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Original Paper

Determining the Threshold Level of Tax Revenue That Affects the Debt-Growth Relationship. A Case of Ghana

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Abstract

This study examined the tax revenue threshold that influences the correlation between governmental debt and economic growth in Ghana. This study utilises time series data from 2002 to 2020 obtained from the World Bank and IMF, employing Hansen's (2000) threshold autoregressive model to evaluate essential macroeconomic variables: GDP growth rate, tax income, public debt, and government expenditure. The results demonstrate that, in a low-tax-revenue environment (below 5.16%), tax revenue negatively impacts GDP growth, indicating inefficiencies in the allocation of tax funds. In a high tax revenue environment, this detrimental effect exacerbates, signifying that excessive taxation hinders economic progress. Public debt exerts a significantly negative effect on GDP growth in both tax revenue systems, with a more substantial impact observed in the low tax revenue system. Conversely, government expenditure exerts a favourable influence on GDP growth in both regimes, underscoring its importance in fostering economic advancement. The relationship between public debt and tax revenue has a moderating effect, whereby public debt amplifies the beneficial influence of tax income on growth when employed effectively. This study's policy implications underscore the necessity for Ghanaian policymakers to enhance fiscal efficiency, optimise tax revenue allocation, and prudently manage public debt to foster long-term economic growth.

Keywords: Tax Revenue, Public Debt, Economic Growth, Threshold Autoregressive Model, Government Expenditure, Fiscal Efficiency, GDP Growth

1. Introduction

The relationship among public debt, tax income, and economic growth has historically been a fundamental topic in economic policy and fiscal management. Governments often utilise borrowing to fund development projects, infrastructure, and other public investments that foster economic growth (Aizenman et al., 2007; Nguyen et al., 2018). Nonetheless, when debt surpasses sustainable thresholds, it can adversely affect growth and result in what is typically referred to as a "debt overhang" (Geleta, 2021). Tax income is crucial for providing the resources necessary for governments to manage debt and finance expenditures (Amankwah et al., 2018). In economies such as Ghana, where tax reforms and borrowing substantially affect the fiscal landscape, it is essential to understand the intricate relationship between these factors. It is crucial to identify the threshold at which tax revenue begins to influence the debt-growth relationship, assisting policymakers in balancing debt sustainability with economic expansion.

Over the past two decades, Ghana's economic trajectory has been characterised by a significant increase in public debt, as the nation has primarily relied on borrowing to pursue its development objectives (Anning et al., 2015; Owusu-Nantwi & Erickson, 2016). The nation's efforts to finance major projects in infrastructure, energy, and social services have led to an increasing debt burden that has come under intensified scrutiny in recent years. Concurrently, Ghana has instituted various tax reforms to enhance revenue collection, anticipating that augmented tax revenue may serve as a deterrent to excessive borrowing. The question remains whether there is an ideal tax revenue level that

could mitigate the adverse effects of public debt on economic growth. This unresolved issue is critical for ongoing research aimed at identifying the tax revenue level that significantly influences the relationship between state debt and growth in Ghana.

The relationship between public debt and economic growth has been thoroughly investigated, with notable researchers such as Reinhart and Rogoff (2010) and Yiadom and Amankwa (2019) proposing that substantial public debt, particularly beyond 90% of GDP, may hinder economic progress. In Ghana, scholars such as Akolgo (2023) and Frimpong (2020) rigorously examined increasing public debt levels and their sustainability, cautioning against the adverse impacts of excessive borrowing on economic growth. Their research suggests that Ghana's national debt has reached unsustainable levels, potentially jeopardising future economic growth.

Conversely, research investigating the impact of tax revenue on economic growth, including studies by Mensah et al. (2017), Ofori (2019), Ofori-Abebrese et al. (2020), and Oluwatobi et al. (2021), highlighted the significance of taxation systems in promoting growth through enhanced revenue collection, reduction of fiscal deficits, and financing essential public projects. These studies emphasise the beneficial effect of effective tax collection on economic development, asserting that an expanded tax base and successful fiscal policies are essential for maintaining public expenditure. Nonetheless, this research has not examined the pivotal level of tax revenue that affects the correlation between debt and growth in Ghana. This research seeks to fill the vacuum in the literature by analysing both the individual impacts of debt and tax revenue on growth, as well as the manner in which tax revenue influences the debt-growth relationship. This approach provides a clearer comprehension of the function of tax income in mitigating the impact of debt on economic performance.

Additionally, Ghana's economy faces unique challenges, including fluctuating revenues from extractive industries, unexpected external influences, and dependence on global markets, complicating fiscal management (Ofori-Abebrese et al., 2020). Notwithstanding the implementation of many tax changes, Ghana persists in its challenges to optimise tax income, and the relationship between debt and economic growth remains ambiguous (Anning et al., 2015). In the absence of identifying the tax revenue threshold influencing debt growth dynamics, authorities may implement fiscal actions that could be ineffective or detrimental. This study is crucial as it seeks to provide empirical evidence on the requisite tax income to balance debt management and economic growth, hence guiding Ghana's fiscal policy strategy.

This study aims to determine the pivotal threshold of tax revenue that affects the relationship between public debt and economic growth in Ghana. This study has three main objectives: first, to determine the critical tax revenue threshold at which the influence of public debt on economic growth changes; second, to examine how different levels of tax revenue impact the relationship between public debt and Ghana's economic growth; and third, to explore whether the threshold level of tax revenue varies under different macroeconomic conditions in Ghana. This study aims to furnish policymakers with practical insights on utilising tax strategies to sustainably manage public debt while promoting economic growth.

This study examined the subsequent research questions to achieve these objectives. What is the threshold level of tax revenue that affects the relationship between public debt and economic growth in Ghana? Secondly, how can tax revenue alleviate the effects of government debt on economic growth? Does the threshold amount of tax revenue fluctuate with varying economic conditions in Ghana, such as inflation or external shocks? These enquiries aim to guide the empirical analysis of the specific tax revenue level that balances debt and economic dynamics, hence improving sustainable fiscal policy.

This study's relevance to Ghana is varied. The economic expansion of Ghana has been predominantly driven by significant governmental investments, frequently funded by borrowing (Amankwah et al., 2020; Amankwah et al., 2018). As a result, a nation's debt-to-GDP ratio increases, raising apprehensions over debt sustainability and its long-term impact on economic growth (Aimola & Odhiambo, 2021). Therefore, it is essential to comprehend how tax revenue might mitigate the effects of debt on growth, as this understanding is vital for devising fiscal policies that foster sustainable development. Moreover, establishing a tax revenue threshold offers empirical rationale for modifying tax policy in response to increasing debt levels, aiding the government in balancing revenue

augmentation with economic stability. This analysis fills a notable gap in the existing literature by analysing the interaction between tax revenue and the debt-growth connection. This region has garnered less focus in Ghana. While scholars have individually examined the impacts of debt and tax revenue on economic growth, limited attention has been given to how tax revenue may influence the larger dynamics of debt growth. This study examined an overlooked domain, yielding substantial insights that augment both theoretical understanding and practical application in public finance.

This study's findings offer substantial practical insights for policymakers in Ghana. This research clarifies the optimal tax revenue level required to prevent debt from hindering economic growth, given the nation's issues with increasing debt and the necessity to boost income. This is particularly crucial in the current economic context, as Ghana aims to reduce its fiscal deficit, improve its debt profile, and stimulate economic recovery. This paper delineates a tax revenue benchmark to inform tax reform initiatives and debt management approaches. This ensures that Ghana's fiscal strategy promotes lasting, sustainable economic growth.

2. Literature Review

2.1 Theoretical Review

Comprehending the relationship between debt and growth, as well as the function of tax income, necessitates a comprehensive analysis of pertinent economic theories. This study utilises Debt Overhang Theory, Laffer Curve Theory, and Endogenous Growth Theory to elucidate the mechanisms governing the relationship between debt, tax revenue, and economic growth.

The Debt Overhang Theory, initially proposed by Krugman (1988), asserts that elevated debt levels inhibit investment due to investors' apprehension that future economic growth returns will be allocated to debt servicing instead of enhancing the economy. This idea is particularly pertinent to Ghana, where escalating debt levels provoke apprehensions regarding the nation's capacity to continue economic growth. The theory posits that tax revenue may either alleviate or intensify this dynamic, contingent upon its efficacy in addressing the debt burden without hindering economic activity.

The Laffer Curve Theory elucidates the correlation between tax rates and tax revenue, positing that an optimal tax rate exists which maximises revenue while not deterring economic activity. This theory is relevant to the current investigation, since it offers a framework for comprehending the threshold at which tax revenue influences the debt-growth relationship. The fiscal policy adjustments in Ghana, designed to augment tax income, require critical analysis to prevent discouragement of growth and investment, especially in the context of elevated debt levels.

The Endogenous progress Theory, formulated by Romer (1990), underscores the significance of human capital, innovation, and knowledge in propelling sustained economic progress. When utilised effectively, tax income can stimulate expenditures in education, infrastructure, and technology, so facilitating growth. In a debt-burdened economy such as Ghana, excessive taxation may jeopardise these investments, hence exacerbating the debt-growth dynamic. This theory underpins the study's examination of the tax revenue threshold by emphasising the enduring advantages of balanced fiscal policies.

2.2 Empirical Review

Multiple empirical studies have examined the correlation between government debt, tax income, and economic progress, yielding varied conclusions shaped by distinct methodologies and country contexts (Yared, 2019; Swamy, 2015).

Reinhart and Rogoff (2010) and Salotti and Trecroci (2016) rigorously examine public debt and its effects on economic growth across various nations. Their analysis revealed that when public debt above 90% of GDP, it substantially hindered growth. Similarly, Owusu-Nantwi and Erickson (2016) and Yiadom and Amankwa (2019) analyse the dynamics of Ghana's public debt, emphasising that excessive debt accumulation might result in unsustainable economic practices that hinder progress. This study employed time-series data and regression analysis to investigate the relationship between Ghana's debt-to-GDP ratio and economic progress. These studies support the idea that excessive debt levels can impede growth, although they do not precisely investigate how tax revenue may affect this relationship.

The relationship between tax revenue and economic growth has been explored in many studies. Mensah et al. (2017) and Agblobi et al. (2019) examined the effects of tax reforms on Ghana's economic growth, concentrating primarily on income generated from diverse taxation systems. The researchers discovered that enhancements in panel data analysis positively influenced tax revenue growth by providing increased funds for government expenditure. The study neglected to consider the influence of public debt in this context, creating a knowledge gap about the interplay between tax revenue and debt on growth outcomes.

Recent research has aimed to reconcile independent assessments of debt and tax revenue. An empirical investigation by Ofori (2019) and Putri et al. (2022) examined the correlation between tax revenue, government debt, and economic growth in rising nations. The study, employing a generalised method of moments (GMM) approach, demonstrated that while tax revenue positively impacts growth, its efficacy declines when public debt reaches unsustainable levels. This study provides a foundation for understanding how tax revenue affects the relationship between debt and growth. However, it fails to specify a certain threshold at which tax revenue influences this interaction, particularly in Ghana.

In Ghana, where tax revenue mobilisation is a critical component of fiscal policy, it is essential to evaluate whether an increase in tax revenue can alleviate the adverse effects of public debt on economic growth. Current research primarily examines public debt and tax revenue independently, with little studies exploring the relationship between these variables and their impact on economic growth. Furthermore, there is a lack of consensus regarding the tax revenue threshold that influences the correlation between debt and growth in Ghana, highlighting a significant divergence between theoretical and empirical research.

This study's conceptual framework examines the relationship between governmental debt, tax revenue, and economic growth. When utilised efficiently, public debt can stimulate economic growth through advantageous investments; nevertheless, excessive borrowing may hinder progress. Tax revenue is a vital factor in this context, since it can mitigate the adverse effects of debt by funding public services and infrastructure (Geleta, 2021). However, tax revenue might hinder growth if it exceeds a particular threshold, since it may impose an undue burden on firms and individuals, thus diminishing investment and consumption (Nguyen et al., 2018).

Current research presents contradictory results concerning the correlations among these variables, underscoring the necessity for country-specific analysis (Marques & Caetano, 2020; Cevik & Miryugin, 2018; Hanappi et al., 2023). This study sought to identify the appropriate tax revenue threshold influencing the link between debt and growth in Ghana. In this country, public debt and tax reforms substantially impacted the fiscal landscape.

The importance of this study is especially evident in Ghana, where financial challenges and increasing government debt jeopardise economic growth. The nation's dependence on foreign loans, coupled with initiatives to increase tax collections, highlights the necessity of balancing debt management and revenue generation to foster sustainable economic growth (Serawitu 2021; Nzeh 2020). Despite comprehensive research on the separate impacts of debt and tax income, there is a scarcity of studies that integrate these elements to comprehend their collective effect on economic growth.

This study examines the moderating effect of tax income on the link between debt and growth, thereby addressing a significant gap in the literature. This analysis identifies the specific tax revenue threshold influencing this relationship, offering useful insights for policymakers aiming to enhance fiscal policies in Ghana.

3. Methodology

This study employs a mathematical methodology to rigorously analyse the intricate link among public debt, tax revenue, and economic growth in Ghana, specifically aiming to identify the tax revenue threshold that affects the impact of public debt on economic growth. This study utilises Hansen's (2000) Threshold Autoregressive (TAR) model to identify nonlinear dynamics and critical thresholds that clarify the interaction between shifting tax revenue levels and public debt in relation to economic growth.

The analysis includes essential data, including the annual percentage change in GDP, public debt as a proportion of GDP, and tax revenue as a proportion of GDP. The TAR model is essential for addressing the intrinsic nonlinearities in the debt-growth relationship that standard linear models may overlook. Considering Ghana's complex economic landscape, where the effects of public debt and tax revenue are significantly context-dependent, this model aids in determining the threshold at which tax revenue starts to impact economic performance positively or negatively.

This research utilises data from reputable sources, including the World Bank and the International Monetary Fund (IMF), spanning the years 1990 to 2022. The technique effectively incorporates control variables like inflation and interest rates to adjust for broader macroeconomic influences that may obscure the core correlations being examined. This thorough methodology improves causal identification and provides essential insights into the formulation of fiscal policy within Ghana's evolving economic context.

3.1 Model Specification and Estimation Technique

This study considered the following linear regression equation:

$$Y_t = \beta_1' \times_t h(qt \geq y) + \beta_2' \times_t h(y < qt < y) + \varepsilon_t \quad (1)$$

Where γ_t is the dependent variable, $\times_t$ is a 1 x k vector of covariates possibly containing lagged values of γ_t, β_1' Is a k x 1 vector of regime-invariant parameters, ε_t is an iid error with mean 0 and variance σ^2, h is a vector of exogenous variables with regime-specific coefficient vectors β_1' and β_2', and q_t is a threshold variable that may also be one of the variables in $\times_t$. Regime 1 is the subset of observations with the value of being q_t less than the threshold γ. Similarly, Regime 2 is defined as the subset of observations in which the value of q_t is greater than γ.

$$\gamma_t = \beta_1' \times_t h + \varepsilon_t \quad \text{if } q_t \leq \gamma \quad (2)$$

$$\gamma_t = \beta_2' \times_t h + \varepsilon_t \quad \text{if } q_t > \gamma \quad (3)$$

Where q_t signifies the threshold variable, dividing all the observed values into two groups or "regimes." Term γ_t Signifies the variable to be explained, whereas a matrix denotes the explanatory variable. The error term ε_t Is white-noise iid, and γ represents the threshold value, which is unknown but can be estimated. The model implies that when the threshold variable is smaller than the threshold parameter, regression equation (2) is applicable. Let $h_t(\boldsymbol{\gamma})$ = {qt $\leq \gamma$}, and {.} as an indicator function with h =1 if $q_t \leq \gamma$ occurs, or h = 0 otherwise. In addition, when $\times_t (\boldsymbol{\gamma}) = \times_t h_t(\boldsymbol{\gamma})$, the equations (2) and (3) revised as follows.

$$\gamma_t = \theta' x_t + \rho' x_t(\gamma) + e_t, e_t \sim iid(0, \sigma_t^2). \quad (4)$$

Therein, $\theta = \theta_2$, $\rho = \theta_1 - \theta_2$, $e_t = [e_{1t}\ e_{2t}]'$ θ, ρ, and γ are the parameters to be estimated. Equation (4) allows all regression coefficients to differ between sample groups. The resulting sum of squared error as a result of estimating these parameters θ, ρ, and γ can be expressed as follows

$$S_1(\gamma) = \hat{e}(\gamma)' \hat{e}(\gamma) \quad (5)$$

The least-squares method for estimating γ was introduced by Hansen (1996). This can be achieved by minimising the sum of the squared errors in (5). The estimated threshold value is given as

$$\hat{\gamma} = \arg\min S_1(\gamma) \quad (6)$$

The variance of the residual is expressed as

$$\sigma^2 = \frac{1}{n} \hat{e}_t(\gamma)' \hat{e}_t(\gamma) = \frac{1}{n} s_1(\hat{\gamma}) \quad (7)$$

Once $\hat{\gamma}$ is obtained, the vector of parameter estimates is $\hat{\theta} = \hat{\theta}(\hat{\gamma})$ and $\hat{\rho} = \hat{\rho}(\hat{\gamma})$. The regression equation for the two-regime TAR model is expressed as follows:

$$GDP_t = \beta_{10}\ debt + \beta_{11}\ tar + \beta_{12}\ govt.exp. + \beta_{13}\ debt * tar + \varepsilon_t \quad \text{if} \quad \leq \gamma \quad (8)$$

$$GDP_t = \beta_{20}\ debt + \beta_{22}\ tar + \beta_{24}\ govt.exp. + \beta_{26}\ debt * tar + \varepsilon_t \quad \text{if} \quad > \gamma \quad (9)$$

In evaluating Model (8), determining the threshold value involves identifying the value that minimises

the cumulative squared error, as depicted in Equation (7). Since the core objective of this study is to investigate the implications of exchange rate thresholds on the relationship between the exchange rate and economic growth, the annual growth rate of the exchange rate is employed as the analysis's threshold variable.

The Eviews software was used to estimate the TAR model. The critical feature of the TAR model is its ability to identify the exact threshold of the relationship between public debt and economic growth changes based on tax revenue levels. This approach is essential for policy formulation, as it reveals the point beyond which higher tax revenues may negatively or positively influence the debt-growth relationship.

4. Presentation of the Result

4.1 Descriptive Statistics

Table 1 displays the descriptive statistics for both the dependent and independent variables. The GDP growth rate served as an indicator of economic growth. Public debt, tax revenue, and government expenditure served as independent variables. The descriptive statistics of the data are organised into four columns: the first column lists the variables, followed by the mean, standard deviation, minimum, median, maximum, skewness, and kurtosis.

Table 1. Statistical Result

	GDP	**PDEBT**	**TAR**	**GOVETEXP**
Mean	0.055080	0.403996	10.52876	0.147892
Median	0.047000	0.405700	12.61246	0.138500
Maximum	0.140500	0.801700	21.75211	0.219800
Minimum	0.028600	0.185100	0.000000	0.071000
Std. Dev.	0.024583	0.157141	7.277452	0.040047
Skewness	1.951842	0.448172	-0.442966	0.134749
Kurtosis	6.987312	2.790176	1.936228	2.454420
Observations	25	25	25	25

Table 1 displays the descriptive statistics of the principal economic indicators during the analysed period. The economic performance had considerable variability, with an average GDP growth rate of 5.5%, ranging from a peak of 14% to a trough of 2.8% within the same year. The public debt indicator demonstrated significant fluctuations in the nation's debt burden during the examined period, averaging 40.3% of GDP, peaking at 80.2%, and declining to a minimum of 18.5%. The average tax revenue is 10.53% of GDP, with a range from 0.00% to 21.75%, indicating diverse approaches in government income generation. Conversely, government expenditure averages 14.78% of GDP, varying between 7.1% and 21.98%. The figures reveal the contrasting fiscal trends between income collection and expenditure patterns, essential for comprehending overall fiscal sustainability and economic performance in the context of Ghana's public financial administration.

Table 2. Results of Unit Root tests with ADF and P.P.

	Augmented Dickey-Fuller (ADF)		Phillips-Perron (P.P.)	
Variables	**Level**	**P. Value**	**Level**	**P. Value**
GDP	2.829657	0.0691	2.829657	0.0691
PDEBT	1.893516	0.3295	1.893516	0.3295
TAR	1.718603	0.4097	1.743722	0.3977
GOVETEXP	0.692817	0.8287	1.327466	0.5997
LNDEBT	2.027503	0.2739	2.079055	0.2541
TARGR	5.058576	0.0005	5.058891	0.0005

The unit root tests using ADF and P.P. displayed in Table 2 indicate that all variables are non-stationary, with the exception of the tax revenue growth rate, which is stationary at 5.058576***. Nevertheless, GDP, PDEBT, TAR, GOVETEXP, and LNDEBT were converted into their first differences.

Table 3. Results of Unit Root tests with ADF and P.P.- (1st Difference)

	Augmented Dickey-Fuller (ADF)		Phillips-Perron (P.P.)	
Variables	**Level**	**P. Value**	**Level**	**P. Value**
GDP	6.005491	0.0001	6.215436	0.0000
PDEBT	3.928007	0.0067	3.904542	0.0071
TAR	4.960601	0.0006	4.960601	0.0006
GOVETEXP	5.225238	0.0003	5.247608	0.0003
LNDEBT	4.909752	0.0007	4.909752	0.0007

4.2 Regression Analysis

The results of the threshold regression analysis presented in Table 3 reveal a singular threshold effect of 5.16% on tax revenue. This study categorises the data into two unique tax revenue classifications: a low-revenue regime beneath the threshold and a high-revenue regime over the threshold. These categories are employed to analyse the varying impacts of tax revenue on economic growth across different regimes.

Table 4. Regression Results of TARGR and GDP (1998–2022)

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
TARGR < 5.157659 -- 94 obs				
C	0.086423	0.010662	8.105408	0.0000
TAR	-0.003130	0.000924	-3.386717	0.0010
PDEBT	-6.95E-06	1.31E-06	-5.302144	0.0000
GOVEXP	4.63E-06	8.01E-07	5.783376	0.0000
INTDEBT	4.44E-07	1.09E-07	4.062666	0.0001

5.157659 <= TARGR -- 35 obs				
C	0.225174	0.036688	6.137534	0.0000
TAR	-0.014498	0.002902	-4.996019	0.0000
PDEBT	-2.33E-05	3.69E-06	-6.304154	0.0000
GOVEXP	5.27E-06	1.45E-06	3.639691	0.0004
INTDEBT	1.78E-06	3.27E-07	5.442289	0.0000
R-squared	0.681571	Mean dependent var		0.052805
Adjusted R-squared	0.657488	S.D. dependent var		0.022161
S.E. of regression	0.012970	Akaike info criterion		-5.778034
Sum squared resid	0.020018	Schwarz criterion		-5.556343
Log-likelihood	382.6832	Hannan-Quinn criter.		-5.687956
F-statistic	28.30110	Durbin-Watson stat		1.383745
Prob(F-statistic)	0.000000			

Table 3 indicates that, within the low-tax-revenue regime (when tax revenue is below 5.16%), tax revenue has a negative and statistically significant impact on GDP growth, with a coefficient of -0.003. This finding indicates that a 1% increase in tax income within this regime correlates with a 0.3% decrease in economic growth, challenging the prevalent notion that tax revenue promotes growth. This discovery indicates inefficiencies in the allocation of tax funds. On the other hand, when tax revenue exceeds the 5.16% threshold, the results demonstrate a stronger negative correlation between tax revenue and economic growth, as indicated by a coefficient of -0.014. This indicates that a 1% increase in tax revenue beyond the threshold leads to a 1.4% decrease in economic growth, highlighting the negative impact of tax collections surpassing the critical level.

Table 4 reveals a negative and statistically significant relationship between public debt and GDP growth within a low-tax revenue framework, as evidenced by a coefficient of -6.950. This outcome indicates that a 1% increase in public debt within this framework leads to a 6.95% decrease in economic growth, supporting the notion that high debt levels hinder economic performance. In contrast, within the high-tax-revenue regime, public debt negatively impacts GDP growth, albeit to a lesser extent, with a coefficient of -2.330. This conclusion indicates that a 1% increase in public debt beyond the threshold leads to a modest, yet still substantial, reduction in economic growth.

The findings demonstrate that government expenditure positively and significantly influences GDP growth in both low- and high-tax revenue regimes, with coefficient values of 4.630 and 5.270, respectively. This research indicates that a 1% rise in government expenditure correlates with an increase in economic growth in both regimes, highlighting the significance of government spending in promoting growth. Furthermore, Table 4 indicates that the interaction term between public debt and tax revenue, which moderates the link between tax revenue and economic growth, exhibits a positive and statistically significant effect. This conclusion indicates that public debt amplifies the correlation between tax revenue and economic growth, suggesting that increased public debt intensifies the beneficial impact of tax revenue on economic growth.

5. Discussion

This analysis clarifies the complex interconnections between economic development, government expenditure, public debt, and tax revenue in Ghana. The inverse relationship between GDP growth and tax revenue in low-tax revenue contexts undermines the traditional notion that heightened tax collection inevitably stimulates economic growth. This outcome indicates inefficiencies in the distribution and utilisation of tax income, likely due to suboptimal management or insufficient public investment. Comparable studies in Ghana highlight the significance of proficient fiscal governance.

Sedegah et al. (2024) emphasise that although tax revenues are crucial for development financing, inefficiencies in the public sector might result in suboptimal growth. Other African nations, including Nigeria, encounter analogous challenges, with studies indicating that augmented tax revenue without improved fiscal efficiency does not foster growth (Igwe & Ugwuanyi 2024; Osamor 2023).

Excessive tax revenue correlates with a reduction in economic growth, indicating that high taxing may impede economic advancement. This corresponds with the Laffer Curve theory, which asserts that beyond a specific threshold, elevated tax rates can diminish investment and productivity, resulting in reduced economic output. Comparable patterns have been noted in other developing nations. Githinji and Ngugi (2017) demonstrate that elevated taxes impede private sector expansion in Kenya, particularly in the absence of robust institutional support.

The detrimental impact of government debt on economic growth across different tax systems corroborates previous research cautioning against elevated borrowing levels, particularly in nations with fragile fiscal governance. Boakye and Atuilik (2024) ascertain that substantial public debt impedes economic progress in Ghana, as debt servicing expenditures restrict resources for vital public investments. Similar outcomes have been noted in other developing countries, including Zambia and South Africa, where elevated debt levels have impeded economic advancement (Bal et al., 2022).

Public expenditure positively influences economic growth in both low- and high-tax revenue environments, underscoring the essential importance of government investment in development. This corresponds with Keynesian economics, which promotes strong government intervention, particularly in infrastructure and social services, to enhance demand and stimulate growth. Studies in Ghana and other African nations indicate that judiciously allocated government resources might mitigate the adverse impacts of taxation and debt (Bathuure, 2024; Sedegah et al., 2024).

The relationship between public debt and tax revenue suggests that although public debt typically impedes growth, it may, in certain circumstances, facilitate economic advancement in conjunction with tax income. Research indicates that the strategic utilisation of public debt for growth-promoting initiatives can alleviate the adverse impacts of elevated taxation (Korankye & Anning, 2018). These findings underscore the significance of a balanced fiscal strategy in Ghana. The ineffective allocation of tax revenue and substantial government debt threaten sustainable growth. Nevertheless, judicious public expenditure can foster economic advancement even in difficult fiscal circumstances.

6. Conclusion

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Theoretical Contribution

This study offers significant theoretical insights by examining Debt Overhang Theory, Laffer Curve Theory, and Endogenous Growth Theory. The identified inverse relationship between public debt and GDP growth, apparent in both low and high tax revenue scenarios, corroborates Debt Overhang Theory's claim that excessive debt hinders economic advancement by diverting resources from productive investments. The considerable negative impact of tax revenue above the 5.16% threshold corresponds with Laffer Curve Theory, which posits that high tax rates can impede investment and productivity, hence diminishing economic output. The ineffective distribution of tax revenue, especially in a low-tax environment, contradicts Endogenous Growth Theory, which underscores the importance of fiscal policy and government expenditure in promoting sustained economic growth through increased productivity and innovation. These findings underscore the complexities of fiscal policy implementation and their implications for Ghana's economic development.

Police Implication

The findings indicate that Ghanaian policymakers ought to prioritise enhancing fiscal efficiency, optimising tax revenue allocation, and practicing prudence in public debt management to ensure sustained economic growth and stability.

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