The moderating effect of Firm Size on Tax Saving and Investment Expenditure in Nigeria

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Abstract

This study examines how taxation and firm characteristics influence investment expenditure. It differs from previous taxation-led investment expenditure narrative that probe whether taxation exerts a positive effect on investment expenditure. The empirical evidence is based on Pooled Ordinary Least Square regression techniques. The study engages data on 119 non-financial firms in Nigeria from 2010 to 2022. Results from the Pooled Ordinary Least Square show that: (1) tax savings exerts a positive effect on investment expenditure. (2) the interaction effect of tax savings and firm size is positive however not significant. This implies that tax savings raises investment expenditure. Also, that expansion in firm size raises the impact of tax savings on investment expenditure. This is on the grounds that managers lessens taxable income to raise investment expenditure. Based on the findings, the following recommendations are made for non-financial firms in Nigeria: (1) concentrate on the increase in total asset to increase their total investment expenditure which will increase profitability. (2) tax authorities should initiate an organized and flexible tax system to avoid negative tax savings from non-financial firms.

1 Introduction

Corporate investment is the designation of cash in the assumption for some advantage in what was in store known as return. Helpman, Melitz and Yeaple (2004) ‘expressed a few thought processes on why and how firms connect on investment are trade tensions, benefit of practicing corporate control, net worth maximization, etc. Investment is gear towards firms' development, abundance development and occupation creation. One of the unsettled inquiry in financial matters is the degree at which corporate tax saving and firm size influence corporate investment (Moon, 2019)’. The review re-stressed that a common discussion on what degree tax savings would invigorate corporate investment expenditure. Federici1 and Parisi1 (2015) ‘detailed that corporate investment expenditure is one of the primary drivers of the economy and what tax collection mean for corporate investment expenditure of firms is an issue of significance. They detailed that tax assessment meaningfully affects company's speculation choices. Corporate taxation encroach straightforwardly on the impetus to aggregate capital and to carry out groundwork in numerous nations. Nigeria is among the country in West African that the impact of corporate tax on investment expenditure actually been classified at a developing stage’. Holland and Vann (1998) ‘obviously made sense of the two expansive corporate taxation drivers on investment expenditure choices. Firstly, investors emphasize on the benefit of tax incentives in form of tax savings of firms which increase investments and give rise and bring about local turn of events; business creation; innovation move and product advancement. Secondly, investors emphasize on the unimportant form of tax savings in investment decision, they think about fundamental monetary and institutional circumstances like potential business sectors improvement; strategy position of legislatures and simple condition of the legitimate system. For this situation, tax savings benefits all alone can't conquer these unfriendly variables all alone’.

Tax savings implies decrease of duty responsibility through firms' expense strategies; which incorporates involving monetary instruments as a vehicle for charge advantage. In any case, it becomes authentic while working inside the substance of the law (tax avoidance) and untrustworthy when it sabotages the trustworthiness of the duty framework of tax system. It is what is happening near abusive tax avoidance, which is the 'thinking pessimistically' of tax aggressiveness. Corporate taxation is a type of abundance to government however tax savings rehearses involves moves of abundance from government to firm proprietors since it is a worth boosting action to investors. Investors esteem increments with corporate tax savings action with the board having two choices. First and foremost, is to pay investors the income from tax savings exercises. While furthermore, is to re-invest the income from tax savings exercises. Supervisors are abundantly worried about re-investment of the income from tax savings exercises to profit from additional motivators and maintainable development (like compensation increase). The degree to which managers uses this income from tax savings on investment expenditure becomes focal inquiry that necessities answer particularly Nigeria being greatest West Africa economy. 'The main aim of the study is to determine the moderating effects of firm size on tax savings and corporate investment in Nigeria, while the specific objectives are:

1. to determine the effect of the tax saving on corporate investment in Nigeria
2. to determine the effect of the effective tax rate on corporate investment in Nigeria
3. to find out the effect of the book tax gap on corporate investment in Nigeria
4. to ascertain the effect of the temporary tax difference on corporate investment in Nigeria
5. to ascertain the effect of the deferred taxation expense on corporate investment in Nigeria
6. to ascertain the interaction of tax savings and firm size on corporate investment in Nigeria'

To dissect the investment expenditure impact, we show how income from tax savings in Nigeria drives investment expenditure. Our exact methodology are (1) the sample contains 119 non- financial quoted companies on the Nigeria Exchange Group, (2) the attention is on the corporate investment expenditure that is, 2010-2022, and (3) empirical techniques - pooled ordinary least squares (POLS) are applied. The increase in value of shareholders investment from tax savings and the question of if retained back for reinvestment in the organization during these periods deem it an interesting phenomenon to be investigated. This study attempts to answer two questions: (1) Does tax saving significantly promote investment expenditure? (2) Is the interaction of tax saving and firm size significantly promote investment expenditure? The paper is organized as follows: The next two sections present a synthesis of theory and summary of evidence, in that order. This is followed in Section III variables, empirical model, and approach in particular. The paper's conclusions, offered in Section IV, are in the form of some proposed issues for research, motivated and discussion.

2 Literature review

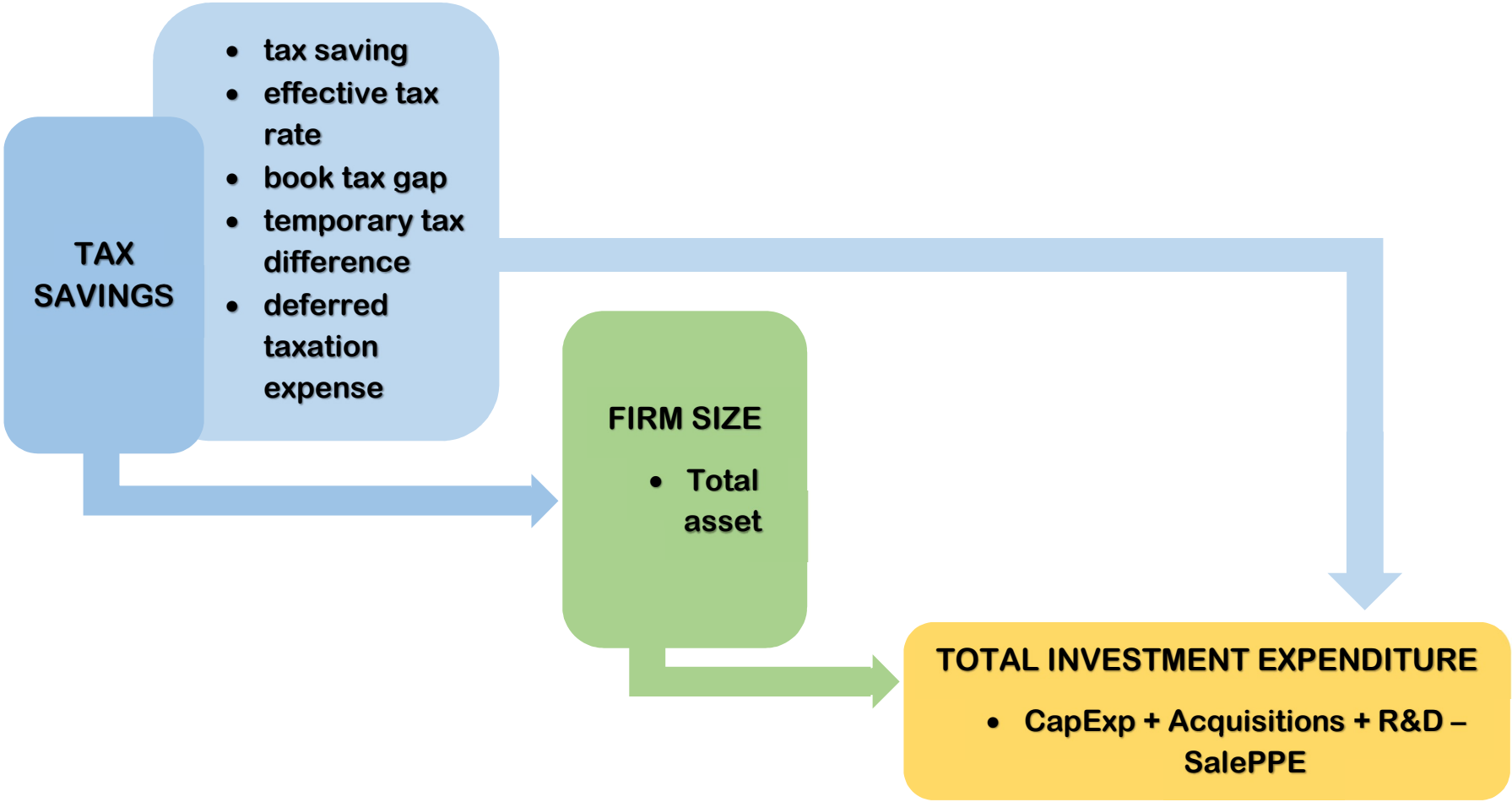
Different assessments on the effects of tax collection and corporate venture use have been finished with going against results, which is regularly attributable to the degree of study, changes in factors and econometric techniques embraced. An assessments take apart corporate venture practically identical to speculation likely entryways and speculation acknowledgment

to make reference to a couple. For instance, Beatty, Riffe, and Welch, (1997) 'uncovered pay from charge reserve funds on venture consumption of US firms going before 1985 as firms with high tax collection installments contribute not precisely with indistinguishable firms. They communicated that with Expense Change Demonstration of 1986 basically adjusted firms' venture direct because of pay from charge reserve funds understood. Firms exploit the venture tax reduction and the sped up deterioration plans (speculation use critical to stay aware of assets set up) in 1986. Their result found confirmation that the 1986 Assessment Change Act essentially influences the speculation consumption of firms in US'.

Seidman, (2010), Watrin et al (2012), Jarboui and Koubaa, (2017) Martinez (2015) 'zeroed in on book-charge hole contrasts without getting the effect of brief and extremely durable duty contrasts'. Muhtar, (2015) 'battled that overflow profit charges put speculation down'. Dhirendra, (2018), Bank Market, (2017) Gordon, (2015) Edame and Okoi, (2014) Musgrave, (1959). Brown, (1962) uncovered detailed positive effect of corporate tax collection on venture while Dacklay, (2015), Arnold, (2008), Clark, (1978), Kelvin, (2018), Becker et al, (2006) and Hakeen, (1966) declared antagonistic result of corporate duty on speculation. Chang et al, (2009) Zur, (2011) Harington, et al, (2010) Corporate Money Foundation, (2018) itemized that conceded charge resources is esteem pertinent, directing out that brief duty contrasts that leads toward conceded charge responsibility is critical. Anyway, Burges, et al (2012), World Stroke Affiliation, (2018), Lisowsky, (2009) and Ayers, (1998) point by point that limiting conceded resource risk is inversion, not connected with genuine assessment responsibility, no critical relationship existing between conceded charge cost and yearly returns. Osegbue et al. (2019) 'contemplated that powerful assessment rate, charge reserve funds, brief and extremely durable expense contrast are irrelevant while charge book hole are vital for profit the executives in Nigeria.

Richardson (2006) 'concentrated on over-speculation of free pay of US firms some place in the scope of 1988 and 2002 with 58,053 discernments. The fundamental point of convergence of the survey is on how much over-venture and the occupation of administration structures in directing over speculation. The outcome shows a beneficial outcome of free income on new investment expenditure. The study announced that larger part of free income is held as financial resources, since little proof show that free income is conveyed to external stakeholders, subsequently making the potential for held free income to be over- invested in the future. This expect income from tax savings increases new investment expenditure'. Kelvin, (2018), 'worked on impacts of retail stock on yearly tax assessments utilizing proof from arising economy and proof from New York. The study detailed that monitoring stock expenses lessens tax and assist with accomplishing a profit figure. The review detailed that monitoring stock expenses decreases charge which will assists one with showing up at a profit figure. The outcome demonstrates a positive huge impact of tax savings investment expenditure implying that organizations report least income to keep away from high expense' Serena, Thomas and Gaetan (2012) 'on obligation - value charge predisposition take a gander at the effect of private value firms and expense evasion on organization's portfolio as an additional wellspring of financial worth, taking wisdom of duty reserve funds, viable assessment rate, book charge hole as free factors on speculation use in Malian. They nitty gritty that obligation value funded firms pay lower charges as well as the reverse way around. Their result exhibits a positive enormous effect on charge reserve funds and speculation use, and that suggests that financial backers

Conceptual Framework



Source: Conceptualized by the Author

outside value supporting make good on higher expenses. Thusly, in this audit we propose to test the occupation of Nigeria data for the period 2010 to 2022'. The point is to check out at how the directing impacts of firm size on charge reserve funds and corporate interest in Nigeria. Taking everything into account, this study is one of the very concentrates on that focuses on that researches the directing effect of firm size on charge reserve funds and corporate interest in Nigeria"..

3. Methodology and Data

The number of inhabitants in the review contains 165 cited firms in Nigeria Stock Trade (Nigerian Stock Trade, 2023). While the example size comprises of 119 cited organizations barring monetary administrations firms because of their inclination of monetary detailing. The review involves information on 119 non-monetary firms in Nigeria from 2010 to 2022 with all factors obtained from the organizations distributed fiscal reports. The justification for 2010 monetary year is the endorsement of Public Assessment Strategy (NTP) in January 2010. The NTP looks to give rules, rules, essentials of assessment regulation and expense organization in Nigeria charge framework. As far as anyone is concerned, this study is one of the very concentrates on that investigates the impacts charge reserve funds and firm qualities on venture use to investigate this way of examination limited exclusively to information in Nigeria.

3.1 The indicators

In line with similar studies, 'the main variables are total investment (TI) which is the measures of investment expenditure; "tax saving (TaxS); effective tax rate (ETR); book tax gap (BTG); temporary tax difference (TDiff), deferred tax expenses (Dtaxex). For robustness, control variable firm size (TA) is included'.

Total investment 'captures all the sum of all outlays on capital expenditure, acquisitions, research and development less receipts from the sale of property, plant and equipment used by Richardson 2006; Armstrong, Blouin, & Larcker, 2012'.

$TI_t = CapExp_t + Acquisitions_t + R\&D_t – SalePPE_t$

Where TI_t = total investment in year t

$CapExp_t$ = 'capital expenditure (book value of property, plant and equipment plus depreciation and amortization expenses); $Acquisitions_t$ = acquisition of property, plant and equipment; $R\&D_t$ = research and development; $SalePPE_t$ = sale of property, plant and equipment'.

Tax saving is 'calculated as difference between the statutory tax rate and the effective tax rate (TaxSav = 30% - ETR)."Where a firm operates across a number of jurisdictions with varying statutory rates, tax rate differentials can provide a tax saving recognized in investment. (Ilaboya, Izevbekhai and Ohiokha, 2016; Ftouhi, Ayed and Zemzem, 2010; Kawor and Kportorgbi, 2014; Lisowsky, Lennox and Pittman, 2013; Atwood and Reynolds, 2008")'

Effective tax rate is 'computed as the total tax expenses divided by the income before tax, reflecting the aggregate proportion of the accounting income payable as taxes. It captures tax aggressiveness as it relates to accounting earnings. (Salihu et al., 2013; Chen et al., 2010; Dyreng et al., 2010)'.

Book tax gap is 'calculated as differences between income reported on financial statements and income reported on tax returns (i.e book income less taxable income) (BTG = EBIT – TI).

Taxable income is calculated as current tax expense divided by corporate statutory rate (30%). We used book tax gap to measure the abusive tax aggressiveness behaviour of sample- quoted firms. (Seidman, 2008; Talisman, 1999; Mills, Newberry and Trautman, 2002; Desai, 2003; Waluyo, 2016; Plesko, 2004 in Satyawati and Palupi, 2017)'.

Temporary tax difference is 'calculated as deferred tax expense divided by the corporate statutory rate (deferred tax / 30%). We used it to measure how temporary tax difference affects investment expenditure because of the nature of most methods used on firm's investment due to time difference that reverses in the near future. (Seidman, 2008)'.

Deferred tax expense is calculated as deferred tax expense

For the control variable, '*firm size* is total assets measured at the start of the year. We used Total assets as a control measure to firm size because firm size drives it investment expenditure. (Welch and Wessels 2000)'.

3.2 The model

There is a broad writing in financial matters and money that has inspected firm level investment decisions (e.g., Hubbard 1998 in Richardson 2006). Expected investment expenditure on new tasks will be a rising capability of amazing learning experiences. The basic build of useful learning experiences alludes to the current worth of the company's choices to make future investments (Myers, 1977 in Richardson 2006; Armstrong, Blouin, and Larcker 2012). Since investment expenditure is impacted by taxation, which often is determined by factors such as tax saving, effective tax rate, book tax gap, temporary tax difference, deferred taxation expense and firm size, there are motivations to assume in a positive impact between corporate tax savings and investment expenditure. The linear model which addresses the first question expresses investment expenditure as a function of tax savings, shown in Eq (1):

$$lnTI_{it} = \alpha_0 + \alpha_1 TaxS_{it} + \alpha_2 CETR_{it} + \alpha_3 lnBTG_{it} + \alpha_4 lnTdiff_{it} + \alpha_5 lnDtaxE_{it} + \alpha_6 lnTA_{it} + d_t + u_{it} \quad (1)$$

where, ln is natural logarithm; *TI* is total investment; *TaxS* is tax saving; *CETR* is effective tax rate; *BTG* is book tax gap; *TDIF* is temporary tax difference; *DTAXEX* is deferred tax expense; TA_{it} is the control variable (*TA* is total assets); *i* is the number of countries in the sample 1,2,. . .,*N*; *t* is the number of years 1,2,. . .,*T*; d_t captures the time trend included to control variations in the dependent variable; and u_{it} is the idiosyncratic error term that is independently and identically distributed (i.i.d).

To address the second question on whether *TA* (firm size) moderates the impact of *TaxS* on total investment expenditure, Eq (1) is augmented to include the interaction term and the moderation model is expressed in Eq (2):

$$lnTI_{it} = \alpha_0 + \alpha_1 TaxS_{it} + \alpha_2 CETR_{it} + \alpha_3 lnBTG_{it} + \alpha_4 lnTdiff_{it} + \alpha_5 lnDtaxE_{it} + \alpha_6 lnTA_{it} + \alpha_7 ln(TaxS * lnTA)_{it} + d_t + u_{it} \quad (2)$$

Importantly, the sign of the coefficient of the interaction term, α_7 gauges whether the interaction of firm size on tax savings increases or reduces total investment expenditure. A positive sign indicates that firm size intensifies the worsening impact of tax savings on total investment

expenditure and vice versa. Also, the statistical significance of α_7 is relevant in the computation of the net effect of *TaxS* on *TI*. If it is statistically significant, then it is factored into the calculation of the net effect but if insignificant, it implies that it is statistically *not* different from zero and the net effect of *TaxS on TI* equates to its unconditional marginal effect. The net effect of tax savings on total investment expenditure conditional on income is derived in Eq (3):

$$\frac{\partial lnTI}{\partial lnTaxS} = \alpha_1 + \alpha_7 lnTA \quad (3)$$

'Note, α_1 is expected to be positive. So, if $\alpha_7 > 0$ it implies that firm size enables the worsening effect of tax savings on total investment expenditure. But if $\alpha_7 < 0$, the net effects of tax savings will be contingent on the magnitude of the negative. Also, if the negative sign of α_7 outweighs the positive sign of α_1 then firm size improves the effects of tax savings on total investment expenditure. On the other hand, if the negative sign of α_7 is less than the positive sign of α_1 it indicates that the ameliorating effect of firm size is not sufficient to constrain the positive weight of tax savings on total investment expenditure. Finally, if $\alpha_7 = 0$ it suggests that the interaction of tax savings with firm size has no significant effect on total investment expenditure'.

3.3 Analytical approach

To logically expound the impact of tax savings and firm characteristics on total investment expenditure, the study adapts salient approaches explained chronologically. First, the analysis begins by observing the distinct properties of a variables (summary) and their correlated associations (correlated analysis). The study uses static models to systematically achieve the research objectives. These estimation approaches are suitable and have been used by similar studies (Bourguignon, 2004; Osegbue et al, 2021) in addition to using a short panel data of 119 companies (N) across 12 years (T), hence, N > T. Similarly, the adoption of these techniques serves as robustness for one another in order to observe the consistency of the relation among the variables of interest. The static models are the pooled ordinary least squares (POLS) across the panels. Column [1] tested for the pooled ordinary least squares (POLS) which do not allow for heterogeneities across the panels. Second column [2], the analysis added the control variable. Third column [3], the analysis added the interaction of the tax savings and total assets on total investment expenditure including the year dummies in other to take advantages heterogeneities across the panels to enhanced efficiency, greater degrees of freedom. Column [4], the analysis added the robust option to reduced incidence of multicollinearity among the variables. Lasted, column [5] engage industry dummies.

4 Analysis and interpretations

4.1 Correlation analysis and summary statistics

The upper panel of Table 2 contains the correlation matrix's results, illustrating the relationship between the regressors and the outcome variables. Our findings indicate a positive correlation between total investment and tax savings, implying that increase in total investment expenditure increases tax savings. However, effective tax rate is positively associated with total investment expenditure; and negatively associated with tax savings. Firm size have a positive relationship with total investment expenditure, effective tax rate, book tax gap, temporary tax

difference and deferred tax expense and tax savings. These findings suggest that increase in tax savings and firm size raises total investment expenditure.

Table 1. Pairwise correlation analysis and summary statistics.

	TI	TAXS	CETR	BTG	TDIF	DTAXEX	TA
TI	1.0000						
TAXS	0.0089	1.0000					
CETR	0.0070	-0.9996	1.0000				
BTG	0.0487	0.0047	-0.0038	1.0000			
TDIFF	0.0376	0.0034	-0.0029	0.6663	1.0000		
DTAXEX	0.0377	0.0034	-0.0029	0.6662	1.0000	1.0000	
TA	0.0320	0.0018	0.0042	0.3860	0.2364	0.2364	1.0000
Summary Statistics							
Observations	112	112	112	112	112	112	112
Mean	2.41	.1238	.1436	12481	7.04	2.11	244833.4
Std. Dev.	1.92	3.3922	3.3923	1.38	1.45	4.36	911899.8
Minimum	0	-40.7839	-90.8830	-3.65	-4.55	-1.37	0
Maximum	4.52	91.1830	41.0839	2.19	3.42	1.03	1.54

Note: *** p<0.01; ** p<0.05; * p<0.1
ln = Natural logarithm; TI = Total investment; TAXS = Tax saving; CETR = Effective tax rate; BTG = Book tax gap; TDIF = Temporary tax difference; DTAXEX = Deferred tax expense; TA = total assets
Source: Authors' Computation

The lower panel of Table 1 indicates the summary statistics for the variables from 2010 to 2022. The average of total investment expenditure was 24 billion, tax savings was 12% of statutory tax rate while effective tax rate was 14% respectively, from the entire sample. At the same time, the standard deviation provides information on the deviation from sample averages.

4.2 Discussion of Findings

Pooled OLS results

Results from Table 2 shows that tax savings is not statistically significant to total investment expenditure, but increase in tax savings raises total investment expenditure. However, total assets is statistically significant to total investment expenditure variable. The coefficient on the robustness option is 0.9175 which is significant at the 1% level suggesting that a percentage change in total assets leads to increase in total investment expenditure by 91 per cent. Given that *total investment* is a true indicator of investment expenditure. Thus, this validates the role that tax savings plays on corporate investment expenditure. Tax savings in this sense are major consideration in driving corporate investment expenditure in Nigeria. Therefore, corporate investment expenditure will increases in Nigeria as a result of an increase in corporate tax savings. The coefficient of tax book gap and temporary tax difference was positive and not statistically significant. This suggests that a percentage change in tax book gap and temporary tax difference results in boosting corporate investment expenditure by about 6 percent, on average, *ceteris paribus.* This outcome is expected as the effect of tax incentives increase corporate investment expenditure.

Table 2. Results (Dep Var: lnTI).

Variables	OLS Linear Models				
				Robust	
	[1]	[2]	[3]	[4]	[5]
taxs	0.0750	0.0528	1.9068	1.9068	1.5152
	(0.34)	(0.27)	(0.81)	(1.64)	(1.00)
cetr					
lnbtg	0.6235*	0.0800	0.1542	0.1542	0.0625
	(8.60)	(0.67)	(1.37)	(1.33)	(0.51)
lntdiff			0.0561	0.0561	0.0688
			(1.05)	(1.20)	(1.38)
lndtaxex	0.1081***	0.0819			
	(1.77)	(1.48)			
lnta		0.8549*	0.7728*	0.7728*	0.9175*
		(5.45)	(5.14)	(5.50)	(5.17)
taxs*lnta			0.1559	0.1559	0.1200
			(0.80)	(1.64)	(0.96)
Constant	5.0533*	2.4060*	-3610.349*	-3610.349*	-3586.157*
	(5.71)	(2.57)	(-3.61)	(-5.08)	(-4.94)
Time Effect	No	No	Yes	Yes	Yes
Industry effect	No	No	No	No	Yes
Observations	133	132	132	132	132
R-squared	0.5012	0.6003	0.6825	0.6825	0.7121
Adj. R^2	0.4891	0.5872	0.6491		
F-test (prob)	0.0000	0.0000	0.0000		0.0000

Absolute values of *t*-statistics are reported in parentheses below the coefficient estimates. Note: *** p<0.01; ** p<0.05; * p<0.1. ln = Natural logarithm; TI = Total investment; TAXS = Tax saving; CETR = Effective tax rate; BTG = Book tax gap; TDIF = Temporary tax difference; DTAXEX = Deferred tax expense; TA = total assets
Source: Authors' Computation

4.2.1 Summary of Findings

For the moderation models, columns [3, 4, 5] reveal that the interaction effect of tax savings and total assets is positive but not statistically significant. In other words, firm size increase the positive effect of tax savings on total investment expenditure. In the fifth column of Table 2, the net effect from the interaction between tax savings and firm size is 0.7921 ([0.1559 × 0.1238] + [0.7728]). In the computation, the mean value of tax savings is 0.1238, the unconditional effect of firm size is 0.7728 while the conditional impact from the interaction between Firm size and tax savings is 0.1559. In the light of the above, for either table, a positive net effect confirms the validation of the tested hypothesis, while a negative net effect implies that the investigated hypothesis is rejected. It is apparent from the tables that the tested hypotheses are valid/invalid contingent on Firm size and tax savings dynamics. These findings corroborate those of Osegbue et al (2021). On the model diagnostics, The R-squared which is 71.2% shows the variation in the outcome variable explained by the regressors. Lastly, the statistically significant F-statistic affirm that the regressors are jointly significant in explaining investment expenditure in sample.

5 Conclusion and Recommendations

This current study highlights the role of tax savings in influencing the effect of firm size on total investment expenditure. To the best of our knowledge, this study that critically evaluates the influence of tax savings and the firm size on the total investment expenditure nexus combining non-financial firms in Nigeria. This position differs from other tax savings and

investment expenditure studies that investigated the direct and linear effect of tax savings on investment expenditure. However, we expand the frontiers of knowledge having recognized that firm size is an important instruments for driving investment expenditure. To this end, this paper examines the moderating effect of tax savings (proxy for taxation) and firm size on investment expenditure from 2010 to 2022. From the sample, the findings revealed that tax savings boost total investment expenditure. On the interaction effect, the positive coefficient but statistically insignificant, it suggests that increase in firm size raises the effect of tax savings on total investment expenditure. Based on the findings, the following recommendations are made for non-financial firms in Nigeria: (1) Concentrate on the increase in total asset to increase their total investment expenditure which will increase profitability. (2) Tax authorities should initiate an organized and flexible tax system to avoid negative tax savings from non-financial firms. We leave this open for more constructive discussions on the issue of taxation on the firm size-investment expenditure in Nigeria for comparison.

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