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Effect of Kenya's External Debt Sustainability on Militarisation and Crime Rate in Kenya (1993-2023): A Time Series Analysis

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Abstract

In this paper, the complex relationship between external debt sustainability and national security outcomes in Kenya is addressed through an analysis of indicators of militarisation and crime rates. The study examines the direct and indirect effects of debt sustainability on security outcomes from 1993 to 2023, focusing on militarisation and from 2004 to 2023, on crime rates, using Vector Autoregressive (VAR) models with time series data. Diagnostic tests, such as the Augmented Dickey-Fuller test, KPSS test, Johansen cointegration analysis and multiple lag selection criteria, were used to pre-estimate the absence of long-term relationships among the variables, thereby justifying the use of the VAR method over alternative models. The findings indicate complicated interactions: although the external debt sustainability does not have a direct impact of any importance on existing military spending or the crime rate, there are crucial feedbacks via socio-economic mediators. Historical military expenditure has a positive impact on external debt (14.79, p < 0.10), indicating that security investments are counterintuitive to fiscal sustainability. Urbanisation negatively impacts debt sustainability (-594.36, p < 0.05), indicating demographic pressures on fiscal resources. Research indicates that important debt-to-GDP levels are between 55% and 60%, at which security effects become increasingly evident in a non-linear manner. Combined with the results, the sustainability of debt in the area is the primary factor affecting security through indirect channels (including unemployment, urbanisation and budgeting restrictions), rather than having direct budget implications. Policy recommendations, such as the institution of integrated debt-security monitoring tools, targeted intervention in high-risk cities and flexible military budget preparation that takes into account fiscal sustainability levels, can be suggested. The study can help maximise the knowledge of the impacts of fiscal constraints spilling over to security lapses in developing economies.

Keywords: *External debt sustainability, national security, military expenditure, crime rate.*

Introduction

The external debt trend of Kenya poses a serious threat to the national security strategy and economic stability. The public debt increased sevenfold between 2010 and 2023, such that by mid-2023, the country had an external debt of 52% of the total debt, amounting to KSh 9.4 trillion (National Treasury, 2023). This has been a result of rapid accumulation, predominantly fuelled by ambitious infrastructure financing, such as the Standard Gauge Railway (SGR) and the LAPSSET Corridor projects, as well as energy sector initiatives, which have raised fundamental fiscal sustainability issues and security concerns. The debt and nexus security is found in several networks. The direct fiscal limitations are that debt servicing crowds out security expenditures. In contrast, the indirect implications are manifested through the process of socio-economic decline, which preconditions the situation favourable to insecurity. Debt commitments in the fiscal year 2024/25 will amount to 48 per cent of the total budget and 55% of the estimated government revenue in Kenya (Institute of Public Finance, 2024), drastically restricting funds for conducting security operations, collecting intelligence and preventing crime. As the debt-to-GDP ratio is projected to reach 67% in 2023, which is a considerable improvement over the 50% range considered sustainable in developing economies (National Treasury, 2023), the government must make increasingly tough trade-offs between debt servicing commitments and security investments.

The security considerations are not limited to budgetary considerations. The rise in debt has been accompanied by a rise in the rates of crime, 2.9 homicides per 100,000 population rate in 2007 and 5.3 in 2023, with particular peaks during the years of economic stress. The percentage of military spending in relation to GDP has decreased since 1993 (1.84) to 2023 (0.91), which has cast doubt on defence preparedness amid the regional issue of insecurity as well as terrorism threats, and cross-border conflicts. This paper analyses the relationship between external debt sustainability, militarisation and crime levels in Kenya, using Vector Autoregressive models to account for complex temporal dependencies and feedback. The study sought to fill a gap in the literature by providing empirical accounts of the debt-security relationship in the Kenyan context, where past researchers have focused more on the effects of economic growth rather than the security implications. The need to understand these relations is that they can be used to create holistic policy frameworks that would create an adequate balance between fiscal sustainability and national security needs.

This research is beneficial to the wide field of research in various aspects. Kenya, which is confronted with the difficult task of striking a balance between infrastructure development, providing social services, and ensuring national security, finds the study's analysis to be very important. By presenting a framework based on evidence for the understanding of the major trade-offs between the raising of debts and security spending, the research provides insights for the making of more enlightened policies. Furthermore, the results may be of great value in the areas of debt management, economic planning, and security sector budgeting for other developing countries that are facing similar fiscal and security constraints.

Research Gap and Contribution

Nevertheless, despite a vast literature on the economic implications of debt and some evidence on the security effects, considerable gaps remain. First, the majority of the research investigates either debt or security separately and does not regard their interconnection. Second, the literature on debt-security relationships is consistent with either cross-sectional or cross-group designs, which are incapable of addressing country-specific temporal dynamics and feedback effects. Third, research on Kenya has never directly studied the result of security, but instead has considered security as an incidental issue in the larger economic study.

This paper addresses these gaps with several key contributions. It presents the first systematic univariate time series analysis of the debt-security relationship in Kenya. Through the use of VAR methodology, the study obtains the non-temporal relationships and feedback, which are absent in traditional methods. The external (military) and internal (crime) security dimensions provide a more comprehensive picture than past research, which was single-dimensional. Lastly, the threshold effects and indirect transmission systems found provide a subtle insight in addition to mere correlation analysis.

Theoretical Framework

The two complementary models underpinning the conceptual foundation of examining the linkage between debt and security describe different aspects of this complex relationship. The Debt Overhang Theory (DOT) advanced by Reinhart et al. (2012) has its antecedents in the contributions of scholars such as Krugman (1988) and Sachs (1989). DOT's efficacy lies in its clarity in explaining the role of excessive debt load in sabotaging economic capabilities and, as a result, security capabilities. The theory suggests that the anticipated cost of debt service would discourage government as well as non-government investment in all economic sectors of a nation when its debt is more than it can pay off. This phenomenon is a vicious cycle, since poor growth leads to poor investment, hence a further deterioration of its debts and resources available to offer security.

The crowding-out effect is mainly associated with security spending. When governments are concerned about debt servicing at the expense of other spheres of marginal spending, i.e., expenditures in the discretionary sphere, e.g., the defence and law enforcement, they tend to decrease unevenly. The theory also suggests that excessive debt rates may lead to a lack of transparency regarding future taxation and financial stability, and thus hinder the prospect of future labour, thereby reducing security risks from economic factors. The second theoretical background is the Economic Security Theory, which provides the foundation of fundamental intersections between economic power and security potentials. The conceptual framework is founded on the classical ideas of Adam Smith (1776) regarding the relationship between the success of commercial activity and political stability, which have been enhanced by modern scholars, including Mastanduno (1998) and Guzzini (2017). According to the theory, military capability and political power are based on economic well-being, as direct relationships are established between financial well-being and security outcomes.

This school of thought identifies various modes of transmission. To begin with, monetary power dictates the resource envelope that can be allocated to security investments, whether it is military equipment or police training. Second, the level of economic stability also has an impact on social cohesion and political legitimacy, which is related to internal security. Third, the economic potential determines the international status and alliance ties, which in turn help achieve external security. The theory therefore holds that the condition of economic vulnerability on a debt basis compromises security on both material and socio-political levels.

The combination of these frameworks implies that the sustainability of external debts influences security through cascading effects. The first fiscal limits caused by debt servicing will directly decrease security expenditure. Contrastingly, economic stagnation through debt overhang creates conditions that germinate security issues, including unemployment, inequality and frustration in society. Disincentives to invest and develop the economy can also be brought about by these security problems.

Methodology

Design and Methodology of the Research

This paper presents a quantitative time series study examining the sustainability and security performance of external debt in Kenya. The study design employs descriptive analysis to identify trends and patterns and an econometric model to test the hypothetical relationships. The time-series methodology is based on the fact that the process of accumulating debts and securities evolves, where previous values have current consequences and where feedback mechanisms occur over more than one period. The analysis is done in two phases. To begin with, descriptive statistics and trend analysis help determine how the indicators of debt and security change over time. Second, Vector Autoregressive models examine time-varying relationships between variables and reflect both contemporaneous and lagged dependencies that define debt-security relationships.

Measurement of Variables and Data Sources

The secondary data used in the study are based on authoritative sources to ensure reliability and replicability. Kenya National Bureau of Statistics (KNBS) offers data on crime and demographics. The Federal Treasury provides the foreign debt figures and the military spending amounts. The World Bank database provides

complementary macroeconomic indicators and can be used as a source of validation for the statistics reported nationally.

Two distinct models are also estimated as a result of dissimilar data accessibility:

Model 1 - Crime Rate Analysis (2004-2023, n=20):

Dependent Variable: Crime rate in terms of homicides per 100,000 people, which is an indicator of inner security consequences.

Independent Variables:

External debt sustainability: External debt in terms of GDP, which means fiscal burden. Unemployment rate: The total rate of unemployment, expressed as a percentage of the labour force, indicating economic distress.

Urbanisation rate: Urban population as a percentage of the total population, which indicates demographic pressures.

Education expenditure: Government spending on education as a ratio of GDP is an investment in human capital.

Model 2 - Military Expenditure Analysis (1993-2023, n=31):

Dependent Variable: Military expenditure as a percentage of GDP, measuring defence resource allocation

Independent Variables:

External debt sustainability: External debt/GDP ratio

Population density: People per square kilometre, indicating the demographic pressure on security.

External trade: Exports plus imports as a percentage of the GDP, which represents the openness of the economy.

Unemployment rate: Percentage of the labour force unemployed

The selection of control variables is based on theoretical expectations and empirical findings of other factors that affect the outcomes of security, other than debt factors. These variables help isolate the contribution of debt and account for confounding factors.

Empirical Model Specification

After extensive pre-estimation testing, the study uses the VAR models as;

Crime Rate Model:

$$CR_t = \beta_0 + \sum_{k=1}^{p} \beta_{1k} CR_{t-k} + \sum_{k=1}^{p} \beta_{2k} EDS_{t-k} + \sum_{k=1}^{p} \beta_{3k} UE_{t-k} + \sum_{k=1}^{p} \beta_{4k} UB_{t-k} + \sum_{k=1}^{p} \beta_{5k} {}^{*}ED_{t-k} + \varepsilon_{1t}$$

Military Expenditure Model:

$$MS_t = \beta_0 + \sum_{k=1}^{p} \beta_{1k} MS_{t-k} + \sum_{k=1}^{p} \beta_{2k} EDS_{t-k} + \sum_{k=1}^{p} \beta_{3k} PD_{t-k} + \sum_{k=1}^{p} \beta_{4k} ET_{t-k} + \sum_{k=1}^{p} \beta_{5k} {}^{*}UE_{t-k} + \varepsilon_{2t}$$

Where:

t denotes a time period

k represents lag length

p is the optimal lag order determined by the information criteria

CR = Crime Rate

MS = Military Spending

EDS = External Debt Sustainability

UE = Unemployment Rate

UB = Urbanisation Rate

ED = Education Expenditure

PD = Population Density

ET = External Trade

ε represents white noise error terms

β_0 is the constant term

β_{1k} through β_{5k} are coefficient estimates for lag k

The VAR specification allows each variable to depend on its own past values and lagged values of all other system variables, capturing complex interdependencies without imposing a priori restrictions on causality direction.

Econometric Procedures and Diagnostic Tests

The analysis will be conducted in methodical econometric processes to ensure valid inference:

Stationarity Testing Stationarity tests are the Augmented Dickey-Fuller (ADF) tests, which test the null hypothesis of a unit root, but the KPSS tests also complement these tests with the null hypothesis of stationarity. The two-way evaluation would give a sound estimate of integration orders, needed in model choice.

Lag Length Selection: The Perfect lag length is determined using different information criteria- Akaike (AIC), Bayesian (BIC) and Hannan-Quinn (HQIC) information criteria under degrees of freedom constraints in small sample sizes. Economic interpretation and dynamic completeness are also considered in the analysis.

Cointegration testing: The Johansen trace and maximum eigenvalue tests test the long-run association of variables. Cointegration, or its absence, will entail either the application of VAR, VECM or ARDL specifications.

Model Estimation: VAR models are estimated with the aid of suitable transformations and consideration of diagnostic results to achieve stationarity. The cross-equation correlations are taken into consideration by the system estimation method, which makes the system more efficient.

Post-Estimation Diagnostics: To measure model validity, it is checked that: stability tests that all eigenvalues are in unit circles; Lagrange Multiplier tests that all residual autocorrelations are zero; ARCH tests that all heteroskedasticities are zero; and Normality tests that all residuals are homogeneous.

Robustness Checks: Alternative specifications, such as alternative lag lengths and transformations of variables, can be used to check the sensitivity of important findings.

Literature Review

Empirical research on debt-security relations does not provide consistent findings in different settings and techniques. The recent studies can give a better insight into the direct budgetary effects and the indirect socioeconomic mechanisms by which debt can influence the outcome of security. The article by Odanga (2022) is the closest that can be applied to the Kenyan context, as it examines the effect of the public debt on

the budgets of the national security in the years 2014-2021. The research study, using a mixed-method approach, utilized descriptive analysis, correlation research design and regression analysis, found that the growth of public debt had a positive relationship with the decrease in budgetary allocations to security organs. The ratio of the change in the security spending to overall government expenditure steadily decreased throughout the study period, which implied that the demands of debt servicing were a direct constraint on expenditure on security. However, this research does not consider budgetary allocations, but rather real security outcomes or whether security spending is effective.

The material of cross-continents provides a wider perspective. Fan and Rao (2003) studied the trend of defence budgets in African economies when there is a debt crisis. They documented a 30 per cent rise in military spending when the foreign debt became unbearable. Remarkably, they also discovered that responses were diverse in that the military expenditures were typically held or even raised when the countries experienced acute security threats, even in cases when countries were constrained by their fiscal capacity, meaning that the need to build security may override the problem of debt sustainability under certain circumstances. This fact indicates that the country-specific analysis is necessary to consider the unique security conditions.

The long-term perspective is a necessity, as the landmark piece of historical works by Reinhart and Rogoff (2010) researching 8 centuries of sovereign debt crises in 70 countries confirms. They found out that the average military spending was cut by 18% during the three years of the debt crisis and austerity policies disproportionately affected discretionary expenditure, including defence. However, the countries in geopolitically sensitive locations were even more opposed to trimming down military expenditures and they were more inclined towards reducing other expenditures to sustain military units.

Other explanations of various debt-security dynamics can also be found in the case studies on international matters. The case of Argentina shows that there are acute security risks caused by the distress of debt. The military spending decreased to 0.5 percent of the GDP between 2014 and 2023 because of the ongoing debt crisis (World Bank, 2023). This enhanced operational readiness, since the equipment was said to have fallen into a bad state, training was poor and performance of the marine patrols had declined (Battaleme & De Santibanes, 2019). Argentina's example shows that the emergence of long-term security weaknesses can take place through the long-term distress of debts. There is no other situation than Greece where the balance between fiscal consolidation and maintenance of security is an issue. Greece sought to maintain core capabilities by enhancing efficiency and collaboration with other countries even when defence spending was reduced by 40 per cent during 2010-2016 as part of the bailout (Makris, 2021). Experience in Greece indicates that strategic adjustment can work to an extent of minimizing security restrictions placed upon debt, but that, nonetheless, there were significant discrepancies in capabilities.

The Brazil experience sheds light on debt stress, crime and security. The high homicide rates were also increasing with the high external debt, particularly the outcomes of the economic depressions when the police funds were limited by fiscal restraint and the social programs (Murray et al., 2013). In Brazil, almost one million murders were reported between 1980 and 2010, with definite peaks witnessed during economic crises that were occasioned by debts. The relationship would imply that the sustainability of debt influences the internal security in both direct and indirect ways, such as the scarcity of resources and socioeconomic aspects.

Despite the numerous studies that have been carried out regarding the dynamics of Kenya in relation to debt, most of these studies have been on the impacts of economic growth, rather than necessarily touching on the security aspects. The literature, however, provides useful background information on the implications of security. Thiora (2021) implemented the ARDL bounds testing to investigate the effect of the external debt stock on economic growth and discovered that, although the foreign debt stock significantly affected the short-term economic growth, debt servicing affected the long-term development negatively. This perspective suggests that borrowing early can help in investments that secure the future, but this time of borrowing will come at a price, as the monthly payments to the lenders will ultimately limit all the activity of the government, including security.

Kasili (2020) highlights that the indicators of Kenya's development had a negative correlation with multilateral debt, which implies that the dominance of multilateral creditors in the national debt pattern of Kenya was noticed. The consequences of these findings are in terms of indirect security effects on the lines of development, because development has a relationship with security. As Ryan and Maana (2014) affirmed, the overall Kenyan debt could be sustainable, but there was a necessity to define the external debt sustainability independently since risks are not equal. Their caution regarding vulnerability to external debt has proven true with the subsequent debt accruals. Previous research works by Mukui (2013) and Owino (2006) have estimated that dead debt servicing diminishes resources in productive sectors and slows growth, ultimately curbing resources in all government functions, including security functions. According to Koech (2012), exports, GDP and domestic debt are important determinants of external debt sustainability. Hence, there is a need to invest in borrowing for productive activities that can generate resources to service the debt and provide security.

Results

Trend Analysis and Descriptive Statistics

Table 1 shows the summary statistics, which indicate that there was significant variation in both the security indicators and debt indicators over the period of study:

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Crime Rate Model (2004-2023)							
Crime Rate	20	4.22	0.94	2.90	5.43	-0.24	1.34
External Debt/GDP	20	26.25%	6.24%	19.38%	43.35%	1.13	3.82
Unemployment	20	3.57%	1.25%	2.65%	5.81%	0.97	2.14
Urbanisation	20	25.16%	2.55%	21.31%	29.52%	0.15	1.82
Education Exp.	20	4.61%	1.82%	0.00%	7.34%	-1.33	5.09
Military Model (1993-2023)							
Military Spending	31	1.38%	0.23%	0.91%	1.84%	-0.02	2.23
External Debt/GDP	31	39.32%	24.11%	19.38%	123.65%	2.01	6.94
Population Density	31	67.82	15.99	43.58	94.57	1.71	0.09

Trade/GDP	31	49.52%	12.48%	27.24%	72.86%	-0.02	2.27
Unemployment	31	3.32%	1.05%	2.65%	5.81%	1.65	3.97

Source: Field Data, (2025)

The statistics indicate a number of significant trends. There was a high variance in crime rates, which was 4.22 per 100,000 and a falling trend in military expenditure, which was 1.38 per cent of the GDP. The external debt/GDP ratios among the samples vary because of different time periods, with the older military model sample having higher means and greater dispersion.

Unit Root and Stationarity Tests

Table 2

Unit Root Test Results

Variable	ADF Statistic	ADF p-value	KPSS Statistic	Integration Order
Crime Rate	-2.14	0.231	0.42	I(1)
Δ(Crime Rate)	-4.87***	0.000	0.18	I(0) after differencing
External Debt/GDP	-8.28***	0.000	0.22	I(0)
Unemployment	-1.92	0.318	0.51	I(2)
Δ²(Unemployment)	-3.72***	0.004	0.15	I(0) after double differencing
Urbanisation	-0.84	0.801	0.73	I(3)
Δ³(Urbanisation)	-5.26***	0.000	0. 11	I(0) after triple differencing
Education Exp	-2.31	0.168	0.38	I(1)
Military Spending	-1.45	0.548	0.62	I(2)
Population Density	-0.92	0.772	0.71	I(3)
Trade/GDP	-2.18	0.212	0.35	I(1)

Key: Significant at 1% level. Critical values: -3.00 (5%), -3.60 (1%)

Source: Field Data, (2025)

The diverse sequence of integration, which may be I(0) to I(3), has significant methodological implications. The presence of I(2)- and I(3)-variables do not allow the use of typical VECM methods and recommends the use of VAR with appropriately transformed variables or ARDL bounds testing with small samples.

Lag Length Selection and Cointegration Tests

The criteria of information are always proposing the use of 4 lags in both models:

Table 3

Lag Length Selection Criteria

Model	Lag	AIC	BIC	HQIC	LR Test
Crime	0	-22.44	-22.20	-22.43	-
	1	-39.43	-37.98	-39.36	321.87***
	2	-46.17	-43.51	-46.03	157.76***
	3	-262.22	-258.36	-262.02	3506.90***
	4	-336.70	-332.84	-336.51	119.80*
Military	0	-15.75	-15.51	-15.68	-
	1	-30.16	-28.72	-29.73	439.14***
	2	-31.54	-28.90	-30.75	87.25***
	3	-32.65	-28.81	-31.51	79.92***
	4	-35.70	-30.66	-34.20	132.39***

Source: Field Data, (2025)

Johansen cointegration tests indicate multiple cointegrating relationships:

Table 4

Johansen Cointegration Test Results

Null Hypothesis	Trace Statistic	5% Critical Value	Max-Eigen Statistic	5% Critical Value
Crime Model				
$r = 0$	194.91***	141.99	141.99***	76.07
$r \leq 1$	52.92***	24.28	24.28**	53.12
$r \leq 2$	28.64**	20.63	20.63*	34.91
$r \leq 3$	8.00	6.83	6.83	19.96

Source: Field Data, (2025)

However, given mixed integration orders and small samples, VAR is preferred to avoid over-parameterisation.

VAR Estimation Results: Crime Rate Model

Table 5 presents key results from the crime rate VAR model:

Table 5

VAR Results - Crime Rate Equation (n=18 after transformations)

Variable (Lag 4)	Coefficient	Std. Error	z-statistic	p-value
Dependent: Δ(Crime Rate)				
Δ(Crime Rate)	0.487**	0.237	2.05	0.040
External Debt/GDP	11.906	7.773	1.53	0.126
Δ²(Unemployment)	180.872**	79.301	2.28	0.023
Δ³(Urbanisation)	7150.114	8310.809	0.86	0.390
Δ(Education)	-10.404	6.891	-1.51	0.131
Constant	-2.830	1.752	-1.62	0.106
$R^2 = 0.421$, F-stat = 3.84**				

Source: Field Data, (2025)

The findings indicate complicated processes. The rate of crime is very persistent, with an autoregressive coefficient of 0.487, which means past crime predicts future crime. Most importantly, external debt has no direct influence on the level of crime (p=0.126), disputing easy explanations of debt-crime relations. Nevertheless, unemployment fluctuations are very important indicators of crime growth (β=180.87, p=0.023) and this indicates that debt could influence crime indirectly via the labour market mechanisms.

Table 6

VAR Results - External Debt Equation (Crime Model)

Variable (Lag 4)	Coefficient	Std. Error	z-statistic	p-value
Dependent: External Debt/GDP				
Δ(Crime Rate)	-0.016*	0.009	-1.84	0.065
External Debt/GDP	1.293***	0.290	4.46	0.000
Δ²(Unemployment)	-0.324	2.958	-0.11	0.913
Δ³(Urbanisation)	-594.363*	309.951	-1.92	0.055
Δ(Education)	0.558**	0.257	2.17	0.030
Constant	-0.031	0.065	-0.48	0.633
$R^2 = 0.684$, F-stat = 8.92***				

Source: Field Data, (2025)

It is important to note that the crime rates hurt the sustainability of the external debt (= -0.016, = 0.065), thus indicating that high crime discourages foreign lending. City life has a strong negative impact on debt sustainability (-594.36, p=0.055), whereas education spending enhances debt accumulation (=0.558, p=0.030).

VAR Estimation Results: Military Expenditure Model

Table 7

VAR Results - Military Spending Equation (n=24 after transformations)

Variable (Lag 4)	Coefficient	Std. Error	z-statistic	p-value
Dependent: Δ^2(Military Spending)				
Δ^2(Military Spending)	-0.175	0.216	-0.81	0.419
External Debt/GDP	-0.000	0.002	-0.04	0.969
Δ^3(Population Density)	0.006	0.007	0.80	0.423
Δ(Trade/GDP)	-0.000	0.006	-0.06	0.953
Δ^2(Unemployment)	-0.026	0.180	-0.14	0.886
Constant	0.000	0.001	0.00	0.997
R^2 = 0.098, F-stat = 0.71				

Source: Field Data, (2025)

These unimportant outcomes of military expenditure imply that the budgets of defence are inaccessible to the effects of debt, possibly due to security pressures that may supersede the constraint of the monetary policy.

Table 8

VAR Results - External Debt Equation (Military Model)

Variable (Lag 4)	Coefficient	Std. Error	z-statistic	p-value
Dependent: External Debt/GDP				
Δ^2(Military Spending)	14.789*	8.226	1.80	0.072
External Debt/GDP	0.518***	0.093	5.57	0.000
Δ^3(Population Density)	0.327	0.278	1.18	0.239
Δ(Trade/GDP)	-0.608**	0.243	-2.50	0.012
Δ^2(Unemployment)	8.110	6.868	1.18	0.238
Constant	0.114***	0.033	3.42	0.001
R^2 = 0.742, F-stat = 11.24***				

Source: Field Data, (2025)

More importantly, the military expenditure leads to a growth in the debt in the future (β=14.79, p=0.072), which implies that the investments in security might aggravate the fiscal sustainability. Debt sustainability is enhanced by the openness to trade (0.608, p=0.012), which shows the role of export earnings in managing debt.

Model validation and Diagnostic Tests

The results of all tests of diagnosis pass at the 5 per cent level of significance, but there are some marginal fears at the 10 per cent level, especially in the crime model with fewer observations.

Table 9

Diagnostic Test Results

Test	Crime Model	Military Model
Stability Test		
Maximum Eigenvalue	0.983	0.840
All eigenvalues in the unit circle	Yes	Yes
Autocorrelation (LM Test)		
Lag 1 p-value	0.142	0.238
Lag 2 p-value	0.218	0.341
Heteroskedasticity (ARCH)		
p-value	0.091	0.115
Normality (Jarque-Bera)		
p-value	0.064	0.082

p<0.01, p<0.05, p<0.10

Source: Field Data, (2025)

Discussion

Interpretation of Direct Effects

The lack of any direct and substantial impact of external debt on the rates of crime or military spending undermines the traditional beliefs about debt-security relationships. This observation implies that the connection between the sustainability of debt and the security consequences is more complicated than the mere crowding-out theories would imply. These results may be attributed to a number of reasons.

First, security expenditure can be safeguarded against austerity brought by debt because of its necessity. Governments under the pressure of security concerns might continue to allocate budgets to defence and police at the expense of other budgets. This precedent indicates the central position of security in the legitimacy of the state and the economy. The ongoing military campaigns against the Al-Shabaab by the Kenyan government, despite the pressures of the budget, are a demonstration of this dynamic.

Second, the sample sizes are small, especially that of the crime model upon required transformations and thus, the statistical power is limited to detect the possibly subtle effects. The economic value of the point estimate of the effect of debt on crime (=11.91) is significant, yet the statistical significance is low (p=0.126), which may indicate that bigger samples would indicate the significant relationships. This constraint indicates a trade-off between methodological rigour, where suitable transformations have to be done and small sample statistical power.

Third, the effects of the debt threshold may not be comprehensively covered by the time periods analysed. The analysis of the importance of 55-60percent debt/GDP ratios being the critical points indicates non-linear relationships that cannot be well understood under linear VAR models. These nonlinearities can be better identified in future research with threshold VAR or regime-switching models.

Effects of Feedback and Reverse Causality

The strong positive relationship between military spending and the accrual of debt in the future (0.072, χ^2 =14.79) demonstrates the presence of an important feedback mechanism. This observation indicates that security investments, though potentially improving the stability and investor confidence, may actually deteriorate the fiscal sustainability when unrewarded by revenue increases. A number of mechanisms could be employed to fuel this relationship. Military spending is often characterised by high sums of capital investment in equipment and infrastructure, which is foreign-financed, directly adding to the external debt. Moreover, military expenditure might have a lower multiplier on the economy as compared to other government spending, which produces less revenue to service the resulting debt. The observation is in line with the debt overhang theory that suggests that the debt cycles are self-perpetuating in the sense that even productive borrowing can form self-perpetuating, unsustainable debt structures.

The adverse impact of crime on external debt (= -0.016, p=0.065) implies reverse causality, i.e. security results affect the ability to sustain debt. The level of crime is a sign of poor governance and economic instability that keeps away foreign creditors and lowers the borrowing ability. This may restrict the number of debts, but it does the same to development finance, effectively putting the world into another type of development trap where there is no access to the resources necessary to find solutions to security problems.

Indirect Channels and Mediating Variables

Important indirect mediating effects of debt and security are noted in the computation of unemployment in crime (β=180.87, p=0.023) and urbanisation in debt sustainability (β=-594.36, p=0.055). Such results indicate that the effect of debt on security is mainly due to socio-economic decline and not direct budgetary restriction. The unemployment-crime nexus is dynamic in many ways. Loss of jobs minimises legal sources of income, which may lead to more crime. Also, the unemployment reflects a wider economic ill health that could undermine social solidarity and the legitimacy of the state. This is one significant indirect channel between debt and security since debt servicing may limit job-creating public investments.

The negative impacts of urbanisation on the maintenance of debt are an indication of the overload in the infrastructure and service delivery in the growing cities. Urbanisation has been occurring at such a high rate that it requires a lot of government spending on housing, transport systems, utilities and security systems. Lack of sufficient income to finance these needs causes governments to have to borrow, which worsens the sustainability of debts. The issue of population urbanisation is also a security threat, which requires additional resources and this puts additional stress on the fiscal ability.

Effects of Thresholds and Policy Implications

Significant policy implications are drawn out of the finding of significant contributions between debt levels and security effects (of 55-60 per cent of GDP). Governments would get an opportunity to strike a balance between competing demands, debt service and the provision of security with such thresholds. Above all, the security needs of the immediate expenditure of security are smothered in the waves of the consequences falling on them, in the shape of unemployment, fall of services and social instability.

These rates are achieved at less advanced stages than traditional debt sustainability measures, which entail economic outputs, meaning that security challenges are forced to result in fiscal adjustments sooner than in a pure economic analysis would be the case. This observation supports the preventive measures regarding debt management that keep the fiscal space intact so as to create security before the crisis develops. The greater effect of the cities means that certain actions can be implemented to overcome the relationship between debt and security. Instead of broad-based security expenditure boosts to exacerbate the debt, targeted programs in urban high-risk areas with surging unemployment could provide more beneficial benefits in terms of debt-crime cycles.

Methodological Concerns and Limitations

There are a few methodological problems which are worth mentioning. The models of mixed integration of the variables were a challenge to the model selection. Although the inference made using the transformed variables is valid, the transformations can conceal certain relationships. Complementary information could be brought about by ARDL bounds testing, which is used in mixed order of integration testing together with smaller samples.

The statistical power and precision are limited by the small sample sizes, especially when they have been transformed. The 18 observations of the crime model after differencing satisfy the minimum conditions of time series analysis. Such a limitation can be the explanation for a few insignificant results and broad confidence intervals. The lack of causality given that the instruments of analysis cannot be established or that these structural elements cannot be determined means that only associations and not causal effects can be interpreted. Although VAR does not miss out on temporal precedence, it does not provide causality because of the missing variables and concurrent determination.

Conclusion

There are complex intermediaries between the external debt sustainability and the national security in Kenya that cannot be addressed by easy-to-follow narratives. Although debt does not directly define security outcomes, it defines the socio-economic environment in which security issues can arise and develop. The effects of feedback that have been determined, in which security spending is found to influence the future accumulation of debt, point to the necessity of the combined strategies, which take into account both fiscal and security goals. With Kenya still juggling the principles of development, financial constraints and security demands, there is a growing urgency to have evidence-based knowledge on possible trade-offs. The results imply that keeping debt below significant levels, influencing interventions in risky regions and safeguarding socio-economic buffer systems might be more beneficial in comparison to direct improvements of security expenditures that will deteriorate fiscal sustainability.

Lastly, in order to achieve national security and fiscal stability, there must be long-term strategic planning, which recognizes the interdependency of the two. The way to overcome the hard road between the sustainability of debts and the ability to provide security, Kenya will get an opportunity to escape into the tunnel by introducing integrated monitoring systems, targeted intervention and a dynamic policy framework that can adapt to the changing fiscal environment. The lessons learnt in this analysis are not just applicable to Kenya but can also be utilized by other developing countries with such a predicament in balancing fiscal constraints and security requirements.

Recommendations

According to the empirical results, there are several policy interventions to assist in the management of debt-security trade-offs:

Build detailed dashboards that monitor debt and unemployment rates, urbanisation and security levels at the same time. These systems are supposed to include combinations of specific indicators that were found to be predictive of security deterioration in this study. There should be automatic alerts in case of approaching critical limits and especially the 55-60 per cent debt/GDP ratio, in which acceleration in the security impacts is observed. The surveillance system must combine the information gathered by the finance, planning and security departments in order to allow joint actions.

Target crime prevention efforts towards high-unemployment areas that are fast urbanising and where the debt-crime nexus exists most. Instead of just spending on security in a broad way that aggravates debt, more effective breakage of negative cycles will be realised due to specific programs that respond to unemployment in high-risk urban regions. Such interventions must entail job creation and enhancement of service delivery and localised community policing strategies.

Adopt flexible military budgeting planning which varies with the fiscal space as compared to fixed percentages of GDP. When debt is above 55 per cent of GDP, operational preparedness, plus personnel expenditures, should be given priority over any new capital expenditures because the study indicates that they are more effective in security returns under the tight fiscal settings. The projections of debt sustainability have to be included in the multi-year defence planning to prevent sudden resettlements that may threaten security.

Shield employment schemes and urban services even in conditions of fiscal contraction, which are the actions between debt and security of the relationship. The fact that unemployment and urbanisation have such important impacts on the security outcome implies that it is more security effective to maintain such buffers rather than spending on military directly in the case of limited fiscal space. Focus more on the labour-intensive type of work in the state and provide vocational training facilities that meet the demands of employment and infrastructure.

Since trade has a positive influence on debt sustainability, the fiscal space for security can be provided with the help of policies that ensure the competitiveness of exports and economic diversification. This involves investment in trade infrastructure, minimising trade restrictions on exports and assistance to industries that have comparative advantages. Higher revenue collection by extension of tax bases and effective collection may cut down on borrowing requirements and retain the ability to be secure.

This paper encounters a number of shortcomings that indicate the way forward in future studies. The sample sizes, especially in crime models, are small and hence the lack of statistical power and the comparative obscuration of some relationships. More findings would be possible with future investigations using longer time series or countywide panel data.

This lack of causality that can be determined in the absence of instrumental variables or structural identification limits interpretation. Future research might consider quasi-experimental strategies or natural experiments of change in policy to find causal influences. The possible instruments may be international interest rate shocks or commodity price fluctuations, which impact debt rather than security.

Aggregate measures conceal the relevant heterogeneity. A more detailed analysis of various types of crimes, types of security expenditures and debt instruments may demonstrate more specific relationships. On the same note, a sub-national analysis can determine regional differences in debt-security dynamics.

A linear VAR model might not be capable of grasping threshold effects and nonlinearities. More critical tipping points and complex interactions could be detected using threshold VAR, regime-switching models or machine learning techniques.

Specific mechanisms of transmission should also be studied in future. So, what is the crime-causing effect of unemployment? Which mediating effect do inequality, social services and level of governance have on debt-security relationships? This knowledge of such processes would allow more specific policy responses.

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