

# **Domestic Borrowing and Its Effects on the Gross Domestic Product in Kenya**

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## **ABSTRACT**

*This study looked at the debt-to-GDP ratio of Kenya which is the ratio between a country's government debt and its gross domestic product with a view of explaining gaps which can be exploited to improve the country's GDP. A low debt-to-GDP ratio indicate an economy that produces and sells goods and services sufficient to pay back debts without incurring further debt. Kenya was classified as low income country until its status was reviewed to a lower-middle income economy by the World Bank in 2015 based on its estimates of the gross national income per capita (GNI). This ratio measures the mean amount of resources available to people living in a certain economy and hence determine the standard of living of that economy. Domestic borrowing reduces the amount of resources (money) available to the citizens, businesses, SMEs and industries thus causing big challenges to financing projects. Using Kenya as the population, this study used a descriptive research design to explain the relationship between domestic borrowing and gross domestic product. Secondary data for ten years was obtained from the Central Bank of Kenya on the specific measures of the domestic debt and GDP growth. The secondary data collected was sorted and organized before being captured in the Statistical Package for Social Sciences (SPSS) for analysis. The ordinary least square (OLS) regression model was then be used where domestic debt was be regressed against gross domestic product. The results revealed that there was negative relationship between inflation, unemployment and total debts and the gross domestic product of Kenya in Kenyan economy for the 44 quarterly periods between 2009 and 2021.*

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## **I. INTRODUCTION**

National debt is a major cause of concern for a country's development in many nations, and more so in less developed countries. National debt plays a critical role in a nation's financial system as it is used to finance major government initiatives such as economic development projects and to repair the budget deficits of a country.

Cecchetti and Zampolli (2011 ) suggest that, instead of avoiding a deeper recession, high levels of government debt do not cause uncertainty. National debt can be used to finance investments and boost infrastructure, contributing to higher growth. This leads to gross domestic product of Kenya and decreases unemployment, thus boosting a country's economy.

Krugman (2010) contended that the national debt is a burden for the next generations, which comes as a decreased flow of income from a lower stock of private capital. Internationally, all governments experience deficits because of significant expenses of consumption and absence of enough revenues. Governments gather incomes through taxes, printing cash, external borrowing and utilization of previous budget overflow. At the point when the governments settle on a choice to borrow other than acquainting more duty measures with account the budget plan, it makes a risk known as public debt.

In order to fund its fiscal deficit, the government has numerous borrowing options. This include domestic borrowing, i.e., from local commercial banks, fund managers, insurance firms , hedge funds, individuals and external sources.

Corsetti (2012 ) argued that both of the government's strategies for raising the effect of finance on the economy. Therefore, it is important for the government to select the most suitable and economical approach that has less effect on a country's gross domestic product of Kenya (Panizza and Andrea, 2012).

### **National Debt**

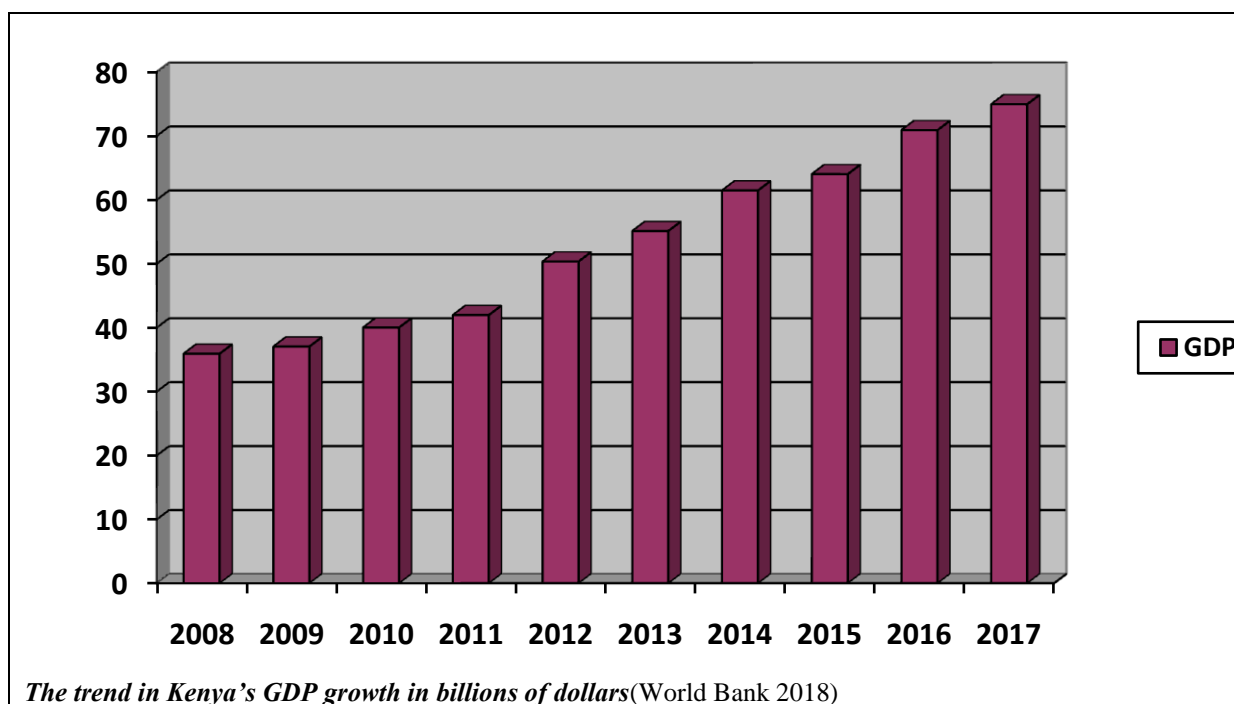
Panizza and Andrea (2012) define national debt as the amount of total government debt a country has. This is also referred to as 'public sector debt. National debt is the composition of debt that the government has borrowed through various means for instance; domestic borrowing through treasury bills, treasury bonds and

sovereign bonds. The national debt seeks to bridge the budgetary deficits. This enables the government to access funds for investment.

There are a few instruments that the administration uses to obtain locally for example; Infrastructure bonds is a depository bond explicitly gave by government for raising funds for framework extends as it were. Treasury bonds could likewise be utilized to raise reserves explicitly to cook for the government cycle. This debt is generally designated to need budgetary regions. Repurchase agreements are utilized to control cash available for use so as to control the exchange rate and inflation. The government likewise utilizes Euro- bond to raise foreign debt. A Eurobond is a worldwide bond that is named in a cash not local to the nation where it is given (Perotti, 2012).

**Government Borrowing and Gross Domestic Product**

Data from CBK (2015) shows that the governments national debt has been a steady rise, this has in part been necessitated by its ambitious investment on infrastructure development, the ballooning wage bill and currently the implementation of the big four agenda.



*The trend in Kenya's GDP growth in billions of dollars*(World Bank 2018)

DOMESTIC DEBT	June-2013	June-2014	June-2015	June-2016	June-2017	June-2018
Central bank	39,170	65,700	63,335	99,856	54,506	110,782
Commercial banks	524,505	617,221	730,419	927,307	1,142,889	1,266,457
Sub-total banks	563,675	682,921	793,754	1,027,163	1,197,395	1,377,239
Non-bank financial institutions	486,880	601,406	626,690	787,970	915,315	1,101,596
<b>Total Domestic</b>	<b>1,050,555</b>	<b>1,284,327</b>	<b>1,420,444</b>	<b>1,815,133</b>	<b>2,112,710</b>	<b>2,478,835</b>
As a % of GDP	23.4%	25.5%	24.4%	27.1%	27.6%	28.0%
As a % of total debt	55.5%	53.0%	50.0%	50.3%	47.9%	49.1%

**Trends in Kenya's total public debt in Kshs millions**(National Treasury 2018)

As a result, the national government has had to contend with increasing financial commitments and a slower GDP growth rate. This has in turn led to a big budget deficit which has to be financed through domestic and foreign borrowing.

The big four action plan of the government has four main pillars namely: manufacturing, food security and nutrition, universal health coverage and affordable housing. The key deliverables being; putting 1 million acres of arable land under irrigation to attain food and nutrition security, expanding universal healthcare coverage, construction of at least 500,000 houses to provide decent & affordable houses for all and supporting value addition and raising the manufacturing sector share of GDP from 9 percent to 22 percent.

According to the Kenya treasury report 2018, the government has set aside 460 billion shillings to spearhead the implementation of the projects. It further seeks to raise an additional 200 billion shillings annually through public private partnerships (PPP) which the government hopes was reduce the fiscal deficit from 9.1 percent in 2016/17 period to 5.7 percent 2018/19 financial year.

The CBK report (2016) shows that though the financial sector growth declined, lending to government increased by 7.1 percent while lending to government parastatals and county governments grew by 28.1 percent.

### **Statement of the problem**

KBA (2016) found that domestic debt has a negative and significant relationship with Gross fixed capital formation even though this relationship diminishes in the long run. The findings postulate that excessive domestic borrowing by the government can negatively affect investment and eventually hurt gross domestic product of Kenya.

According to the annual public debt report 2017-2018, Kenya's overall actual FY 2017/18 fiscal balance was Kshs 607,974 million (6.9 percent of GDP) and was financed through external borrowing of Kshs 331,641 million (3.7 percent of GDP) other domestic financing of Kshs 2,623 million (0.03 percent of GDP). As at the end of June 2018, the outstanding total public debt, including publicly guaranteed debt, stood at Kshs 5,047,234 million, an increase of 14.5 per cent from Kshs 4,406,863 million at end June 2017. Domestic debt increased by 17.3 per cent to Kshs 2,478,835 million while external debt increased by 12.0 per to Kshs 2,568,398 million at end June 2018 from June 2017.

Against this background, one important question that needs to be addressed is the economic consequences of a nation that heavily relies on public debt. While the gross domestic product of Kenya rate is likely to have a linear negative effect on the public debt-to-GDP ratio, high levels of public debt are likely to have detrimental effects on growth, especially, after a certain threshold has been attained. It is this very essential relationship between domestic debt and growth of GDP that the paper seeks to investigate.

### **Objectives of the study**

- i. To investigate the effect of CBK overdraft on the gross domestic product in Kenya
- ii. To investigate the effect of government securities on the gross domestic product in Kenya.
- iii. To determine the effect of credit from commercial banks on the gross domestic product in Kenya.

## **II. REVIEW OF LITERATURE**

This chapter presents review of related literature on public debt in gross domestic product of Kenya. The first part provides theoretical foundation of the study. The second part reviews the empirical literature by focusing on conceptualization of CBK overdraft, government securities, credit from commercial banks and the GDP. The chapter then proceeds to analyze the empirical studies in relation to the objective of this study. A critique of existing literature is then done to give a basis for knowledge gaps.

### **Theoretical Review**

This study was guided by three theories: the general theory of employment, interest, and money, loanable funds theory of interest rates and liquidity preference theory.

#### **The General Theory of Employment, Interest, and Money**

The theory coined and formulated by Keynes presupposes that, after accounting for key economic variables, the short-term interest rate is the driving force of long-term treasury bond yield remains in the long run. In deciding the long-term interest rate on government bonds, Keynes claims that the actions of the central bank play a crucial role (Kregel, 2011). He argues, as stated in Cassel (1903), Marshall (1890), Wicksell and Taussig (1918), and classical economics, against the traditional view of interest rates based on the theory of loanable funds. The capacity of the central bank to control the long-term interest rate is derived from its ability to set the equilibrium rate and anchor the short-term interest rate around equilibrium rates, and to use numerous other monetary policy instruments (Keynes, 1930). Keynes relies on a seminal empirical study of the conduct of interest rates on US government securities by Riefler (1930) (Kregel, 2011; Keynes, 2018).

Conventional view of the theory is that government liabilities and debts have a deciding impact on the returns of government bonds. Many items remain steady, if public debt and/or government deficits (both as a share of nominal GDP) rise (reduce), then government bond yields likewise increase (decline). The view complements the theory of loanable funds. For Keynes, liquidity expectations and the actions of the central bank are primarily responsible for interest rates as seen in an economy's yield curve for government securities and other fixed income instruments (Akram & Das, 2019).

The theory, likewise, states that the macroeconomic effect of minimum wage increases on gross domestic product (GDP) is ambiguous. Minimum wage increases may increase labor costs and output prices, reduce

firms' profits and job training, and cause adverse employment and hours effects, each of which may reduce in GDP (Knote & Zaman, 2014; Huo & Shang, 2015). Cobb and Douglas (1928) corroborate the relationship by indicating that the total production is a derivative of the capital and labour units of a given economy. Thus, the price of labour is considered as a function of general gross domestic product of Kenya.

The theory advocates debt-financed public spending arguing that there is employment generating result of public outlays during time of unemployment. According to Keynes, when the economy is in recession, public debt was be of value in the short term as a good fiscal measure, since there was low investment, high unemployment and poor gross domestic product of Kenya due to aggregate demand at this period (Blinder, 2012; Mwaniki, 2016).

### **Loanable Funds Theory of Interest Rates**

According to the advocates of this hypothesis, the interest rate is dictated mainly by the demand for and the availability of loanable funds from the economy's commercial banks. There is a differentiated pedigree in the loanable funds principle. In classical economics, it is supported, among other economists, by Cassel (1903), Böhm-Bawerk (1959), Hayek (1933 and 1935), Marshall (1890).

This is an old classical hypothesis where the interest rate in an economy is determined by investment (loan demand) and sparing (loan supply). The financing cost (the cost charged by the utilization of cash advanced by another throughout a given timeframe) is directed by the interest for and the accessibility of loanable assets. The market for loanable finances comprises of plans and strategies to do exchanges among borrowers and banks (Tsiang, 1980). The pace of revenue is, along these lines, dictated by balance between the degree of sparing and the degree of venture (Hansen, 1951).

The loanable funds theory as an extrapolation of the classical theory, implies that the total amount of credit available in an economy may surpass private savings because the banking sector is capable of creating credit out of out of nothing. Consequently, the optimum (or market) interest rate is determined not only by the desire to save and spend, but also by generating or reducing fiat money and credit. Unless the bank system increases credit, the market interest rate should be reduced below the natural rate at least temporarily. Wicksell had described the natural rate as that interest rate consistent with a stable level of prices (Robertson, 1934; Patinkin, 1958).

However, Keynes rejects the loanable funds theory of interest rates since he believes it is insufficient to determine interest rates solely on the basis of knowledge of the demand for investment and the supply of savings. He criticizes the loanable funds theory for neglecting the roles of national income, the marginal propensity to consume, and liquidity preference in the determination of interest rates (Bertocco, 2013). Despite the criticism, the theory complements the contribution of the General theory as well as the liquidity preference theory in explaining the influence the price of money on the gross domestic product. Thus, this theory specifically grounds the relationship that exists between credit from commercial banks and their contribution to GDP as a measure of gross domestic product of Kenya.

### **Liquidity Preference Theory**

Liquidity refers to the availability of liquid assets (cash or near cash assets) to finance a given company. The theory of liquidity preference is concerned with the rational behaviour in situations amidst interdependence, that is, the interaction among a group of rational individuals who behave strategically (Ogiriki & Andabai, 2014).

The theory was coined by an economist, John Maynard Keynes in response to the rather primitive-pre-Friedman quantity theory of money, which was simply an assumption-laden identity called the equation of exchange:  $M V = P Y$ . where M is the money supply, V is the Velocity of money, P is the price level and Y is the real GDP.

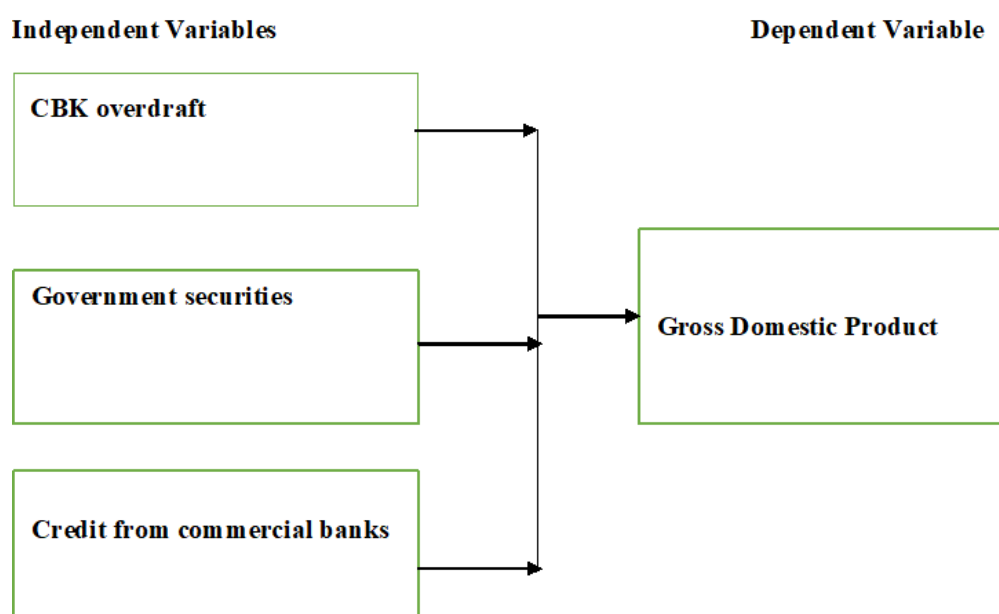
To differentiate his idea, the theorist sought to find out the reasons why people would hold money. Previously, the money demand as an asset was assumed to be dependent on the interest foregone by not holding bonds (Keynes, 1936). As per Keynes, money is the most liquid asset whereas liquidity is also attributed to an asset. In the process he came up with three reasons, that is: transaction motive where he describes economic agents to be in need of money in order to make payments. Since the demand for liquidity amount is determined by the level of income, therefore, as incomes rise, so does the number and value of those payments. That is the demand for carrying out transactions increases due to increased spending. Thus, as a general rule, we may say that the transaction demand for money is income-elastic and may be expressed as  $M_d = f(Y)$ , where  $M_d$  is the transaction demand for money and  $f(Y)$  denotes it to be the function of income. The influence of interest rate is much less or insignificant;

Precautions motive: This happens when people prefer to have liquidity for precautionary purposes/ the unexpected outcomes in future. In that case, the amount of money demanded for this purpose increases as income increases. Hence, the precautionary demand for money according to Keynes is also income-elastic, it is

expressed as  $M_p = f(Y)$ , where  $M_p$  is the precautionary demand for money and  $f(Y)$  denotes it to be the function of income. Since both the transaction and precautionary motive are income-elastic, we merge them together ( $M_d + M_p$ ) and show them as  $M_1 = f(Y)$ ;

This theory has been instrumentally used to show the relationship that exists between the interest rate levels that is the price at which firms are able to borrow from banking institutions. This is because it is able to explain how companies/individuals respond to shifts in the interest rate levels either by holding money for transaction motive, precautions motive or speculative motive. An investor was choose a higher interest rate on long-term securities such as mortgage since interest rates are volatile in the short time. Thus, they was reduce the risk by holding more cash instead, since cash is the most liquid asset. Thus, the theory is instrumental in explaining the role of the interest rate price of money in creating supply and demand for money.

**Conceptual Framework**



**Conceptual Framework**  
Source: Researcher (2020)

**III. METHODOLOGY**

**Research Design**

Research design is the plan and a mechanism used for the collection, measurement and analysis of the data (Schwart & Yanow, 2013). According to Etikan and Bala (2017) a research design is a roadmap of carrying a research study. This study was adopt an explanatory research design. This design seeks to find out what is causing a certain occurrence to happen. It seeks to establish the effect of one variable on the other. The design is suitable for this study as it seeks to establish the causal- effect between the independent variables (domestic borrowing) and dependent variable (GDP).

**Target Population**

A population refers to the total collection of elements about which inferences are made and applies to all possible cases which are of interest for a study (Asiamah, Mensah & Oteng-Abayie, 2017). Target population refers to the population constituting of individuals sharing similar characteristics (Sekaran & Bougie, 2010), and is useful since it forms the basis of a research scope. The population of interest for this study was Kenya. Particularly, the research focused on domestic borrowing and their effect on Kenya’s GDP. Time series data was be collected covering the period 1980 to 2018. Therefore, the number of observations was be 39.

### **Sample Size and Sampling Technique**

A sample is a fraction of the study population and is necessitated when the study population is relatively large (Etikan & Bala, 2017). On the other hand, sampling is the procedure of obtaining the sample from the study population. This study surveyed the whole of Kenya and therefore, there was no need for sampling. This means that the study collected national data on domestic borrowing and GDP for the specified period.

### **Data Analysis and Presentation**

Data analysis is the process of structuring and bringing order and meaning to the bulk of data collected (Connaway & Powell, 2010). The secondary data to be collected was analyzed quantitatively using Statistical Package for Social Sciences (SPSS vs.21). Descriptive statistics including mean, standard deviation, minimum and maximum were used to describe the characteristics of the research variables. Further, inferential statistics including correlation and regression were used to test the relationship between the independent and dependent variable. The findings were presented in form of tables and graphs.

### **Analytical Model**

The following model was estimated to determine the relationship between the independent and dependent variables.

$$Y_t = \beta_0 + \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \epsilon_t$$

#### **Where:**

- Y = Gross Domestic Product
- X<sub>1</sub> = CBK overdraft
- X<sub>2</sub> = Government Securities
- X<sub>3</sub> = Credit from Commercial Banks
- t = denotes time
- ε = Error term and β<sub>0</sub> = constant, β = beta coefficient

### **Diagnostic Tests**

Prior to running the regression analysis, several diagnostic tests were conducted on all the variables data. These tests include; normality, multicollinearity, heteroscedasticity and autocorrelation test. This was done to ensure that the analysis results are accurate and free from bias.

#### **Normality Test**

Normality test improves the regression model by ensuring the data is normally distributed which can be tested by plotting. Normality of data was tested using the Shapiro-Wilk test. The criterion is that the probability value should be greater than 0.05 for the data to be normally distributed (Saunders & Thornhill, 2012).

#### **Multicollinearity Test**

Multicollinearity occurs when there is high correlation between the independent variables, which affects the significance of the individual variables. In this study, it was checked using Variance Inflation Factor (VIF). A VIF value more than 10 implies presence of Multicollinearity problem while a VIF value less than 10 implies no Multicollinearity problem.

#### **Heteroscedasticity Test**

If the error variance is not constant, then there is Heteroscedasticity in the data. Running a regression model without accounting for Heteroscedasticity would lead to biased parameter estimates. To test for Heteroscedasticity, the Breusch-Pagan/Godfrey test (1979) was applied. The null hypothesis indicates that the error variance is homoscedastic, thus the null hypothesis was rejected if the error term is found to be varying.

#### **Autocorrelation Test**

Autocorrelation test was conducted to establish whether or not the residuals are serially correlated, Durbin-Watson test for autocorrelation was used. The Durbin-Watson test reports a test statistic, with a value from 0 to 4, where: 2 denotes no autocorrelation; 0 to 2 < 2 denotes a positive autocorrelation; while >2 denotes a negative autocorrelation. The decision rule is that test statistic values in the range of 1.5 to 2.5 are relatively normal. Values outside this range could be cause for concern (Field, 2009).

## IV. RESULTS AND DISCUSSIONS

## Descriptive Findings

Variable	Observations	Mean	Std Deviation	Minimum	Maximum
GDP growth rate	44	5.1	2.7	-0.4	8.6
CBK Overdraft	44	8.6	3.8	4.3	15.1
Government Securities	44	9.4	0.1	9.2	9.6
Public/Domestic Debt(Billion USD)	44	53.4	8	46.3	74.3
Total Debts (Billion USD)	44	61	7.7	53.4	80.2
Credit from Commercial Banks	44	0.3	16.9	-32.4	23.8
Total Debt	44	1	15.4	-29	22.1

The Table gives descriptive findings including mean, standard deviation, minimum values as well as maximum values. A total of 44 observations were made which entailed quarterly analysis of the variable for 11 years from 2009 to 2020. Mean for total debts was 61 billion USD with Credit from Commercial Banks being 53.4 billion USD. Inflation and Government Securities were 8.6 and 9.4% respectively for the 11 years observed while change in Credit from Commercial Banks and total debt averaged at 0.3% and 1% respectively.

Maximum GDP was found to be 8.6 with minimum of -0.4. Inflation was highest at 15.1% and lowest at 4.3% while Government Securities was ranging between 9.2% and 9.6% respectively. These results show that for the period between 2009 and 2020, Kenya's average uptake of debt had been very high while at the same time the average gross domestic product of Kenya was very minimal. Average percentage of public debt to GDP was as high compared to other borrowings as indicated by the difference between the total debts and Credit from Commercial Banks. Inflation as GDP deflator was also very high during this period as evidenced by high mean value giving an indication that the gross domestic product of Kenya is critical.

## Inferential Analysis

Inferential statistics was used to make inferences from the data to more general conditions. With inferential statistics, we try to reach conclusions that extend beyond our immediate data alone. For instance, we use inferential statistics to try to infer from the sample data what the population might think. Hypothesis testing (using  $P$ -values) and point estimation (using confidence intervals) are two concepts of inferential statistics that help in making inference about population from samples. The reason for calculating an inferential statistic is to get a  $p$ -value ( $p$  = probability). The  $p$  value is the probability that the samples are from the same population with regard to the dependent variable (outcome). (Creswell, 2010)

Hypothesis testing is a method of inferential statistics. There are seven steps in hypothesis testing. *First*, step is where the null hypothesis is stated ( $H_{01}$ ), second step is where the alternate hypothesis is stated ( $H_{a1}$ ), third step is where the level of significant is selected, fourth step is to select statistical test, fifth determine table value, *sixth* determine calculated value, seventh make a comparison and finally make a decision where you reject or fail to reject the null hypothesis. (Kothari, 2012).

The main reason of tests of significance is to calculate the probability that an observed outcome has merely happened by chance. This probability is known as the  $P$ -value. The  $p$  value determines whether or not we reject the null hypothesis. We use it to estimate whether or not we think the null hypothesis is true. The  $p$  value provides an estimate of how often we would get the obtained result by chance, if in fact the null hypothesis were true. If the  $P$ -value is small ( $P < 0.05$ ), then null hypothesis can be rejected and we can assert that findings are 'statistically significant'. (Creswell, 2010).

Rejecting the null hypothesis means that the findings are unlikely to have arisen by chance and rejecting the idea that there is no difference between the two treatments. When  $P < 0.05$ , the degree of difference or association being tested would occur by chance only five times out of a hundred. When  $P < 0.01$ , the difference or association being observed would occur by chance only once in a hundred.

Confidence interval (CI) is defined as 'a range of values for a variable of interest constructed so that this range has a specified probability of including the true value of the variable. The specified probability is called the confidence level, and the end points of the confidence interval are called the 'confidence limits. By convention, the confidence level is usually set at 95%. The 95% CI is defined as "a range of values for a variable of interest constructed so that this range has a 95% probability of including the true value of the variable". In simple words, it means that we can be 95% sure that truth is somewhere between 95% confidence

interval. Because we are only 95% confident, there is a 5% probability that we might be wrong i.e. 5% probability that the true value might lie either below or above the two confidence limits.

Thus, the 95% CI corresponds to hypothesis testing with  $P < 0.05$ . Hypothesis testing produces a decision about any observed difference: either that the difference is ‘statistically significant’ or that it is ‘statistically insignificant,’ whereas confidence interval gives an idea about the range of the observed effect size. Therefore, Inferential statistics help assess strength of the relationship between your independent (causal) variables, and you dependent (effect) variables.

#### 4.3.1 Summary of coefficients

**Table 4.2: Summary of coefficients**

	Unstandardized Coefficients		Standardize Coefficients	t	Sig.
	B	Std.Error	Beta		
(Constant)	84	80		1.05	0.34
CBK Overdraft	-0.5	0.2	-0.75	-2.14	0.09
Government Securities	-7.8	8.4	-0.4	-0.93	0.39
Credit from Commercial Banks	0.9	0.9	5.91	1.01	0.36
Total Debt	-1	1	-6.03	-1.03	0.35

Dependent Variable: Growth Domestic Product

Table 4.2 illustrates the summary of coefficients where standardized values were used. Results indicates that the constant stood at 84.0 with coefficients being -0.75, -0.40, 5.91 and -6.03 for inflation, Government Securities , Credit from Commercial Banks and change in total debt respectively and respective significant level being 0.09, 0.39, 0.36 and 0.35. This implies that regardless of the level of inflation, domestic debt, total debt and Government Securities, gross domestic product of Kenya would still change but to only to 84% of any change. This is because the gross domestic product of Kenya does not only get influenced by public domestic debts, total debts, employment and inflation but also by other factors such as higher initial schooling and life expectancy, lower fertility, lower government consumption, better maintenance of rule of law, and improvements in the terms of trade (Barro, 1996).

Since the large percentage of variations in GDP was explained by total debts, this means that total debts has strong contribution to gross domestic product of Kenya (GDP) of Kenyan economy. Moreover, the summary of the results showed that the impact of inflation on gross domestic product of Kenya is statistically significant at 5 percent level for its absolute t-values was greater than two (Gujarati, 2014). The regressor inflation, unemployment and total debts has the sign that accord with prior expectations, the said variables have a negative impact on gross domestic product of Kenya. The opposite was found true for Credit from Commercial Banks.

The results therefore reveals that there was negative relationship between inflation, unemployment and total debts and the gross domestic product of Kenya in Kenyan economy for the 44 quarterly periods between 2009 and 2020. The results implied that as the general level of prices increases, the GDP decreases. This means that an increase in the general price level (CBK Overdraft ) by 1% results in a decrease of GDP by 0.75%. This could imply that an increase in the general price level was harmful to gross domestic product of Kenya. In addition, the study decided to regress inflation against GDP in order to know the nature of relationship when Inflation was dependent variable and GDP was independent variable.

On the other hand the When governments borrow, they was issue Treasury bonds with varying maturities. This debt is owed to whoever has purchased the Treasury bonds; for many countries, a substantial amount is purchased by domestic citizens, meaning that the country borrows from itself and thus must pay back its own citizens in the future. Excessive borrowing by a government can cause economic difficulties. Sometimes private lenders worry that the government may become insolvent (i.e., unable to repay its debts) in the future. In this case, creditors may demand a higher interest rate to compensate for the higher perceived risk. To prevent that risk, governments sometimes revert to the printing of money to reduce borrowing needs. However, excessive money expansion is invariably inflationary and can cause long-term damage to the economy.



**4.3.2 Regression Model**

The researcher used the following model to analyze the effects of domestic borrowing on gross domestic product of Kenya.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + E$$

Where:

Y = Gross domestic product of Kenya

X1 = CBK Overdraft, X2= Credit from Commercial Banks and X3= Government Securities

E= Error or random term

$\beta_0$  ,  $\beta_i$  = Constant Slope co-efficient of X1 , X2 and X3

Given the results in Table 4.2, the model can be constituted as follows:

$$Y = 84 - 6.0X_1 + 5.9X_2 - 0.4X_3 + E$$

In summary, a change in 1(one) unit of total debts would lead to a *negative* change in 6.0 units of domestic product while a change in 1 unit of Credit from Commercial Banks would lead to a *positive* change in 5.9 units of domestic product. At the same time, a change in 1 unit of unemployment would lead to a *negative* change in 0.4 units of domestic product.

As Kannan and Singh (2009) postulates, fiscal deficits and debt have an adverse impact on all the macroeconomic variables under consideration in the medium to long run. In nutshell, a vast knowledge on the behavior of domestic debt and inflation is not available as there are few studies on the topic. Nonetheless, basic economic logic should give us the idea that internal borrowing is likely to increase the price level.

**Correlation Analysis**

The results of correlation analysis are as shown in Table 4.3. The findings indicated that there was strong positive and significant relationship between CBK Overdraft and domestic borrowing on gross domestic product of Kenya. With a Pearson correlation coefficient  $r=0.684$ ,  $p$ -value  $<0.05$  which was significant at 0.05 level of significance. This implies that improved CBK Overdraft results in increase of gross domestic product of Kenya. There was strong positive and significant relationship between Government Securities and gross domestic product of Kenya. With a Pearson correlation coefficient  $r=0.485$ ,  $p$ -value  $<0.01$  which was significant at 0.01 level of significance. This implies that increased Government Securities results in increase of gross domestic product of Kenya.

There was strong positive and significant relationship between Credit from Commercial Banks and gross domestic product of Kenya. With a Pearson correlation coefficient  $r=0.891$ ,  $p$ -value  $<0.05$  which was significant at 0.05 level of significance. This indicates that improved Credit from Commercial Banks results in improved gross domestic product of Kenya.

**Table 4.3: Correlation Matrix**

		GDP	CBK Overdraft	Government Securities	Credit from Commercial Banks
GDP	Pearson Correlation	1			
	Sig. (2-tailed)	0			
CBK Overdraft	Pearson Correlation	<b>.684*</b>	1		
	Sig. (2-tailed)	0.036			
Government Securities	Pearson Correlation	<b>.485**</b>	0.023	1	
	Sig. (2-tailed)	0	0.805		
Credit from Commercial Banks	Pearson Correlation	<b>.891**</b>	.516**	0.143	1
	Sig. (2-tailed)	0	0	0.123	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

**Table 4.4: Coefficient of Determination**

R	R-Square	Adjusted Square	R	Std. Error of the Estimate	R Square Change	F	df1	df2	Sig. F
0.7	0.49	0.09	2.56		0.49	1.22	4	5	0.41

Predictors: (Constant), CBK Overdraft, Government Securities, Credit from Commercial Banks

Dependent Variable: GDP growth rate

As indicated in Table 4.4, 49% of any change in gross domestic product in Kenya is explained by Credit from Commercial Banks, Government Securities as well as inflation in cluster. The other 51% is explained by variables not considered in this study.

#### ANOVA

**Table 4.5: Analysis of Variance**

	Sum of Squares	df	Mean sum of Squares	F	Sig.
Regression	31.9	4	8	1.2	0.04
Residual	32.7	5	6.5		
Total	64.6	9			

Predictors: (Constant), CBK Overdraft, Government Securities, Credit from Commercial Banks

Dependent Variable: GDP growth rate

According to the ANOVAs results, the probability value for the regression model was 0.04 was obtained. Since this is less than  $\alpha=0.05$ , it implies that the regression model was significant in predicting the relationship between GDP growth rate and the predictor variables (CBK Overdraft, Government Securities and Credit from Commercial Banks).

#### Summary of Findings

This study was an effort to determine the effect of public debt on gross domestic product of Kenya in Kenya. Specifically, the study tried to answer the questions whether public debt and debt servicing payment have any significance effect on gross domestic product of Kenya in Kenya. In doing this the study used a linear model to analyze Kenyan data from 2009 to 2021 by expressing the GDP growth rate as a function of, Credit from Commercial Banks, Government Securities and CBK Overdraft. The result indicates that while Government Securities has positive effects on the GDP. Other factors found to affect growth negatively include, Credit from Commercial Banks and CBK Overdraft.

### V. CONCLUSIONS AND RECOMMENDATIONS

#### Summary

This study was informed by the consistent rising of the public debt levels while the gross domestic product of Kenya levels have remained lower than what is stipulated to make Kenya a newly industrializing middle-income economy by the year 2030. This is despite various measures being undertaken to regulate the debt levels and promote private investments and gross domestic product of Kenya. Various literatures reviewed also presented conflicting results on the role that debt plays in determining the levels of private investments and gross domestic product of Kenya. This study was therefore carried out to find out the effect of public debt on gross domestic product of Kenya in Kenya.

The analysis was guided by the two contrasting context views on public debt; the Traditional view and the Ricardian view, Keynesian model and the Debt overhang hypothesis. Changes in inflation, Government Securities, Credit from Commercial Banks and change in total debt were used as the predictor variables while GDP was the dependent variable. Data for all the variables were collected for 11 years from 2009 to 2021. The data was obtained from the Kenya economic surveys and the World Bank publications on quarterly basis. Consequently, a total of 44 observations were collected.

From the findings, the Mean for total debts was 61 billion USD with Credit from Commercial Banks being 53.4 billion USD. Inflation and Government Securities s were 8.6 and 9.4% respectively for the 11 years

observed while change in Credit from Commercial Banks and total debt averaged at 0.3% and 1% respectively. Maximum GDP was found to be 8.6 with minimum of -0.4. Inflation was highest at 15.1% and lowest at 4.3% while Government Securities was ranging between 9.2% and 9.6% respectively.

Regression results indicated that the constant stood at 84.0 with coefficients being -0.75, - 0.40, 5.91 and -6.03 for inflation, Government Securities, Credit from Commercial Banks and change in total debt respectively and respective significant level being 0.09, 0.39, 0.36 and 0.35. therefore, the findings revealed that a change in 1(one) unit of total debts would lead to a **negative** change in 6.0 units of domestic product while a change in 1 unit of Credit from Commercial Banks would lead to a **positive** change in 5.9 units of domestic product. At the same time, a change in 1 unit of unemployment would lead to a **negative** change in 0.4 units of domestic product. Finally, in 1 unit of inflation would lead to a **negative** change in 0.75 units of domestic product.

From the correlation analysis, it was noted that the correlation between GDP and all the four explanatory variables under consideration is negative while total debts has positive correlation between inflation and Credit from Commercial Banks. From the ANOVAs results, the probability value for the regression model was 0.04 was obtained indicating the significance of the model in explaining the relationship between the GDP and the predictor variables considered.

### **Conclusion**

These results showed that for the period between 2003 and 2013, Kenya's average uptake of debt had been very high while at the same time the average gross domestic product of Kenya was very minimal. The average percentage of public debt to GDP was as high compared to other borrowings. Inflation as GDP deflator was also very high during this period. Regardless of the level of inflation, domestic debt, total debt and Government Securities, gross domestic product of Kenya would still change but to only to 84% of any change. Since the large percentage of variations in GDP was explained by total debts, it is inferred that total debts has strong contribution to gross domestic product of Kenya (GDP) of Kenyan economy.

The results also revealed that there was negative relationship between inflation, unemployment and total debts and the gross domestic product of Kenya in Kenyan economy for the 44 quarterly periods between 2009 and 2021. From the findings, it was concluded that as the general level of prices increases, the GDP decreases. Inference was made that change in 1(one) unit of total debts leads to a six times negative change in units of domestic product while a unit change in Credit from Commercial Banks leads to a positive change in 5.9 units of domestic product. At the same time, a change in a unit of unemployment results to a negative change in domestic product by 0.4 units. Finally, a unit change in inflation leads to a negative change in GDP by 0.75 units of GDP.

It was also inferred that there is negative correlation between debt and growth but show that debt does not have a causal effect on gross domestic product of Kenya. Additionally, it can be concluded that total debts, Credit from Commercial Banks, Government Securities as well as inflation explain nearly half of the change in gross domestic product in Kenya.

### **Recommendations Policy and Implications**

This study found out that an increase in the general price level (inflation) has been detrimental to sustainable gross domestic product of Kenya in Kenya. These results have important policy implications for both domestic policy makers and development partners, implying that controlling inflation is a necessary condition for promoting gross domestic product of Kenya for the country. Thus, policy makers should focus on maintaining inflation at a low rate (single digit) for a healthy gross domestic product of Kenya.

The study also noted that an increase in the total debt has a negative effect on the GDP in Kenya. However, domestic debts change has a positive effect on the GDP. The important policy implication in this is that the government should make sure that the total debt for the country should be kept at the lowest level possible. If the government has to borrow, it should consider domestic borrowing for the benefit of the economy of the nation.

The Kenya Revenue Authority which is mandated to collect revenue should also make policies to ensure optimal revenue collection. This was contribute positively to the gross domestic product of Kenya of the country since it was help to reduce the amount of debt that may be needed to finance the national budget.

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