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IMPACT OF TAX PLANNING AND FINANCIAL PERFORMANCE OF QUOTED DEPOSIT MONEY BANK.

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Abstract

This article emphasis on capturing tax planning and financial performance of quoted deposit money banks.By exploring the complex relationships between tax strategies employed and key performance metrics realized over time, this study aims to provide novel insights for optimizing shareholder value creation amid Nigeria's evolving fiscal landscape. The Objectives of the study aimed at analyzing the impact of tax planning on Returns on equity of quoted deposit money bank, to determine the impact of tax planning on Returns on investment of quoted deposit money bank and to examine the impact of tax planning on earnings per share of quoted deposit money bank. The research design used for this Research is ex-post facto research design to examine the relationship between tax planning and financial performance of quoted deposit money banks. The work employed the OSL regression analysis using E-views 10 software. The article found out that TP has a positive correlation with ROE. The regression analyses find no significant relationships between the independent variables of ETR and TP in predicting EPS, ROI, or ROE, while TP and ROE had a moderate positive correlation of 0.2416. Regression results indicated ETR and TP were not statistically significant in predicting EPS, ROI or ROE based on p-values above 0.05. It recommends that Based on the analysis, simple reliance on tax rates or profits to forecast key metrics like earnings or returns is misguided. Companies and policymakers require comprehensive modeling considering multiple influencing factors.

Keywords: tax planning, financial performance and deposit money banks.

1.1 Introduction

The banking sector plays a pivotal role in the economic development and growth of any nation. As financial intermediaries, deposit money banks mobilize funds from surplus units and channel these funds to deficit units, thereby facilitating trade and investment (Smith et al., 2020). In Nigeria, the banking industry has experienced significant reforms and restructuring in recent times geared towards ensuring financial stability and stimulating greater economic activities. Despite these efforts, issues around taxation and performance persist for key players in the banking space.

Effective tax planning is crucial for banks to balance financial obligations with profitable operations and prudent capital allocation (Williams & Smith, 2021). However, uncontrolled tax avoidance through elaborate schemes also attracts regulatory sanctions and public scrutiny. Meanwhile, changes in the digital economy pose new frontiers for taxing mobile banking income across borders. Within this dynamic landscape, gauging the impact of tax management on performance metrics is imperative for benchmarking, policymaking and maximizing shareholder value over the long term (Jones, 2022).

Banks aim to minimize costs including taxes, excessive reduction may undermine budgetary objectives and social contracts. Conversely, overtaxation could discourage investments and competitiveness. Therefore, examining the relationship between tax efforts and realized returns, earnings and equity yields provides nuanced insights for deposit money banks, regulators, investors and other stakeholders (Brown, 2019). Against this backdrop, this study analyzes the influence of tax planning on key indicators of financial performance for quoted Nigerian banks utilizing quantitative models on secondary data spanning 2013 to 2022. Addressing this issue is essential to balancing tax, compliance and performance dynamics in a sustainable manner for the Nigerian banking sector.

1.2 Objectives of the study

The main objective is aimed at capturing tax planning and financial performance of quoted deposit money bank. The specific objectives include:

1. To Analyze the impact of tax planning on Returns on equity of quoted deposit money bank.

2. To determine the impact of tax planning on Returns on investment of quoted deposit money bank.

3. To examine the impact of tax planning on earnings per share of quoted deposit money bank.

1,3 Research Hypotheses

1. There is no significant impact of tax planning on Returns on equity of quoted deposit money bank.

2. There is no significant impact of tax planning on Returns on investment of quoted deposit money bank.

3. There is no significant impact of tax planning on earnings per share of quoted deposit money bank.

2.1 Conceptual framework

2.1.1 Concept of tax planning.

Tax planning refers to the process of minimizing tax liability through lawful means in accordance with tax codes (Internal Revenue Service, 2019). The goal of tax planning is to take advantage of permissible tax credits, deductions and exemptions legally available to a taxpayer.

There are various techniques individuals and businesses utilize for tax planning. Common options include contributing to retirement accounts to reduce taxable income, taking advantage of tax deductions for home mortgage interest or property taxes, making charitable donations for a tax deduction, and deferring income or realizing capital gains at optimal rates (Internal Revenue Service, 2021).

Proper tax planning requires understanding which sources of income are taxed and at what rates based on income levels. It also involves carefully timing income and expenses across tax years to maximize deductions and take advantage of tax brackets. For businesses, tax planning may involve strategies like accounting for expenses, depreciating assets, and taking deductions for business losses or casualty losses (Internal Revenue Service, 2022).

With tax laws and rates subject to changes under new legislation, taxpayers must stay up-to-date on the latest codes and reforms to optimize their tax strategies accordingly. For example, the 2017 Tax Cuts and Jobs Act had widespread impacts on individual and corporate tax rates through 2025 that required taxpayers to adjust planning approaches (Citigroup, 2019). Looking ahead, various tax reforms have been proposed for 2023 that could again change the landscape for taxpayers.

2,1.2 Tax Planning Strategies Employed by Banks

Like other companies, banks actively undertake tax management to reduce their global effective tax burden. Some major strategies commonly adopted include:

1. Transfer Pricing: Banks manipulate prices of treasury products and services between affiliates in high and low tax countries to shift profits.

2. Thin Capitalization: Achieving advantageous debt to equity ratios by loading subsidiaries with related party loans from

low-tax parent entities to maximize interest deductions.

3. Acquisition Structuring: Refining cross-border M&A transaction structures to capitalize on jurisdictional asymmetries in tax laws concerning tax-free mergers, tax liability assumptions.

4. Offshore Holdings: Maintaining holding companies and treasury centers in low/no tax environments like Mauritius, Luxembourg and the Cayman Islands for IP rights, funding and investments.

5. Tax Loss Utilization: Carrying back/forward unabsorbed capital allowances and business losses against taxable incomes of past/future years under domestic tax regimes.

These deliberate tax reduction tactics have gained considerable attention and are regularly scrutinized by tax administrations globally (Oladipupo & Obazee, 2019).

2.1.3 Controversies and Calls for Reform

Aggressive tax avoidance using artificial or abusive tax havens structures by globally systemic banks has attracted strong regulatory and public backlash in recent times (Edison et al., 2020). Post financial crisis reforms to protect budgets and discourage risk have led to global scrutiny of the tax conduct of banks. Some cases in the European Union and India exposed how large banks booked most profits in low-tax jurisdictions while deriving them from economic activities elsewhere resulting in minimal overall taxes (Sawyer, 2019). Anti-avoidance laws targeting these practices now pose compliance costs to multinational banking groups.

The banking sector continues engaging policymakers in dialogues around appropriate international tax standards for cross-border financial services while resisting unilateral importation of tax rules that impair competitiveness or flexibility (Ligthart & Voget, 2021). Ensuring financial stability and tax collection are valid government priorities but overregulation may reduce efficiencies if taken to extremes, banks caution (Cobham & Janský, 2019). Overall, taxation of mobile and intangible banking income remains an ongoing challenge with divergent stakeholder perspectives.

2.1.4 Taxing Banking in the Digital Era

Digitization is transforming banking delivery and cross-border interactions at a rapid pace (Ahmed & Lennerfors, 2021). The mobility and inconspicuousness of digital banking transactions exacerbates difficulties associated with locating economic activities for tax purposes based on physical presence rules (Oriakhi & Osaze, 2019). Establishing nexus and allocating profits of banks amidst mobility of related risks, clients, data and processes is thus increasingly complex.

Digital footprint taxes and other measures have emerged with mixed reception

(Imdadullah et al., 2020). Ensuring taxation does not discourage financial innovation presents a balancing act. Overall, taxation in a digitalizing banking industry characterized by virtual interactions requires fresh policy lenses and international cooperation (Abdulghani et al., 2019). Formulating globally accepted principles to tax banking income fairly across jurisdictions based on economic activities instead of physical assets remains a pressing agenda (Ndife & Erhijakpor, 2021).

2.1.5 Overview of financial performance.

A company has multiple stakeholders, such as trade creditors, bondholders, investors, employees, and management, each with a vested interest in monitoring the financial performance of the company. Financial performance serves as an indicator of how effectively a company generates revenue and manages its assets, liabilities, and the financial interests of its stakeholders and shareholders. It is a subjective assessment of how proficiently a company utilizes its primary business assets to generate revenue. (Gofwan,2022). The term "financial performance" is also employed as a comprehensive gauge of a company's overall financial well-being during a specific timeframe. It encompasses the assessment and quantification of how effectively a company or organization is performing regarding its financial activities and outcomes. (Daud, et al, 2022). Financial performance offers valuable insights into various aspects of a business, including its financial health, efficiency, profitability, and overall success. It serves as a means to evaluate and assess the financial standing and performance of a company, providing a comprehensive understanding of its operational effectiveness and ability to generate profits.

2.1.6 Deposit money bank.

A deposit money bank, often referred to as a commercial bank, is a financial establishment that receives deposits from individuals, businesses, and other entities and offers a range of banking services. (Bhaurao, 2023). These institutions provide a wide array of services, including lending funds, facilitating payments, offering savings accounts, granting loans, mortgages, and credit cards, as well as providing other financial products and services.

Deposit money banks serve a crucial role in the economy by gathering funds from depositors and directing them towards productive activities, such as lending to businesses and individuals. They act as intermediaries, connecting individuals with surplus funds to those seeking loans for various purposes, such as starting or expanding a business, purchasing a home, or financing personal expenses. Revenue for deposit money banks primarily stems from the interest earned on loans and investments, as well as fees levied for the services rendered.(Wieandt and Heppding,2023). Deposit money banks also have a crucial

function in the monetary system through the practice of fractional reserve banking. Under this system, they hold only a portion of the deposited funds as reserves and utilize the remaining amount for lending and investment activities.

2.1.7 Return on equity (ROE)

The return on equity (ROE) The return on equity (ROE) is a metric that assesses the profitability of a business relative to its equity. (Jason,2023).ROE quantifies the amount of profit generated per dollar of shareholder's equity, thereby indicating the efficiency with which a company utilizes its equity to generate profits. It can be interpreted as a measure of return on assets minus liabilities, as shareholder's equity is derived by deducting liabilities from assets.

ROE = Net Income/Shareholders' Equity

ROE is calculated by dividing the net income for a fiscal year (after deducting preferred stock dividends and before common stock dividends) by the total equity (excluding preferred shares) and expressing the result as a percentage.

2.1.8 Return on investment (ROI)

ROI (Return on Investment) is a metric employed to assess the profitability of an investment. It compares the cost of the investment to the earnings generated, allowing for an evaluation of its efficiency. (Silva, Duarte, and Almeida,2020). Both individual investors and businesses utilize return on investment (ROI) as a tool for analysis. ROI is calculated by dividing the net profit (or loss) of an investment by its cost. This ratio, expressed as a percentage, enables the comparison of the effectiveness and profitability of various investment options.

Formula is NPAT/CE

Where:

NPAT = net profit after tax

CE= Capital Employed.

2.1.9 Earnings per share (EPS)

Earnings per share (EPS) is a financial measurement that signifies the proportion of a company's earnings designated for each outstanding share of common stock. It serves as an indicator of a company's profitability and can be calculated by dividing the company's net income by the average number of outstanding shares during a specific period. (Chibuike, et al, 2023), Earnings per share (EPS) is a commonly used financial metric that provides insights into a company's profitability. It is calculated by dividing the company's net income by the total number of outstanding shares of common stock. It is important to note that companies often report adjusted EPS figures to account for extraordinary items and potential dilution of shares, which can impact the overall profitability analysis.

EPS= NPAT/NS

where:

NPAT= Net profit after tax

NS=NO OF SHARES

2.1.10 The Effective Tax Rate

The effective tax rate (ETR) is an important metric for measuring the tax burden on a business entity. It is calculated as the total amount of tax expense paid divided by pre-tax income or earnings before taxes (Forman et al., 2019). For example, if a company had pre-tax earnings of $100,000 and paid total tax expense of $25,000, then its ETR would be 25% ($25,000/$100,000). Tracking ETR over time can help assess the impact of tax reforms and efficiency of tax planning strategies (Government Accountability Office, 2021). Under the Tax Cuts and Jobs Act of 2017, many corporations saw lowered statutory corporate tax rates that contributed to reduced ETRs (Internal Revenue Service, 2020). However, changes to tax deductions, credits and one-time charges meant some companies experienced higher ETRs in subsequent years despite lower headline rates (Bloomberg, 2022). Ongoing tax reforms make monitoring ETR an important part of budgeting, performance benchmarking and maximizing shareholder value.

Effective Tax Rate (ETR) = Total Tax Expense / Earnings Before Taxes

3.1 Research Design

The research design utilized in this study is the ex-post facto research design. This approach is employed to assess the impact of tax planning on performance by analyzing historical data. Ex-post facto research is appropriate for this purpose as it aims to measure and establish relationships between variables or determine the impact of one variable on another when the variables are not manipulated by the researcher. By examining existing data or past events, ex-post facto research seeks to identify factors associated with specific occurrences, conditions, events, or behaviors in order to uncover potential causal factors. (Okonkwo, and Ekwueme,2022).

3.2 Population of the Study

The population of this study encompasses all five (5) listed Deposit Money Banks (DMBs) in Nigeria as of December 31, 2022. They include:

1) Access Bank Plc

2) Fidelity Bank Plc

3) Guaranty Trust Bank Plc

4) United Bank of Africa Plc

5)Zenith International Plc

3.3 Sample Size and Sampling Technique

The study employed a purposive sampling technique to select deposit money banks that had up-to-date and complete annual reports and accounts for the study period spanning from 2013 to 2022. The sample size consisted of the five (5) deposit money banks that were consistently listed and actively trading on the

quoted deposit money bank floor from January 1, 2013, to December 31, 2022. Furthermore, the selected banks had their financial statements available and consistently submitted to the quoted deposit money bank during the entire study period.

3.4 Source of Data

This study relied on secondary data obtained from various sources. The data were sourced from publications of the quoted deposit money bank, fact books, and the annual reports and accounts of the selected deposit money banks. Specifically, the comprehensive income statement, statement of financial positions, and accompanying notes to the accounts were utilized. Both the dependent and independent variables were derived from the data extracted from these sources, and ratios were computed based on the figures reported in the annual reports.

3.5 Method of Data Analysis

The data analysis for this study involved utilizing data collected from the publications of the quoted deposit money bank, fact books, and annual reports and accounts of the selected deposit money banks in Nigeria. The E-Views 10 statistical software was employed for the analysis. Descriptive statistics, including measures such as mean, median, standard deviation, skewness, kurtosis, maximum, and minimum, were used to summarize the study variables. Inferential statistics, specifically for testing the stated hypotheses, were conducted using the E-Views 10 statistical software.

i.The Pearson coefficient of correlation, a reliable measure of the relationship between two variables, provides insights into both the strength and direction of the relationship.

ii. Ordinary Least Squares (OLS) regression analysis was employed in this study to predict the value of one variable based on the value of another variable and to examine the impact or effect of changes in the values of variables on the values of other variables.

3.6 Model Specification

In order to ascertain the Impact of tax planning on Financial Performance, the following econometric models were specified:

$Y = f(X) + \mu$

The above model could be re-constructed as thus;

$Y = \beta o + \beta 1X1 + \mu$

$ROEit = \beta 0 + \beta 1ETRit + \mu it.$ - - - H1

$ROIit = \beta 0 + \beta 1IETRit + \mu it.$ - - - H2

$EPSit = \beta 0 + \beta 1TPit + \mu it.$ - - - H3

Where:

$\beta 0$ = Intercept of the regression

$\beta 1$ = Coefficients of financial performance

µít = error term capturing other explanatory variables not explicitly included in the model of bank í in period t

Y = dependent variable (Performance)

X = independent/explanatory variable (TP)

ROEít = Return on Equity of bank í in period t (dependent variable)

ROIít = Return on Investment of bank í in period t (dependent variable)

EPSít = Earnings Per of Shares of bank í in period t (dependent variable)

ETRít = Effective Tax Rate of bank í in period t (independent variable)

TPit= Tax Planning of banks *i* in period *t* (independent variable)

í = individual bank (1, 2 ….. 14)

t = time period (1, 2 ..... 10)

Decision Rule

The decision was based on 5% (0.05) level of significance. The null hypothesis (Ho) will be accepted, if the Prob (F-statistic) value is greater (>) than the stated 5% level of significance, otherwise reject.

A Priori Expectation

The theoretical (a priori) expectations regarding the signs of the coefficients are as follows: $\beta o > 0$, $\beta 1 > 0$. It is anticipated that the coefficients associated with the adoption of IFRS 1 will have a positive sign. This expectation is based on the belief that an increase in the level of IFRS 1 adoption will correspondingly enhance the performance of listed deposit money banks in Nigeria.

4.1 Data Analysis

Descriptive statistics

	ETR	TP	ROI	ROE	EPS
Mean	0.866240	0.500000	0.310800	0.409540	2.597420
Median	0.860500	0.500000	0.181000	0.234500	1.967000
Maximum	1.045000	1.000000	4.131000	2.203000	9.601000
Minimum	0.442000	0.000000	0.011000	0.026000	0.001000
Std. Dev.	0.090430	0.505076	0.646070	0.461627	2.608649
Skewness	-1.773402	0.000000	4.802913	2.306334	0.999029
Kurtosis	11.10172	1.000000	26.90123	8.532677	3.281195
Jarque-Bera	162.9536	8.333333	1382.377	108.0984	8.481891
Probability	0.000000	0.015504	0.000000	0.000000	0.014394
Sum	43.31200	25.00000	15.54000	20.47700	129.8710
Sum Sq. Dev.	0.400705	12.50000	20.45295	10.44189	333.4475
Observations	50	50	50	50	50

The descriptive statistics table shows that ETR (effective tax rate) has a mean of 0.866, median of 0.860, and standard deviation of 0.090. It is left-skewed (negative skewness) with high kurtosis, showing most values are close to the mean but a few are much lower. TP (third party transactions) has an average and median of 0.500, with a standard deviation of 0.505. It is symmetrically distributed with no skewness. ROI (return on investment) has higher variability than other variables as evidenced by a standard deviation of 0.646. It is right-skewed with very high kurtosis, indicating a few extremely high values. ROE (return on equity) also exhibits positive skewness and high kurtosis similarly to ROI. EPS (earnings per share) has the highest average at 2.597 but also the largest standard deviation of 2.609, thus most variability. It is positively skewed with moderate kurtosis.

Correlation

	ETR	TP	ROI	ROE	EPS
ETR	1.000000	-0.067917	-0.221340	0.015566	0.000820
TP	-0.067917	1.000000	-0.069233	0.241626	0.127624
ROI	-0.221340	-0.069233	1.000000	-0.060734	-0.178182
ROE	0.015566	0.241626	-0.060734	1.000000	0.072972
EPS	0.000820	0.127624	-0.178182	0.072972	1.000000

The correlations table present that ETR has a weak negative correlation with TP (-0.0679), indicating as tax rates increase, third party transactions slightly decrease. ROI has a weak negative correlation with ETR (-0.2213) and TP (-0.0692), suggesting higher returns are associated with lower tax rates and fewer third party transactions. ROE has a moderate positive correlation with TP (0.2416), meaning higher equity returns relate to increased third party involvement. There is virtually no correlation between ROE and other variables. EPS has a weak positive correlation only with TP (0.1276), signifying earnings may rise somewhat with higher third party transactions. There are no strong correlations above 0.25 in magnitude, demonstrating the variables generally have little linear interdependence. In summary, the correlations analysis provides an initial view of how movements in the variables are associated or not associated with each other on a simple linear basis

Covariance

	ETR	TP	ROI	ROE	EPS
ETR	0.008014	-0.003040	-0.012673	0.000637	0.000190
TP	-0.003040	0.250000	-0.022140	0.055210	0.164790
ROI	-0.012673	-0.022140	0.409059	-0.017751	-0.294297
ROE	0.000637	0.055210	-0.017751	0.208838	0.086117
EPS	0.000190	0.164790	-0.294297	0.086117	6.668950

The covariance table provides valuable insights into the joint variability and linear dependence between the 5 variables. It shows: The covariance between ETR and itself is 0.008, indicating low variability between tax rate observations. ETR has negative covariances with TP (-0.0030) and ROI (-0.0127), reflecting their tendency to vary in opposite directions. There is little covariance between ETR and other variables. TP exhibits a covariance of 0.250 with itself, depicting moderate variability within third party transactions data. It has negative covariances with ROI (-0.0221) and EPS (0.1648), signifying their values often move in opposing directions. TP's covariance with ROE is positive at 0.0552, suggesting they tend to fluctuate jointly. ROI demonstrates high self-covariance of 0.4091, portraying considerable internal variability. It has strongly negative covariances with ROE (-0.0178) and EPS (-0.2943), implying their frequent inverse relationship in movements.

ROE and EPS only have a low positive covariance of 0.0861 with each other, representing minimal coresponsiveness. The other covariances of ROE and EPS with other variables are negligible. the covariance metrics provide further quantitative insights into how the economic variables jointly experience fluctuations or oppose each other's changes on a linear basis beyond what correlations reveal. This aids in understanding their underlying relationships.

Regression analysis

Dependent Variable: EPS
Method: Least Squares
Date: 02/16/24 Time: 07:35
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.027990	3.686820	0.550065	0.5849
ETR	0.274957	4.182831	0.065735	0.9479
TP	0.662503	0.748907	0.884627	0.3809

R-squared	0.016378	Mean dependent var	2.597420
Adjusted R-squared	-0.025478	S.D. dependent var	2.608649
S.E. of regression	2.641672	Akaike info criterion	4.838826
Sum squared resid	327.9862	Schwarz criterion	4.953547
Log likelihood	-117.9706	Hannan-Quinn criter.	4.882512
F-statistic	0.391299	Durbin-Watson stat	0.340022
Prob(F-statistic)	0.678360		

This table evaluates the impact of ETR and TP on EPS. However, the model has very low explanatory power as seen in its small R-squared of 0.016. Neither independent variable is statistically significant in affecting EPS.

Table 2

Dependent Variable: ROI
Method: Least Squares
Date: 02/16/24 Time: 07:37
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.770346	0.894457	1.979242	0.0537
ETR	-1.622416	1.014794	-1.598765	0.1166
TP	-0.108289	0.181692	-0.596002	0.5540

R-squared	0.056125	Mean dependent var	0.310800
Adjusted R-squared	0.015960	S.D. dependent var	0.646070
S.E. of regression	0.640894	Akaike info criterion	2.006220
Sum squared resid	19.30503	Schwarz criterion	2.120941
Log likelihood	-47.15549	Hannan-Quinn criter.	2.049906
F-statistic	1.397363	Durbin-Watson stat	2.182038
Prob(F-statistic)	0.257330		

This table analyzes the impact ETR and TP on ROI. While the R-squared improves slightly to 0.056, still conveying little predictive ability, the variables remain insignificant drivers of ROI.

Table 3

Dependent Variable: ROE
Method: Least Squares
Date: 02/16/24 Time: 07:38
Sample: 1 50
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.156071	0.637990	0.244629	0.8078
ETR	0.163987	0.723823	0.226556	0.8218
TP	0.222834	0.129595	1.719459	0.0921

R-squared	0.059410	Mean dependent var	0.409540
Adjusted R-squared	0.019385	S.D. dependent var	0.461627
S.E. of regression	0.457131	Akaike info criterion	1.330431
Sum squared resid	9.821534	Schwarz criterion	1.445153
Log likelihood	-30.26078	Hannan-Quinn criter.	1.374118
F-statistic	1.484324	Durbin-Watson stat	1.544237

Prob(F-statistic)	0.237086

This table assesses the impact of ETR and TP on ROE. It too shows limited explanatory power with an R-squared of 0.059. Once more, the independent variables do not demonstrate quantitative impact on ROE in a meaningful way.

Across the regressions, ETR and TP consistently fail to provide much linear insight into the variations in the dependent variables. The regression statistics indicate the simple models omit important factors behind the movements in EPS, ROI and ROE.

Cross Correlogram

Date: 02/16/24 Time: 07:39
Sample: 1 50
Included observations: 50
Correlations are asymptotically consistent approximations

ETR,TP(-i)	ETR,TP(+i)	i	lag	lead
. *| . |	. *| . |	0	-0.0679	-0.0679
. *| . |	. *| . |	1	-0.0839	-0.0532
. *| . |	. |* . |	2	-0.1047	0.0944
. *| . |	. |** . |	3	-0.0597	0.1602
. |* . |	. |** . |	4	0.0496	0.1613
. | . |	. |** . |	5	0.0465	0.1769
. |* . |	. |* . |	6	0.0983	0.1108
. |* . |	. *| . |	7	0.1512	-0.0929
. |* . |	. *| . |	8	0.1245	-0.1310
. | . |	. *| . |	9	0.0340	-0.1366
. | . |	. **| . |	10	0.0239	-0.1841
. *| . |	. *| . |	11	-0.0536	-0.1010
. *| . |	. |* . |	12	-0.1078	0.1299
. *| . |	. |* . |	13	-0.0760	0.1542
. | . |	. |** . |	14	0.0038	0.1756
. | . |	. |** . |	15	0.0097	0.2406
. |* . |	. |** . |	16	0.0860	0.1705
. |* . |	. *| . |	17	0.1311	-0.0685
. |* . |	. *| . |	18	0.0935	-0.0834
. | . |	. *| . |	19	0.0213	-0.1153
. | . |	. **| . |	20	0.0326	-0.1932
. *| . |	. **| . |	21	-0.0504	-0.1524
. *| . |	. | . |	22	-0.0977	-0.0113
. *| . |	. | . |	23	-0.0595	-0.0073
. | . |	. | . |	24	-0.0013	0.0273

The cross-correlogram table examines the correlation between ETR and TP over a range of time lags and leads. Some key findings:

At a lag/lead of 0, the correlation is -0.0679, replicating the correlation observed at time period t. Negative correlations are observed at small lags of ETR versus TP, such as -0.0839 at lag 1 and -0.1047 at lag 2, suggesting their relationship moves in opposite directions in the short-run. Correlations become predominantly positive at higher lags of ETR versus TP, reaching values over 0.16. This implies their association evolves to move in the same direction over a longer time frame. Leads of TP versus ETR also turn positive at larger leads, exceeding 0.15. So reversing their order of precedence produces a correlated relationship lagged over time.

Correlations persist for over 20 time periods suggesting stability in the cross-sectional dynamics between the variables. the cross-correlogram unveils an initially negative short-term interaction between ETR and TP that transitions to a stronger positive correlation when their interconnections are observed with larger time lags or leads. This indicates their relationship grows progressively aligned if assessed at wider intervals.

5.1 Summary of findings.

1. TP has a positive correlation with ROE. The regression analyses find no significant relationships between the independent variables of ETR and TP in predicting EPS, ROI, or ROE.

2. TP and ROE had a moderate positive correlation of 0.2416. Regression results indicated ETR and TP were not statistically significant in predicting EPS, ROI or ROE based on p-values above 0.05.

3. The correlation matrix indicates a negative correlation between ETR and ROI.

5.2 Conclusion

This study presented a statistical analysis of key economic metrics for 50 observations. Descriptive statistics provided an overview of the sample, while correlation revealed both positive and negative relationships between some variable pairs. However, the regression models were unable to establish statistically significant predictive relationships between the independent variables of effective tax rate and total profit on the dependent variables of earnings per share, return on investment, and return on equity. Based on the p-values and other regression output, we cannot say with confidence that changes in ETR or TP would reliably forecast changes in EPS, ROI or ROE within this sample. While correlations were observed, more data or additional explanatory variables may be needed to develop robust predictive models according to these regression results. Overall, the analysis provided insight but more research is warranted to truly understand the relationships between these important economic indicators.

5.3 Recommendations

1.Based on the analysis, simple reliance on tax rates or profits to forecast key metrics like earnings or returns is misguided. Companies and policymakers require comprehensive modeling considering multiple influencing factors.

2. For investors, metrics like ETR and profits alone provided limited predictive value. Deeper research beyond narrow metrics is advised before investment decisions.

3. Acquiring a larger, more recent sample across diverse firms and adding macro or industry covariates could strengthen explanatory models. Qualitative interviews may also complement statistical analysis for more conclusive results.

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