



Effect of Fiscal Policy Variables on Economic Growth: Taxation.

Munene Lewis Njagi, Department of Social Sciences, Tharaka University, munene.njagi@tharaka.ac.ke

Maureen Ndagara, Department of Social Sciences, Tharaka University, maureen.ndagara@tharaka.ac.ke

Anita Ncurai, , Department of Social Sciences, Tharaka University, anita.ncurai@tharaka.ac.ke

Abstract

Fiscal policy, which involves government decisions on taxation and spending, plays a fundamental role in shaping economic outcomes by fostering sustainable growth and alleviating poverty (IMF, 2023). Kenya's government has sought to increase the tax revenue collected by enhancing collection efficiency and broadening the tax base. The tax revenue collected is expected to influence fiscal policy and economic growth because the government finances its expenditures (development and recurrent) largely through tax revenues, which form the backbone of government income. This study sought to establish the effect of tax revenue on economic growth in Kenya. It aligned with the Endogenous Growth Theory, emphasizing the growth enhancing role of tax revenue when it is focused to productive sectors. This was done while accounting for Keynesian concerns over demand suppression. Inflation moderates the relationship negatively by reducing the growth benefits of tax revenue. The study adopted a causal research design. The research utilized annual data on gross domestic product (GDP) and total tax revenue from 2013 to 2024. The primary data sources included the Central Bank of Kenya (CBK). Data, sampled systematically, was analyzed using Stata software (version 14.2) and the Vector Error Correction Model. Findings ($\beta = 1.732414$, $p = 0.0000$) showed that tax revenue had a statistically significant effect on economic growth. It is recommended that Kenya should broaden its tax base to reduce over-reliance on a narrow pool of taxpayers, and improve tax administration efficiency. At the same time, tax revenues should be strategically redirected towards infrastructure, industrialization, and agricultural modernization to generate long-term growth multipliers.

Keywords: Tax Revenue, Economic Growth, VECM, Inflation Moderation, Kenya, Fiscal Policy.

1.0 Introduction

Taxation represents a key component of a country's fiscal policy especially for a developing economy as it serves as the primary source of revenue to finance infrastructure, education, healthcare and social welfare programs essential for economic progress. Taxation however, presents two opposing characteristics (Asawasakulkrai, 2022; Dianov et al., 2022). On the one hand it can potentially a stimulate growth by providing financing for investment expenditure. On the other hand, high levels of taxation suppress growth by reducing the disposable income for citizens. Fiscal policy, which involves government decisions on taxation and spending, plays a fundamental role in shaping economic outcomes by fostering sustainable growth and alleviating poverty (IMF, 2023). The Kenyan tax system is outlined in the National Tax Policy which governs the system and its administration. The policy is ideally designed with the economy's tight fiscal space in mind (The National Treasury, 2024). This paper focuses on the effect of tax revenue as a component of fiscal policy on the rate of economic growth in Kenya. We present a Vector Error Correction Model analysis of the short-run dynamics and long-run equilibria using annual data from 2001 to 2024. The study examines the two questions of how tax revenue influences Kenya's economic growth, and how inflation moderates this relationship.

1.1 Statement of the problem

Kenya, as a developing economy, must optimize its fiscal policies to drive sustainable economic growth and improve living standards. Despite recognizing the critical role of fiscal policy for economic growth in Kenya Vision 2030, the country faces persistently low rates of economic growth (Maupeu, 2021). Compared to neighbors across East Africa, Kenya, with an average growth rate of 5.0% in recent years is notably lagging behind Ethiopia (6%) and Rwanda (7.5%) despite over the decades being the best performing economy in the region (African Development Bank Group., 2024). Challenges such as a persistent budget deficit brought on by excessive recurrent expenditures and a narrow tax base have constrained revenue generation, increased government borrowing, and exacerbated unemployment and poverty, which are all key indicators of economic growth. Successive governments have therefore sought to find ways to redesign and restructure Kenya's tax system as a fiscal vehicle to stimulate and drive sustainable long-term growth. This study sought to evaluate the effectiveness of Kenya's tax policy in fostering economic growth using the Vector Error Correction Model (VECM).

1.2 Objective of the study

To analyse the effect of tax revenue on economic growth in Kenya.

2.0 Theoretical framework

2.1 Peacock and Wiseman's Political Constraint Model.

This study was anchored on Peacock and Wiseman's Political Constraint Model. Developed by Peacock and Wiseman (1961), this model expands upon Wagner's Law by examining the growth trajectory of government expenditure in democratic nations. The model introduces two key effects. The Displacement Effect which posits that during social upheavals (e.g., war, famine, economic crises), government spending increases sharply to address immediate challenges (Dada & Adesina, 2013). To finance this expenditure, taxation levels rise temporarily but are accepted by the public. The second is the Inspection Effect – As citizens become more aware of social needs during crises, governments expand public services even after the crisis subsides. Consequently, higher taxation and government spending persist, leading to a long-term upward trend in public expenditure. The model suggests that government spending rarely returns to pre-crisis levels, even after the initial emergency has passed (Peacock & Wiseman, 1961).

This theory makes several assumptions for its application including that public spending increases in steps, citizens accept temporary higher taxes in crisis allowing government to spend more, spending does not revert to pre-crisis levels, that governments respond to public demand for services and that long run growth is driven by short run shocks (Peacock & Wiseman, 1961). Kenya's economic history illustrates this model well. Periods of significant socioeconomic shocks, such as tribal clashes and political violence (e.g., 2007 post-election crisis), climate-related disasters (e.g., prolonged drought and famine), economic and public sector reforms (1980s–2000s) have all led to increased government spending, which did not subsequently decline (Republic of Kenya, 2022). The Kenyan government expanded its fiscal footprint to manage crises, aligning with the displacement and inspection effects outlined by Peacock and Wiseman.

Despite its explanatory power, the Peacock-Wiseman Model has several limitations. It assumes that crises are the only drivers of increased government expenditure, overlooking other economic and political factors. Peacock and Wiseman also do not factor the fact that government spending is also financed through other avenues such as external borrowing, aid, and revenue from state-owned enterprises, not just taxation (Brown et al., 1996). The model also does not fully account for political influences on fiscal policy decisions and does not clarify what happens to government spending post-crisis, that is whether it stabilizes or continues growing. In some cases, post-war or post-crisis government spending has reverted to previous levels, contradicting the long-term displacement effect predicted by the model.

2.2 Empirical Review

Theoretically, taxes are expected to negatively impact economic growth, but empirical evidence suggests this relationship is weak and inconsistent. Easterly and Rebelo (1993) support the negative link, while Perotti (2005) offers two explanations for the mixed findings. Much of the evidence relies on cross-sectional data, whereas time series analysis shows a stronger correlation between taxes and growth and structural changes in advanced economies, especially under flexible exchange rate regimes, have reduced the effectiveness of fiscal policy. These insights highlight the need for further research using time series data and modern analytical tools.

Dabla-Norris and Lima (2023) conducted a macro study of OECD fiscal consolidations found that increases in tax rates (especially on income and corporate taxes) led to sharp declines in consumption, investment, wages—and even higher unemployment. In contrast, base broadening tended to have much smaller adverse effects on output. In a similar study, Elshani and Pula (2023) conducted a time-series study using Autoregressive Distributed Lag (ARDL) models on data from Euroland economies that revealed that indirect taxes like value-added tax (VAT) can positively affect short-term economic growth. However, direct taxes, such as personal and corporate income taxes, consistently exhibited a negative relationship with GDP growth in both the short and long term.

In Nigeria, Worlu and Nkoro (2012) examined the role of tax revenue in growth from 1980 to 2007, emphasizing its direct and indirect impact through infrastructure development, foreign direct investment, and GDP. Infrastructure, in particular, was identified as a catalyst for investment and growth. Similarly, Bukie et al. (2013) analyzed data from 1970 to 2011 and found that tax revenue positively influenced domestic investment, labor force participation, and foreign direct investment, all of which contributed significantly to economic growth.

2.3 Conceptual Framework

Figure 1 shows the conceptual framework.

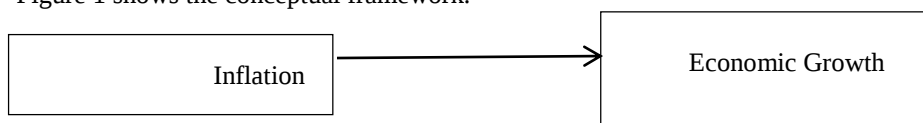


Figure 1
Conceptual Framework

3.0 Methodology

The study adopted a causal research design. According to Oppewal (2010), causal research design is appropriate for examining whether a long-term cause-and-effect relationship exists between taxation and economic growth. Purposive sampling was used in selecting annual time series data from 2006 to 2024 from the Central Bank of Kenya database. The data analysis employed a

regression analysis using Stata software. This design facilitated the identification of the extent to which changes in fiscal policy variables—such as development expenditure, recurrent expenditure, and tax revenue—affect economic growth, typically measured by GDP growth. As noted by Sadorsky (2023), causal research designs are essential in macroeconomic analysis for isolating the impact of policy variables on economic performance over time.

3.1 Model Specification

The VECM is appropriate for this study as it effectively models variables that share a long-term equilibrium relationship while simultaneously capturing short-term dynamics (Wang & Wang, 2018). Its ability to integrate both short-run fluctuations and long-run adjustments ensures a more flexible and comprehensive analysis of economic relationships.

The model was specified as follows;

$$\Delta Y_t = \alpha + \beta_1 \Delta T.R_{t-1} + \gamma ECT_{t-1} + \epsilon_t \quad (1)$$

where;

Δ is the difference operator, indicating changes in the variables over time.

ΔY_t represents the logarithmic difference of GDP at time t , a measure of GDP growth.

$\Delta T.R_{t-1}$: Lagged differences of tax revenue

γ : The coefficient of the error correction term (ECT), representing the speed of adjustment toward equilibrium.

ECT_{t-1} : The error correction term at time $t-1$, which captures deviations from long-term equilibrium.

ϵ_t : The error term at time t , capturing unexplained variation in the model.

To assess whether the effect of fiscal policy on economic growth is moderated by inflation the interaction terms are introduced as follows:

$$\Delta Y_t = \alpha + \beta_1 INF_t \Delta T.R_{t-1} + \gamma ECT_{t-1} + \epsilon_t \quad (2)$$

where:

Subscript t represents the time period

$INF_t \Delta T.R_{t-1}$ is the interaction effect of inflation on tax revenue.

4.0 Results and Discussions

Summary Statistics

Table 1

Summary statistics of the study variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
TTR	24	1000927	13581133	5422442	3971706	0.61	-0.85
Inflation	24	1.961	26.24	8.385	4.872	1.29	2.31
GDP growth	24	-0.273	8.058	4.488	2.083	0.21	0.74

Tax revenue ranged from 1,000,927 to 13,581,133, with a mean of 5,422,442. The skewness of 0.57 indicates a moderate right skew as it is within ± 2 . The kurtosis (2.07) is below 3 in absolute terms, reflecting that the data is approximately normally distributed (Certo et al., 2024; Ho & Yu, 2015) (Certo et al., 2024; Ho & Yu, 2015). Inflation ranged from 1.961 to 26.24 with a mean of 8.35. The skewness of 1.29 suggests a stronger right skew, though still within ± 2 . The kurtosis value of 2.31 is less than 3 in absolute terms, indicating that the distribution is approximately normal. Gross domestic product ranged from 1,820,810 to 13,431,305 with a mean of 5,772,153. The skewness of 0.61 reflects moderate right skewness within ± 2 . The negative kurtosis (-0.85), being less than 3 in absolute terms, shows that the data is approximately normally distributed. Gross domestic product ranged from 1,820,810 to 13,431,305 with a mean of 5,772,153. The skewness of 0.68 reflects moderate right skewness within ± 2 . The negative kurtosis (2.33), being less than 3 in absolute terms, shows that the data is approximately normally distributed. GDP growth ranged from -0.34 to 8.40 with a mean of 4.07. The skewness of -0.21 indicates a slight left skew, well within ± 2 . The kurtosis value of -0.74 is below 3 in absolute terms, implying that the distribution is approximately normal.

Generally, the variable exhibited skewness values within the acceptable range of ± 2 and kurtosis values less than 3 in absolute terms. This indicates that the data for the variable is approximately normally distributed, showing no evidence of extreme outliers or heavy-

tailed distributions. The implication is that the dataset is suitable for econometric modelling, particularly the estimation of VECM parameters, since normality ensures stability in parameter estimation, reliability in hypothesis testing, and efficiency in forecasting relationships among the variables.

4.1 Stationarity Test

The ADF test was performed on each variable to assess whether the series is stationary, which is a necessary condition for reliable time series modelling. The ADF unit root test was carried out at both levels and first difference, with the test specified to include a deterministic trend. Including a trend in the test ensures that the ADF test accurately distinguishes between true stochastic non-stationarity and stationarity around a deterministic trend. The null hypothesis of the ADF test is that the series contains a unit root (non-stationary), while the alternative hypothesis states that the series is stationary. The decision rule is based on the comparison between the test statistic and the 5% critical value: if the test statistic is less than the 5% critical value, the null hypothesis of non-stationarity is rejected, indicating stationarity.

Table 2
Stationarity Test Results

Variable	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	p-value L0	p-value L1	p-value L2
Tax revenue	-6.186	-3.750	-3.000	-2.630	1.000	0.0000	.
Inflation	-3.772	-3.750	-3.000	-2.630	0.0032	.	.
GDP growth	-8.463	-3.750	-3.000	-2.630	0.000	0.0000	.

The findings show that inflation was stationary at level meaning it is integrated of order zero, I (0). After first differencing, tax revenue and GDP growth became stationary at first difference, suggesting it is integrated of order one, I (1).

4.2 Lag Length Selection

The optimal lag lengths were determined using four information criteria: Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), Schwarz Bayesian Information Criterion (SBIC), and Final Prediction Error (FPE).

Table 3
Lag Lengths Results

lag	LL	LR	df	P	FPE	AIC	HQIC	SBIC
0	-870.21				1.2e+36	97.2458	97.2799	97.4932
1	-844.50	51.424	25	0.001	1.2e+36	97.1667	97.3714	98.6507
2	-795.63	97.749	25	0.000	2.1e+35	94.514	94.8891	97.2346
3	189.165	1969.6	25	0.000	7.3e=10*	-12.1295	-11.583	-8.17227
4	2084.91	3791.5*	25	0.000	.	-221.66*	-221.0*	-217.21*

The results were that the LR test statistics and p-values which are all $p < 0.001$ indicating that adding lags significantly improved the model up to lag 4. The information criteria including the (AIC, HQIC and SBIC) all suggested an optimal lag order. The SBIC decreases up to lag 4 indicating that the criterion was minimized in lag 4. AIC and HQIC also showed improvement with higher lags, with 4 providing the lowest values. The number of lags in VECM is usually the varsoc selected lag minus 1, because VECM includes the error correction term that captures the longrun relationship. All four criteria (AIC, HQ, and SC) therefore suggested an optimal lag length of 3. The optimal ensures that sufficient dynamics of the endogenous variables are captured while maintaining parsimony in the model specification.

4.3 Cointegration Test

The Johansen cointegration procedure assumes that all series included in the system are integrated of order one [I (1)], since cointegration is defined as a linear combination of I (1) variables that yields a stationary series [I (0)]. As such, the data matrix to be investigated for cointegration (X) was restricted to the four I (1) series: Development Expenditure, Tax Revenue, Inflation and GDP

growth. The differenced exogenous variable was included in the model through the `dumvar` option, which allows it to enter only the short-run dynamics without influencing the cointegrating space. This specification ensured that the VECM was consistent with the cointegration restriction of I (1) variables, maintained consistency with the VECM framework, which uses first difference series.

Table 4
Cointegration Test Results

Maximum rank	parms	LL	eigen value	Trace statistic	5% critical value
0	30	-940.92649		85.4402	68.52
1	39	-924.17004	0.81281	51.9273	47.21
2	46	-912.35846	0.69308	28.3041	29.68
3	51	-903.014	0.60720	9.6152	15.41
4	54	-898.66259	0.35283	0.9124	3.76
5	55	-898.20638	0.04460		

The trace tests the null hypothesis, H_0 : cointegrating vectors $\leq r$ versus H_1 : cointegrating vectors $\geq r + 1$. Based on the Johansen cointegration test results, the appropriate cointegration rank (r) for the model is selected as $r = 2$. The null hypothesis of no cointegration ($r = 0$) is rejected since its trace statistic is invalid due to an invertibility problem. Similarly, when testing the null hypothesis of at most one cointegration vector ($r \leq 1$) is rejected since the trace statistic of 51.9273 is higher than the 5% critical value of 47.21. When the null hypothesis of at most two cointegration vectors ($r \leq 2$) is tested, the trace statistic of 28.3041 is less than the 5% critical value (29.68). Therefore, the null hypothesis was not rejected suggesting at least 2 cointegrating relationships. Rank 3 to 5 trace statistics are below their respective critical values. The null hypotheses ($r \leq 3, 4, 5$) are not rejected. The results suggest the presence of exactly two cointegrating relationships. Therefore, the optimal cointegration rank was set at $r = 2$ under the trace statistic.

The selection implies that the system of variables shares two long-run equilibrium relationships that should be preserved in the subsequent VECM estimation. Selecting $r = 2$ ensures that the model captured the maximum number of meaningful long-run relationships while avoiding the risk of under-specification associated with a lower rank ($r = 0$ or $r = 1$) and the over-specification risk of estimating three or a full VAR in levels ($r = 4$). The inclusion of two cointegrating vectors implies that the system of endogenous variables is jointly driven towards equilibrium through multiple adjustment channels, reflecting the structural interdependence of economic and financial indicators in Kenya (Johansen, 1991; Juselius et al., 2006).

4.4 VECM Model

After analysing the data using the vec command in Stata 14, the results of the VECM were as illustrated in Table 5, Table 6 below.

Table 5
VECM Model

	Variable	Coefficient	Std. Err.	z	p-value	R-sq	95% Conf. Interval
After including the coefficients and arrived	d_taxrevenue	1.732414	0.4067	4.26	0.000	0.9602	[0.9357, 2.5291]
	inflation	-4.35e-06	1.18e-05	-0.37	0.713	0.5639	[-2.74e-05, 1.90e-05]
	d_gdpgrowth	0.0000106	6.53e-06	1.62	0.106	0.8084	[-2.20e-06, 0.0000234]

at in Table 5, the estimated model is then presented as below:

$$\Delta Y_t = 1.732414 \Delta T_{t-1} - (4.35e - 06) \Delta INF_{t-1} + \gamma ECT_{t-1} + \epsilon_t$$

4.5 The Effect of Tax Revenue on Economic Growth in Kenya

The objective evaluated the effect of tax revenue on economic growth. Results from the restricted VECM showed that tax revenue at lag 1 had a coefficient of $\beta = 1.732414$, standard error of 0.4067, z value 4.26 and $p = 0.000$ which is below the 0.005 significance level. The results indicate that the coefficient is statistically significant meaning that a unit change in the tax revenue leads to economic growth increasing 1.732414 times, other factors held constant. Findings across countries show mixed effects of different tax categories on growth. In Nigeria, Adefolake and Omodero (2022) reported that Petroleum Profit Tax and VAT positively affected GDP, while corporate income tax had a negative effect. Maganya (2020) found that in Tanzania, domestic goods and services taxes stimulated growth, but income taxes undermined it. In Kenya, Ndegwa (2024) observed that VAT and income tax reduced GDP, while import duties and excise duty boosted growth.

4.6 The Moderating Effect of Inflation on Tax Revenue

A linear regression model was estimated with the change in GDP growth ($\Delta \text{gdp_growth}$) as the dependent variable. Predictors include the transformed fiscal variables, inflation, and the key interaction terms to test moderation. The model is specified as:

$$\Delta Y_t = -(2.7e - 06) \text{INF}_t \Delta T. R_{t-1} + \gamma \text{ECT}_{t-1} + \epsilon_t$$

Table 6
Moderating Effect of Inflation on Tax Revenue and Economic Growth

Predictor	Coefficient	Std. Error	z-statistic	p-value	95% Confidence Interval
Constant	7.5199	1.717	4.379	0.000	[4.154, 10.886]
$\Delta^2(\text{Tax Revenue})$	1.991e-05	5.4e-06	3.685	0.000	[9.32e-06, 3.05e-05]
Inflation	-0.4628	0.138	-3.353	0.001	[-0.733, -0.192]
$\text{Inflation} \times \Delta^2(\text{Tax Revenue})$	-2.7e-06	7.01e-07	-3.849	0.000	[-4.07e-06, -1.33e-06]

The R-squared was 0.740 (adjusted R-squared = 0.575), indicating that the model explains about 74% of the variance in changes in GDP growth. The F-statistic is 7.950 ($p = 0.00144$), confirming overall significance.

$\text{Inflation} \times \Delta^2(\text{Tax Revenue})$: Coefficient = -2.7e-06 ($p = 0.000$, highly significant). It showed strong evidence of moderation implying that inflation negatively moderates the relationship between tax revenue changes and economic growth. For instance, the marginal effect of $\Delta^2(\text{Tax Revenue})$ on $\Delta(\text{GDP Growth})$ is $1.991e-05 - 2.7e-06 \times \text{Inflation}$. At low inflation (e.g., 5%), the effect is positive ($\sim 6.41e-06$); at high inflation (e.g., 10%), it becomes negative ($\sim -7.09e-06$), suggesting inflation erodes or reverses the growth benefits of tax revenue increases.

The null hypothesis—that inflation has no statistically significant moderating effect—was rejected for tax revenue (strong evidence).

5.0 Conclusion

The study also indicates that taxation does have an effect on the rate of economic growth in Kenya. As such the government can leverage taxation to stimulate and maintain economic expansion. These findings align with Keynesian, Endogenous Growth, and Political Constraint models, which collectively highlight the trade-off between fiscal needs and growth incentives. Empirical evidence from Kenya and comparable economies confirms that the composition of taxation, rather than its aggregate level alone, determines whether fiscal policy fosters or suppresses economic activity. For fiscal authorities, the results imply that budgetary planning and resource allocation can be pursued with a degree of independence from inflationary considerations in terms of growth outcomes.

5.1 Recommendations from the Study

Kenya should broaden its tax base, reduce over-reliance on a narrow pool of taxpayers, and improve tax administration efficiency. At the same time, tax revenues should be strategically redirected towards infrastructure, industrialisation, and agricultural modernisation to generate long-term growth multipliers. The study underscores the importance of a growth-oriented tax structure, advocating for consumption and trade-based taxes while reducing reliance on income taxes. Future research could expand the dataset or include non-tax revenues to strengthen findings.

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