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Do the Tax Shields affect Corporate Financing Decisions?

James A. Sarakiri (Ph.D)
Department of Accounting and Finance
McPherson University, KM 75 Lagos-Ibadan Expressway,
Seriki, Sotayo, Ogun State, Nigeria.
sarakirijames@gmail.com

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Abstract

This study investigates the debt and non-debt tax shields and their impact on capital structure of firms listed under the food and beverages sector of the Nigeria Stock Exchange. The empirical analysis is based on the differenced GMM framework which controls the potential endogeneity between capital structure and its determinants through instrumental variables while using ten (10) years panel data covering the period 2011 to 2020, Our results show that non-debt tax shield, measured by depreciation to total assets ratio, has no significant effect on debt-equity ratio as a proxy for capital structure. On the contrary, debt tax shield, measured by corporate income tax, has a highly significant but negative effect on capital structure. Hence, for listed firms in the Nigerian food and beverages industry, we do not find evidence that the relationship between tax shields and capital structure is governed by the trade-off theory. These results hold controlling for other firm-specific factors such as profitability, growth opportunities and firm size.

Key words*: Capital structure, non-debt tax shield, debt tax shield, D-GMM*

1. Introduction

The debate on optimal capital structure of a firm, which started with the highly influential work of Modigliani and Miller (1958), has continued to gain momentum in the corporate finance literature despite being a decade long issue. Although, several insights have so far been provided in both the theoretical and empirical literature, the main issue of concern: namely, whether optimal capital structure exist and if yes, what factors determine this optimal debt level has remained unresolved.

The trade-off theory is among the popular theories that recognizes the existence of optimal capital structure. The theory which supports moderate corporate borrowing, contends that corporate leverage can be influenced by debt-tax shield effect and value-maximizing firms can attain optimal capital structure by incorporating this tax shied effect in their leverage models (Myers, 1984, 2001). This implies a positive relationship between debt tax shield and corporate leverage. But DeAngelo and Masulis (1980) show that non-debt tax shield such as depreciation, amortization, Research and Development can also affect corporate debt level in a significant way. Specifically, they argue that an increase in non-debt tax shield would

significantly reduce corporate debt to equity ratio. Their argument, therefore, implies a negative relationship between non-debt tax shield and corporate leverage.

Though the empirical relationship between non-debt tax shield and corporate leverage has been well investigated, the literature on its impact on financial leverage is scanty, particularly in Nigeria. Furthermore, previous studies in this line of research reported mixed findings. For example, Ahmad and Etudaiye-Muhtar (2017), Benson et al. (2013), Gao (2016), Goh et al. (2018), Lei (2020), Nasution at el. (2017) and Ur Rehman et al. (2017) all reported a negative relationship between non-debt tax shield and financial leverage. On the contrary, the findings by Dakua (2019), Hossain and Ali (2012), and Shah and Khan (2017) show a positive relationship between non-debt tax shield and financial leverage. Then some very recent studies such as Lamichhane (2020), Eze and Uzochukwu (2020) find that non-debt tax shield has no significant effect on financial leverage.

Therefore, this study as set out, is to provide more empirical insight on the determinants of capital structure by examining the impact of both non-debt and debt tax shields on financial leverage in the Nigerian food and beverages industry using the differenced GMM (D-GMM) framework. The study is significant in two distinct ways. First, it considers the relative impacts of non-debt and debt tax shields on financial leverage which is a significant contribution to knowledge as no recent empirical study in Nigeria considers both dimensions of tax shields in a single empirical framework, to the best of our knowledge. Secondly, our analysis covers the period from 2011 to 2020, hence the present study is the most recent attempt to validate the trade-off theory in the context of tax shield effects on capital structure using up-to-date data obtained from listed firms in the Nigerian food and beverages industry.

The remainder of this study is structured as follows. Section 2 reviews the extant literature on capital structure and its determinants to an extent. Sections 3 and 4 contain the methodology and empirical analysis respectively while the study is concluded in section 5.

2 Literature Review

Studies in Other Countries

Hossain and Ali (2012) show among other things that non-debt tax shield, measured by depreciation to total assets ratio, has a large positive and highly statistically significant impact on financial leverage, measured by total debt to total assets ratio. Focusing on companies listed on Dhaka stock exchange and based on panel data collected from 39 listed companies from 2003 to 2007, the fixed effect model is employed to estimate the impact of non-debt tax shield and other firm-specific factors on financial leverage.

Dwenger and Steiner (2014) in using the OLS and instrumental variable regression methods to estimate the impact of corporate effective profit taxation on capital structure for German firms from 1998 to 2001 find that there is a relatively large positive and statistically significant effect of effective tax rate on financial leverage.

Focusing on A-share Chinese companies across 12 industries from 2008 to 2013, Gao (2016) considers whether non-debt tax shield directly affects corporate debt level. Based on multiple regression analysis, they find that corporate debt level, measured by debt to assets ratio, has a negative, significant and robust relationship with non-debt tax shield, measured by the ratio of sum of depreciation, amortization and R&D to total assets. This finding is, however, based on

a model that includes other firm-specific variables such as size, collateral value of assets, firm growth, property right, board size, company age, year and industry dummies as control factors.

Ur Rehman et al. (2017) use multiple GMM models to examine the adjustment behaviours of Chinese firms towards optimal capital structure as well as the determinants of financial leverage policy. Using a large panel dataset comprising 760 firms that are observed from 2001 to 2013, they find that Chinese firms generally behave in a way that is consistent with the trade-off theory in determining their target capital structure. Specifically, their findings indicate among other things, that corporate tax rate has a significant and positive effect on financial leverage while the relationship between non-debt tax shield and financial leverage is significantly negative.

Shah and Khan (2017) seek to uncover the main factors determining the capital structure of non-financial firms in Pakistan using the fixed effects model. Their analysis focuses on non-financial companies that are listed in the Pakistani stock exchange from 2005 to 2014. Based on a panel sample comprising 10 listed firms, they find, among other things that debt equity ratio is a negative function of profitability, while it has a positive relationship with non-debt tax shield.

Nasution at el. (2017) examines the effects of non-debt tax shields and other firm-specific factors on capital structure of manufacturing firms in Indonesia using the multiple linear regression analysis. Their empirical evidence shows that profitability and non-debt-tax shield have negative and highly significant effects on capital structure, while the effects of corporate tax and tangibility are positive and significant at 1% and 10% levels respectively. This evidence is based on a sample of 49 nonfinancial firms across different sectors and panel data covering financial years spanning 2000/01 to 2017/18 with a model that incorporates inflation as a control factor.

Goh et al. (2018) investigate the factors that determine the capital structure of Malaysian manufacturing companies from 2011 to 2014. Their empirical analysis involves 174 listed firms and is based on fixed effects regression model. The reported findings indicate that financial leverage is a negative function of non-debt tax shield and profitability. Their findings also indicate that other firm-specific variables such as firm size, corporate governance, ownership concentration and liquidity have no significant effect on corporate leverage.

Dakua (2019) employs the multiple regression framework to examine the firm-specific determinants of capital structure focusing on Indian steel industry. Based on panel data collected from 42 steel companies spanning from 2010 to 2017, their findings indicate no evidence of significant relationship between non-debt tax shield, measured by depreciation to total assets ratio and financial leverage. However, the coefficient linking these variables is estimated with a positive sign, which is not consistent with the trade-off theory. They also find that profitability, risk and growth opportunity have significant impact on financial leverage, while firm size, asset structure and liquidity have no significant impact on financial leverage.

Lamichhane (2020) examines the impact of firm-specific factors on corporate financial leverage using data collected from Nepalese nonfinancial firms from 2000/01 to 2017/18 across different sectors. Based on multiple regression analysis, the study finds that non-debt tax shield is not among significant determinants of financial leverage, although, as predicted by the trade-off theory, it has a negative correlation with different leverage ratios.

Lei (2020) examines the impact of corporate income tax shield on corporate leverage using data comprising 224 listed Chinese companies from 2002 to 2017. Their empirical analysis is based on static random effect model that incorporates other firm-specific determinants of corporate leverage (firm size, asset structure, profitability, growth, cash flow, liquidity and bankruptcy risk) as control variables. They find that corporate leverage, measured by debt to assets ratio, is a positive function of debt-tax shield, while it is negatively related to non-debt tax shield. They also find that industry effects significantly affect the relationship between corporate tax shields and corporate leverage.

Friedwald et al. (2020) expands the evidence on capital structure to maturity structure of debts which affects equity returns using cross sectional data. Short term debt is associated with positive premium but more exposure to systematic risk with a key contribution that leverage effects significantly account for the maturity structure of debt which significantly explains the equity returns. Consequently, there is an implication on sustained use of debt for higher tax shield. These findings violate the M & M conversation of risk principle and the effect on capital structure.

Studies Focusing in Nigeria

Focusing on large non-financial firms, Salawu and Agboola (2008) examine the impact of non-debt tax shield on capital structure in Nigeria using conventional panel data models that incorporate other firm-specific factors as control variables. Their analysis which is based on data collected from 33 large non-financial firms in terms of market capitalization between 1990 and 2004 shows that non-debt tax shield, measured by depreciation to total asset ratio, tends to move in opposite direction with financial leverage. The analysis also shows that profitability and long-term debt are positively related, thereby proved to be largely consistent with the trade-off theory.

Benson et al. (2013) employ the multiple regression method to analyze the relationship between capital structure and its determinants in Nigeria. Their analysis is based on 14 listed manufacturing companies from 2005 to 2010. The findings show among other things, that non-debt tax shield has a highly significant negative impact on long-term debt ratio.

Focusing on the Nigerian banking sector, Aremu et al. (2013) employ the pooled regression method to estimate the impact of corporate taxation and other firm-specific variables on corporate leverage using data obtained from five deposit money banks between 2006 and 2010. They find a highly significant negative relationship between corporate taxation and financial leverage. Their results also indicate that profitability, risk tangibility and growth all exhibit negative and highly significant effects on financial leverage while the effects of firm size and dividend payment are positive and highly significant.

Toby and Sarakiri (2021) validate Sarakiri (2020) that the tax relief from corporate borrowing is a strong determinant of value maximization among listed firms in the Nigeria Stock Exchange. With the Eviews application in the empirical analysis, there is strong evidence that the M and M (1963) framework determines corporate financing choices in line with major variations in market value of shares which is significantly explained by changes in corporate income tax.

Ahmad and Etudaiye-Muhtar (2017) use the system panel GMM estimation framework to investigate the dynamic adjustment to target leverage ratio as well as the determinants of capital structure in nonfinancial firms in Nigeria. Their sample includes 369 firm-year unbalanced panel observations obtained from 59 firms across different sectors (excluding the financial sector) covering from 2003 to 2012. Their results show that one period lagged values of both short-term and long-term debt ratios exhibit positive and significant effects on their current levels. Again, non-debt tax shield, profitability and growth opportunities, all exhibit significantly negative effects on both long-term debt and total debt ratios. On the contrary, debt ratios respond significantly but positively to changes in asset tangibility and firm size. These results hold controlling for both inflation and GDP.

Eze and Uzochukwu (2020) examine the relationship between corporate tax shield and financial leverage in Nigeria using static panel data models. They investigate the effects of both debt and non-debt tax shields on both short-term and long-term debt ratios, controlling for firm size and trade credit using data collected from 35 non-financial firms from 2015 to 2019. Based on random effect model, they find among other things, that the tax shield effects on both long-term and short-term debt ratios are not significant.

3 Methodology

3.1 Empirical Framework

In this study, we employ the dynamic panel data framework to examine the relative impacts of non-debt and debt tax shields on capital structure in the Nigerian food and beverages industry. Based on the argument by DeAngelo and Masulis (1980) that corporate leverage depends on both debt tax shield and non-debt tax shield. However, in line with the position of Downs (1993) that any empirical analysis between corporate debt ratios and non-debt tax shield should incorporate other firm-specific determinants of capital structure to avoid the problem of omitted variable bias, we specify our dynamic panel regression model as follows:

$$DER_{it} = \alpha + \theta_i + \beta_1 DER_{it-1} + \beta_2 DEPR_{it} + \psi_1 CIT_{it} + \psi_2 ROA_{it} + \psi_3 PER_{it} + \psi_4 LTA_{it} + \epsilon_{it} \quad (1)$$

$$\Delta DER_{it} = \beta_1 \Delta DER_{it-1} + \beta_2 \Delta DEPR_{it} + \psi_1 \Delta CIT_{it} + \psi_2 \Delta ROA_{it} + \psi_3 \Delta PER_{it} + \psi_4 \Delta LTA_{it} + \Delta\epsilon_{it} \quad (2)$$

The model at (1) assumes that capital structure depends on its previous level as well as both non-debt and debt tax shields while controlling for profitability, growth opportunities and firm size. The model also incorporates θ_i, which represents cross-sectional heterogeneity or unobserved company-specific effects such as management philosophy and organizational culture. However, consistent with our main objective and following Arellano and Bond (1991), we remove this heterogeneity parameter by specifying the D-GMM model at (2). The implication of this approach is that instrumental variables are required to control the potential endogeneity bias resulting from the correlation between ΔDER_{it-1} and $\Delta\epsilon_{it}$. To this end, we use the lagged values of DER from the second period as instrumental variables. However, consistent with previous studies, the plausibility of these instruments would be confirmed based on the Sargan's test of overidentifying restrictions or the J-statistic.

Our main variables are hereby defined as follows:

Dependent Variable

Capital Structure: This is the dependent variable and is measured in terms of the ratio of non-current liabilities to total equity (DER). Higher value of this ratio indicates higher financial leverage and by implication a step towards optimal capital structure.

Explanatory Variables

Non-Debt Tax Shield: This is measured by the ratio of depreciation to total assets (DEPR). According to DeAngelo and Masulis (1980), firms with large non-debt tax shield have the tendency to use less debt. Hence, we expect a negative relationship between non-debt tax shield and debt to equity ratio.

Debt Tax Shield: This is proxied by company income tax (CIT). Higher corporate income tax signifies higher tendency to rely on debt financing since tax paying firms prefer using debts over equity due to interest tax shield effect (Barclay et al., 1995; MacKie-Mason, 1990; Myers, 2001; Salawu & Agboola, 2008). Hence, consistent with the trade-off theory, we expect a positive relationship between debt tax shield and debt to equity ratio (Barclay et al., 1995; Myers, 1984, 2001).

Other Determinants of Capital Structure

Profitability: We measure profitability in terms of returns on assets (ROA), which is the ratio of profit after tax to total assets. Higher ratio indicates higher profitability. However, there are mixed views regarding the impact of profitability on debt-equity ratio. On the one hand, the trade-off theory implies that firm profitability and leverage move in similar direction as more profitable firms have the incentive to issue more debt since they have more taxable income to shield and lower bankruptcy risks (Myers. 2001). Hence, the theory predicts a positive relationship between profitability and capital structure. On the other hand, the pecking order theory implies that higher profitability is associated with lower financial leverage. Since, profits are almost the only source of internal equity, which in turn is the cheapest source of capital, firms that are more profitable tend to use less debt (Myers, 2001; Shah & Khan, 2017).

Growth Opportunities: This is measured by price-earnings ratio (PER), which is the ratio of market value per share to earnings per share (Kuzucu, 2015). Higher value of this ratio indicates higher growth opportunities. The trade-off theory implies that leverage is a negative function of growth opportunities (Gul,1999); firms with higher growth opportunities are less profitable and are more likely to use less debt owing to high bankruptcy risk.

Firm Size: This variable is measured in terms of natural logarithm of total assets (LTA). The trade-off theory implies that firm size and corporate leverage move in similar direction as larger firms issue more debt to maximize the tax benefits of debt since they have lower direct bankruptcy costs (Benson et al., 2013; Salawu & Agboola, 2008; Shah & Khan, 2017).

3.2 Data and Sample

Our dataset comprises 110 firm-year panel observations on 11 food and beverages firms that are listed in the Nigerian stock exchange over the period from 2011 to 2020. However, the dataset contains some missing date observations. The companies selected are CADBURY, CHAMPIONS BREWERIES, DANGOTE SUGAR, FLOUR MILLS, GUINNESS, MCNICHOLS, NASCON, NESTLE, NIGERIAN BREWERIES, PZ and UNILEVER. The data were sourced from two sources: namely, www.cashcrat.com and the financial/annual reports of the individual firms. EViews is employed to aid data analysis.

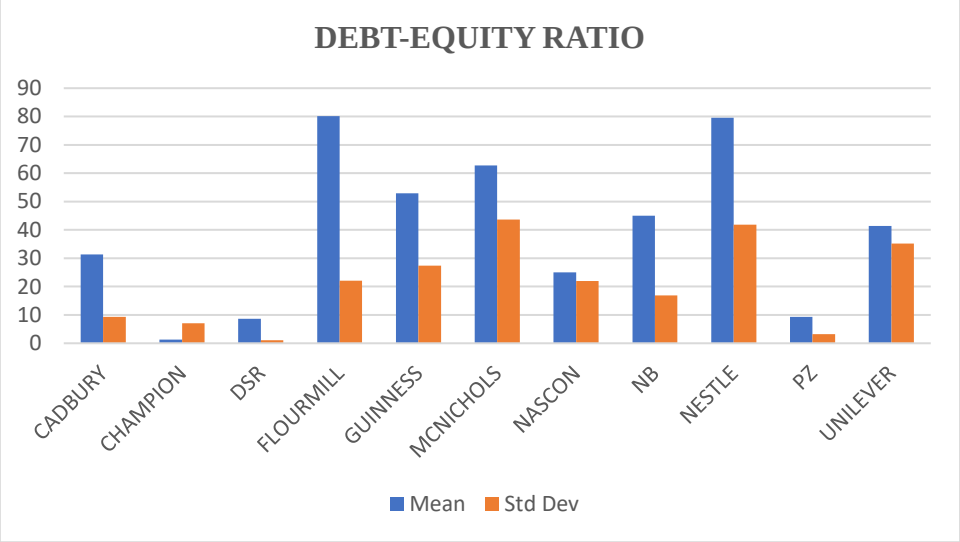

Figure 1: Debt-Equity Ratio for Listed Food and Beverages Firms in Nigeria

Figure 1 shows the debt-equity ratio for the selected food and beverages firms that are listed in the Nigerian stock exchange. We can see that debt-equity ratio varies considerably across firms, with CHAMPION, DANGOTE SUGAR and PZ having the lowest ratios. These companies are largely unlevered as the proportion of debt in their capital structure is infinitesimal. However, FLOURMILL has the highest debt-equity ratio, followed by NESTLE, then by MCNICHOLS and GUINNESS respectively.

Table 1: Descriptive Statistics of the Pooled Data

Variables	$\bar{x}$	σ	CV	$SKEW$	$KURT$	$JB(p\text{-value})$
DER	39.75	35.78	90.01	1.06	3.81	0.0000
DTA	4.55	2.54	55.82	0.24	2.61	0.4143
CIT	3952348	5660204	143.21	1.79	5.58	0.0000
ROA	8.41	7.48	88.94	0.49	2.65	0.0787

PER	21.83	36.25	166.06	4.13	34.41	0.0000
TA	1.19E+08	1.24E+08	104.20	1.25	3.58	0.0000

Table 1 provides the statistical description of the pooled data. As shown by the coefficient of variation, although the variables all recorded high variability over time, volatility is highest for PER, followed by CIT, while it is lowest for DTA. The positive skewness coefficients show that all the variables have a positively skewed distribution, while the coefficient of kurtosis shows that most of the variables, except DTA and ROA, have a fat-tailed distribution. Both DTA and ROA have a distribution that is flatter than normal distribution. The JB statistic is significant for all variables, except DTA, hence rejecting the hypothesis that the data are normally distributed. This evidence implies that our variables require log-transformation for reliable and dependable empirical analysis.

Table 2: Correlation Matrix

Variables	DER	DTA	CIT	ROA	PER	TA
LDER	1.000					
LDTA	0.130	1.000				
LCIT	-0.009	-0.179	1.000			
LROA	0.030	-0.172	0.575	1.000		
LPER	-0.129	0.004	0.723	0.207	1.000	
LTA	0.082	-0.119	-0.119	0.917	0.742	1.0000

Table 2 reports the correlation matrix for the study variables. As seen from this Table, although the debt-equity ratio moves in similar direction with non-debt tax shield (DTA), profitability and firm size, it moves in opposite direction with corporate income tax and price-earnings ratio. However, the correlation between debt-equity ratio and its determinants is generally low. Also, we observe a negative correlation between corporate income tax and non-debt tax shield which is consistent with the theoretical view that the potential tax benefits of debt can be reduced or hindered by non-debt tax shield (Ur Rehman et al., 2017).

4 Results and Discussion

Table 3 shows the D-GMM results for the determinants of capital structure in the Nigerian food and beverages industry. The estimated model has an instrument rank of 11 which is greater than the number of endogenous variables in our model. However, the J-statistic is not statistically significant, hence it fails to reject the null hypothesis of overidentifying restrictions. This implies that the selected instruments are all valid. Also, the Arellano-Bond's first order serial correlation statistic AR(1) has the expected negative sign, while the second order statistic (2) is not statistically significant, which is also expected. Hence, the estimated

errors are not serially correlated. These diagnostic tests, therefore, show that our D-GMM model has no specification problem.

Table 3: D-GMM results; DV = DER

Variable	Coefficient	P-value
LDER(-1)	0.1886	0.2920
LDTA	-0.1743	0.7762
LCIT	-0.5742***	0.0000
LROA	0.1330	0.6347
LPER	-0.0895	0.3082
LTA	-0.2190	0.5212
Instrument Rank	11	–
J-statistic	3.3086	0.6525
AR(1)	-0.0643	0.9487
AR(2)	1.3468	0.1780

*****indicates highly statistically significant**

Persistence in Capital Structure

We examine whether financial leverage exhibits persistence by incorporating the lagged dependent variable in our model. From the results, the coefficient on lagged debt-equity ratio is positive but its attached probability is much higher than the conventional significant levels, indicating that debt-equity ratio is not significantly related to its previous level. This implies that the relationship between financial leverage and its determinants is not a dynamic process. Hence, for listed food and beverages companies in Nigeria, financial leverage is not persistent and cannot be predicted based on its previous value. This finding therefore contradicts Ahmad and Etudaiye-Muhtar (2017) that interpreted the lagged debt ratio as the dynamic adjustment parameter and whose empirical evidence confirms the presence of dynamic adjustment in the capital structure model. However, this contradiction can be attributed to the differences in the sample and methodological frameworks. For example, our analysis focuses only on listed food and beverages firms and is based on Differenced GMM framework, while Ahmad and Etudaiye-Muhtar (2017) employ the system GMM approach and focuses on listed nonfinancial firms across different industries.

Non-Debt Tax Shield and Capital Structure

Our first and main objective is to examine the extent to which non-debt tax shield, measured by the ratio of depreciation to total assets, affect financial leverage. The trade-off theory implies a negative relationship between non-debt tax shield and financial leverage. From Table 3, the coefficient on DTA has an estimated value of -0.1743 and a p-value of 0.7762, indicating that the relationship between non-debt tax shield and debt-equity ratio is negative but not statistically significant. The estimated coefficient, which seems not to be significant in economic sense given its small size, implies that a 1% increase in depreciation expense relative

to total assets, holding other factors constant, would be followed by only about 0.17% decrease in debt-equity ratio and vice versa. Hence, our evidence shows that non-debt tax shield has no significant explanatory power for the observed cross-sectional variation in debt-equity ratio, although the negative sign associated with the estimated relationship between these variables tend to agree with DeAngelo and Masulis (1980) as well as the trade-off theory. This finding contradicts several previous studies including Ahmad and Etudaiye-Muhtar (2017), Benson et al. (2013), Gao (2016), Hossain and Ali (2012) and Shah and Khan (2017). These studies all reported a significant relationship between non-debt tax shield and corporate financial leverage. On the contrary, our finding largely agrees with Dakua (2019), Eze and Uzochukwu (2020) and Lamichhane (2020). These studies find that non-debt tax shield and capital structure are not significantly related.

Corporate Income Tax and Capital Structure

We also investigate the impact of debt-tax shield proxied by corporate income tax on financial leverage. As stated previously, the trade-off theory implies a positive relationship between corporate income tax and financial leverage. However, our analysis shows that corporate income tax has a negative relationship with financial leverage. From Table 3, the coefficient on CIT has an estimated value of -0.5742 and a probability value of 0.0000, indicating that the negative effect of corporate income tax on debt-equity ratio is highly statistically significant. The estimated coefficient is also significant in economic sense given that its size is relatively large. It implies that *ceteris paribus*, a 1% increase in corporate income tax would, on average, be followed by approximately 0.57% decrease in debt-equity ratio. Hence contrary to the trade-off theory, our analysis provides evidence that debt-tax shield does not give corporate managers the incentive to increase financial leverage. In other words, there is no evidence suggesting that corporate managers heavily rely on debt for tax purposes, which may be due to fear of bankruptcy and financial distress costs associated with debt financing. Our finding, therefore, contradicts MacKie-Mason (1990), Dwenger and Steiner (2014), Nasution at el. (2017) and Ur Rehman et al. (2017). On the contrary, our finding tends to be consistent with Aremu et al. (2013).

Profitability and Capital Structure

We examine the impact of profitability on financial leverage with profitability being measured by returns on assets. The trade-off theory suggests a positive relationship between profitability and financial leverage, while the pecking order theory predicts a negative profitability-leverage relationship. From Table 3, we can see that the coefficient on LROA is estimated at 0.1330 with a p-value of 0.6347, indicating that the relationship between profitability and financial leverage is positive but not statistically significant. This implies that although profitability and leverage comove in the direction that is consistent with the trade-off theory, our evidence does not indicate any significant interaction between the two variables. This finding, which largely disagrees with the pecking order theory, tends to agree with Salawu and Agboola (2008) but disagrees with Ahmad and Etudaiye-Muhtar (2017), Aremu et al. (2013), Dakua (2019) and Goh et al. (2018) as well as Shah and Khan (2017).

Growth Opportunities and Capital Structure

We also consider the effect of growth opportunities (measured by price-earnings ratio) on financial leverage. As stated previously, the trade-off theory implies that leverage is a negative function of growth opportunities (Gul,1999). From Table 3, the coefficient on LPER has an estimated value of -0.0895 and a high p-value at 0.3082 indicating that the effect of growth opportunities on debt-equity ratio is negative but not statistically significant. Hence, for listed food and beverages firms in Nigeria, although, the relationship between growth opportunities and financial leverage is consistent with the trade-off theory, there is no evidence suggesting that managers significantly reduce their debt ratios when faced with higher growth opportunities. This finding seems to contradict Aremu et al. (2013) who find that growth is one of the major determinants of financial leverage in the banking sector.

Firm Size and Capital Structure

Finally, we analyze the impact of firm size, measured by natural logarithm of total assets. The trade-off theory implies that firm size and corporate leverage are positively related firms. From Table 3, the coefficient on LTA has an estimated value of -0.2190 and a p-value of 0.5212, indicating that firm size has a negative but not significant relationship with debt-equity ratio. Hence, the view that larger firms tend to issue more debt to maximize the tax benefits of debt since they have lower direct bankruptcy costs compared to smaller firms does not hold for listed firms in the food and beverages sector. This finding agrees with Dakua (2019) and Goh et al. (2018) but contradicts Ahmad and Etudaiye-Muhtar (2017) and Aremu et al. (2013).

5 Concluding Remarks

This study provides empirical evidence on the effect of both debt and non-debt tax shields on capital structure using firm-level panel data obtained from 11 listed food and beverages firms in Nigeria from 2011 to 2020. The empirical analysis is based on the dynamic panel differenced GMM framework which controls the potential endogeneity between financial leverage and its determinants through instrumental variables.

We find that capital structure, measured by debt-equity ratio, is not persistent and does not depend on its previous level. We also find that non-debt tax shield, measured by depreciation to total assets ratio, has a negative but not significant effect on debt-equity ratio. On the contrary, debt tax shield, measured by corporate income tax, has a negative and highly significant effect on debt-equity ratio. This implies that corporate managers do not adjust their debt-equity ratios for tax purposes, which can be explained by fear of bankruptcy and financial distress costs. Hence, for listed firms in the Nigerian food and beverages industry, there is no evidence suggesting that the relationship between capital structure and the tax shields are governed by both static and dynamic trade-off theories. Further, our results indicate that profitability, growth opportunities and firm size are all not significant determinants of capital structure.

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Appendices

Dependent Variable: LDER
Method: Panel Generalized Method of Moments
Transformation: First Differences
Date: 09/24/21 Time: 00:56
Sample (adjusted): 2013 2020
Periods included: 8
Cross-sections included: 11
Total panel (unbalanced) observations: 74
White period instrument weighting matrix
White period standard errors & covariance (d.f. corrected)
Instrument specification: @DYN(LDER,-2,2)
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LDER(-1)	0.188653	0.177659	1.061879	0.2920
LNDTS1	-0.174303	0.610783	-0.285376	0.7762
LTAX	-0.574213	0.130496	-4.400216	0.0000
LROA	0.133096	0.278869	0.477272	0.6347
LPER	-0.089520	0.087185	-1.026793	0.3082
LTA	-0.219007	0.339603	-0.644892	0.5212

Effects Specification

Cross-section fixed (first differences)

Root MSE	0.583993	Mean dependent var	0.004432
S.D. dependent var	0.488197	S.E. of regression	0.609212
Sum squared resid	25.23751	J-statistic	3.308695
Instrument rank	11	Prob(J-statistic)	0.652511

Arellano-Bond Serial Correlation Test
Equation: Untitled
Date: 09/24/21 Time: 00:58
Sample: 2011 2020
Included observations: 74

Test order	m-Statistic	rho	SE(rho)	Prob.
AR(1)	-0.064333	-1.339302	20.818260	0.9487
AR(2)	1.346868	0.791298	0.587509	0.1780