

---

## The Impact of Public Domestic Borrowing on Private Sector Investments in Kenya

Charles Katua Kithandi

Daystar University, 13 P.O. Box, 44400 - 00100, Nairobi – Kenya.

Correspondence Email: [charleskithandi@domain.com](mailto:charleskithandi@domain.com)

### Abstract

*In recent there has been rapid increase in uptake of domestic debt by the government of Kenya. The purpose of this study was to establish the Impact of Public Domestic Debt on Private Investments in Kenya. The independent variable was public domestic debt while the dependent variable was private investment. Secondary data on Public domestic debt data and private investment was collected from Central Bank of Kenya. The secondary data was for the periods 1999 to 2021. Private investment was operationalised using Gross fixed capital formation (GFCF) and the study applied Autoregressive distributed lag (ARDL) econometric model. The study found out that the long-term analysis indicated sustained public domestic borrowing had a negative influence on GFCF, revealing a crowding-out effect. This implied that over time, persistent government debt led to reduced private sector investment.*

**Keywords:** Public debt, Domestic debt, Public domestic debt, Private investment.

**JEL Classification:** H74

---

### 1. Introduction

Private sector investment is vital for all growing economies to propel economic growth and support long-term economic development. However, the crowding-out effect the government's significant borrowing from domestic financial institutions may have on private sector investment, is a major cause for concern (Hadji, 2022). The crowding out happens when government borrowing reduces the amount of money available to private sector borrowers, which restricts their capacity to make investments and expand their companies. Therefore crowding-out effect can be described as the impact of government activities on private sector investments and other activities. Several debates concerning the connection between public spending and private sector activity have been based on it. This idea states that the government competes with the private sector for loanable money when spending is financed by borrowing. Global debt has been on

the increase, particularly during the times of crisis. In 2021 for instance, it reached a historic level of \$303 trillion, recording a 34% surge from 2020 (World Economic Forum, 2023). This raises several concerns about sustainability of public debt and its effect on economic growth and private-sector investment.

The International Monetary Fund (IMF) describes the 2021 global debt increase as the largest one-year debt surge that the world has ever observed since World War II (Gaspar, Medas, & Perrelli, 2023). Certainly, 2021 was a special year as many countries across the world were just recovering from the impact of the COVID 19 pandemic. It can therefore be justified that many countries increased their borrowing to protect people's lives during the emergency, preserve jobs through subsidies, and avoid potential bankruptcies. A country's level of debt can have a substantial impact on its economic growth and development. Excessive debt loads can crowd out private investment, resulting in decreased economic activity and hampered long-term growth prospects (Feltenstein, 1986; 2023). The rise in global debt is not just unique to 2020 or 2021. According to the World Bank, the rise in global debt has been recorded since 1970, reaching around 230% of world GDP in 2018 (Rajan, 2019).

Kenyan debt has been steadily rising at an average of 14% annually. According to the Central Bank of Kenya (CBK), the debt increased from Ksh.606B in December 2001 to Ksh.8,207B in December 2021 (CBK, 2023). This is a 1,254% increase in the 21-year period at an average of 14% annually and constitutes both public and publicly guaranteed debt equivalent and is consistent with the global debt rise discussed earlier. The rise in Kenya's national debt is attributed to budget deficits, infrastructure expansion, and economic issues such as increased demand for subsidies. Analysing Kenya's debt status through time provides information about the country's fiscal policies and the impact they have on private investment. Examining the growth of private investment in Kenya also provides insight into the dynamics of government borrowing and private sector activity. However, in Kenya, the relationship between government borrowing and private investment is still a matter of debate and investigation. Understanding this relationship is critical for policymakers, economists, and investors seeking to develop effective strategies and policies that encourage long-term economic growth.

According to the World Bank, the Kenya Private Sector Alliance (KEPSA) reported an estimated loss of \$7 billion in 2017, equivalent to around 10% of Kenya's GDP, due to heightened political uncertainties (The World Bank, 2017; 2023). The World Bank further attributes the downturn in private investment to poor seasonal rains and drought, resulting in reduced crop production and limited hydroelectric power generation throughout. Consequently, higher power tariffs were imposed, exerting inflationary

pressure on households and businesses. The aim and objective of this research is to fill the research gap that exist in relation to the study variables.

## **2. Literature Review**

Mwakalila (2020) carried out a study in 2020 on the impact of domestic borrowing by the Tanzanian government on credit availability to the private sector. Using quarterly data from 2004 through 2018, the scholar was able to establish a relationship between the variables by subjecting the results to diagnostic tests for robustness using autoregressive distributed lag (ARDL) model estimation with a bound cointegration test. The results revealed that government spending and domestic borrowing squeeze out loans to the private sector in the long run, increasing the lending rate. This requires the Tanzanian government to lower part of its deficit expenditure and domestic borrowing in order to enhance tax income by borrowing from external sources to pay its budget deficit. Further, the report suggests that the government should focus on promoting private sector development by making the country an easier place to conduct business, thereby expanding the tax revenue stream base.

Kiriga et al. (2020) conducted a study in 2020 on the influence of the interest rate cap on credit uptake by various sectors, as well as the impact of private sector credit on economic growth. These implications were evaluated using the HP filter and the ARDL approach to cointegration. According to the findings, interest rate caps resulted in a monthly decrease in total credit of around 4.3% from its peak level. In terms of sectoral credit uptake, the ARDL estimates that the agriculture sector had the greatest fall of around 5.4 percent compared to other sectors. The study discovered a long-run and short-run positive and significant relationship between private sector access to credit and real GDP growth in Kenya. Policies that assist private investment in gaining access to credit remain vital both during the crisis and, more critically, during the recovery phase. A study by Abubakar and Mamman (2021) was conducted to analyze the impact of public borrowing on private investment in Nigeria. The linear and non-linear ARDL models were applied to analyze the data series from 1981 to 2018. The results indicated that an increase in total debt, and debt service payment has a negative symmetric effect on private investment. The effect of domestic debt on private investment, on the other hand, was found to be asymmetric. According to the scholar, although a negative shock to domestic debt enhances private investment significantly, a positive shock has just a minor beneficial effect. These results suggest that, while domestic debt reduction benefits private investment more, domestic debt increase has no detrimental impact on private investment in Nigeria, a consistency with RET. To boost private investment in Nigeria, the report suggests that the government should limit excessive public borrowing and decrease the stock of public debt.

A study was carried out by Kocha, Iwedi, and Sarakiri (2021) to analyse the impact of public debt on capital formation in Sub-Saharan Africa (SSA) from 2000 to 2008. The results concluded that increasing the stock of external debt and paying interest on foreign debts has only a little impact on capital formation in the short run and has a considerable negative impact in the long run. The scholars applied pooled mean group estimation approach in arriving at their conclusion. According to the scholars, SSA countries are not ignoring investments in vital infrastructure required to fuel economic growth, despite the fact that they face a massive debt service burden as a result of their substantial external debt stock.

#### *Theoretical review*

Ricardian Equivalence Theory: The Theory of Ricardian Equivalence (RET) was advanced by David Ricardo, a 19th-century British political economist (Ansari, 2023). According to the scholar, the theory postulates that public debt has no impact on economic growth and that it is built on the assumption that changes in public expenditures and revenues are matched by changes in private savings. The scholar further affirms that the core premise behind RET assumptions is that irrespective of whether government expenditure increases, economic demand remains constant. Taxpayers and households will increase their savings in anticipation of government deficit, which leads to increased taxes. Because taxpayers are aware that the government deficit will be paid off, they use excess savings to pay for projected tax increase, which are then used to repay government debt. Despite its advancement, some scholars have criticized the Ricardian Equivalence Theory casting doubt on its predictions (Gordon, 2023). According to the scholar, some prominent criticisms include unrealistic assumptions in the theory, such as perfect foresight and complete access to financial markets, which may not correspond to real-world behaviour. The scholar further argues that the theory's predictions were undermined by imperfect capital markets, liquidity limits, and variable individual expectations. The theory's relevance lies in its perspective on what impact government borrowing has on the private sector consumption and behaviour as they anticipate future tax increases.

Investors may reduce current spending and boost savings to offset predicted tax increases, according to RET, if they believe that government borrowing would result in future tax increases. This has the potential to reduce the stimulatory effect of government borrowing. Governments may discover that their endeavours to stimulate the economy through deficit spending are less effective as a result of the anticipation of future tax obligations. Consequently, the theory contends that when compared to traditional economic models, governmental borrowing may have a weaker impact on furthering private investment growth. Likewise, investors who raise their savings in anticipation of future tax increases may limit the cash available for private investment.

Reduced disposable income because of increasing savings may result in less consumer spending, lower business revenues, and potentially less appealing investment options. Private-sector businesses may encounter diminished demand for their products and services in this environment, perhaps leading to lower profitability and a cautious attitude to extending their operations. According to the assumptions in the Ricardian Equivalence Theory (RET), more government borrowing does not inevitably excite the private sector. According to the findings of a study conducted in Ethiopia, economic stimulation efforts by government through debt financed expenditures, consumption and demand do not increase but rather remain constant (Beyene, 2020). The scholar's objective in this study was to test the reality of the RET in Ethiopia by utilizing annual data from 1990 to 2011 and applying the autoregressive distributed lag cointegration technique. According to the findings, only the budget deficit and government consumption expenditure satisfy the RET. However, government debt falls short of the mark. As a result, Ethiopia has only scant proof of the RET's existence.

### 3. Methodology

The study applied descriptive research design so as to provide a comprehensive overview and description of the variables, public domestic borrowing, and private investment. Secondary yearly data on Public domestic debt data and private investment was collected from Central Bank of Kenya from the year 1999 to the year 2021. Private sector investment was measured using Gross Fixed Capital Formation (GFCF) data while private sector borrowing will be sourced directly from the CBK. The study applied the following regression model:

$$PINV_t = \beta_0 + \beta_1 DEBT_t + \beta_i X_t + \varepsilon_t \dots\dots\dots 1$$

Where  $PINV_t$  is Private Sector Investments (dependent variable);  $DEBT_t$  is Public Domestic Borrowing (Independent Variable); the parameter  $\beta_1$  measures Public Domestic Borrowing;  $X_t$  is the set of control variables in the model. These will comprise inflation, interest rate, exchange rate and the measure of political stability. The parameters  $\beta_i$  for  $i = 2,3,4$  will measure the impact of each control variable on Public Domestic Borrowing;  $\beta_0$  is the intercept term in the model.  $\varepsilon_t$  is the error term, which is used to account for other variables that are not included in the model.

### 4. Result

The descriptive statistics for both independent and dependent variable are shown below. The maximum value of GFCF was 0.4317, while the minimum was -0.0634. The standard deviation was 0.1288, suggesting a moderate level of variability. Skewness was positive (0.7362), indicating a slight right-skewed distribution. Kurtosis was 2.9013, indicating slightly heavier tails compared to a normal distribution. The Jarque-

Bera test statistic (1.9967) and its associated probability (0.3684) suggested that the data followed a normal distribution, as the probability was relatively high.

Table 1: Descriptive Statistics

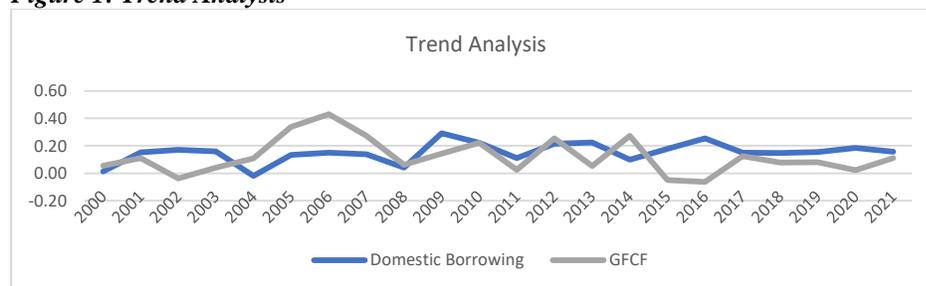
	GFCF	Domestic Borrowing
Mean	0.1207	0.1511
Median	0.0944	0.1532
Maximum	0.4317	0.2909
Minimum	-0.0634	-0.0193
Std. Dev.	0.1288	0.0730
Skewness	2.9011	-0.0535
Kurtosis	1.9967	3.3929
Jarque-Bera	1.9967	1.1921
Probability	0.3688	0.5509
Sum	2.6558	3.3255
Sum Sq Dev.	0.3484	0.1119
Observations	22	22

Source: Authors Computation

From the results in Table 1 above, the mean (average) value of domestic borrowing was approximately 0.1511, while the median (middle) value was approximately 0.1532, indicating a right-skewed distribution. The maximum value of domestic borrowing growth was 0.2909, while the minimum was -0.0193, indicating a wide range of values. The analysis showed the standard deviation (Std. Dev.) of 0.0730, suggesting a relatively high level of variability in domestic borrowing. The skewness of domestic borrowing was negative (-0.5352), indicating a longer tail on the left side of the distribution. Its Kurtosis was high at 3.3929 indicating a distribution with heavier tails and a more peaked shape. The Jarque-Bera test statistic of (1.1921) and its associated probability (0.5509) suggesting that the data was not significantly different from a normal distribution, as the probability was high (above 0.05).

#### **Domestic Borrowing**

The mean value for Domestic Borrowing was 0.1511, indicating a positive average trend in domestic borrowing over the years. The data was negatively skewed, implying that there was a decreasing trend in domestic borrowing, although this was a subtle trend. The stationarity test suggested that there was evidence against the null hypothesis of a unit root, indicating that domestic borrowing was stationary. The p-value of 0.0021 in the stationarity test was significant, supporting the idea that the data exhibited a trend. The data appeared to exhibit a trend, with a slightly decreasing tendency, and the stationarity test suggested that this trend was statistically significant.

**Figure 1: Trend Analysis****GFCF**

The mean value for GFCF was 0.1207, indicating a positive average trend in gross fixed capital formation over the years. The data was positively skewed, implying that there was an increased trend in GFCF growth. The stationarity test suggested that there was strong evidence against the null hypothesis of a unit root, indicating that GFCF was stationary. However, this was achieved after the first differencing. The p-value of 0.0003 in the stationarity test was highly significant, supporting the idea that the data exhibited a trend. GFCF exhibited a trend, with a noticeable increasing tendency, and the stationarity test suggested that this trend was statistically significant. In summary, all the economic variables showed evidence of trends, with GFCF having the most pronounced positive trend, Domestic borrowing was showing a subtle negative trend, and foreign borrowing indicated a moderate positive trend. The stationarity tests provided additional support for the presence of trends in these variables.

**Diagnostic Tests**

The researcher tested for the stationarity of Domestic Borrowing using the Augmented Dickey-Fuller (ADF) test with the null hypothesis that the time series Domestic Borrowing has a unit root.

From the results in Table 2, the ADF test statistic was -5.2476 and the one-sided p-value associated with this ADF test statistic was 0.0021 significant at level. This p-value was compared to the critical values to determine the stationarity of GFCF. The critical values obtained were -4.4678, -3.6449, and -3.2614 at different levels of 1%, 5%, and 10% respectively. The p-value of F Statistic was (0.0002) which suggested that the model was statistically significant.

Table 2: Augmented Dickey-Fuller (ADF)

Null Hypothesis:	Domestic Borrowing has a unit root			
Exogenous:	Constant Linear Trend			
			t-Statistics	Prob.
Augmented Dickey-Fuller test Statistic			-5.2476	0.0021
Test Critical Values	1% Level		-4.4678	
	5% Level		-3.6449	
	10% Level		-3.2614	
	Coefficient	Std Error	t-Statistics	Prob.
Domestic Borrowing	-1.1589	0.2208	-5.2476	0.0001
R-Squared	0.6099	Mean dependent Var		0.0068
Adjusted R-squared	0.5665	S.D Dependent Var		0.1035
S.E of regression	0.0681	Akaike Info Criterion		-2.4027
Sum squared resid	0.0835	Schwarz Criterion		-2.2535
Log Likelihood	28.2287	Hannan-Quinn Criterion		-2.3703
F-statistics	14.0727	Durbin-Watson Stat		2.1140
Prob (F-statistic)	0.0002			

Source: Authors Computation

Based on these ADF test results, the ADF test statistic (-5.2476) was significantly lower than the 1% critical value (-4.467895), indicating that the null hypothesis of a unit root was rejected at level values. Further, the p-value of 0.0021 was well below 0.05 significance level, indicating strong evidence in favour of stationarity. This analysis therefore provided evidence to suggest that the time series Domestic Borrowing was stationary at level, as it did not have a unit root. This meant that the series exhibited stationary behaviour, and its statistical properties remained relatively constant over time.

Table 3: The Variance Inflation Factor (VIF) test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
GFCG (-1)	0.0312	3.1832	1.6886
Domestic Borrowing	0.1771	16.8920	2.5235
C	0.0143	46.7473	NA

Note: Included Observations 22. Source: Authors Computation

The Uncentered VIF was 16.89201 while the Centered VIF was 2.5235. Centering significantly reduce the multicollinearity associated with domestic borrowing. While the uncentered VIF was very high (16.8920), centering brought it down to a much more reasonable level (2.5235). The Uncentered VIF value for GFCF was 3.1842 while the centered VIF was 1.6886. Centring improved the multicollinearity situation for the lagged GFCF (-1) as well. The uncentered VIF was somewhat high (3.1842), and centered reduced it to a more reasonable level (1.6886).

To determine whether heteroscedasticity was present, the study used the Breusch-Pagan test.

Table 4: Heteroscedasticity

Heteroskedasticity Test	Breusch-Pagan-Godfrey			
Null Hypothesis:	Homoskedasticity			
	Coefficient	Std Error	t-Statistics	Prob.
C	0.0003	0.0104	0.8861	0.3916
GFCF (-1)	0.0008	0.0154	0.0546	0.9572
Domestic Borrowing	-0.0224	0.0368	-0.6081	0.5535
R-Squared	0.2118	Mean dependent Var		0.0039
Adjusted R-squared	-0.2125	S.D Dependent Var		0.0063
S.E of regression	0.0070	Akaike Info Criterion		-6.7938
Sum squared resid	0.0006	Schwarz Criterion		-6.3959
Log Likelihood	79.335	Hannan-Quinn Criterion		-6.7074
F-statistics	0.4992	Durbin-Watson Stat		2.4381
Prob (F-statistic)	0.8191			
F-statistics	0.4992	Prob. F(7,13)		0.8191
Obs. R-squared	4.4493	Prob. Chi-Square		0.7268
Scaled explained SS	2.0822	Prob. Chi-Square		0.9551

Source: Authors Computation

From the results, the F-statistic was 0.4992 with a p-value of 0.8191 (Prob. F(7,13)). Since the p-value was high, the study failed to reject the null hypothesis, suggesting that there was no significant evidence of heteroskedasticity in the model. The coefficients and their corresponding t-statistics were also provided. These statistics helped assess the individual significance of each variable in the model. The model's R-squared was 0.2118, indicating that the independent variables explained approximately 21% of the variation in the dependent variable. The adjusted R-squared was negative, suggesting that the model was not a good fit. Based on the results of the Breusch-Pagan-Godfrey test, there was no significant evidence of heteroskedasticity in the model. This suggested that the variance of the error terms was relatively constant across the range of the independent variable.

Table 5: Correlational Analysis

	Domestic Debt	GFCF
Domestic Debt	1	
GFCF	0.1187	1

Source: Authors Computation

GFCF with Domestic borrowing (0.1187): The correlation between gross fixed capital formation (GFCF) and domestic borrowing was positive but relatively weak. This

implies that an increase in domestic borrowing was associated with a slight increase in GFCF.

Table 6: Autoregressive distributed lag (ARDL) Regression

Variable	Coefficient	Std. Error	t-statistic	Prob.
GFCF	0.3141	0.1767	1.7777	0.0988
Domestic Borrowing	-0.9921	0.4208	-2.3573	0.0347
C	0.4620	0.1197	3.8582	0.0020
R-Squared	0.7565			
Adjusted R-Squared	0.6254			
S.E of regression	0.0802			
F-Statistics	5.7712			
Prob (F-statistic)	0.0033			
Akaike Info	-1.9244			
Schwarz criterion	-1.5265			
Hannan -Quinn	-1.8381			
Durbin-Watson Stat	1.8970			

Source: Authors Computation

The R-squared value was 0.7565, indicating that the model explained approximately 75.65% of the variation in the dependent variable, GFCF. The adjusted R-squared was 0.6254, which adjusts the R-squared value for the number of independent variables in the model was also relatively high. It suggested that the model cannot be overfitting and retained a good level of explanatory power. The F-statistic was 5.7712, and its associated probability (Prob(F-statistic)) was 0.003323 which was very low. This suggested that the overall model was statistically significant at 0.05 significance level. In other words, there was evidence that at least one of the independent variables had a significant impact on GFCF.

The coefficient of GFCF (-1) was 0.3141, with a t-statistic of 1.7777. It indicated that a one-unit increase in the lagged GFCF was associated with a 0.314183 unit increase in the current GFCF. The t-statistic suggested that this relationship was marginally significant ( $p = 0.0988$ ). The coefficient for domestic borrowing was -0.992112, with a t-statistic of -2.357343. This suggested that an increase in domestic borrowing was associated with a decrease in GFCF. The relationship was statistically significant ( $p = 0.0347$ ). Based on this analysis the study model representing the short-term relationship between the variables was updated as follows:

$$PINV_t = 0.462082 - 0.992112D1_t + \varepsilon_t \dots\dots\dots 2$$

Where 0.462082 is the constant term,  $PINV_t$  is the private sector investment. This is the dependent variable represented by GFCF,  $D1_t$  is the domestic borrowing, which was found to be significant in the ARDL analysis. Its coefficient (-0.992112) captured the impact of domestic borrowing on private investment.

The Augmented Dickey-Fuller tests revealed that private investment and some other variables were stationary in first differences. The VIF analysis suggested that multicollinearity was not a significant issue, particularly with centered VIF values falling within acceptable limits. Normality tests indicated that the data approximated a normal distribution. The Breusch-Pagan-Godfrey test for heteroskedasticity failed to reject the null hypothesis of homoskedasticity. The Recursive Coefficient Test was applied to examine structural stability in the data and there was no evidence to conclude that structural shifts or irregularities existed based on the graphical representations.

### **5. Conclusions and Recommendations**

The study found out that the long-term analysis indicated that sustained public domestic borrowing had a negative influence on GFCF, revealing a crowding-out effect. This implied that over time, persistent government debt led to reduced private sector investment. Policymakers should consider the trade-off between immediate economic stimulation and the potential long-term crowding-out effect. Fiscal policies should aim for equilibrium, ensuring that public borrowing does not hinder private sector growth in the long run.

Future studies can focus on specific sectors of the economy that can yield insights into how government borrowing affects different industries. For example, the study could explore how public borrowing impacts sectors such as manufacturing, agriculture, or technology, considering sector-specific factors and challenges. The study's results emphasized the importance of prudent fiscal policies. While short-term increases in public borrowing may stimulate private sector investment, the long-term crowding-out effect should be a concern. The government must strike a balance between addressing short-term economic needs and ensuring long-term sustainability by managing its debt levels effectively. Government borrowing should be directed towards productive public investments that can enhance the overall business environment and stimulate private sector growth. The findings suggested that targeted and well-planned public investments can have a positive impact on private investment.

### **References**

- Abubakar A. B., & Mamman, S. O. (2021). Effect of Public Debt on Private Investment in Nigeria: Evidence from an Asymmetric Dynamic Model. *Central Bank of Nigeria*, <https://www.cbn.gov.ng/Out/2022/RSD/Effect%20of%20Public%20Debt%20on%20Private%20Investment%20in%20Nigeria%20Evidence%20from%20an%20Asymmetric%20Dynamic%20Model.pdf>.
- Affek, S. P. (2019). *Detecting stationarity in time series data*. Retrieved from <https://towardsdatascience.com/detecting-stationarity-in-time-series-data-d29e0a21e638>
- Amadeo, K. (2021). *Keynesian Economics Theory*. Retrieved from The Balance: <https://www.thebalancemoney.com/keynesian-economics-theory-definition-4159776>

- Ansari, S. (2023). *Ricardian Equivalence*. Retrieved from Economics Online: <https://www.economicsonline.co.uk/definitions/ricardian-equivalence.html/>
- Beyene, S. D. (2020). Testing the Ricardian equivalence hypothesis in the case of Ethiopia: An autoregressive-distributed lag approach. *Hungarian Statistical Review*, [https://www.ksh.hu/statszemplé\\_archive/en/2020/2020\\_02/2020\\_02\\_026.pdf](https://www.ksh.hu/statszemplé_archive/en/2020/2020_02/2020_02_026.pdf).
- Bhandari, A. (2020: 2023). *Multicollinearity | Causes, Effects and Detection Using VIF (Updated 2023)*. Retrieved from Analytics Vidhya : <https://www.analyticsvidhya.com/blog/2020/03/what-is-multicollinearity/>
- Box, G. E., Jenkins, G. M., Reinsel, G. C., & Ljung, G. M. (2015). *Time Series Analysis: Forecasting and Control, 5th Edition*. John Wiley and Sons Inc.
- CBK. (2018). *The Impact of Interest Rate Caps on The Kenyan Economy*. Nairobi.
- CBK. (2023). *Public Debt*. Retrieved from Central Bank of Kenya: <https://www.centralbank.go.ke/public-debt/>
- CDC. (2013; 2023). *Creating an Analysis Plan*. Retrieved from Centers for Disease Control and Prevention (CDC): [https://www.cdc.gov/globalhealth/healthprotection/fetp/training\\_modules/9/creating-analysis-plan\\_pw\\_final\\_09242013.pdf](https://www.cdc.gov/globalhealth/healthprotection/fetp/training_modules/9/creating-analysis-plan_pw_final_09242013.pdf)
- CEIC. (2023). *Kenya Gross Fixed Capital Formation*. Retrieved from CEIC Data: <https://www.ceicdata.com/en/indicator/kenya/gross-fixed-capital-formation>
- CFI Team. (2020: 2023). *Heteroskedasticity*. Retrieved from CFI: <https://corporatefinanceinstitute.com/resources/data-science/heteroskedasticity/>
- Emeritus. (2023). *5 Types of Research Design – Elements, Needs and Characteristics*. Retrieved from <https://emeritus.org/in/learn/types-of-research-design/>
- Eurostat. (2023). *Glossary:Gross fixed capital formation (GFCF)*. Retrieved from Eurostat: Statistics Explained: [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross fixed capital formation \(GFCF\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Gross_fixed_capital_formation_(GFCF))
- Feltenstein, A. (1986; 2023). *Financial Crowding Out: Theory with an Application to Australia*. Retrieved from IMF eLibrary: <https://www.elibrary.imf.org/view/journals/024/1986/001/article-A003-en.xml>
- Focus Economics. (2023). *Public Debt*. Retrieved from Focus Economics: [https://www.focus-economics.com/economic-indicator/public-debt/#:~:text=Public%20debt%2C%20sometimes%20also%20referred,Gross%20Domestic%20Product%20\(GDP\).](https://www.focus-economics.com/economic-indicator/public-debt/#:~:text=Public%20debt%2C%20sometimes%20also%20referred,Gross%20Domestic%20Product%20(GDP).)
- Gaspar, V., Medas, P., & Perrelli, R. (2023). *IMF BLOG*. Retrieved from IMF: <https://www.imf.org/en/Blogs/Articles/2021/12/15/blog-global-debt-reaches-a-record-226-trillion>
- Glen, S. (2023). *Intervening variable: Simple Definition & Examples*. Retrieved from StatisticsHowTo.com: Elementary Statistics for the rest of us!: <https://www.statisticshowto.com/intervening-variable/>
- Gordon, J. (2023). *Ricardian Equivalence - Explained*. Retrieved from The Business Professor: [https://thebusinessprofessor.com/en\\_US/economic-analysis-monetary-policy/ricardian-equivalence-definition](https://thebusinessprofessor.com/en_US/economic-analysis-monetary-policy/ricardian-equivalence-definition)
- Greene, W. H. (1990). *Econometric Analysis*. Macmillan.

- Hadji, S. B. (2022). External Debt-Economic Growth Nexus: The Sierra Leonean Case (1973-2021). *Scite*, <https://scite.ai/reports/external-debt-economic-growth-nexus-the-9OrAjL62.Y>
- Hamilton, J. D. (1994). *Time Series Analysis*. Princeton University Press.
- Huang, Y., Pagano, M., & Panizza, U. (2020). Local Crowding-Out in China. *Wiley Online Library*, <https://onlinelibrary.wiley.com/doi/10.1111/jofi.12966>.
- IMF. (2023). *What Is Keynesian Economics?* Retrieved from International Monetary Fund: <https://www.imf.org/external/pubs/ft/fandd/2014/09/basics.htm#:~:text=Stabilizing%20the%20economy&text=Rather%20than%20seeing%20unbalanced%20government,direction%20of%20the%20business%20cycle>.
- KIPPRA. (2007; 2023). *Policy Brief No. 11 of 2007 on Effectiveness of Financial Sector Reforms in Promoting Domestic Private Investment in Kenya*. Retrieved from The Kenya Institute for Public Policy Research and Analysis:
- KIPPRA. (2022). *Effect of External Public Debt on Private Investments in Kenya*. Nairobi: Kenya Institute for Public Policy Research and Analysis.
- Kiriga, B., Chacha, T., & Omanyoo, D. (2020). *KIPPRA: Assessing the Impact of Private Sector Credit on Economic Growth in Kenya*. NAIROBI.
- Kocha, C., Iwedi, M., & Sarakiri, J. (2021). The Dynamic Impact of Public External Debt on Capital Formation in Sub-Saharan Africa: The Pooled Mean Group Approach. *ResearchGate*, [https://www.researchgate.net/publication/357366061\\_The\\_Dynamic\\_Impact\\_of\\_Public\\_External\\_Debt\\_on\\_Capital\\_Formation\\_in\\_Sub-Saharan\\_Africa\\_The\\_Pooled\\_Mean\\_Group\\_Approach](https://www.researchgate.net/publication/357366061_The_Dynamic_Impact_of_Public_External_Debt_on_Capital_Formation_in_Sub-Saharan_Africa_The_Pooled_Mean_Group_Approach).
- Lidiema, C. (2017). Effects of Government Borrowing on Private Investments in Kenya. *Econstor*, <https://www.econstor.eu/bitstream/10419/249523/1/WPS-22.pdf>.
- Mazumdar, M. (2022). *Ethical considerations in research every author should know*. Retrieved from Researcher.life Blog: <https://researcher.life/blog/article/ethical-guidelines-for-researchers/>
- McCombes, S. (2021). *What Is a Research Design | Types, Guide & Examples*. Retrieved from Scribbr: <https://www.scribbr.com/methodology/research-design/#:~:text=A%20research%20design%20is%20a,primary%20research%20or%20secondary%20research>
- McCombes, S., & George, T. (2022). *How to Define a Research Problem | Ideas & Examples*. Retrieved from Scribbr: <https://www.scribbr.com/research-process/research-problem/>
- Muthu, S. (2018). Does public investment crowd-out private investment in India. *Journal of Financial Economic Policy*, [https://www.researchgate.net/publication/315946012\\_Does\\_public\\_investment\\_crowd-out\\_private\\_investment\\_in\\_India](https://www.researchgate.net/publication/315946012_Does_public_investment_crowd-out_private_investment_in_India).
- Mwakalila, E. (2020). Crowding Out of Private Sector in Tanzania: Government Expenditure, Domestic Borrowing, and Lending Rates. *SAGE*, <https://journals.sagepub.com/doi/pdf/10.1177/2394901520913653>.
- NASDAQ. (2022). *What is a Private Investment?* Retrieved from NASDAQ: <https://www.nasdaq.com/articles/what-is-a-private-investment>
- NLM. (2023). *A Student's Guide to the Classification and Operationalization of Variables in the Conceptualization and Design of a Clinical Study: Part 1*. Retrieved from National Library of Medicine:

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8313451/#:~:text=Independent%20variables%20influence%20the%20value.an%20expected%20relationship%20between%20variables>
- O'Brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. . <https://doi.org/10.1007/s11135-006-9018-6>.
- OECD. (2021). *Revenue Statistics: Interpretive Guide*. Retrieved from OECD: <https://www.oecd.org/tax/tax-policy/oecd-classification-taxes-interpretative-guide.pdf>
- OECD. (2023). *GDP and spending*. Retrieved from OECDiLibrary: [https://www.oecd-ilibrary.org/economics/investment-gfcf/indicator/english\\_b6793677-en](https://www.oecd-ilibrary.org/economics/investment-gfcf/indicator/english_b6793677-en)
- Phelps, E. (2022). Public Debt: My Dissent from “Keynesian” Theories. *Journal of Government and Economics*, <https://www.sciencedirect.com/science/article/pii/S2667319322000015>.
- QuestionPro. (2023). *Research Design: What it is, Elements & Types*. Retrieved from Question Pro: <https://www.questionpro.com/blog/research-design/>
- Rajan, R. (2019). *Debt: Evolution, Causes, and Consequences* . Retrieved from World Bank: <https://thedocs.worldbank.org/en/doc/377151575650737178-0050022019/original/DebtChapter1.pdf>
- Rehal, V. (2023). *Breusch Pagan test for Heteroskedasticity* . Retrieved from Spur Economics: <https://spureconomics.com/breusch-pagan-test-for-heteroscedasticity/>
- Sangarshanan. (2018). *Time series Forecasting — ARIMA models*. Retrieved from Towards Data Science: <https://towardsdatascience.com/time-series-forecasting-arima-models-7f221e9eee06>
- Scribbr. (2023). *Population vs. Sample | Definitions, Differences & Examples*. Retrieved from Scribbr: <https://www.scribbr.com/methodology/population-vs-sample/>
- Scribbr. (2023). *What's the difference between reliability and validity?* Retrieved from Scribbr: [https://www.scribbr.com/frequently-asked-questions/reliability-and-validity/#:~:text=Reliability%20refers%20to%20the%20consistency,they%20are%20supposed%20to%20measure\).](https://www.scribbr.com/frequently-asked-questions/reliability-and-validity/#:~:text=Reliability%20refers%20to%20the%20consistency,they%20are%20supposed%20to%20measure).)
- Swaen, B., & George, T. (2022). *What Is a Conceptual Framework? | Tips & Examples*. Retrieved from Scribbr: <https://www.scribbr.com/methodology/conceptual-framework/>
- The University of Utah. (2023). *Ordinary Least Squares (OLS) Regression*. Retrieved from The University of Utah: <https://soc.utah.edu/sociology3112/regression.php>
- The World Bank. (2017; 2023). *Private Sector Credit Growth is Key to Kenya's Economic Recovery*. Retrieved from The World Bank: <https://www.worldbank.org/en/country/kenya/publication/private-sector-credit-growth-is-key-to-kenyas-economic-recovery>
- The World Bank. (2023). *Domestic credit to private sector (% of GDP) - Kenya*. Retrieved from The World Bank: <https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS?locations=KE>
- The World Bank. (2023). *Gross Capital Formation*. Retrieved from World Development Indicators: <https://databank.worldbank.org/reports.aspx?source=2&type=metadata&series=NE.GDI.TOTL.CD#>
- Treasury. (2023). *Public Debt Management Office*. Retrieved from The National Treasury and Economic Planning: <https://www.treasury.go.ke/public-debt-management/>
- UNECA. (2023). *Private sector urged to “own and drive” Africa's continental free trade*. Retrieved from United Nations: Africa Renewal: <https://www.un.org/africarenewal/magazine/january-2023/private-sector-urged-%E2%80%9Cown-and-drive%E2%80%9D-africa%E2%80%99s->

[continental-free-trade#:~:text=%E2%80%9CAfrica's%20private%20sector%20accounts%20for,Commission%20for%20Africa%20\(UNECA\).](#)

USC. (2023). *USC Libraries*. Retrieved from University of Southern California: <https://libguides.usc.edu/writingguide/literaturereview#:~:text=Definition,the%20research%20problem%20being%20investigated>.

USC. (2023). *USC Libraries*. Retrieved from University of Southern California: <https://libguides.usc.edu/writingguide/theoreticalframework#:~:text=The%20theoretical%20framework%20is%20the,research%20problem%20under%20study%20exists>.

Vinz, S. (2022). *What Is a Theoretical Framework? | Guide to Organizing*. Retrieved from Scribbr: <https://www.scribbr.com/dissertation/theoretical-framework/>

World Economic Forum. (2023). *DAVOS 2022*. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2022/05/what-is-global-debt-why-high/>