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Intervening Impact of Sovereign Debt on the Relationship Between Public Expenditure and Economic Security Among East African Member Countries

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Abstract

Economic security is a constituent of national security and provides protection to a nation's economic capacity. The definition of national security has evolved from the military centered focus to incorporate the safety of a nation from all threats indicators to its people, economy and institutions. Economic security guarantees freedom to the state and her people to control their economic and financial matters. However, there have been limited studies on economic security at the microeconomic level and factors that affect it. The objective of this study was to find out the intervening impact of sovereign debt on the relationship between public expenditure and economic security among East African member countries. Sovereign debt and public expenditure were expressed as percentages of the Gross Domestic Product while economic security was measured as an equally weighted composite economic security index of three economic insecurities being unemployment rate, poverty rate and universal healthcare uncovered rate. The study used secondary data, from year 2008 to 2022, that was sourced from the World Bank Group World Development Indicators, for five selected countries of the East African Community. The study adopted the Broyden–Fletcher–Goldfarb–Shanno (BFGS) Autoregressive Moving Average (ARM) Generalized Least Squares (GLS) regression model to test the research hypothesis. The study found that sovereign debt had a non-statistically significant impact on the relationship between public expenditure and economic security. Further the study found that sovereign debt worsens the adverse impact that public expenditure has on economic security. Raising sovereign debt to bridge the gaps in ordinary revenue does not therefore aide in reducing the adverse that public expenditure has on economic security. The study findings can guide government entities in directing their resource allocation to programmes with higher economic productivity that lead to provision of enhanced enabling environment for improved economic security. The study findings can guide policy makers in formulating policies that maintain public expenditure increment and sovereign debt within sustainable limits to avoid increasing their negative effect on economic security. The study findings can also guide academicians in identifying future areas for research such as testing the impact of various components of public expenditure on differently weighted economic security indices as well as testing the influence of components of sovereign debt on the relationship of between various of public expenditure and differently weighted composite economic security indices.

Keywords: Sovereign debt, Public expenditure, Economic security, Economic insecurities, Economic security index

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Introduction

The definition of national security has evolved from the traditional military focused safety against threats to encompass the safety of a nation from all threats and includes defence of a sovereign state against threats indicators to its citizens, economy and institutions (Brown, 1977). Economic security being a constituent of national security provides protection to the nation's economic capacity. Economic security guarantees freedom to the state and her people to control their economic and financial matters (Kadala, Guzenko & Bondarenko, 2023). Economic security of a state is a key determinant to its national security (Ibragimovich, Ogli, Kholikovich & Ogli, 2020). Economic security is one of the fundamental rights under the Universal Declaration of Human Rights (UDHR) for all humanity (Assembly, 1948). Economic security has cascaded to incorporate both the macro-level of the state and the micro-level of individuals and their households (Griffiths, 2014). Economic security defined from a micro-economic well-being point of view is the ability of people to meet their needs consistently and in a sustainable manner (ICRC, 2015).

Governments are charged with running countries and their mandate include the responsibilities of providing an enabling environment and requisite infrastructure and must incur expenditure, which is referred to as public expenditure. Government are also required to provide public goods and services such as infrastructure besides ensuring there is a healthy competition within the markets and taking necessary actions to have a stable economy. Governments endeavor to provide safety nets to their citizens to cushion the less fortunate through provision of minimum protections. States that have commitment to provide elementary economic security to their populations through providing protection against market related risks such as sickness, unemployment, accidents and old age are referred to as welfare states. The concept of a welfare state developed during World War II in the United Kingdom (Weir, 2001).

Governments raise funds for public expenditure mainly through taxation, levies and fees as well as from sovereign debt to finance budget deficits (Oyewobi & Falolu, 2023). Raising of debt financing is informed by budget deficits principally related to capital formation projects (Yusuf & Mohd, 2021). Political turnover is associated with increasing sovereign debt as holders of political offices seek short term gains due to its temporary nature and the inability of political parties to make binding commitment to other political parties that may take power from them (Yared, 2019). Sovereign debt comes with obligations to ultimately repay the debt and the intervening requirements to meet the cost of borrowing in terms of payment of regular interest or one-off interest. This calls for elaborate planning and execution of the plans to ensure that sovereign debt meets the stated objectives of borrowing principally being capital formation that positively impacts on the economy (IMF, 2019). The effective management of sovereign debt is meant to achieve sovereign debt efficiency (SDE) that can be defined as the attainment of the maximum economic productivity from sovereign debt at lowest possible cost and/or without wasted efforts for any given level of sovereign debt.

The study was anchored on the agency theory by Jensen and Meckling (1976), which seeks mechanism to address agency conflict thus ensure the agent always acts in the paramount interest of the principal. The efficiency of a government, as an agent of the people, is reflected by the quality and implementation of its policies, protection of property, service delivery and provision of public goods, which leads to economic development (Kochanova, Hasnain & Larson, 2020). Government's actions on behalf of the people

influence the independent variable of public expenditure that affects economic security experienced by the people. The realism theory, public debt theory and financial theory were the other key theories that guided this study. Realism theory advanced by Morgenthau (1948) holds that states are the solo actors in the international arena and are driven by pursuit of national interests and power politics to ensure their survival (Tilly, 1985). Public debt theory postulated by Buchanan (1958) posits that the real burden of sovereign debt similarly known as public debt is borne by the current generation and shifts to future generations. Governments should therefore evaluate the impact of sovereign debt policies on their people. The financial theory developed by Minsky (1974) postulates that the financial system experiences swings arising from surpluses that lead to borrowing with some of the borrowing not being commensurate with ability to pay thus causing financial crisis (Minsky, 1974).

The East African Community (EAC) is a Regional Economic Community (REC) as well as a regional inter-governmental entity made up of eight (8) member states and first formed in 1967 by Kenya, Tanzania and Uganda and headquartered in Arusha, Tanzania. Unfortunately, the first EAC collapsed in 1977 only 10 years after its formation due to ideological differences that made it impracticable for the leaders of the three countries to harmoniously work together. The current EAC became officially effective on 7th July 2000 as a culmination of efforts to re-establish EAC that had seen the singing of the EAC treaty on 30th November 1999 by Kenya, Tanzania and Uganda. Thereafter, five other countries have joined the EAC. Burundi and Rwanda joined in June 2007, South Sudan joined in August 2016, the Democratic Republic of Congo (DRC) joined EAC in July 2022 while the Federal Republic of Somalia joined in March 2024 (EAC, 2024).

The EAC member states are classified as developing countries with the East Africa region expected to register rapid income growth though about two thirds of workers in Sub-Sahara Africa are classified as working poor (WESP, 2020). Poverty is an indicator of prevalence of economic securities thus majority of EAC member have lower economic security (Osberg & Sharpe, 2010). The World Development Indicators in 2023 indicated that EAC member countries are at different economic developmental stages. The GDP of Kenya was indicated as being United States Dollars (USD) 108.04 billion followed by Tanzania with a GDP of USD 79.06 billion. Democratic Republic of Congo was third with a GDP of USD 66.38 followed by Uganda with a GDP of USD 48.77 billion. Rwanda was fifth with a GDP of USD 14.10 billion, Somalia was sixth with a GDP of USD 11.0 billion, Burundi was seventh with a GDP of USD 2.64 billion while data on South Sudan related to year 2015 when it had a GDP of 12.0 billion (World Bank Group, 2024). The expected rapid income growth within EAC member states would be expected to enable governments raise additional revenues for their development programmes whose impact would be manifested in the outcomes experienced by the people that would translate to increased economic security.

Sovereign debt has been shown to variedly affect the economy in both short and long terms (Elbadawi, Ndulu & Ndung'u, 1997; Duran, 2017; Topal, 2014). Sovereign debt may redistribute resources available within an economy in case of domestic debt and provide additional resources in the case of external debt. Calderon and Fuentes (2013) demonstrated that sovereign debt and economic growth have a varied relationship with the impact being positive or negative. In Greece for instance, sovereign debt became a crisis while in Kenya sovereign debt has had both positive and negative impact on the economy (Murungi & Okiro, 2018). Mah, Mukkudem-Petersen, Miruka and Petersen (2013) discovered a positive significant association between government expenditure and public debt in Greece. Borrowing too much external debt comes with excessive risks that developing countries must bear (Claessens, 2008). Default has a positive effect on inequality with the default being

sensitive to debt size, type of sovereign debt, level of development and institutional capacity (Apeti, 2023).

The impact of public expenditure on economic growth ranges from negative to positive, it tilts more towards being positive (Nyasha, & Odhiambo, 2019). Investment spending and GDP have been shown to have a bi-directional relationship that is negative in the short run and a positive in the long run (Hilton, 2021). Social speeding and subsidies on the other hand have been shown to increase inequality (Apeti, 2023). Most studies done on the effectiveness of public expenditure have mainly been on education and health (Sant´ Ana, Lopes, Miranda, Bermejo & Demo, 2020). Categories of public expenditure also tend to depict heterogeneity in their impact on the economy. Capital expenditure has been shown to have positive significant impact on economic growth while recurrent expenditure has been shown to have no significant impact on economic growth (Aluthge, Jibir & Abdu, 2021).

There has been limited mention of the concept of economic security at microeconomic level and factors that would be indicators, affect or measures of the same (Stiglitz, Sen & Fitoussi,2009). Measures of economic security are segregated to various components of insecurities as opposed to composites through economic security indices. The economy influences economic security thus factors that affect the economy affect economic security (Gryshova, Kyzym, Hubarieva, Khaustova, Livinskyi & Koroshenko, 2020; Grigoreva & Garifova, 2015). The ability to achieve economic security on long term basis has become a challenge to many households (Rank & Thomas, 2014). Countries around the world have unique features of economic insecurities (Zhengyi, 2004) while factors that affect the economy do so in different manner.

Studies have found come up with various findings on the impact of sovereign debt and public expenditure on macro-economic security and segregated components of micro-economic security. Zemskov, Prasolov, Sinyavsky, Konovalova and Botasheva (2020) analyzed the interrelation between external debt and macroeconomic stability and established that marginal increase in sovereign debt affects negatively Russia's economic security by reducing it. Abouelfarag and Qutb (2021) found out that public expenditure increases unemployment rate in Egypt in the long run while Joy, Okafor and Ohiorenuan (2021) found out that capital public expenditure had significant directly proportionate impact on poverty in Nigeria. Saraireh (2020) found out that public expenditure is inversely related to unemployment rates both in long run and short run. Alamanda (2020) found out that components of public expenditure had both positive and negative effect on poverty and income inequality while Yusoff, Law, Mohamed and Ismail (2023) found out that capital public expenditure had no or little impact in lowering poverty levels while reduction in capital public expenditure would reduce poverty levels in the long run. Nyamweya (2021) found a significant effect of economic growth on poverty. Mukisa, Nathan and Bulime (2020) found that sustaining economic growth among EAC would reduce unemployment rates. Mathenge and Muturi (2021) made a similar conclusion in relation to economic growth and unemployment. Studies on universal healthcare have majorly grouped the EAC among the Sub-Saharan Africa (SSA) countries.

There was need therefore to understand the moderating effect of sovereign debt on the relationship between public expenditure and economic security within the EAC member countries and thus the objective of this study. The study selected a fifteen years' study period from 2008 to 2022 that was considered long enough to enable extension of application of the study findings to future periods. This would be achieved by understanding the historical perspectives, the related trends and thus aide in forecasting future challenges, related to the

relationship amongst the study variables, all geared towards aiding and guiding stakeholders in future periods in making informed decisions.

Literature Review

Sovereign debt aides in bridging the budget gaps but comes with the ultimate obligations for repayment besides periodic financing of its cost in terms of interest. Public expenditure reduces the disposable income arising from raising of taxes to finance public spending and this reduces the ability of individuals and households to meet their basic and essential needs in a sustainable manner. This ability is at the core of the micro-economic component of economic security.

Sovereign Debt

Sovereign debt is defined as the aggregate funds that a country's government owes at any particular time and combines both domestic and foreign borrowing that a country's government has sourced and secured (McBride, Chatzky & Siripurapu, 2020). Sovereign debt is similarly referred to as national debt, public debt or government debt. National debt can also be defined as funds sourced to bridge the accumulation of budget deficits (Shuaibu, Muhammad, Abdullahi & Gwazawa, 2021). Mitchener and Trebesch (2021) noted that by the third quarter of 2020 sovereign debt had reached precedent high levels around the world with the need for borrowing spurred up by the Covid-19 crises. Growth in public debt ought to come with benefits to compensate the increase in risks associated with increased debt burden (Vitols & Jekabsone, 2021).

Sovereign debt portfolio is typically the major financial liability portfolio that a country holds and encompasses risky financial and complex structures that can cause significant risks affecting financial stability and the balance sheet of a government (Misztal, 2021). The sustainability of sovereign debt is among the most utilized and abused concepts in sovereign debt crises owing to it being an art rather than a science as well as involving a huge number of alternative approaches (Sturzenegger & Zettelmeyer, 2006). A Debt Sustainability Analysis (DSA) is an assessment of how a country's current and prospective borrowing impacts its present and future abilities to meet its debt service obligations. DSA is a key factor for achieving sustainability of sovereign debt and contributes to macroeconomic stability.

High indebtedness especially from external debt causes management and servicing challenges especially for the Highly Indebted Poor Countries (HIPC) and this affects development (Were, 2001). The key fiscal goal of debt management is to use sovereign debt to finance public expenditure in a manner that provides sufficient budgetary leeway for future budgetary periods. Reduction of debt financial burden related to interest rates payment, redemption of principal, administrative costs and transactions costs ranks as priorities in undertaking debt sustainability (Rehm, 2005). DSA is critically important to avoid a government getting into a debt trap which may lead to some HIPCs seeking Multilateral Debt Relief Initiative (MDRI) with the hope of shedding excess debt burden and boost investments and promote economic growth (Martin, 2013).

Public Expenditure

Public expenditure definition has evolved over time with the generally agreed definition being the accounts aggregates from the central government, local authorities and public corporations, which are collectively referred to as the aggregates of the general government

in short or in the long format as aggregates of the General Government Fiscal Operations (GGFO). This is considered the best macroeconomic definition of public expenditure (IMF, 2019). Categorization and measurement of public expenditure is diverse. The principal categorization of public expenditure relates to the level of governments that are mainly three with the first being the national or central government, the second being local authorities or federal governments and the third being public corporations or parastatals that are state owned entities that render social and welfare essential services at reasonable fees and prices (IMF, 2019). Public expenditure can also be categorized based on the purpose of the expenditure whether for current purposes or future purposes thus developmental in nature or recurrent. Recurrent expenditure, which takes a higher component of public expenditure, has less discretionary latitude and covers items such as salaries for public officers, wages, bills, sovereign debt servicing and other ongoing activities. Development expenditure on the other hand has a higher discretionary latitude and touches mainly on new programmes related to investment such as on infrastructure.

The effectiveness of government programmes implemented through incurring public expenditure is measured by the outcomes that are derived from outputs for any given level of inputs and such outcomes include the impact of public expenditure on economic security (Matos, Jorge & Moura e Sá, 2023). Governments match their expected revenues to projected expenditures as guided by development plans. In most instances, and especially in the developing economies, like within the EAC member countries, the development plans are more ambitious than the revenue base thus creating a mismatch that constitutes budget deficits (Geng & Qian, 2024). Governments results to either rescheduling the timing of some development plans or seeking alternative funding (Scharff, 2020), which leads to borrowing driven by government budget deficits (Ahmed, 2021).

The outcomes from public spending reflect how public expenditure benefits the public from whom its derived from thus the effect of public expenditure on economic security. The measurement of public expenditure varies according to definition and categorization of public spending. The measurement of public expenditure can be expressed in absolute monetary terms, either in the local currency or equivalent standard international currency principally being the United States Dollars (USD). Public expenditure can also be expressed relative to macro-economic variables. This study adopted the measure of public expenditure expressed as a percentage of GDP.

Economic Security

Economic security at the macro-economic level is the possession by individuals, households and communities of income and/or resources to provide for their respective basic and essential needs in a sustainable and a dignified manner, which includes having access to the requisite enabling environment and infrastructure (Mollenkamp, 2022). The economic well-being measure of per capita Gross Domestic Product (GDP) has been criticized for not being a sufficient measure to capture the real economic well-being of the people (Berik, 2018). The criticism gained impetus leading to the French government to set up a commission in 2008 to develop a robust measure of the people's welfare (Stiglitz, et al., 2009). This coincided with intellectual works in the same field that led to the development of an Index of Economic Well-Being (IEWB) that incorporated four aspects namely consumption flows, equality, wealth stocks, and economic security (Osberg & Sharpe, 2010).

Economic security is measured through the presence of economic insecurities with the two having an inverse relationship. There is however no universal methodology

consensus to measure economic insecurity (Richiardi & He, 2020). Economic security can be measured by various economic insecurities such as unemployment, poverty levels, old age income coverage, social security and public healthcare coverage, which reflects the gap that individuals are required to bridge in meeting their healthcare needs (Osberg & Sharpe, 2010; Hacker, Huber, Rehm, Schlesinger & Valleta, 2010). Clause 25 of the Universal Declaration on Human Rights (UDHR) established by the United Nations (UN) provides old age, unemployment, disability, illness and widowhood as the hazards that produce economic insecurity (Assembly, 1948). Aggregation of measures of economic insecurities provides an index as a measure of economic security (Osberg, 2015).

Economic Security Index (ESI) measures the magnitude of economic security that individuals experience as derived from composite measure of economic insecurities. The composition of ESI is relatively new and still in the developmental stage with various scholars adopting and developing various composites. Hacker et. al (2010) developed an aggregated economic security index focusing on the degree of protection against hardships from large income losses for individuals in the United States of America. Osberg and Sharpe (2010) developed an Index of Economic Well-Being (IEWB) on economic security encompassing four economic hazards. This study developed and adopted an ESI comprising of equally weighted composite index of unemployment rate, universal healthcare uncovered rate and poverty rate. The composition of the ESI was informed by the primary three components of economic security being income component, out-of-pocket medical expenses component and financial wealth component. Unemployment represented the income component, universal healthcare uncovered rate represented the out-of-pocket medical expenses component while poverty represented the financial wealth component.

Empirical Review

The impact and outcome of sovereign debt and public expenditure to the economy and various parameters of economy security have been studied with varied findings.

Zemskov et al. (2020) analyzed the risks to sovereign and private debts as aspects that impact economic security of the state using the case study of Russia. They noted that foreign debt had positive and negative effect on the national economy and further noted that economic security was a lens to analyze the problems arising from internal and external debt in Russia. They also noted that marginal increase in sovereign debt affects negatively Russia's economic security increasing debt service cost. The impact of the adverse effect of marginal increase in sovereign debt ultimately affects the society's wellbeing that would lead to poverty, increase in crime, decrease in tax revenues and unrests in the society. They concluded that having effective mechanisms both at the state level and corporate level to control and management of marginal increase in debt would be desirable.

Baidoo, Duodu, Kwarteng, Boatemaa, Opoku, Antwi and Akomeah (2021) studied the impact of sovereign debt occasioned by infrastructure spending deficit on economic growth in Ghana through evaluating data from 1980 to 2017 using the ARDL framework. Their study findings showed that sovereign debt negatively impacts on economic growth by exerting pressure on it. Their study findings would therefore support financing of infrastructural projects from ordinary revenues.

Mqolombeni, Tewari and Ilesanmi (2023) used data for 12 emerging African countries from year 1991 to 2020 to study the influence of high public debt on their economic growths. Their findings supported proposition of presence of a U-shaped association of sovereign debt and economic growth implying past a certain debt point, incremental

sovereign debt affects economic growth negatively. Their study implications are that governments should prudently manage sovereign debt to maintain it as the lower threshold to avoid negative impacting on economic growth.

Apeti (2023) analyzed a sample of 124 developing economies to study the impact of sovereign debt default on inequality using secondary data from 1980 to 2016. He found out that default has a positive effect on inequality that can last up to five years after default ends. The default is sensitive to debt size, type of sovereign debt, level of development and institutional capacity. He identified lower taxes and social speeding and subsidies as the factors that increase inequality arising from reduced redistributive capacity due to default. Default can therefore be said to increase wealth inequalities that increases economic insecurities.

Saraireh (2020) evaluated data covering the period 1990 to 2019 to estimate impact of state expenditure on unemployment in Jordan. He established that public expenditure is inversely related to unemployment in the long and short runs with an increases in public spending measured as a fraction of GDP reducing unemployment by 0.43%. Unemployment is an indicator of economic security. His studies however did not study the association between public expenditure and a composite of economic insecurities modelled into an economic security index, which was the study gap that this study addressed.

Alamanda (2020) analyzed panel data from 33 provinces in Indonesia from the period 2005 to 2017 to investigate the effect on income inequality and poverty by various categories of public expenditure. He aimed to evaluate the claim that the structure and types of government spending affects income disparity and poverty. He found out that grant expenditure, social assistance and subsidy have no significant influence on income inequality and reducing poverty. He further found out that investment expenditure and income inequality are negatively correlated in both urban and rural parts of Indonesia. He also found out investment expenditure is still adversely correlated with poverty in both urban areas and rural zones with the impact being higher in rural areas. Poverty is one of the economic insecurity factored in the economic security index adopted by this study. Alamanda did not however incorporate other economic insecurities in his study, which was the study gap that this study addressed by incorporating three economic insecurities into an economic security index.

Obisike, Okoli, Onwuka and Mba (2020) using secondary data from 1981 to 2016 studied the effect of public social expenditure on unemployment rates in Nigeria. They analyzed the data using ordinary least square (OLS) and found out recurrent spending did not have a significant influence on unemployment as did capital expenditure. They further found out that both capital and recurrent spending on health and education had a significant bearing on unemployment. Their study's conclusion showed that a government should focus its expenditure on health, education and other social activities to reduce unemployment in Nigeria. Though their study looked at the breakdown of public expenditure on unemployment rates, it did not make comparative analysis with other economies nor with other types of economic insecurities. These were the study gaps addressed by this study.

Abouelfarag and Qutb (2021) studied the effect of public expenditure on unemployment rate in Egypt. They analyzed data for the duration from 1980 to 2017 using vector error correction model (VECM) and Johansen cointegration test. They further examined whether discretionary and non-discretionary expenditure items had difference impact on unemployment. They found out that in the long run marginal increases in public expenditure results in increased unemployment rate and there was approximately similar

effect of increasing unemployment by both discretionary and non-discretionary expenditures. Investment spending however had insignificant impact owing to its minimal percentage in public expenses. The study looked at only one aspect of economic insecurity and did not factor a composite of insecurities that was the gap that this study addressed.

Joy, Okafor and Ohiorenuan (2021) carried out a study on the impact of capital public expenditure on poverty in Nigeria. They used secondary panel data from Central Bank of Nigeria as well as from the Nigeria Bureau of Statistics for the duration from year 1981 to 2015. They analyzed the data using Autoregressive Distributed Lag model (ARDL) and discovered a positive significant influence on poverty by capital public expenditure. Their study findings reflected that increases in capital public expenditure resulted in increased poverty. These findings suggest it would be counterproductive to increase public expenditure as it would be tantamount to increasing poverty. The study finding can therefore be extended to the influence of public expenditure to other economic insecurities or composite of economic insecurities to means increasing public expenditure results into increased composite economic insecurities. The study sought to test this theorized extension.

Yusoff, Law, Mohamed and Ismail (2023) studied the impact of capital public spending in alleviating of poverty in Malaysia. They analyzed time series data for the years 1970 to 2019 using a Non-Linear Autoregressive Distributed Lag (NARDL) model. They discovered that public development expenditure had no or little impact in lowering poverty levels in Malaysia both in the long and short runs. They also found a positive significant effect on poverty by increasing capital public expenditure but reducing capital public expenditure was insignificant in the determination of poverty in Malaysia in the long run. The study finding support reduction of all forms of capital public expenditure whose effect would be to reduce poverty. It can also be argued that since increasing capital public expenditure does not significantly adversely affect poverty, governments may consider increasing capital public expenditure in areas that would have a higher multiplier effect in improving the quality of lives in poverty-stricken areas.

Conceptual Framework

Figure 1 conceptualized a linkage between the independent variable, public expenditure to economic security as the dependent variable and hypothesized that public expenditure had no significant influence on economic security among EAC member countries. If further conceptualized sovereign debt as an intervening variable to relationship between the public expenditure and economic security and hypothesized that the intervening variable had no significant effect to the relationship between public expenditure and economic security.

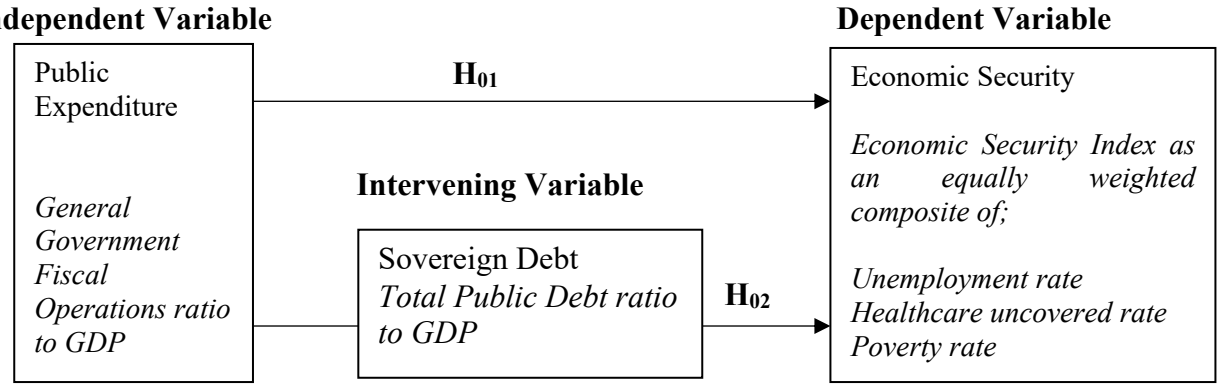


Figure 1: Conceptual Framework

Research Methodology

The study used positivism research philosophy and adopted the descriptive and exploratory study designs in analyzing the longitudinal and cross-sectional panel data to describe and evaluate the intervening impact of sovereign debt on the relationship between public expenditure and economic security among the five selected EAC member countries that were Kenya, Uganda, Tanzania, Burundi and Rwanda. The data considered was for a fifteen-year period from year 2008 to 2022. The analysis was done using E-Views Version 12 with the Broyden–Fletcher–Goldfarb–Shanno (BFGS) Autoregressive Moving Average (ARMA) Generalized Least Squares (GLS) being utilized as some of the data failed to meet the classical regression assumptions. Sovereign debt was operationalized as being the total national debt and expressed as a percentage of the GDP. Public expenditure was operationalized as being the general government final consumption expenditure and expressed as a percentage of the GDP. Economic security was operationalized as the level of economic insecurity in a country and measured using a customized economic security index developed as a composite index of equal weights of unemployment rate, universal healthcare uncovered rate and poverty rate.

The hierarchical regression models (Baron & Kenny, 1986) adopted and developed by the study to test the research hypothesis that sovereign debt had no significant intervening impact on the relationship between public expenditure and economic security in EAC member countries were as indicated below.

$$ESj_t = \alpha + \beta_1 P_{jt} + \acute{\varepsilon} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where;
ESj_t = economic security
Pjt = public expenditure
α = intercept/constant
β_1 = coefficient for public expenditure
t = time period
j = country (1,2,3,4,5)
$\acute{\varepsilon}$ = error term

$$Xjt = \alpha + \beta_1 Pjt + \acute{\varepsilon} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Where;
Xjt = sovereign debt
Pjt = public expenditure
α = intercept/constant
β_1 = coefficient for public expenditure
t = time period
j = country (1,2,3,4,5)
$\acute{\varepsilon}$ = error term

$$ESjt = \alpha + \beta_1 Pjt + \beta_2 Xjt + \acute{\varepsilon} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

Where;
ESjt = economic security
Pjt = public expenditure

Xjt = sovereign debt
α = intercept/constant
β_1 = coefficient for public expenditure
β_2 = coefficient for sovereign debt
t = time period
j = country (1,2,3,4,5)
ε = error term

The regression conditions for full intervention were three namely overall p value in equation (1) should be less than 0.05, p value in equation (2) should be less than 0.05 and in equation (3) p value linked with sovereign debt should be less 0.05 and p value linked with public expenditure should be greater than 0.05.

Trend analysis of the study variables was done. Descriptive analysis of the data in terms of the mean, standard deviation of the data, being the measures of central tendency and the minimum and maximum values associated with the study variables of public expenditure and economic security were also done.

Results and Analysis

Trend Analysis

The trend analysis of sovereign debt, public expenditure and economic security in the five member countries selected for the study from the East African Community were as presented in Figures 2, 3 and 4 below.

Figure 2: Trend Movement of Sovereign Debt Within East African Community

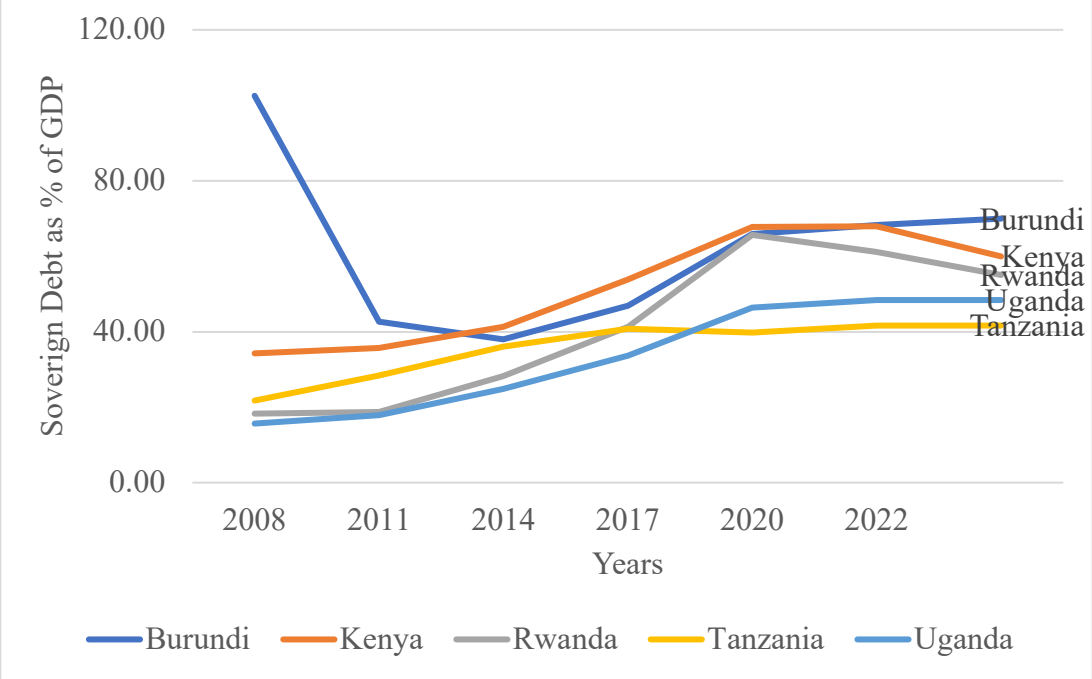


Figure 3: Trend Movement of Public Expenditure Within East African Community

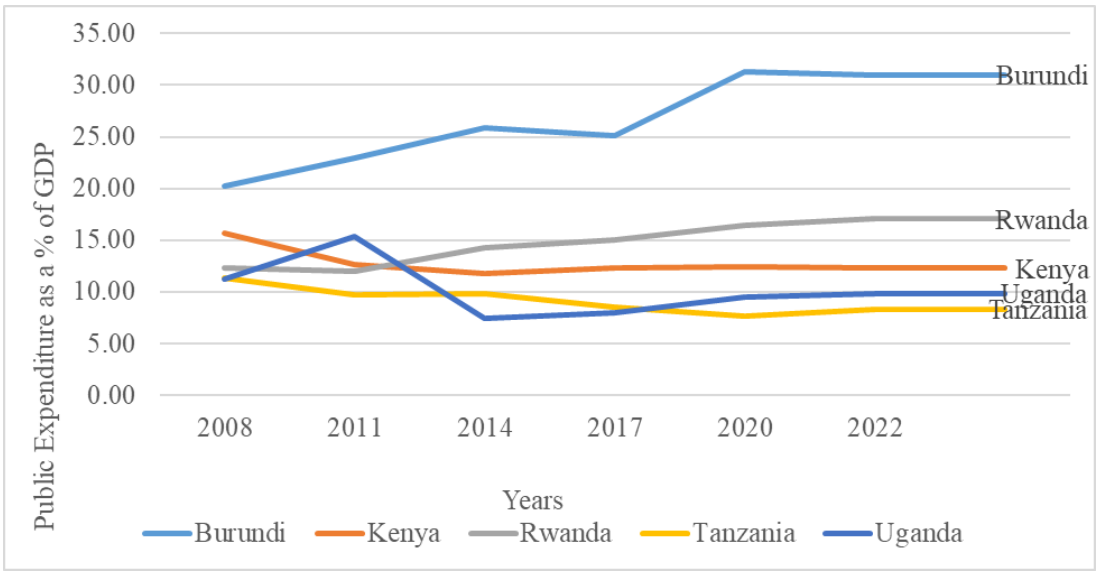
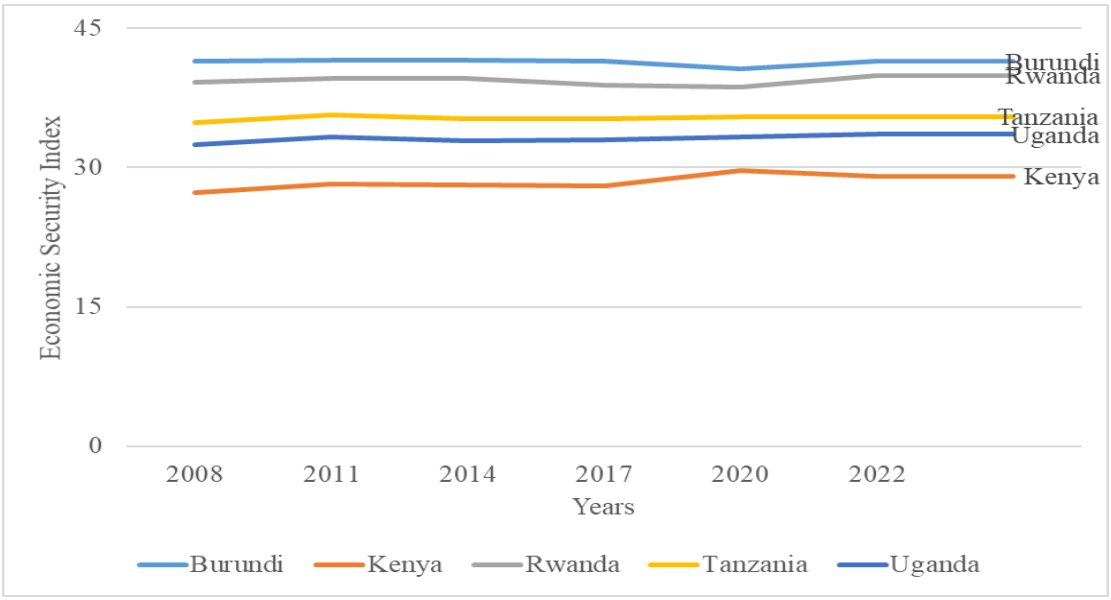


Figure 4: Trend Movement of Economic Security Within East African Community



Descriptive Statistics and Regression Analysis

The summary of the descriptive statistics of the data variables were presented in Table 1 below while the results of the regression analysis were presented in Table 2, 3 and 4 below.

Table 1: Summary of Descriptive Statistics of Public Expenditure on Economic Security

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Sovereign Debt as a % of GDP	75	14.79	102.52	40.3348	16.3079
Public Expenditure as a % of GDP	75	6.59	31.34	14.0941	6.2591
Economic Security represented by Economic Security Index (ESI)	75	27.12	44.75	35.6400	4.7917

Table 1 shows the mean for public expenditure was 14.09% implying that on average the EAC member countries had public expenditure of 14.09% of the Gross Domestic Product (GDP). The mean for economic security was 35.64% implying that on average 35.64% of the population among the EAC region experienced economic insecurities. A higher value of the economic security index reflected a lower level of economic security.

Table 2: Regression Analysis on the Intervening Impact of Sovereign Debt on the Relationship Between Public Expenditure on Economic Security in East Africa Community, Step One

Dependent Variable: ESI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	29.31728	2.026748	14.46519	0.0000
Public Expenditure	0.461352	0.098715	4.673576	0.0000
AR (1)	0.839834	0.065652	12.79222	0.0000
R-squared	0.804303	Mean dependent var		35.64000
Adjusted R-squared	0.798867	Durbin-Watson stat		2.318156
Prob (F-statistic)	0.000000			

Table 2 shows the coefficient of determination (R^2) value of 0.804) that indicates that public expenditure explains 80.4% of the magnitude of variation in economic security index thus economic insecurity among EAC member countries. The overall computed p (0.000) value was lower than 0.05 indicating that public expenditure had a significant effect on economic security among EAC member countries. This met the first intervening condition. Further, the p (0.000) value allied with public expenditure was less than the 0.05. The intercept of 29.317 gives the level of economic security index thus economic insecurity holding public expenditure at constant zero. The positive coefficient of public expenditure of 0.461 means that an increase in a unit of public expenditure would translate to a 0.461 units rise in economic security index thus increase in economic insecurity among EAC member countries. The regression results were fitted in the simple linear regression equation 1 as follows:

$ESj_t = 29.317 + 0.461P_{jt} + \acute{\varepsilon}$ ………………………………………………………… (1)

Table 3: Regression Analysis on the Intervening Impact of Sovereign Debt on the Relationship Between Public Expenditure on Economic Security in East Africa Community, Step Two

Dependent Variable: Sovereign Debt

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	20.73135	7.633713	2.715762	0.0083
Public Expenditure	1.507731	0.464140	3.248439	0.0018
AR (1)	0.657864	0.096061	6.848415	0.0000
R-squared	0.475155	Mean dependent var		40.33480
Adjusted R-squared	0.460576	Durbin-Watson stat		2.166682
Prob (F-statistic)	0.000000			

Table 3 shows R2 (0.475) value that indicates that, in the regression model, public expenditure explains 80.4% of the magnitude of variation in sovereign debt among EAC member countries. The overall computed p (0.000) value was lower than of 0.05 revealing that public expenditure had a significant effect on sovereign debt among EAC member countries. Further, the p (0.002) value linked with public expenditure was lower than 0.05. The intercept of 20.731 gives the level of sovereign debt holding public expenditure at constant zero. The positive coefficient of public expenditure of 1.508 means a unit growth in public expenditure would result in an increase by 1.508 units in sovereign debt among EAC member countries. From the regression results, the second intervening condition for rejecting the second hypothesis was met given that the overall computed p (0.000) value was lower than 0.05. The linear regression model was fixed in equation 2 as follows:

Xjt = 20.731 + 1.508Pjt + έ………………………………………………………….. (2)

Table 4: Regression Analysis on the Intervening Impact of Sovereign Debt on the Relationship Between Public Expenditure on Economic Security in East Africa Community, Step Three

Dependent Variable: ESI

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	29.42293	2.069714	14.21594	0.0000
Public Expenditure	0.469852	0.106206	4.423990	0.0000
Sovereign Debt	-0.005114	0.021113	-0.242218	0.8093
AR (1)	0.838352	0.067263	12.46380	0.0000
R-squared	0.804467	Mean dependent var		35.64000
Adjusted R-squared	0.796205	Durbin-Watson stat		2.335893
Prob (F-statistic)	0.000000			

Table 4 shows R2 (0.804) value that indicates that, in the regression model, public expenditure and sovereign debt explains 80.4% of the magnitude of variation in economic security index thus economic security among EAC member countries. The overall computed p (0.000) value was lower than 0.05 implying that both public expenditure and sovereign

debt have significant effect on economic security among EAC member countries. Further, the p (0.000) value associated with public expenditure was lower than the 0.05. However, the p (0.809) value linked with sovereign debt was greater than 0.05 while the p (0.000) linked with public expenditure was less than 0.05 indicating lack of full intervention and thus failed to satisfy the third condition for full intervention. The intercept of 29.423 gives the level of economic security index thus economic insecurity holding public expenditure and sovereign debt at constant zero. The positive coefficient of public expenditure (0.470) means that public expenditure is associated with increase in economic security index thus increase in economic insecurity holding other factors constant. The negative coefficient of sovereign debt (-0.005) means that sovereign debt is associated with decrease in economic security index thus decrease in economic insecurity holding other factors constant. The regression model in equation 3 was fitted as follows:

$ESj_t = \alpha + \beta_1 Pj_t + \beta_2 Xj_t + \acute{\varepsilon}$ ………………………………………………………………… (3)

One of the three conditions for full intervention was not met and thus the study failed to reject the hypothesis and resolved that sovereign debt had no significant intervening effect on the relationship between public expenditure and economic security among EAC member countries. The study findings indicate that increase in public expenditure would results in an increase in the level of economic insecurities and the presence of sovereign debt minimally mitigates that increase though the overall effect increases the adverse effect of public expenditure on economic security. The study findings have addressed the study gap on the moderating effect of sovereign debt on the relationship between public expenditure and economic security as well as on the relationship between public expenditure and economic security.

Contribution

The study has contributed to the development of economic security index. Hacker et. al (2010) developed an aggregated economic security index focusing on the degree of protection against hardships from large income losses for individuals in the United States of America. Osberg and Sharpe (2010) developed an Index of Economic Well-Being (IEWB) on economic security encompassing four economic hazards while the study developed an equally weighted economic security index of three economic insecurities. The study findings can help government entities charged with the responsibility of spending public funds in directing public expenditure to programmes and areas that have a higher contribution to economic growth that translates in provision of an enhanced enabling environment for improved economic security.

The study findings can guide policy makers in formulating policies that maintain public expenditure increment and sovereign debt within sustainable limits to avoid increasing their negative effect on economic security. The study findings can be used by the academicians to identify further research areas such as developing differently weighted economic security indices, testing the impact of different components of public expenditure such as recurrent and development expenditure on various differently weighted economic security indices as well as testing the influence of different components of sovereign debt being the domestic and external debt on the relationship between various components of public expenditure and differently weighted economic security indices.

Limitations and Future Studies

The study employed secondary data from year 2008 to 2022 and contained imputed data in two economic insecurities being poverty rates and universal healthcare coverage for years where the data was not readily available. The unavailability of the data primarily relates to practices of periodic collection of the two data sets and lack of collecting the primary data on them annually. The study explored available data sources but failed to secure secondary data in these two data sets thus the imputation. This limitation limits the application of the study results to the assumptions made by the data imputation process. A longer study period and availability of published primary data for all variables would have given a wider more accurate implication of the study results.

The study included only five (5) member countries within the EAC leaving out some countries that full members of the EAC throughout the study period. This limitation was necessary as there was expectation that the East Africa protocol establishing the EAC has several expectations including economic policies that were expected to produce some uniform application and thus results across the member countries. The study deliberate limitation was aimed at assessing effects on the EAC member countries that were subjected to the same economic policy environment with the EAC regional economic block. The application of the study findings is therefore limited to the member countries that were included in the study.

The study makes suggestions on further areas of research such as using a wider composed Economic Security Index (ESI), having different weighting on the composition of the ESI guided by assessment of the impacts of the factors on economic security, having a longer study period that expands the scope to include all EAC member countries with the duration being where they have all been EAC members, undertaking comparative study of effects of macroeconomic variables on economic security between various regional economic blocks, undertaking comparative studies on factors influencing economic security in economies with different development status based on the geographical north and south classifications. Studies can also be done on the factors that influence economic insecurities thus economic security that can help in categorizing economic insecurities in different economies probably as basic economic insecurities and periphery insecurities and the results used to guide in developing economic security indices.

Conclusion

The objective of the study was to determine the moderating impact of sovereign debt on the relationship between public expenditure and economic security among EAC member countries. The study's findings from the hypothesis testing, using secondary data, concluded that public expenditure had a significant adverse impact on economic security among EAC member countries. Increasing public expenditure therefore adversely affects the economic well-being of the people who contribute to it through direct and indirect taxations. The adverse effects of public expenditure arise from reducing the capacity of individual, households and societies to meet their basic and essential needs, thus the reduction in economic security, through reduction of disposable income that goes to taxation.

The study also concluded that the sovereign debt had no significant intervening impact on the relationship between public expenditure and economic security among EAC member countries. The study further concluded that public expenditure positively and significantly affects sovereign debt. This means an increase in public expenditure would

cause an increase in sovereign debt where ordinary revenues are not sufficient to meet public expenditure. This in turn adversely affects economic security by increasing economic insecurities. The coefficient of public expenditure when combined with sovereign debt is slightly higher than the coefficient of public expenditure alone. Raising sovereign debt to bridge the ordinary revenue gaps therefore does not aide in reducing the adverse impact of public expenditure on economic security EAC member countries. The conclusion drawn supports the Public Debt Theory that the burden of new sovereign debt is borne by present generation and shifts to future generations.

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