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Moderating Role of Institutional Quality between Company Income Tax and Economic Growth in 15 West African Countries: (An Application of Mean Group (MG) and Pooled Mean Group (PMG) Model)

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Abstract

This study seeks to examine Moderating Role of Institutional Quality Between Company Income Tax (CIT), and Economic Growth in 15 West African Countries. In the context of selected West African countries, the links between corporate income tax, institutional quality, and economic growth are of particular interest. To achieve this study, this research employed the Dynamic Panel ARDL model: (An Application of Mean Group (MG) and Pooled Mean Group (PMG) Model) and a robust dataset comprising 345 observations from diverse West African countries. The data covers a range of key economic variables, including gross domestic product (GDP), corporate income tax (LNCIT), institutional quality (LNITQ), trade openness (LNTOP), inflation rate (LNINF), interest rate (LNINT), exchange rate (LNEXR), and tax effort ratio (LNTER). By analyzing these variables and their interrelationships through rigorous statistical methods, we aim to provide valuable insights into the mechanisms influencing economic growth in the region. In the following sections, presented the descriptive statistics and correlation matrices for the economic variables under study. Then proceed with the Error Correction Estimation (MG and PMG) to identify the most suitable model for analyzing the relationships. Therefore, the interpretation is based on the PMG. LNCIT, LNITQ, LNTOP, LNINF, has a positive relationship with GDP while LNCITITQ and LNEXR has a negative relationship with GDP. A unit change in LNCIT, LNITQ, LNTOP, LNINF, GDP increases by 3.159 (10.530), 346.741 (744.897), 0.414 (0.340) and 0.001 (0.423) respectively. A unit change in LNCITITQ and LNEXR, GDP decreases by -29.023(56.963) and -0.405(0.545). Any movement from disequilibrium, the speed adjustment is corrected by -0.240. The findings suggest that various economic indicators influence economic growth differently in different countries. Policymakers should consider these insights while formulating tax policies, improving institutional quality, and attracting foreign investment to promote sustainable economic growth in the selected West African Countries.

Keywords: Quality, company income tax, economic growth, and West Africa

Introduction

In the context of selected West African countries, the links between corporate income tax, institutional quality, and economic growth are of particular interest. These countries' fiscal policies and tax structures are critical in fostering economic growth and attracting investment. However, in order to make appropriate policy suggestions, the influence of corporate income tax, institutional quality on economic growth must be investigated further. The corporate income tax is a critical component of fiscal policy and government revenue collection. It has a direct impact on firm profitability and investment decisions, as well as economic activity and capital formation. Chengying et al. (2023). Understanding the relationship between corporate income tax and economic growth is critical for policymakers seeking to find a balance between revenue generation and encouraging private sector growth. With a certain level of institutional quality, a well-designed and balanced corporate income tax policy can promote investment, foster entrepreneurship, and contribute to long-term economic growth.

Institutional quality serves as the basis for the growth of economic activity and governance (Agility et al. 2023). Robust institutions, encompassing the principles of legal governance, safeguarding of property rights, and effective administrative procedures, establish a conducive atmosphere for commercial operations and instill confidence in the economy among investors. Institutional quality significantly influences investor perceptions, foreign direct investment (FDI) inflows, and economic stability. Analyzing the impact of institutional quality on economic growth in West African countries might provide policymakers with insights into the importance of institutional changes and good governance practices in promoting sustainable long-term growth. It is also important to look at the trend of the 15 selected west countries. For simplicity, the countries are divided into three (3) based economic indicators. They are as follows.

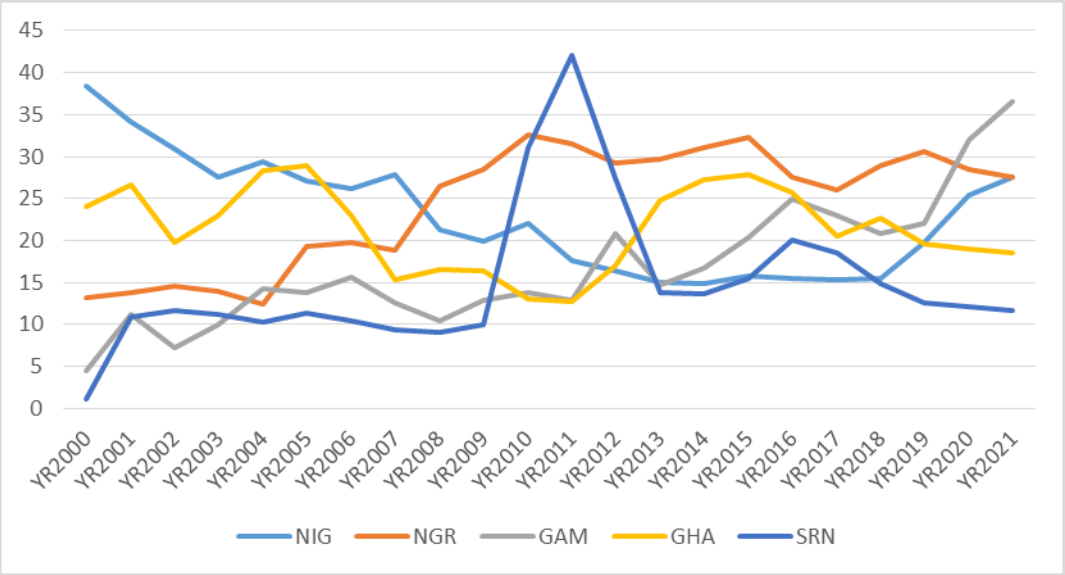

Fig 1.1: Trend of Company Income Tax (CIT) of the Nigeria, Niger, Gambia, Ghana and Sierra Leone.
Source: (complied by the authors)

From the figure 1.1 above, shows the trend of Company Income Tax (CIT) in Nigeria, Niger, Gambia, Ghana, and Sierra Leone has been decreasing due to several factors. First, economic challenges and slowdowns in these countries (Nigeria, Niger, Gambia, Ghana and Sierra Leone) have impacted business profitability, leading to lower taxable incomes for companies. Additionally, there might be increased tax incentives and exemptions to attract foreign investments and foster economic growth, which directly reduces the overall tax revenue from corporations. Moreover, tax evasion and avoidance practices, coupled with weak enforcement and compliance measures, have contributed to the decline in CIT collection. Some governments may have implemented tax reforms or adjustments to alleviate the burden on businesses during difficult economic times, further reducing the overall CIT revenue in the region. It is important to note that between 2008 and 2013,

Nigeria experienced a sharp rise in CIT. Below is a table showing company income tax for 5 countries, Senegal, Burkina Faso, Guinea Bissau, Guinea, Cote d'Ivoire.

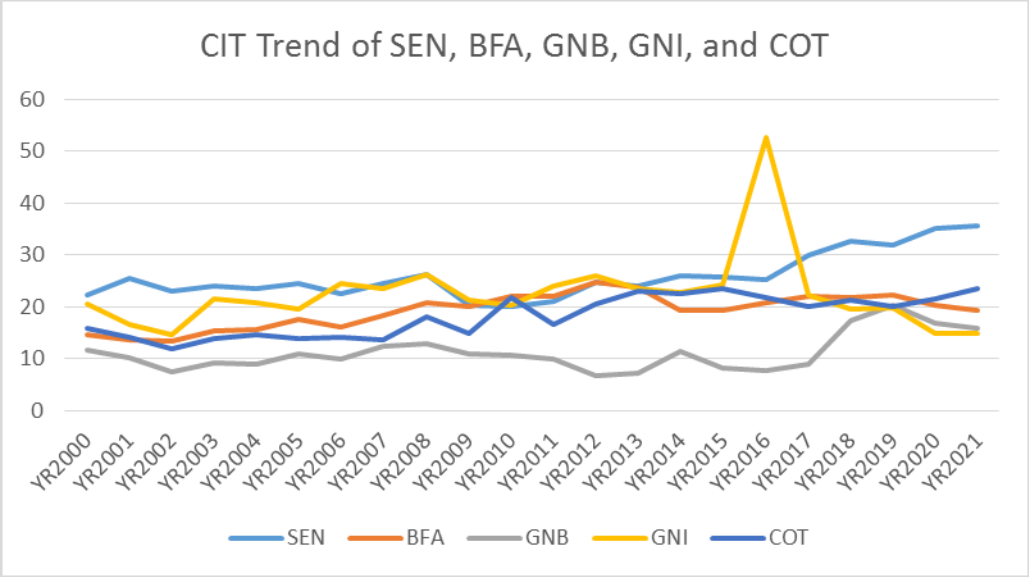

Figure 1.2 Trend of Company Income Tax (CIT) of Senegal, Burkina Faso, Guinea Bissau, Guinea, and Cote d 'Ivoire.

Source: (complied by the authors)

figure 1.1 above, it shows that aside the Guinea that had a sharp increase between 2015 and 2016, trend of Company Income Tax (CIT) in Senegal, Burkina Faso, Guinea Bissau, Guinea, and Cote d'Ivoire has been decreasing due to a combination of economic and policy-related factors. Firstly, prolonged economic challenges and regional instability may have negatively impacted business activities and profitability, resulting in lower taxable incomes for companies. Additionally, these countries may have implemented tax incentives and preferential regimes to attract foreign investments and stimulate economic growth, thereby reducing the effective tax rates and overall CIT collections. Furthermore, weak tax administration and compliance measures could contribute to tax evasion and avoidance practices, leading to a decline in tax revenues from corporations. Lastly, governments in the region might have undertaken tax reforms aimed at fostering business competitiveness or supporting industries, which could also contribute to the observed decrease in CIT revenue.

Below is a table showing company income tax for 5 countries Cameroon, Cabo Verde, Togo, Mali and Benin.

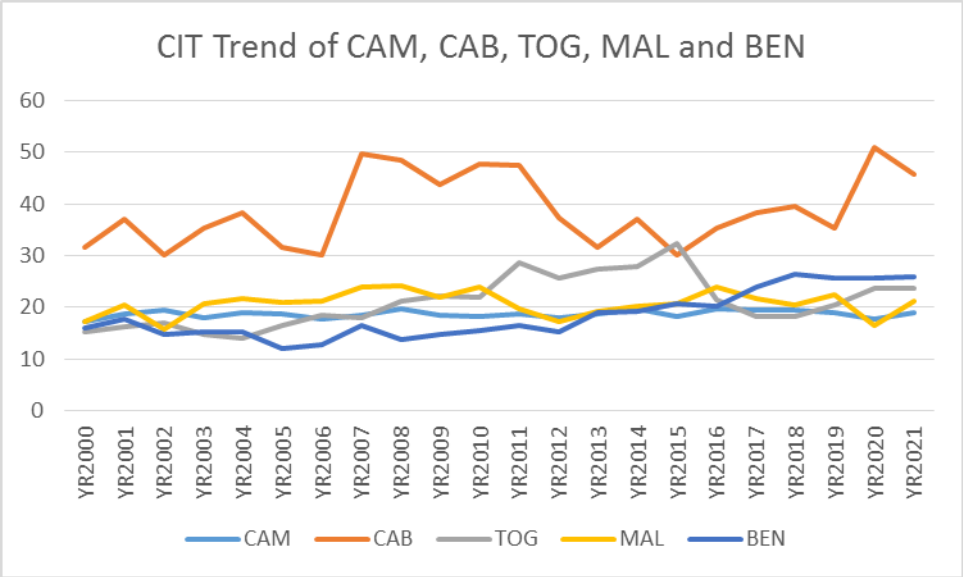

Figure 1.3 Trend of Company Income Tax (CIT) of Cameroon, Cabo Verde, Togo, Mali and Benin.

Source: (complied by the authors)

The declining trend of Company Income Tax (CIT) in Cameroon, Togo, Mali, and Benin can be attributed to a combination of economic and policy-related factors. Persistent economic challenges, regional instability, and slow business growth have likely impacted corporate profitability, resulting in lower taxable incomes and reduced CIT collections. Additionally, these countries have introduced tax incentives and preferential tax regimes to attract foreign investment and encourage domestic business expansion, thereby lowering the effective tax rates for companies. Moreover, weak tax administration and compliance measures could contribute to tax evasion and avoidance practices, further diminishing the overall CIT revenue. However, it is noteworthy that Cabo Verde experienced an increase in CIT during the periods of 2006-2011 and 2018-2021, potentially due to similar factors mentioned earlier. Nevertheless, to fully understand the distinct CIT trends in Cabo Verde, a thorough examination of specific economic conditions and tax policies during those periods would be necessary.

Economic growth is the ultimate goal of growth, encompassing rising living standards, job creation, and poverty reduction. It reflects the success of economic policies and the overall health of an economy. Understanding company income tax, institutional quality, is paramount for formulating effective policies that drive long-term and sustainable growth in West African countries. Insights into the interplay between these variables can guide policymakers in crafting strategies to foster inclusive growth, reduce income inequality, and enhance the overall welfare of citizens

Statement of the Problem

The act of intentionally evading or avoiding taxes by taxpayers in developing nations, specifically in Sub-Saharan Africa (SSA), leads to significant financial losses, amounting to around $50 billion per year (Murphy, 2012; Cobham & Janský, 2018). The substantial discrepancy in tax payments weakens the government's ability to collect necessary funds for administrative purposes and results in a regressive tax system that hinders economic progress. The tax evasion rates in these regions might vary between 30% and 60% of the total amount of taxes owed (Alm & Torgler, 2006).

In economies with significant income inequality, improper tax assessments worsen the regressive nature of the tax system, placing a disproportionate cost on lower-income individuals. This is supported by a Gini coefficient of approximately 0.43 in SSA, as reported by the World Bank in 2018. Although there has been significant research on the significance of institutions for economic growth, many emerging economies still face the challenge of low economic growth and declining institutional quality. As an illustration, the average annual GDP growth rate of SSA has been less than 3% in the last ten years, which is considerably lower than the world average (International Monetary Fund, 2020).

The institutions of low-income countries, as assessed by indices like the Worldwide Governance Indicators (WGI), are still lacking in quality (Kaufmann, Kraay, & Mastruzzi, 2010). Political factors frequently take precedence over economic priorities, leading to weak government and subpar public service delivery. There is a significant disparity in economic performance between high-income and low-income countries, with high-income countries having GDP per capita levels that are more than 20 times higher (World Bank,

2021). The presence of corruption, bureaucratic inefficiencies, and regulatory constraints is widespread, as evidenced by low corruption perception indices (Transparency International, 2021).

The aforementioned concerns result in substantial migratory patterns, as seen by the 38 million Africans who are actively seeking improved prospects and political stability in foreign countries (International Organization for migratory, 2020). In extreme circumstances, the convergence of stagnant income growth, inadequate institutional quality, and political instability has resulted in the collapse of the state (Rotberg, 2004). Therefore, it is essential to examine the significance of corporate income tax, institutional quality, and economic growth in West Africa in order to establish policies that would enhance revenue collection, improve institutional quality, and promote sustainable economic development.

Research Question	What is the interactive effect of institutional quality on the relationship between company income tax and economic growth in the selected West African countries?
Research Objective	To investigate the interactive effect of institutional quality on the relationship between company income tax and economic growth in the selected West African countries.
Research Hypothesis	H_0 : there is no significant role Institution quality play on the relationship between Company Income Tax and Economic Growth in the selected West African countries.

Significance of the Study

The study is of great significance to government, Policymakers, researchers and readers. To the government, it serves as a working document based on the out of the study. To Policymakers, the study serves as a guide and policy direction for the category of people

mentioned above. This study also is of great significant benefit to researchers as it will serve as a source of material such as literature whether conceptual, empirical, theoretical or methodologically. This serves as a reference material to researchers to build on the existing protocol. The information from this study would also contribute to knowledge relevant to policy formulation that would create enabling environment for company income tax revenue base.

Literature Review

Company Income Tax

According to Richardson and Sawyer (2023), company income tax refers to a tax imposed on the profits or earnings of incorporated enterprises. This tax is computed by applying a predetermined tax rate to the taxable income and is designed to fund government operations, public services, and infrastructure developments. Saez (2023) defines company income tax as a tax imposed on the profits generated by businesses or firms. Its purpose is to ensure that corporate organizations make a fair contribution to public finances, which in turn funds government programs and promotes economic stability. Company income tax refers to the levying of taxes on the profits generated by corporate companies. This is typically calculated by applying a tax rate to the net income after accounting for deductions and exemptions. It serves as a significant source of government revenue, as stated by (Pomeranz & Naritomi 2022).

Raassens and Sansing (2022) define a firm income tax as a direct tax imposed on the net profits of corporations or businesses, which is collected by governments to fund public expenditures and attain economic objectives, while considering principles of equity, effectiveness, and simplicity.

Institutional Quality

Institutional quality pertains to the efficacy of institutions in promoting economic growth and development, as delineated by different writers. Akinlo (2024) defines institutional quality as the capacity of institutions to alleviate the adverse impacts of capital flight on economic development in Sub-Saharan Africa. Aydin et al. (2024) examine the impact of institutional quality on the promotion of environmental sustainability in European Union

countries, specifically through the use of environmental technology and globalization. Degbedji et al. (2024) highlight the significance of institutional quality in attaining environmentally sustainable economic growth in the West African Economic and Monetary Union.

In their study, Fengju and Wubishet (2024) examine the influence of financial development on economic growth in East Africa, emphasizing the significant role played by institutional quality. Khan et al. (2024) establish a connection between the quality of institutions and the advancement of financial market development through the utilization of innovation and technologies. In a similar vein, Khan, Raza, and Vo (2024) investigate the potential for enhanced institutional quality to strengthen the connection between government spending and economic growth.

In their study, Mbulawa and Chingoiro (2024) examine the relationship between financial development, institutional quality, and economic growth in Sub-Saharan Africa, with a particular focus on the significant impact of strong institutions. MTIRAOUI (2024) investigates the relationship between economic growth, institutional quality, and energy transition in MENA countries. In their study, Wahab et al. (2024) examine the influence of institutional quality on greenhouse gas emissions in OECD nations, taking into account its relationship with economic growth, trade, and resources. Zheng et al. (2024) evaluate the importance of higher education and the quality of institutions in attaining carbon neutrality in developing economies.

Economic Growth

Economic growth is defined as the process whereby the real per capita income of a country increases over a long period (Jhingan, 2004). Also, it can be simply defined as the increase over time of an economy's capacity to produce those goods and services needed to improve the wellbeing of the citizen in increasing numbers and diversity. It is the steady process by which the productive capacity of the economy is increased over time to bring about a rising level of national income (Anyanwu, 1997). Economic growth is one of the four macroeconomic goals of any society. It is the increase of per capita gross domestic product

(GDP) or another measure of aggregate income, typically reported as the annual rate of change in real GDP.

Theoretical Framework

The study adopts the exogenous growth model to analyze the variables under study. The interaction term (institutional quality which is proxied by corruption control) introduced in the model is an external factor meant to strengthen the relationship between company income tax (CIT) and economic growth (EG). The institutional quality represents a bridge that link levied imposed on company's profit in other to strengthen the growth in an economy. The institutional quality helps to bring the desired growth in the economy.

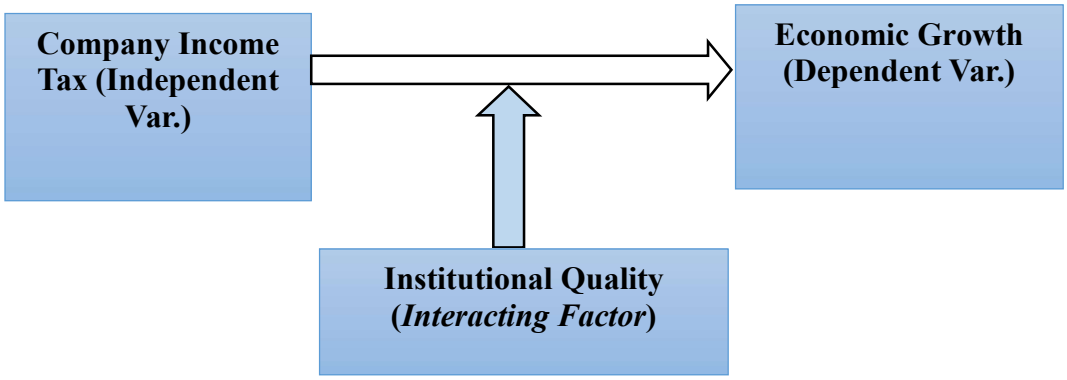

Figure 2.1 Diagram for the theoretical framework of the study

Empirical Review

Company Income Tax and Economic

The link between corporate income, tax revenue, and economic growth in Nigeria is examined by Eneche & Stephen (2023). Value Added Tax and Companies Income Tax exhibited a strong correlation with economic growth, but Petroleum Profit Tax showed a favourable but non-significant correlation. The report suggests keeping an eye on oil corporations to reduce tax fraud, highlighting the importance of businesses paying short-term income taxes, and encouraging entrepreneurship to maintain the strong correlation between non-oil tax collection and Nigeria's economic expansion. According to a cross-country analysis by Devereux and Griffith (2021), greater company taxes are linked to lower levels of business investment, which may impede overall economic development.

Wijeweera and Mounter (2007) demonstrate how changes in the corporation tax rate in Australia affect business income tax, real GDP, and commerce through the use of vector auto-regression analysis. With a focus on Nigeria, Osho et al. (2018) discover a positive and significant effect of corporate income tax collection on the GDP of the nation. Wijeweera and Mounter (2007) demonstrate how changes in the corporation tax rate in Australia affect business income tax, real GDP, and commerce through the use of vector auto-regression analysis. With a focus on Nigeria, Osho et al. (2018) discover a positive and significant effect of corporate income tax collection on the GDP of the nation.

Institutional Quality and Economic Growth

A study conducted by Martorano and Wagle (2023), Narayan et al. (2023), Chao and Nicholson (2023), Dincer and Orhan (2023), Li and Qian (2023), and Cambré et al. (2023) explores the correlation between institutional quality and economic results. Narayan et al. examine the influence of political stability, corruption, and governance on economic growth in Asian nations. Chao and Nicholson further extend this analysis to include emerging market economies. Dincer and Orhan utilize various measures to examine the worldwide quality of institutions and its impact on economic growth, whereas Li and Qian's study on European nations focuses on the consequences of institutional factors on innovation and economic growth. Martorano and Wagle examine the role of institutional factors in reducing poverty in sub-Saharan Africa. Furthermore, research investigates the correlations between institutional quality, economic openness, growth, and foreign direct investment (FDI) across different areas and time periods. Chengying et al. (2023) discover consistent findings regarding the significance of national absorptive capacity in emerging economies such as Pakistan and the BRICS countries. In contrast, other studies investigate the influence of economic openness and institutional quality on growth within the Belt and Road Initiative (BRI) countries. Zakari & Khan's research on Chinese investment in Africa demonstrates a direct connection between energy consumption, economic growth, and the quality of institutions in African countries. Similarly, Ashraf et al.'s analysis emphasizes the importance of robust institutions in the relationship between growth and the environment in South Asia. Singh & Pradhan emphasize the crucial significance of governance measures in improving economic performance in South Asia, whereas Kouadio & Gakpa underscore

the necessity of institutional quality in tackling inequality and poverty in West Africa. Ragmoun's study examines the complex relationships between institutional quality, economic conditions, unemployment, and entrepreneurship dynamics throughout time.

Company Income tax, Institutional Quality and Economic Growth

The research conducted by Jomoh (2023), Aden and Dirir (2023), Olatunbode et al. (2023), and Amoh et al. (2023) explores the complex connections that exist between Company Income tax, Institutional Quality and Economic Growth. Jomoh's research, which focuses on South West Nigeria, highlights the influence of public perception on tax compliance by finding a substantial negative connection between institutional characteristics such rule of law and control of corruption and tax fraud management. According to Aden and Dirir's study on Djibouti, institutional reforms and tax laws have little immediate impact on economic growth, but over time, they can have a significant impact thanks to things like corporate taxes and robust institutions. The analysis of Nigeria by Olatunbode et al. highlights the nuanced relationship between public debt and institutional quality and economic growth, exposing different consequences of public debt that originates domestically and abroad. The Ghanaian study by Amoh et al. demonstrates the complex interplay between tax compliance, evasion, and economic development. The dynamics of tax-related behaviours are further complicated by the moderating effect of institutional quality. When taken as a whole, these studies provide insightful information on the complex relationships that exist between taxation, institutional issues, and economic outcomes in many settings.

Method

The main aim of this study is to present a detailed discussion of the estimation techniques that was used in this study as well as the theoretical and empirical model specification. The study adopted dynamic panel ARDL (Application of Mean Group (MG) and Pooled Mean Group (PMG) Model)) due to the nature of the data. This includes, sources of data and scope of the data, model specification (Economic theory, mathematical model and Econometrics model), Test for Stationarity, descriptive statistics, matrix correlation, pooled mean group, mean group and Hausman test normality test and method of data analysis. This is because

the data available for the selected county negates the regression of N>30, which shows the data not up to 30 years.

Sources and Nature of Data

This study used panel data of 15 West African countries (Nigeria, Niger, Gambia, Ghana, Sierra Leon, Senegal, Burkina Faso, Guinea Bissau, Guinea, Cote d'Ivoire, Cameroon, Cabo Verde, Togo, Mali and Benin). The countries base year was selected based on their availability of data between 2000 and 2022 for the selected macroeconomic indicators. The study has employed secondary data, which are collected from secondary sources such as World Bank Index. The data covers from 2000-2022.

3.3 Model Specification

$$GDP_{it} = f(GDP_{-1}, CIT, ITQ, (CIT \times ITQ), TOP, INF, INT\ EXR) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

$$GDP_{it} = \beta_0 + \beta_1 GDP_{-1} + \beta_2 CIT_{it} + \beta_3 ITQ_{it} + \beta_4 (CIT \times ITQ)_{it} + \beta_4 TOP_{it} + \beta_5 INF_{it} + \beta_6 INT_{it} + \beta_7 EXR_{it} + \mu_{it}$$

…….. (2)

Where:

GDP_{it}: Gross Domestic Product
GDP_{-1}= Lag of **GDP**
CIT_{it}: Company Income Tax
ITQ_{it}: Instructional Quality
$(CIT \times ITQ)$= Moderating variable
TOP_{it}: Trade Openness
INF_{it}: Inflation Rate
INT_{it}: Interest Rate
EXR_{it}: Exchange Rate
μ_{it}: Error Term

Variable Description and Expected Sign

The variables that was used in achieving this study were carefully selected based on their theoretical and empirical underpinning as regards to the interactions between company income tax and Institutional quality on Economic Growth. The variables are summarized in table below.

Table 3.1. Measurement of Variables

Dependent	Measurement	Sign	Source

Gross Domestic Product	Gross domestic product per capita	Positive	WDI
Independent			
Lag of GDP	Lag of **GDP** (GDP_{-1})	positive	STATA
Company Income Tax	It is measure as the percentage of profit tax	Positive	WDI
Institutional Quality	A proxy for corruption control	Positive	WDI
$(CIT \times ITQ)$	Moderating variable (company income tax multiplied by institutional Quality	positive	WDI
Trade Openness	Export plus import divide by GDP	Positive	WDI
Inflation	It is a measure of changes in price (%)	Positive	WDI
Interest Rate	the cost of debt for the borrower and the rate of return for the lender (%)	Positive	WDI
Exchange Rate	A relative price of one currency expressed in terms of another currency	Positive	WDI

Result

This study present and interpret results on the relationship between Company Income Tax and Institutional Quality on Economic Growth of 15 selected West African states. The study examines the long-run and short-run dynamics of the relationship between economic growth and company income tax revenue, while accounting for endogeneity, heterogeneity, and cross-sectional dependence.

4.1. Descriptive Statistics Result

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	345	21.391	8.62	1.097	52.67
CIT	345	16.164	11.735	6.149	58.266
ITQ	345	.189	.062	.125	.473
CITITQ	345	3.118	2.74	.857	17.179
TOP	345	59.11	20.726	16.352	132.382
INF	345	6.527	11.899	-7.901	100.608
INT	345	20176820	21699801	-8579117	99638199
EXR	345	728.253	1474.837	.545	9565.082

Source: Author Computation STATA 15 Output 2023; Note: CIT= Company Income Tax, ITQ=Institutional Quality, CITITQ= Moderation Variable, TOP=Trade Openness, INF=Inflation, **INT**=Interest Rate, EXR=Exchange Rate.

Table 4.1 presents descriptive statistics for several variables with 345 observations. The variables examined include Gross Domestic Product (GDP), Company Income Tax (CIT), Institutional Quality (ITQ), CIT*ITQ, Trade Openness (TOP), Inflation Rate (INF), Interest

Rate (INT), and Exchange Rate (EXR). The table provides the average values, standard deviations, minimum, and maximum values for each variable. For instance, GDP has an average value of approximately 21.391, with a standard deviation of around 8.62, ranging from 1.097 to 52.67. Similarly, CIT has an average value of approximately 16.164, with a standard deviation of about 11.735, and its values vary from 6.149 to 58.266. ITQ exhibits an average value of approximately 0.189, with a standard deviation of roughly 0.062, ranging between 0.125 and 0.473. The CITITQ variable has an average value of approximately 3.118, with a standard deviation of about 2.74, spanning from 0.857 to 17.179. Moreover, TOP has an average value of approximately 59.11, with a standard deviation of around 20.726, varying from 16.352 to 132.382. INF has an average value of approximately 6.527, with a standard deviation of about 11.899, and it includes negative values, with a minimum of approximately -7.901 and a maximum of approximately 100.608. INT2, with an average value of approximately 20,176,820 and a substantial standard deviation of around 21,699,801, covers both positive and negative values, ranging from approximately -8,579,117 to approximately 99,638,199. Lastly, EXR displays an average value of approximately 728.253, with a standard deviation of around 1474.837, and its values range from 0.545 to 9565.082. These descriptive statistics offer valuable insights into the central tendency, variability, and range of each variable, enabling a comprehensive understanding and comparison of their characteristics in the dataset.

Correlation Estimation

Table 4.2 Matrix of correlations estimation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	1.000							
CIT	-0.251	1.000						
ITQ	-0.132	0.087	1.000					
CITITQ	-0.292	0.892	0.453	1.000				
TOP	0.449	-0.160	0.007	-0.163	1.000			
INF	-0.046	0.052	0.047	0.098	0.054	1.000		
INT2	-0.042	-0.029	-0.260	-0.124	-0.219	0.025	1.000	
EXR	0.087	-0.135	-0.036	-0.126	0.324	0.061	-0.134	1.000

Source: Author Computation STATA 15 Output 2023; Note: CIT= Company Income Tax, ITQ=Institutional Quality, CITITQ= Moderation Variable, TOP=Trade Openness, INF=Inflation, **INT2**=Interest Rate, EXR=Exchange Rate.

The correlation matrix reveals the relationships between various economic variables based on their correlation coefficients. It indicates that GDP and Company Income Tax (CIT) have a negative correlation of -0.251, suggesting that as GDP increases, Company Income Tax tends to decrease, and vice versa. Similarly, GDP and Institutional Quality (ITQ) show a negative correlation of -0.132, implying that as GDP increases, Institutional Quality tends to decrease, and vice versa. Moreover, GDP has a negative correlation of -0.292 with the combination of Company Income Tax and Institutional Quality (CITITQ), indicating that as GDP increases, the CITITQ combination tends to decrease, and vice versa. On the other hand, GDP positively correlates with Trade Openness (TOP) with a correlation coefficient of 0.449, implying that as GDP increases, Trade Openness also tends to increase, and vice versa. The weak negative correlations between GDP and Inflation (INF) (-0.046) and between GDP and Interest Rate (INT2) (-0.042) suggest minor inverse relationships with these variables. However, there is a slight positive correlation between GDP and Exchange Rate (EXR) of 0.087, signifying a slight positive relationship between the two. The correlation matrix also reveals various relationships between the other variables. For instance, Company Income Tax (CIT) and Institutional Quality (ITQ) positively correlate with a coefficient of 0.087, as do CIT and the combination of CITITQ with a strong positive correlation coefficient of 0.892. Additionally, Trade Openness (TOP) negatively correlates with CIT (-0.160), INF (0.007), and EXR (-0.163). Meanwhile, Inflation (INF) and Interest Rate (INT2) have a weak positive correlation of 0.098, and Interest Rate (INT2) and Exchange Rate (EXR) negatively correlate with a coefficient of -0.134. These correlation coefficients offer valuable insights into the associations between economic indicators, helping analysts understand potential patterns and dependencies in the dataset. The information from the correlation matrix can be beneficial for making informed decisions and further analyzing the relationships between the variables

4.3 Unit Root Estimation (at Levels)

The presence of stationarity is determined by unit root tests, which frequently call for data to be tested at levels or at difference to establish stationarity for accurate analysis and modelling.

Table 4.3 a Unit Root at Level

	GDP		CIT		ITQ		INF		INT		EXR		TER	
	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob	Statistic	Prob
Levin, Lin & Chu test	-0.88589	0.19	-1.25659	0.11	-7.44789	0.01	-7.64277	0.01	-4.65965	0.01	0.65428	0.74	-2.88293	0.01
Im, Pesaran and Shin W-stat	-0.90829	0.18	-2.74584	0.01	-4.42765	0.01	-8.09435	0.01	-.5.06653	0.01	-0.36291	0.35	-2.80174	0.01
ADF - Fisher Chi-square	42.8786	0.06	56.6151	0.01	70.5149	0.01	124.825	0.01	79.4173	0.01	57.2043	0.01	52.9105	0.01
PP - Fisher Chi-square	53.8542	0.01	94.5963	0.01	115.595	0.01	417.863	0.01	124.730	0.01	28.3565	0.55	39.8002	0.10

Table 4.3 b. Unit root Estimation (at First Difference)

	GDP	CIT	ITQ	INF	INT	EXR	TER
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
Levin, Lin & Chu test	-10.4798**	-5.41695**	-2.87271**	-8.69483**	-13.0840**	-5.24713**	-6.01482**
Im, Pesaran and Shin W-stat	-10.6976**	-9.05997**	-3.78357**	-14.1158**	-13.8611**	-4.48938**	-7.20761**
ADF - Fisher Chi-square	161.446	137.337**	63.6487**	215.063**	210.872**	76.2740**	107.912**

PP - Fisher Chi-square	533.282	402.163**	166.798**	1505.28**	1036.61**	96.2796**	160.945**

****P=.001**

Table 4.3. c. Summary of Unit Root Estimation

Variables	GDP	CIT	ITQ	INF	INT	EXR	TER
Levin, Lin & Chu test	I(I)	I(I)	I(0)	I(0)	I(I)	I(I)	I(I)
Im, Pesaran and Shin W-stat	I(I)	I(I)	I(0)	I(0)	I(I)	I(I)	I(I)
ADF - Fisher Chi-square	I(I)	I(I)	I(0)	I(0)	I(I)	I(0)	I(I)
PP - Fisher Chi-square	I(I)	I(I)	I(0)	I(0)	I(I)	I(I)	I(I)

Source: Authors constructed table

The unit root test results at the level suggest that some of the variables are not stationary at level as shown in the summary table above. The null hypothesis in all the tests is that the variable has a unit root, which indicates a non-stationary time series. The alternative hypothesis is that the variable is stationary.

For the Levin, Lin & Chu t-test, the test statistic is greater than the critical values at the 1% and 5% significance levels for GDP, indicating that we cannot reject the null hypothesis of non-stationarity. For CIT, ITQ, INF, INT, EXR and TER, the test statistics are less than the critical values at the 5% significance level, indicating that we can reject the null hypothesis of non-stationarity.

For the Im, Pesaran and Shin W-stat test, the test statistics for GDP, CIT, ITQ, INF, INT, EXR and TER are greater than the critical values at the 5% significance level, indicating that we cannot reject the null hypothesis of non-stationarity. For FDI, the test statistic is less than the critical value at the 5% significance level, indicating that we can reject the null hypothesis of non-stationarity.

For the ADF and PP tests, the test statistics for all variables are greater than the critical values at the 5% significance level, indicating that we cannot reject the null hypothesis of non-stationarity.

The unit root test results for the variables in first differences show that all variables have become stationary at the first difference. This suggests that the variables have a common stochastic trend and can be co-integrated. The statistical significance of the test results indicates that we can reject the null hypothesis of a unit root, which means that the variables are non-stationary at level but become stationary after taking the first difference. Thus, we can use the first difference of the variables in the analysis. Non the variable exhibited 2^{nd} difference I (2).

4.4 Panel ARDL Estimation (MG and PMG)

Table 4.4 Panel ARDL Estimation (MG and PMG)

Variables	**Mean Group**		**Pooled Mean Group (PMG)**	
D.GDP	**Coeff**	**Std**	**Coeff**	**Std**
LNCIT	3.159	10.530	-0.126	0.067
LNITQ	346.741	744.897	-96.938	9.137
LNCITITQ	-29.023	56.693	0.458	0.407
LNTOP	0.414	0.340	0.583	0.025
LNINF	0.001	0.423	-0.157	0.050
LNEXR	-0.405	0.545	0.030	0.004
EC	-0.732	0.152	-0.240	0.090

LNCIT=company Income Tax, LNITQ= Institutional Quality, LNCITITQ= Moderating Variable, LNTOP= Trade Openness, LNINF=Inflation and LNEXR= Exchange Rate

Table 4.4 shows the mean Group (MG) and Pooled Mean Group (PMG) Estimations. Based on the Hausman test shown in table 4.14, the pooled mean group best explains the model. The p-value of the Hausman test is greater than 0.05, confirming the PMG is the best model to estimate the relationship between institutional quality and economic growth. Therefore, the interpretation is based on the PMG. LNCIT, LNITQ, LNTOP, LNINF, has a positive relationship with GDP while LNCITITQ and LNEXR has a negative relationship with GDP. A unit change in LNCIT, LNITQ, LNTOP, LNINF, GDP increases by 3.159 (10.530), 346.741 (744.897), 0.414 (0.340) and 0.001 (0.423) respectively. A unit change in LNCITITQ and LNEXR, GDP decreases by -29.023(56.963) and -0.405(0.545). Any movement from disequilibrium, the speed adjustment is corrected by -0.240.

Table 4.5 Hausman (1978) specification test

	Coef.
Chi-square test value	.813
P-value	.992

Table 4.7 shows the Hausman test to compare the mean group and pooled mean group. From the table above the p-value is 0.9 greater than 0.05 which indicates that the PMG is the best estimator of the relationship between institutional quality and economic growth in the selected West African countries.

Individual Country pooled Mean Group

To analyze the individual country's effect on the relationship between institutional quality and economic growth, the 15 countries are divided into group A, B and C.

Table 4.6 Group A

Country	Nigeria	Niger	Gambia	Ghana	Sierra Leone
Error correction (EC)	-0.021	-1.0069	-0.117	-0.227	-0.003
Standard Error	0.07	0.105	0.111	0.082	0.165

Group A above consist of Nigeria, Niger, Gambia, Ghana and sierra Leone respectively. The table shows the speed of adjustment from short run to long run. The error correction values represent how much the dependent variable adjusts or corrects in response to deviations from the equilibrium relationship between the variables in the short run. For instance, a negative error correction coefficient suggests that the dependent variable tends to decrease (or increase at a slower pace) when there is a deviation from the equilibrium relationship, bringing it back to the long-run equilibrium in subsequent periods. For Nigeria, Niger, Gambia, Ghana and sierra Leone, any deviation from equilibrium will be corrected by -0.021, -1.0069, -0.117, -0.227 and -0.003 respectively.

Table 4.6 Group B

Country	Senegal	Burkina Faso	Guinea Bissau	Guinea	Cote d' Ivoire
Error correction (EC)	-0.244	-0.024	-0.238	-0.642	-0.368
Standard Error	0.105	0.055	0.093	0.200	0.094

Group B above consist of Senegal, Burkina Faso, Guinea Bisau, Guinea, and Cote d'Ivoire respectively. The table shows the speed of adjustment from short run to long run. For Senegal, Burkina Faso, Guinea Bisau, Guinea, and Cote Devoir, any deviation from equilibrium will be corrected by -0.244, -0.024, -0.238, -0.642, and -0.368 respectively.

Table 4.6 Group C

Country	Cameroon	Cape Verde	Togo	Mali	Benin
Error correction (EC)	-0.107	-0.444	-0.248	-0.255	-0.167
Standard Error	0.087	0.137	0.097	0.115	0.045

Same analogy goes for country C. Group C above consist of Cameroon, Cape Verde, Togo, Mali, and Benin respectively. The table shows the speed of adjustment from short run to long run. For Cameroon, Cape Verde, Togo, Mali, and Benin, any deviation from equilibrium will be corrected by -0.107, -0.444, -0.248, -0.255 and -0.167, respectively.

Conclusion

The relationship between company income tax and institutional quality on economic growth has long been a subject of interest for researchers in the field of economics, finance, and to policymakers worldwide. In the context of West African countries, where economic growth and stability play a critical role in improving the livelihoods of their populations,

understanding the dynamics between company income tax, institutional quality, and economic growth becomes even more imperative.

This study seeks to delve into the intricate connections company income tax and institutional quality on economic growth, examining how variations in tax policies can impact the overall economic growth of selected West African nations. Additionally, the study investigates the role of institutional quality in shaping economic growth, emphasizing the significance of transparent governance, rule of law, and reduced corruption in promoting a conducive business environment.

The study explores the role of institutional quality in to achieve this study, this research employs a robust dataset comprising 345 observations from diverse West African countries. The data covers a range of key economic variables, including gross domestic product (GDP), corporate income tax (CIT), institutional quality (ITQ), trade openness (TOP), inflation rate (INF), interest rate (INT), exchange rate (EXR), and tax effort ratio (TER). By analyzing these variables and their interrelationships through rigorous statistical methods, we aim to provide valuable insights into the mechanisms influencing economic growth in the region. In the following sections, presented the descriptive statistics and correlation matrices for the economic variables under study. Then proceed with the Error Correction Estimation (MG and PMG) to identify the most suitable model for analyzing the relationships.

Strengthening the relationship between company income tax and economic growth in selected West African countries. Descriptive statistics for various variables are presented in Table 4.1, and a correlation matrix in Table 4.2 shows the relationships between these variables. The study uses panel ARDL (MG and PMG) and finds that PMG is the better model. The PMG model indicates that LNITQ, LNTOP, LNINF have a positive relationship with GDP, while LNCIT, LNCITITQ, and LNEXR have a negative relationship. Recommendations can be made to enhance institutional quality and trade openness to foster economic growth.

Conclusion

In conclusion, the study explores the relationships between Company Income and Institutional Quality with Economic Growth in selected West African countries. The

correlation matrices and Error Correction Estimations provide insights into these relationships. The findings suggest that various economic indicators influence economic growth differently in different countries. Policymakers should consider these insights while formulating tax policies, improving institutional quality, and attracting foreign investment to promote sustainable economic growth in the selected West African Countries.

Recommendations

Tax Policies: Based on the findings of Objective, policymakers should consider optimizing Company Income Tax rates to strike a balance between revenue generation and incentivizing economic growth. Lower tax rates might attract more investments and stimulate economic activity. Additionally, measures should be taken to improve tax compliance to enhance tax revenues without burdening businesses excessively.

Institutional Quality: Highlights the importance of institutional quality in fostering economic growth. Governments should focus on enhancing transparency, reducing corruption, and improving the rule of law. Strengthening institutions can attract more investments, support economic stability, and create a favorable business environment.

Trade Openness: The positive correlation between Trade Openness and Economic Growth (Objectives 1 and 2) suggests that countries should continue to promote trade liberalization and engage in international trade agreements to enhance economic growth through increased market access and competitiveness.

Foreign Direct Investment (FDI): Indicates a positive relationship between FDI and Economic Growth. Policymakers should actively encourage FDI by providing incentives, streamlining regulatory processes, and creating an attractive investment climate to boost economic growth.

Monitoring and Evaluation: Continuous monitoring and evaluation of economic indicators are essential to track progress, identify areas for improvement, and adapt policies accordingly. Governments should invest in data collection and analysis to make informed decisions and ensure effective policy implementation.

By incorporating these recommendations, West African countries can create a conducive environment for economic growth, attracting investments, and fostering long-term prosperity in the region.

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