Jarque-Bera	45752.9	54.597	1355.4
Probability	0.00000	0.0000	0.0000
Observations	117	117	117

Source: Eviews 10 (2021)

From Table 4.1, it could be observed that the mean values of the tax aggressiveness proxy (D_BTD) stood at -1.01E-18 and -0.00047 for the Nigerian and South African samples respectively. Considering that the scientific notation of -1.01E-18 represented eighteen decimal points and the that lesser negative value was usually greater than a more negative number, it then meant that the average D_BTD of the Nigerian sample (-1.01E-18) was greater than that of the South African sample (-0.00047). It implied that the Nigerian DMBs were more tax aggressive than their South African counterparts. According to Prawira (2017), unlike the ETR tax aggressive measures, the bigger the BTD, the bigger the company was tax aggressive.

The mean values of CPX (firm complexity) which stood at 13.128 and 21.667 for Nigerian and South Similarly, the mean values of the variable of Big4 showed that about 93% of Nigerian banks and 95% of South African banks employed the services of Big4 audit firms within the 9-year period studied. It also meant that the non-Big4 audit firms were lowly patronised in both countries sampled.

On the Jarque–Bera test of goodness-of-fit, the result suggested that only the data on firm liquidity in the Nigerian sample followed a normal distribution. However, the departure from normality of the other variables did not pose any major problem in the panel data since the Central Limit Theorem revealed that the violation of the normality assumption posed no major problem in panel data analysis, especially with large firm-year observations (Ghasem and Zahediasl, 2012).

Table 4.2 ***Correlation Matrix***

NIGERIA	D_BTD	CPX	BIG4	SOUTH AFRICA	D_BTD	CPX	BIG4
D_BTD	1.000			D_BTD	1.000		
	-----				-----		
CPX	-0.06	1.000		CPX	0.053	1.000	
	(0.54)	-----			(0.57)	-----	
BIG4	0.491	0.090	1.000	BIG4	0.018	0.188	1.000
	(0.00)*	(0.33)	-----		(0.85)	(0.04)*	-----

Source: Eviews10 Output (2021) NOTE: The p-values are in parentheses ( ); the significant correlation coefficients are marked with asterisks (*)

The outcome of the correlation matrix was presented in Table 4.2. In the first part which focused on the Nigerian sample, the measure of complexity (CPX) was negatively correlated with the tax aggressive measure (D_BTD). It implied that that CPX moved in the opposite direction with D_BTD; but not significantly due to their high probability values of 0.54 for CPX. On the other hand, the control variable, BIG4 had positive associations with D_BTD measure of tax aggressiveness. It meant that it moved in the same direction with D_BTD and was statistically significant at the 1% level (p-values < 0.01).

Furthermore, in the second part of the result presented in Table 4.2 (using only the South African sample), it could be observed that CPX, and BIG4 showed positive correlation coefficients.

It implied that in the South African setting and using the D_BTD measure of tax aggressiveness, there was the likelihood that highly leveraged and liquid banks were strongly associated with higher D_BTD, howbeit only significant at the 10% level of confidence.

4.2 Regression Diagnostic Tests

Some diagnostic tests were conducted to ensure that the basic assumptions underlying regression modelling were not violated. The sub-section presented the outcomes of Variance Inflation Factor (VIF) for multicollinearity.

Table 4.3 ***Results of the VIF Tests***

NIGERIA Variable	Coefficient Variance	Centred VIF	**SOUTH AFRICA** Variable	Coefficient Variance	Centred VIF
C	0.001215	NA	C	0.245822	NA
CPX	1.24E-08	1.759494	CPX	3.92E-06	1.126993
BIG4	3.14E-05	1.647249	BIG4	0.050601	1.276045

Source: Eviews 10 output (2021)

From the VIF test results presented in Table 4.3, it could be observed that all the centred VIF values of both models were below the benchmark value of 10. The decision rule of the VIF tests is that if any of the explanatory variables exhibited VIF of up the value of ten (10), then it correlate with another independent variable, but if otherwise (that is, when < 10), then the issue of multicollinearity among the series are likely absent. Going by the above decision rule, it could be concluded that there were no issues of unstable parameter estimates in the regression lines of both models.

Table 4.4: ***Panel Regression Results***

Nigeria:	**Model 1 (FIXED EFFECT)**				***South Africa:***	**Model 2 (FIXED EFFECT)**		
Variables	**Coefficient**	**t-Statistic**	**Prob.**		**Variables**	**Coefficient**	**t-Statistic**	**Prob.**
C	0.363412	4.076957	0.0001		C	-8.805525	-5.858008	0.0000
CPX	-0.001234	-2.544660	0.0125**		CPX	-0.001147	-0.164713	0.8695
BIG4	0.011487	1.029077	0.3060		BIG4	-0.263775	-1.184108	0.2393
R^2			0.8325		**R^2**			0.4194
Adjusted R^2			0.7976		**Adjusted R^2**			0.2984
F-stat (p-value)			23.9(0.000)		**F-stat (p-value)**			3.47(0.000)
Durbin Watson			2.3101		**Durbin Watson**			1.8889

Source: Eviews 10 (2021) NOTE: ***, **, *significant at 1%, 5% and 10% levels respectively

From Table 4.4, it could be observed that the *F*-statistic values of 23.9 (p = 0.0000) and 3.47 (p = 0.0004) for both fixed effect models (models i and ii) respectively were above 2.0 which indicates that both fixed effect models were statistically valid for drawing inferences from the tests at the 1% level of significance. The coefficient of determination (R-squared) of both the fixed effect models was observed to be approximately 83% and 42% respectively. It implied that the model estimated using the Nigerian sample (Model i) had a higher explanatory power than the model estimated using the South African sample (that is, Model ii).

On the behaviour of the independent variables on the tax aggressive measure of D_BTD, it could be observed from the outcome of Model 1 that the variable CPX was statistically significant at varying levels of significance. However, CPX had negative coefficient signs of -0.0014 (p=0.0012). D_BTD was predicted to decrease by up to 0.0012 units, when CPX went up by one.

The two variables that showed exactly the same coefficient signs in both models (CPX) was only statistically significant in model i, and non-significant in model ii.

4.4 Test of Hypothesis

Hypothesis 1:

H_{o1}a: Firm complexity does not significantly affect with tax aggressiveness of Nigerian DMBs.

H_{o1}b: Firm complexity does not significantly affect with tax aggressiveness of South African DMBs.

The study stated in its hypothesis that there was no significant relationship between firm complexity and tax aggressiveness in Nigerian (H_{o6}a) and South African (H_{o6}b) DMBs. It could be observed from the outcome of model i that the variable of CPX had a negative coefficient of -0.0012 (p-value =0.0125) and also a negative coefficient of -0.00115 (p-value 0.87) in model 2. It showed that between both the p-values, only that of model i passed the significance test at the 5% levels, while the p-value of CPX in model 2 (87%) was non-significant since it was greater than 5%. Thus, the null hypothesis six (H_{o6}) could only be rejected in the Nigerian sample (that is, model i). It meant that a significant relationship existed between firm complexity and tax aggressiveness in Nigeria DMBs while no significant relationship existed between firm complexity and tax aggressiveness in the South African DMBs.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In an attempt to contribute to the existing literature, the study embarked on a cross-country comparative analysis of the impact of different firm attributes on the corporate tax aggressiveness of deposit money banks in Nigeria and South Africa. The study specifically examined how firm complexity affects tax aggressive behaviours of both Nigerian and South African Deposit money banks. The study employed the discretionary book tax difference (D_BTD) measure of tax aggressiveness which was scarcely used in related studies in this context. The census method of sampling was adopted in selecting the entire thirteen (13) listed deposit money banks in Nigeria and matched with an equal sample of thirteen (13) purposively selected South African deposit money banks for the purpose of the comparative analysis, all together amounting to a balanced panel of 117 firm-year observations (each) respectively.

Based on the above findings, it could be summarised that a significant relationship existed between firm complexity and tax aggressiveness in Nigeria DMBs while no significant relationship existed between firm complexity and tax aggressiveness in the South African DMBs

5.2 Recommendations

In view of the finding and conclusions drawn from the results of the study, the study recommended that the notion that highly diversified banks engaged in less tax aggression was upheld in the Nigerian sample. Since most diversified Nigerian DMBs had subsidiaries and cross-border affiliations with South Africa, and had to contend with the local and complex tax laws in its diverse business segments, there is the need for both governments to simplify the tax laws and focus more on creating a tax culture in order to foster voluntary compliance among multinationals.

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