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Environmental Disclosure and Tax Avoidance in Developing Economies: Moderating Role of Audit Firm Type in Nigeria's Manufacturing Sector

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ABSTRACT

As a result of the social and economic consequences of tax avoidance, the past few decades have witnessed increased attention on tax avoidance. Thus, this study examined the effect of environmental disclosure on tax avoidance. Data from 31 listed manufacturing firms from 2013 to 2022 were aggregated, and the generalised method of moments was explored. We find that firms disclosing environmental information are more likely to engage in tax avoidance, as evidenced by the negative nexus between environmental disclosure and effective tax rate. This suggests that environmental disclosure serves as an opportunistic tool for engaging in unethical practices such as tax avoidance. However, further finding shows that external audit firm type exposes environmentally disclosing firms to a high effective tax rate, suggesting that Big Four audit firms may critically evaluate the quality of environmental disclosure towards ensuring that it is not designed to engage in unethical tax avoidance behavior. The study concludes that environmental disclosure serves as an impetus for engaging in tax avoidance, but that audit firm type helps in curtailing this tendency, most especially when firms are audited by one of the Big Four. It is recommended that the government should take appropriate policy measures through reducing loopholes in the tax system to reduce tax avoidance, particularly in environmentally disclosing firms. It is also recommended that the government should give more tax incentives to environmentally disclosing firms to reduce their engagement in tax avoidance.

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ملخص

نتيجة للآثار الاجتماعية والاقتصادية المترتبة على التهرب الضريبي، شهدت العقود القليلة الماضية اهتماما متزايدا بهذه الظاهرة. ومن هذا المنطلق، استعرضت هذه الدراسة أثر الإفصاح البيئي على التهرب الضريبي. وقد صنفت بيانات 31 شركة صناعية مدرجة خلال الفترة من 2013 إلى 2022، واستخدم أسلوب العزوم المعمم (Generalized Method of Moments - GMM) في التحليل. وتوصلنا إلى أن الشركات التي تفصح عن معلومات بيئية تكون أكثر قابلية للانخراط في ممارسات التهرب الضريبي، وهو ما يتضح من العلاقة السلبية بين الإفصاح البيئي ومعدل الضريبة الفعلي (Effective Tax Rate). ويشير هذا إلى أن الإفصاح البيئي قد يُستخدم كأداة انتهازية للانخراط في ممارسات غير أخلاقية مثل التهرب الضريبي. وأظهرت نتائج إضافية أن نوع شركة التدقيق الخارجي يؤدي إلى تعرّض الشركات المفصحة بيئيا لمعدل أعلى للضريبة الفعلية، مما يشير إلى أن شركات التدقيق الأربع الكبرى (Big Four) قد تقيم جودة الإفصاح البيئي بصورة أكثر صرامة لضمان عدم استخدامه كوسيلة لممارسة سلوكيات غير أخلاقية تتعلق بالتهرب الضريبي. وتخلص الدراسة إلى أن الإفصاح البيئي قد يشكل دافعا للانخراط في التهرب الضريبي، إلا أن نوع شركة التدقيق يسهم في الحد من هذا التوجه، ولا سيما عندما تتم مراجعة حسابات الشركات من قبل إحدى شركات التدقيق الأربع الكبرى. وتوصي الدراسة بأن تتخذ الحكومة تدابير وسياسات مناسبة للحد من التهرب الضريبي، وذلك من خلال تقليص الثغرات الموجودة في النظام الضريبي، خاصة بالنسبة للشركات التي تفصح عن معلومات بيئية. كما توصي بمنح مزيد من الحوافز الضريبية للشركات المفصحة بيئيا للحد من لجوئها إلى ممارسات التجنب الضريبي.

RÉSUMÉ

En raison des conséquences sociales et économiques de l'évasion fiscale, celle-ci a fait l'objet d'une attention croissante au cours des dernières décennies. C'est pourquoi la présente étude a examiné l'effet de la divulgation d'informations environnementales sur l'évasion fiscale. Les données de 31 entreprises manufacturières cotées en bourse, couvrant la période de 2013 à 2022, ont été agrégées, et la méthode des moments généralisée a été appliquée. Nous constatons que les entreprises qui divulguent des informations environnementales sont plus susceptibles de se livrer à l'évasion fiscale, comme en témoigne le lien négatif entre la divulgation d'informations environnementales et le taux d'imposition effectif. Cela suggère que la divulgation d'informations environnementales sert d'outil opportuniste pour se livrer à des pratiques contraires à l'éthique telles que l'évasion fiscale. Toutefois, d'autres résultats montrent que le type de cabinet d'audit externe expose les entreprises divulguant des informations environnementales à un taux d'imposition effectif élevé, ce qui suggère que les cabinets d'audit du Big Four pourraient évaluer de manière critique la qualité de la divulgation environnementale afin de s'assurer qu'elle n'est pas conçue pour se livrer à des pratiques d'évasion fiscale contraires à l'éthique. L'étude conclut que la divulgation d'informations environnementales sert de catalyseur à l'évasion fiscale, mais que le type de cabinet d'audit contribue à limiter cette tendance, en particulier lorsque les entreprises sont auditées par l'un des « Big Four ». Il est recommandé que le gouvernement prenne des mesures politiques appropriées en réduisant les failles du système fiscal afin de limiter l'évasion fiscale, en particulier chez les entreprises qui divulguent des informations environnementales. Il est également recommandé que le gouvernement accorde davantage d'incitations fiscales aux entreprises qui divulguent des informations environnementales afin de réduire leur recours à l'évasion fiscale.

Keywords: Effective tax rate, environmental disclosure and tax avoidance

JEL classification: Q01; Q56

1. Introduction

The importance of tax as a veritable source of revenue to government has generated hot debates among academicians, researchers, policy makers, regulators and the public. Tax serves as a means of providing public infrastructures, equitable wealth redistribution, and facilitating the attainment of the government's developmental agenda (Duhoon & Singh, 2023; Mocanu et al., 2021). Tax is one of the most important fiscal tools of the government in achieving its economic objectives because it is the largest source of revenue to the government with a larger portion of it attributed to direct taxes (Duhoon & Singh, 2023).

Corporate tax occupies a central position among numerous sources of direct tax revenue. Direct tax imposes civic and legal obligations on payers, either individual or corporate bodies, to pay a fair share of their profit to the government (Akinadewo et al., 2023). Taxpayers, in an attempt to reduce their tax burden, engage in either tax avoidance or tax evasion. This is particularly true for corporations given that the tax burden on corporations is higher compared to taxes on other subjects. Tax avoidance represents a legal tax management strategy that involves exploiting loopholes in the tax system. On the other hand, tax evasion involves illegal circumvention of tax payment through deliberate evasion of tax, and it is punishable under the law. Tax avoidance hinders governments 'ability to generate sufficient revenue needed for financing their developmental agenda and thus constitutes a threat to the attainment of the overall objective of the tax system (Ajeigbe et al., 2024).

The radical climate change has created demand for environmental sustainability. Transparency and accountability have been progressively incorporated into the corporate communication and decision-making process of entities (Gerged et al., 2023; Gu & Wang, 2023; Akhter et al., 2023). In Nigeria, the manufacturing sector seems to be a typical example of trade-off or interaction between tax avoidance and environmental disclosure. The operation of the manufacturing sector in Nigeria has grievous environmental impacts (Olaussen, 2018). Thus, environmental disclosure is particularly important, as manufacturing firms can be both causes and solutions for environmentally hazardous activities (Li et al., 2018). By affording stakeholders the opportunity of getting the actual environmental performance of a firm, environmental disclosure offers itself as an answer to the problem of information asymmetries (Belal et al., 2015; Li et al., 2018).

Theoretical arguments in the literature in support of the nexus between environmental disclosure and tax avoidance are broadly categorized under the legitimacy and opportunistic perspectives. The legitimacy perspective in the argument of Dowling and Pfeffer (1975) requires firms to align their value system with that of the society to gain the support of their operating environment and avoid a threat to their survival. Therefore, arguing from this legitimacy perspective, we propose a negative association between environmental disclosure and tax avoidance. On the other hand, the opportunistic perspective argues that firm discloses environmental information as a tool for covering up their unethical behavior (Gerged, 2020), including tax avoidance, which involves not paying a sufficient amount of tax to the government in financing government expenditure on social infrastructure; thereby limiting government effort to meet people's expectations. Therefore, we propose a positive relationship between environmental disclosure and tax avoidance.

The above opposing theoretical arguments have been upheld by empirical findings. The environmental disclosure-tax avoidance nexus has produced mixed arguments. This contentious finding is linked to the fact that firms, to meet policy requirements, incur costs relating to information decision, which in turn reduces productivity and profitability. In this situation, a firm may seek to mitigate the additional costs attributed to corporate environmental disclosure by reducing its tax expenditure through tax avoidance (Ren et al., 2020). By contrast, environmental disclosure can diminish firm's tendency to engage in tax avoidance, help firms in overcoming information asymmetry, boost firm value and reduce the problem of information asymmetry, resulting in improved financial condition and lower cost of financing (Luo et al, 2019; Meng et al, 2022; Gu & Wang, 2023).

External audit quality may play a prominent role in addressing the agency crisis that accompanies the use of environmental disclosure to perpetrate and mask tax avoidance. According to DeFond et al. (2024), external auditors such as the Big-Four audit firms are custodians of assurance services, and they reduce tax avoidance of their clients because the practice is associated with a high tendency for the occurrence of unfavourable outcomes that impose costs on auditors. In the Nigerian context, we expect listed firms to benefit from the audit service of Big-Four auditors as a means of ameliorating the weaknesses in the institutional and legal environment that may propel managers to use environmental disclosure to engage in unethical tax practices such as tax avoidance.

The existing corporate environmental disclosure and tax avoidance literature seems to have some weaknesses. First, there are very few studies that have examined the effect of corporate environmental disclosure on tax avoidance (Gu & Wang, 2023; Fallan & Fallan, 2019; Cahyati, Lestari, Mulyasari & Idriana, 2023; Marsdenia & Martan, 2018). Second, most of these few studies have focused on developed countries to the detriment of developing countries. It is to be noted that institutional and legal settings as they relate to tax matters are predominantly weak in Africa, leaving loopholes for taxpayers to avoid and evade tax. Third, most of the reviewed studies have analyzed the direct effect of environmental disclosure on tax avoidance without moderating for any variable that can shape the relationship between environmental disclosure and tax avoidance. Fourth, most of these studies have examined the corporate environmental disclosure-tax avoidance nexus from a static perceptive using regression that is not efficient in addressing the endogeneity concern inherent in panel data (Chijoke-Mgbame et al, 2020).

The empirical findings showed that environmental disclosure has a significant negative effect on ETR. The overall result of the study suggests that companies that disclose environmental information are more likely to engage in aggressive tax avoidance behavior. However, the empirical findings showed that audit firm type has a significant but positive moderating effect in the relationship between environmental disclosure and ETR.

This paper makes numerous contributions to the literature. First, the study contributes to the body of literature on corporate environmental disclosure and tax avoidance. Most studies in this arena have focused on developed economies with strong legal and institutional environments that discourage unethical tax practices such as tax evasion and avoidance. In contrast, this study provides evidence for a developing country with a weak tax system that leaves loopholes for taxpayers to evade and avoid tax.

Second, this study contributes to the literature by examining the moderating role of external audit firm type in the relationship between corporate environmental disclosure and tax avoidance. Big four auditors can serve as an external corporate governance mechanism for improving the monitoring mechanisms of a firm by preventing managerial use of environmental disclosure to engage in tax avoidance.

Third, this study used a difference GMM to analyze the data from listed manufacturing firms in Nigeria to overcome the problem of endogeneity and simultaneity that characterize panel data.

Fourth, the study contributes to the literature by focusing on the manufacturing sector that contributes significantly to Nigeria's overall economy. In addition, its level of environmental impact based by its operations and use of toxic energy is yet another reason for selecting the sector. The dataset comprises 31 listed firms across the manufacturing sector from 2013 to 2022, resulting in 310 firm-year observations.

The investigation of the moderating role of external audit firm type on the relationship between environmental disclosure and tax avoidance is apt for a considerable number of reasons. First, Nigeria is one of the countries of the world where laws, including those relating to environmental protection, are perniciously enforced; thereby giving opportunities for entities and individual to engage in environmentally disastrous endeavours in their bid to engage in activities that confer economic benefits on them. Thus, firms may prey on this laxity to avoid environmental accountability and disclosure. Secondly, poor accountability and transparency, lack of tax justice. that give room for a rise in tax avoidance and evasion is predominantly in Nigeria compared to other countries of the world. This is further worsened by the fact that larger companies with the financial muscle and popularity often engage the service of tax consultants to avoid and evade tax. Third, firms engaging in high tax avoidance practice may utilize environmental disclosure, not for legitimate reasons, but as a cover-up for their unethical tax avoidance behavior. Going by the above-mentioned facts, the nexus between environmental disclosure and tax avoidance in developed climes may produce contrary result compared with the findings on Nigeria. These points therefore, situate Nigeria as a perfect case study for the investigation of the moderating role of external audit firm type on the relationship between environmental disclosure and tax avoidance.

This study sampled 31 listed manufacturing environmental disclosing firms by obtaining data from their annual reports spanning 10 years from 2013 to 2022. The data were analysed using both descriptive and inferential statistics. The descriptive statistics involve descriptive analysis, correlation analysis, while the inferential analysis involves difference GMM, which is more appropriate for panel data as it addresses the problems of endogeneity that are inherent in panel data.

The remaining parts of this paper are sectioned into theoretical background, review of literature and hypotheses development; research design, discussion of findings, conclusion and lastly, recommendations and suggestions for future studies.

2. Literature Review

Prior literature (Chen et al., 2014; Lu & Abeysekera, 2017; Gerged et al., 2020; McWilliams et al., 2006) argues that theoretical arguments for environmental disclosure can be categorized into two broad taxonomies, namely, the legitimacy and opportunistic perspectives. Researchers who justify environmental disclosure from a legitimacy perspective argue that environmental disclosure is a way organizations legitimate their actions by responding to pressure from the public (Chijoke-Mgbame et al., 2020). These scholars agitate for environmental disclosure as a means of aligning a firm's operations to societal norms to gain societal acceptance. Drawing on legitimacy theory, an entity must align its established value system with that of the social system it belongs to (Guthrie & Ward, 2006).

Dowling and Pfeffer (1975) argued that for an organization to gain the support of society and avoid a threat to survival, the organization should align its value system with that of the society within which it operates. One of the basic tenets of the legitimacy theory is the existence of a social contract between the business and society, of which compliance sanctions organizations to behave with the "legitimacy" and authenticity required for the retention of their authorization to operate, likewise for the inevitable utilization of social resources (Archel et al., 2009). This view has been supported by Cho and Patten (2007), who argued that firms could use sustainability-related reporting, including environmental disclosure, as a tool for legitimating their activities.

According to Deegan and Blomquist (2006), firms are required by the legitimacy process to identify indicators or other standards to measure their performance in terms of social and environmental impact, to communicate to society concerning the status of their adherence. Therefore, firms that organize their value system in tandem with the larger society are expected to shun all forms of unethical behavior, such as tax avoidance, as tax avoidance behavior indicates a deliberate attempt by firms' actors to deprive society of getting its fair portion of firm's economic fortunes.

On the other hand, the opportunistic argument for firm disclosure of environmental information indicates that firm utilizes environmental disclosure as a tool for covering up their unethical behavior (Gerged, 2020). Unethical behavior in this argument will include any form of behavior that hinders societal well-being. Tax avoidance is one of these unethical behaviors as it reduces the ability of the state to generate a sufficient amount of tax revenue needed in financing government expenditure on social infrastructure; thus, limiting government effort to meet people's expectations. Drawing on agency theory, the asymmetric information issues that are brought by the relationship between the agent and principal can afford the managers to opportunistically pursue their interest at the detriment of the shareholders (Koch & Schmidt, 2010).

As a way of increasing their benefits, managers may opt for accounting options that reduce firm corporate tax obligations through aggressive tax behavior in order to increase their profit-based compensation. Therefore, managers may resort to the disclosure of environmental information in the annual report in order to shift public attention away from observing their unethical tax practice of tax avoidance. Empirically, this stance has been validated by researchers such as (Gu & Wang, 2023; and Marsdenia & Martan, 2018).

In line with agency theory, the external auditor is considered an effective tool for mitigating the agency crisis occasioned by the separation of ownership from management. As earlier argued, managers may engage in environmental disclosure to mask their unethical behavior, such as tax avoidance. Therefore, the role of external audit firm type in detecting and preventing managers' use of environmental disclosure to perpetrate and hide tax avoidance becomes expedient.

3. Data and Methodology

3. 1. Research Design

The sample of the study consists of 31 listed manufacturing firms in Nigeria from 2013 to 2022, and the data are obtained from the annual reports and accounts of the selected firms. In analyzing the obtained data, this study employs the generalized method of moments. The GMM method addresses dynamic endogeneity, firm-specific unobserved heterogeneity, and potential simultaneity bias that are attributed to panel data, which can introduce estimation biases (Gu & Wang, 2023).

3.2. Measurement of Variables

3.2.1 Dependent Variable

Corporate tax avoidance is the dependent variable of the study. The study use the effective tax rate to measure the extent of firms' engagement in tax avoidance. Cash effective tax rate (CETR) and book-to-tax difference (BTD) are also used as an alternative measure of tax avoidance. Effective tax rate is measured as: Tax/profit before tax Book-to-tax difference is measured as: profit before tax –tax/tax rate

3.2.2. Independent Variable

Corporate environmental disclosure is the only independent variable of the study. It is measured using a content analysis of disclosure checklist of 8 items. It is thereafter measured as firm total environmental disclosure.

3.2.3. Control Variable

To avoid spurious results, the study introduced other variables that can influence corporate tax avoidance aside from environmental disclosure. The variables identified as control in this study are profit before tax, leverage, return on asset, age, size and directors' remuneration.

3.3. Model Specification

$$ETR_{it} = \beta_0 + \beta_1 ETR_{it-1}\ \beta_2 ED + \beta_3 PBT_{it} + \beta_4 LIQ + \beta_5 SIZE_t + \beta_6 DRM_{it} + \beta_7 TANG_{it} + \beta_8 LOS_{it} + \beta_9 LEV + e_{it}$$

$$ETR_{it} = \beta_0 + \beta_1 ETR_{it-1}\ \beta_2 ED + \beta_3 ED{*}AFT + \beta_4 AFT + \beta_5 PBT_{it} + \beta_6 LIQ + \beta_7 SIZE_t + \beta_8 DRM_{it} + \beta_9 TANG_{it} + \beta_{10} LOS_{it} + \beta_{11} LEV + e_{it}$$

Where:

ETR=Effective tax rate

ED=Environmental disclosure

ED*AFT=Moderating role of audit firm type on environmental disclosure

PBT-Natural logarithm of profit before tax

AFT= Audit firm type

LIQ=Liquidity ratio

SIZE=Natural logarithm of total asset

DRM= Directors remuneration

TANG=Tangibility

LOS= Los

LEV=Leverage

4. Empirical Results

4. 1. Summary Statistics

Table 1 below shows that ETR has a mean of 0.237. The high figure of 23.83824 in respect of ETR arose from the fact that a particular company included in the sample had a high tax credit running into millions as a form of loss relief. The mean value of ED is 0.54. PBT is averaged 14.5 and ranges from 20.12 to 6.20. The correlation coefficient in Table 3 shows evidence of low correlation of the independent variables, with the highest being 0.161039.

Table 1. Descriptive statistics

Variables	**Obs**	**Mean**	**Median**	**Std.Dev.**	**Min**	**Max**
ETR	310	0.237101	0.275130	1.518176	-9.301140	23.83824
ED	310	0.543548	0.625000	0.307206	0.125000	1.000000
PBT	310	14.51133	14.51493	2.343217	6.202536	20.11628
LIQ	310	1.695803	1.242561	2.810952	0.048472	36.41061
SIZE	310	17.03598	16.73801	1.951027	13.88677	21.70101
DRM	310	11.10860	11.12932	1.683180	4.110874	14.41049
TANG	310	0.425270	0.406747	0.226751	0.014399	0.938118
LOS	310	0.190323	0.000000	0.393190	0.000000	1.000000
LEV	310	0.178587	0.115489	0.233906	0.000000	2.059207

Source: Authors Computation (2024)

Table 2. Correlation Analysis

	ETR	EDI	LPBT	LIQ	LSIZE	LDRM	TANG	LOSS	LEV
ETR	1.00								
ED	0.06	1.00							
PBT	0.10	0.55	1.00						
LIQ	0.04	-0.15	-0.34	1.00					
SIZE	0.01	0.48	0.89	-0.31	1.00				
DRM	0.16	0.57	0.74	-0.34	0.74	1.00			
TANG	0.02	-0.21	-0.14	-0.06	-0.00	-0.10	1.00		
LOS	0.16	-0.06	-0.14	0.23	-0.00	-0.12	0.17	1.00	
LEV	-0.12	-0.05	-0.16	-0.12	-0.09	-0.25	-0.07	-0.02	1.0

Source: Authors Computation (2024)

This is an indication of the absence of multicollinearity. Since all correlations are less than the 80% benchmark for multicollinearity, it can be safely said that there is an absence of multicollinearity amongst the independent variables

4.3. Generalized Method of Moments

Table 3 below shows that almost 45% variation in tax avoidance is caused by environmental disclosure and the control variables. The AR (1) shows evidence of the absence of first-order serial correlation, given the fact that it is not significant at 5% level of significance. As per the F-statistics of 5.856 and corresponding probability of 0.000, the study concludes that the model as a whole is fit. About the moderating effect of audit firm type, the adjusted R2 shows that only 12% variation is caused by the moderating effect of audit firm on environmental disclosure and other control variables of the study, while the remaining 88% is accounted for by other variables outside the scope of this study. The AR (1) shows evidence of first-order correlation, but the AR (2) shows evidence of the absence of second- order serial correlation, given the fact that it is not significant at 5% level of significance. As per the F-statistics of 4.945 and corresponding probability of 0.000, the study concludes that the model as a whole if fit. However, the Hansen J test of over-identification indicates a probability of j-statistics in over 0.05. We therefore failed to reject the null hypothesis of no over-identification. This is similar to the finding of Chijoke-Mgbame (2020).

The empirical findings showed that environmental disclosure has a significant negative effect on ETR. Therefore, the study rejects the null hypothesis H_01, stating no significant effect of environmental disclosure on tax avoidance. This shows the significance of the model and is somehow useful for the exploration of the effect of the independent and dependent variables. The coefficient of -0.131 and t-stat of -2.119 indicate a negative and significant effect of environmental disclosure on ETR. Thus, the alternate hypothesis is validated. The overall result of the study suggests that companies that disclose environmental information are more likely to reduce their ETR; hence, they are associated with high tax avoidance behavior. Our finding is in tandem with the opportunistic motive for ED, which argues that managers may utilise the disclosure of environmental information as a means of covering up their unethical practice of tax avoidance. This finding contradicts the argument by

Chouaibi et al. (2021) that corporate social responsibility and taxation share the same characteristic, which is welfare to society by participating in social and environmental activities. This finding is not in tandem with those published by Firmansyah and Estutik (2020) and Kian et al. (2023) that found a significant negative effect of ED on tax avoidance. On the other hand, according to Gu and Wang (2023), the agency theory argues that ED may be perceived by managers as a tool for risk management to cover up opportunistic behavior that may give rise to increased tax avoidance behavior. In this direction, Gu and Wang (2023) found evidence of a significant and positive effect in Chinese listed firms.

Table 3: Generalized Method of Moments

	Without moderating effect	**With moderating effect**
ETR(-1)	0.077 (9.927)***	0.101388 (8.500)***
ED	-0.131 (-2.119)**	-1.463113 (3.845)***
ED*AFT	NA	1.451224 (2.950)***
AFT	NA	-0.167907 (-0.261)
PBT	0.104 (5.671)***	0.100376 (2.886)***
LIQ	-0.057059 (-8.269)***	-0.038230 (-2.187)***
DRM	0.037490 (1.083)	-0.030546 (0.5857)
SIZE	-0.088 (-1.963)*	0.011137 (0.093)
TANG	-0.606325 (-2.290)**	-0.046526 (-0.077)
LOSS	1.440015 (9.109)***	1.411585 (5.744)***
LEV	0.081421 (0.915)	0.216108 (1.191)
AR(1)	(0.05)	0.036
AR(2)	NA	(0.734)
Hansen J test of over-identification	0.393	0.459
R2	0.541	0.158
Adj R^2	0.448	0.123
F-Stat	5.856 (0.000)***	4.945 (0.000)***

Source: Researchers' Computation Using E-Views 9 (2024)

Contrary to our expectation, the empirical findings showed that audit firm type has a significant but positive moderating effect on the relationship between ED and ETR. Therefore, the study rejects the null hypothesis H_{02}, stating no significant effect of audit firm type in the relationship between ED and ETR. The coefficient of 1.651 and t-stat of 1.891 indicate a significant but positive effect of environmental disclosure on ETR under the moderating role of audit firm type. Thus, the alternate hypothesis is validated. This finding atligns with that of Kim et al. (2023). In general, the outcome of this study supports the claim that big-four auditor serves as a monitoring and controlling mechanism for preventing managerial use of ED to mask unethical practices such as tax avoidance and evasion.

Concerning the control variables of the study, profitability is found to have a positive and significant effect on ETR ($P<0.05$). This finding implies that profitable firms engage less in tax avoidance practice as larger profit implies that more tax burden will be placed on them. However, liquidity is found to negatively and significantly influence ETR ($P<0.05$). This finding implies that liquid firms may engage in high tax avoidance practices. The explanation in support of this argument is that liquid firms may have considered investing tax savings in tax avoidance activity on viable projects. This finding indicates that high directors' remuneration increases ETR. Additionally, firm size has a significant negative effect on ETR ($P<0.1$). This finding implies that larger firms are more politically powerful to the extent of reducing their political cost. Tangibility has a significant negative effect on ETR ($P<0.05$). This finding implies that firms with more physical assets engage in more tax avoidance behavior. However, loss significantly and positively drives ETR.

Robustness Check

To confirm the robustness of the result of the GMM analysis estimated in Table 3, we used two alternative measures of tax avoidance. These alternative measures are cash tax ratio (CETR) and book-to-tax difference (BTD). CETR shows the actual tax paid by a firm as a proportion of taxable profit. The measure is one of the prime measures of tax avoidance as it shows the extent of tax paid by a firm out of the tax due for payment. A high proportion indicates that firms pay a high amount of cash as tax. On the other hand, the BTD shows the extent of firm tax aggressiveness as it measures the difference between the accounting profit and actual taxable profit. The higher the BTD, the more tax aggressive a firm is. The result of the CETR is also in tandem with that of the main analysis. It shows that environmental disclosure has a significant negative effect on tax avoidance. However, it is found to be positively significant under the moderating effect. ED exerts a significant but positive effect on BTD under the direct effect, but a significant effect under the moderating influence of audit firm type.

Table 4: Alternative Measures for Tax Avoidance

Variables	CETR		BTD	
CETR(-1)	0.129 (33.301)***	0.1356 (9.070)	0.010 (13.492)***	0.109 (4.770)***
EDI	-0.319 (-2.254)**	-2.030 (-4.468)***	1.1196 (5.303)***	5.932 (2.377)**
ED*AFT	NA	2.041 (4.376)***	NA	-6.353 (-2.362)**
AFT	NA	0.151 (0.160)	NA	2.539 (1.1855)
PBT	-0.149 (-9.456)***	0.039 (1.259)	-0.502 (-7.602)***	-0.397 (-1.734)
LIQ	-0.068 (-11.506)***	-0.089 (-2.209)**	0.118 (8.214)***	0.044 (0.458)
SIZE	0.004 (0.053)	1.860 (1.018)	0.453 (3.017)***	-0.013 (-0.021)
DRM	0.220 (4.528)***	0.033 (0.562)	-0.238 (-4.475)***	0.002 (0.008)
TANG	-0.088 (-0.279)	0.062 (0.158)	1.891 (2.311)**	-0.882 (-0.329)
LOSS	0.450 (1.927)*	1.386 (3.225)***	-4.114 (-6.170)***	-5.084 (-1.997)**
LEV	-0.044 (-0.576)	-0.266 (-1.424)	-0.318 (-0.977)	-1.476 (-2.170)**
AR(1)	(0.17)	0.9462	0.023	0.807
AR(2)	NA	0.9840	0.532	0.941
J-Stat			0.523	0.611
R2	0.072		0.157	0.158
Adj R^2	0.032		0.129	0.123
F-Stat	1.822 (0.066)*		5.622 (0.000)	4.499 (0.000)

Source: Researchers' Computation Using E-Views 9 (2024)

5. Conclusion

Prior studies have shown that firms that engage in tax avoidance are exposed to reputational damage and loss of legitimacy from society (Cragg, 2002; Graham et al., 2014). Environmental disclosure can serve as a means of mitigating this reputational damage and loss of legitimacy attributed to tax avoidance behavior. We find that firms disclosing environmental information are less likely to engage in tax avoidance, suggesting that environmental disclosure will serve as a legitimating tool for avoiding a firm's engagement in unethical behavior such as tax avoidance. Secondly, tax avoidance is found to be significantly and positively affected by environmental disclosure when moderated by external audit firm type. The study shows a great influence of environmental disclosure.

The study contributes to the literature in four ways. First, it investigates the effect of environmental disclosure on the tax avoidance of listed manufacturing firms in Nigeria. Second, the study emphasizes the significance of environmental disclosure by finding that ED has a significant effect on tax avoidance. Third, it investigates the understudied effect of environmental disclosure on tax avoidance by moderating for external audit type. Fourth, this study extends the legitimacy theory by establishing the significance of environmental disclosure in Nigerian context. The finding shows the importance of environmental disclosure in addressing managerial inclination in using environmental disclosure to perpetrate and mask unethical behavior, such as tax avoidance, through environmental and social sustainability practices that address unethical behavior. Lastly, by linking environmental disclosure with tax avoidance, the study offers lots of advantages to organizations seeking to improve their environmental disclosure to gain societal acceptance.

The outcome of this study has important implications for managers in improving environmental disclosure to improve firms' legitimacy. The findings provided by the study can be used to enhance environmental and social sustainability by improving the quality of environmental disclosure for improved corporate tax compliance. Therefore, firms are encouraged to recognize the importance of environmental disclosure as a sustainability tool in ensuring that the concern for environment is given priority in companies' strategies and policies. More importantly, the environmental disclosure should be used as a legitimising tool rather than as a green-washing tool for engaging in unethical practices.

This study emphasizes the importance of integrating environmental disclosure, external audit and tax avoidance to enhance firm legitimacy and sustainability. Specifically, implementing policies that promote environmentally sustainable practices, environmental disclosure, encourage external audit quality and reduce tax avoidance behavior can drive firm sustainability, legitimacy and improve the welfare of society through tax compliance. This policy intervention can help inculcate a culture of environmental concern and disclosure of its information, and also help in ensuring corporate tax compliance behavior among firms, leading to a lasting positive effect on the environment and society.

Based on the outcomes of the study, several suggestions were put forward. First, the government can pass regulations to ensure rigor in the volume and quality of environmental disclosure to foster tax compliance. This can be achieved by developing a reporting framework for all listed entities to ensure uniformity. Second, companies can enhance environmental transparency and accountability by frequently reporting on their environmental endeavours. This will help the firm gain legitimacy. Third, more academic publications and industry collaborations should be encouraged in the area of the moderating effect of external audit firm type on the relationship between environmental disclosure and tax avoidance.

Lastly, companies should provide training programmes for their directors, managers and employees on environmental-related activities. This will ensure that every stakeholder within the company is aware of their responsibility regarding environmental responsibility and disclosure.

Despite the contributions of the study, it has its limitations. First, the fact that the study only focused on manufacturing firms of Nigeria implies that the findings of the study cannot be generalized to other sectors of the Nigerian economy and other countries. This is because Nigerian economy, just like that of Organisation of Islamic Countries (OIC) Member countries is characterized by extreme poverty and other economic and social menaces (Asadullah & Mansor, 2021; COMCEC 2018). Second, the sample size of the study may have been insufficient, which could affect the statistical power in drawing meaningful conclusions. Lastly, the timeframe of the study could also pose a significant shortfall, as environmental disclosure indexes are not static. These shortcomings should be taken into consideration while interpreting the results of the findings and making generalisations based on the findings.

Future studies can overcome these challenges by conducting comparative studies on the financial and non-financial sectors of Nigeria. Future studies can also extend this study by focusing on other African countries with similar institutional, legal, economic and political settings to Nigeria. Future studies can consider the introduction of other control variables such as firm size, environmental committee and family ownership that can serve as potential moderators in the relationship between environmental disclosure and tax avoidance.

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