Iosr Journal Of Economics And Finance (Iosr-Jef)
E-Issn: 2321-5933,P-Issn: 2321-5925.Volume 15, Issue 2 Ser. 2 (Mar. – Apr. 2024),Pp 55-77
www.Iosrjournals.Org

Effect Of Public Debt On Private Investment And Economic Growth

Winfred Gathu[1], Dr. James Maingi[2]
1 (Kenyatta University, Kenya)
2(Kenyatta University, Kenya)

Abstract
The Kenya Vision 2030 set ambitious goals for the nation's political, social and economic development. Specifically, the economic component aspires to attain a 10% annual economic growth rate. Achieving this goal heavily hinges on investments, and Kenya currently leans on public debt to fund investments and promote economic growth. Nevertheless, an excessive dependence on public debt carries potential drawbacks, including the risk of crowding out private investments and obstructing long-term economic growth. This research sought to examine the impact of public debt on Kenya's private investments and economic growth. Time series data spanning from 2000 to 2021 were utilized to analyse the causal relationships among public debt, economic growth, and private investments. A Vector Error Correction Model (VECM) was employed to estimate the models, providing insights into the dynamics between public debt, economic growth, and private investments in Kenya. The findings revealed a significant negative effect of domestic debt on private investment and foreign debt on private investment. The analysis also considered other variables such as income tax yield, and total money supply which showed significant associations with private investment. Additionally, the findings revealed a significant negative effect of domestic and foreign debts on economic growth. Other variables such as capital and labour also demonstrated significant associations with economic growth. The study concluded that continuous monitoring and evaluation of debt management policies are crucial to ensure the long-term fiscal sustainability of the nation and foster an enabling environment for private investment. The study recommends that policymakers implement strategies to enhance domestic capital formation, attract foreign direct investment, and improve infrastructure and human capital. These measures can help reduce the reliance on public debt as a financing mechanism and promote sustainable economic growth in Kenya.

Date of Submission: 04-04-2024 Date of acceptance: 14-04-2024

I. Background

Introduction

Public debt consists of two components: domestic debt and foreign debt. Domestic encompasses the amount of government debt owed to creditors within the country, while foreign debt represents the sum of government debt owed to creditors outside the country (Orszag et al., 2004). Prudent borrowing levels can boost economic growth through increased productivity and capital accumulation. Borrowing from the outside world for productive investment also delivers capital inflows that have a beneficial impact on domestic savings and investment demand, thereby supporting macroeconomic stability (Burnside, 2000). However, high debt levels may negatively impact the rate of economic growth and investment.

Accumulated public debt can discourage investors, leading to low investment in the economy (Orszag et al., 2004; Ball & Mankiw, 1995). Empirical findings also support that high public debt crowds out private investment, leading to long-term economic growth reduction (Hoffman & Reisen, 1991). This is because high public debt results in a rise in the government's interest bills and interest charges, as the government increases its public expenditure. Similarly, the government resorts to increasing taxes to pay off their debt, which reduces public savings. Consequently, an increase in interest rates and reduced public savings crowd out available credit for private investments, resulting in lower economic growth (Yusuf & Mohd, 2021).

Governments often accumulate debt due to budget deficits or increased spending. When government spending surpasses its revenue, a budget shortfall occurs, which can be financed through borrowing, either domestically or internationally, or through grants. If the government borrows to finance the shortfall, it accumulates debt that it is obligated to repay. To avoid the problems associated with high debt, a nation's economic growth rate should match its annual public debt growth.

Economic Growth in Kenya

The goal of Kenya's Vision 2030 is to achieve a consistent 10% annual economic growth rate. (Republic of Kenya, 2007). Kenya's economy has experienced low and unpredictable growth, with the year 2010 seeing the most growth (8.1%) and the year 2020 seeing the lowest growth (-0.3%). The economic growth trend between 2000 and 2021 is depicted in the graph below.

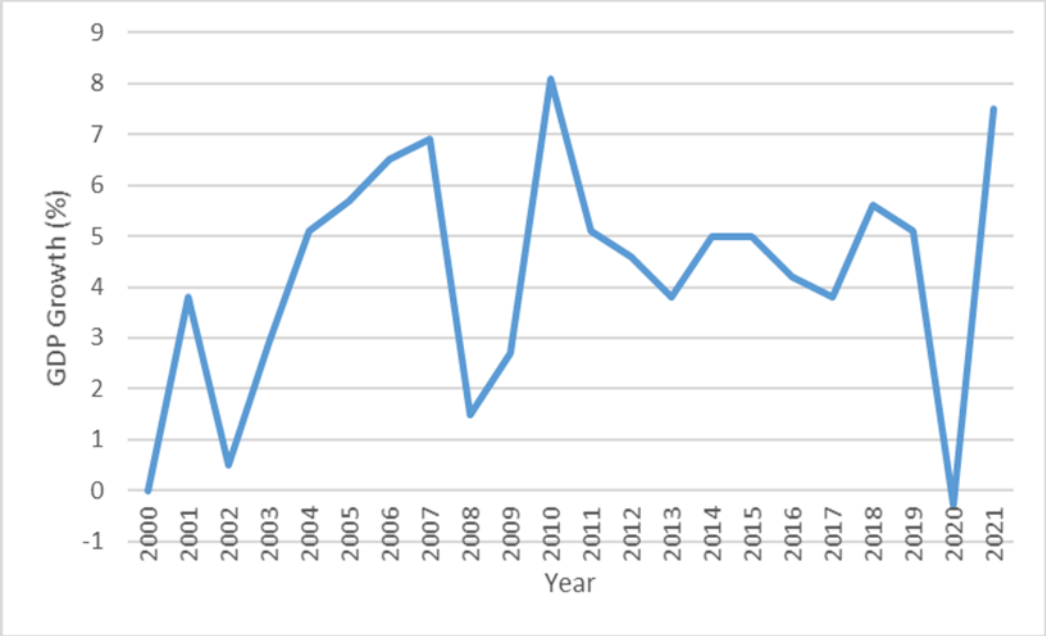

Figure 1.1: GDP Growth in Kenya from 2000 to 2021
Source: Central Bank of Kenya (2022)

Figure 1.1 shows that economic growth was on the rise between 2003 and 2007. The National Debt Management Department was formed at the treasury in 2003, and the Kenya Revenue Authority underwent reforms. These changes resulted in an increase in government revenue by ensuring that at least 30% of tax revenue was invested in economic development projects. However, in 2007, economic growth reduced drastically to 1.5% in 2008 because of the post-election violence. From 2009 to 2013, the economic growth rate gradually began rising with ups and downs. The global financial crisis and drought in 2009 led to a decrease in demand for some of Kenya's exports and high input costs, resulting in a GDP rise of only 1.2% between 2008 and 2009. Since then, the economic growth rate has been low and erratic.

As Kenya aims to achieve middle-income status by 2030, it requires policies that stimulate economic growth. Government spending, particularly involving public debt, is one key fiscal policy component that could be utilized (World Bank, 2015). Public debt, as a significant component of fiscal policy, plays a role in influencing private investments in a country.

An observed consequence of a substantial public debt level is a decline in investor confidence or trust, resulting in low investment in the economy (Orszag et al., 2004). Furthermore, the Kenya Vision 2030, national development strategies, and the Economic Recovery Strategy (ERS) for employment creation have all identified private investments as the foundation of Kenya's revived economic aspirations.

Economic growth in Kenya has therefore been characterized by fluctuations and has fallen short of the ambitious targets set by the Kenyan Vision 2030. While there were periods of relatively high growth between 2003 and 2007, various factors such as post-election violence, global financial crises, and drought have contributed to a slowdown in growth. The country's economy has struggled to maintain a steady and sustainable growth trajectory. One of the challenges faced by Kenya is its increasing public debt, which has the potential to undermine economic growth. High levels of public debt can erode investor confidence and deter private investments, hindering economic development. To attain middle-income status by 2030, Kenya must tackle the public debt issue and adopt sound fiscal policies that foster sustainable economic growth and responsible debt management. Without effective debt control measures, Kenya might encounter challenges in attracting investments and realizing its economic ambitions.

Public Debt

Prudent borrowing can foster economic growth through capital accumulation and increased productivity. Public debt encompasses the collective obligations of a nation, encompassing debts incurred by local, state, and federal governments (IMF, 2016). It functions as an indicator of the extent to which the country's expenditures are covered by borrowing instead of taxation. The government has the option to secure loans from individuals and domestic financial institutions. Additionally, it can also obtain external loans from foreign countries.

Domestic borrowing is commonly termed "internal debt," while foreign borrowing is referred to as "external debt." Public debt consists of both internal and external borrowing, primarily employed to cover budget deficits. Internal debt is in the domestic currency, while external debt is in a foreign currency. The borrowing nation is obligated to repay this debt, including interest, by a specified maturity date. Nevertheless, scholars like Klein (1994) and Ariyo (1997) have highlighted the significance of external assets in supporting capital formation within the national economy, playing a pivotal role in the escalating debt levels.

Government debt is another method used to finance government operations. Such debt can be accrued through a range of mechanisms, such as the issuance of Treasury bills and bonds, utilizing overdraft facilities from the Central Bank, and securing loans from commercial banks.

However, government debt is not the only means of meeting financial obligations; governments can also monetize their debt by printing money, which eliminates the need to pay interest (Martin, 2009). This practice is not encouraged or permitted in most countries as it can lead to hyperinflation and the crowding out of the private sector since the government would control all available resources.

Though debt can help a country’s economic growth increase, it has to be well-planned. This is because too much borrowing from domestic financial institutions can lead to a reduction of funds available for the private sector. Moreover, domestic savings reduce, leading to an escalation of interest rates, which, in turn, discourages private sectors from borrowing funds for investment, resulting in low private investments in the country. The debt burden increases with increasing interest payments and current account deficits.

Notable attempts to reduce debt in Kenya include the Medium Term Debt Management Strategy (MTDS), which aims to maintain sustainable public debt (Kimolo & Onono, 2017). This would ensure that the country can pay its debt without renegotiating or defaulting, and without having to make drastic policy changes from an economic and political standpoint. In the budget statement for the 2019-20 financial year, the Treasury revealed the government’s intention to explore new ways to diversify means of debt repayment (KNBS, 2019). Debt is being driven by expansionary budgets as the government spends on infrastructure projects, such as railways, to spur economic growth, as well as a shortfall in tax revenues, which has resulted in a widening deficit. Figure 1.2 shows the public debt trends in Kenya.

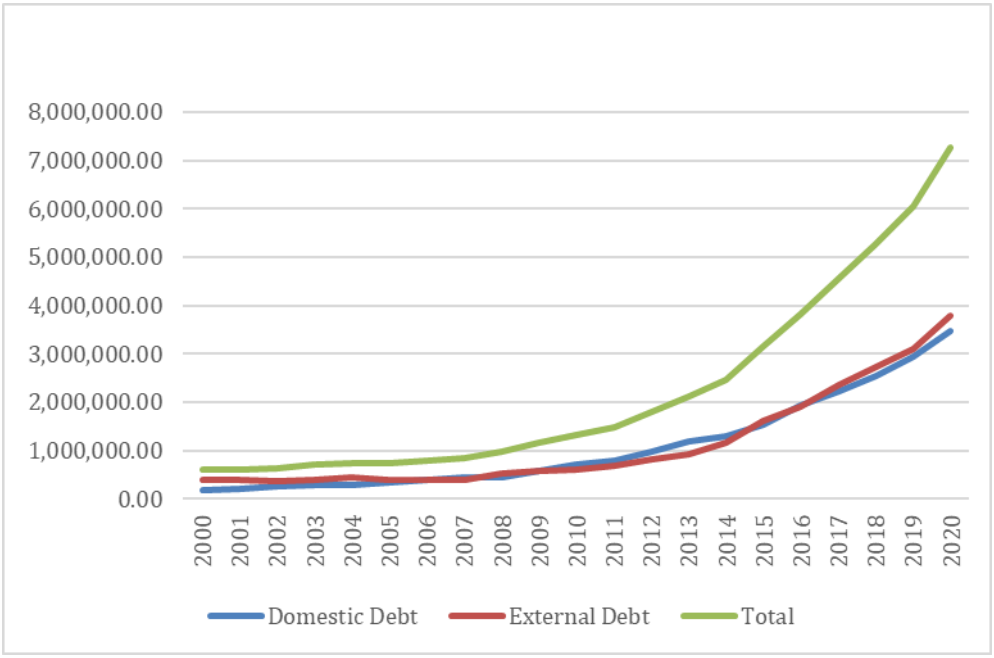

Figure 1.2: Public Debt in Kenya from 2000 to 2020
Source: Central Bank of Kenya (2021)

From the Figure 1.2 above, it is evident that the public debt in Kenya has been increasing since 2000. The external debt has been higher than the domestic debt from 2014 to 2020, except for 2016. In general, both

domestic and external debts have increased. This accumulation of debt poses significant challenges for the economy. One problem associated with high public debt is the potential decline in economic growth. As debt servicing obligations increase, the budget for other development activities becomes constrained, leading to a slowdown in investment and infrastructure projects. Additionally, high debt levels can increase interest rates, which discourage private sector borrowing and investment. The risk of default on debt obligations also becomes a concern, particularly when relying on significant borrowing from bilateral partners and issuing Eurobonds. This highlights the importance of prudent debt management strategies and the need to diversify means of debt repayment to ensure sustainable public debt and mitigate the adverse effects on the economy (Isibor et al., 2018).

Private Investments

Investment is a vital component of economic growth, and the Kenyan government has implemented several strategies to encourage investment since the introduction of structural adjustment programs in 1986. These strategies include simplifying the investment code, enhancing the overall business climate (including rules, processes, and infrastructure), and strengthening the Export Processing Zone (EPZ), the Export Promotion Council (EPC), and the Investment Promotion Centre (IPC) to better coordinate and monitor both domestic and foreign investment in the nation (National Development Plan, 1997-2001).

Private capital inflows to Kenya have experienced significant growth since the 1980s, soaring from $365 million in 1980 to $987 million by 1991. This growth was linked to heightened credit availability in developed nations following the global economic downturn and oil price shocks, alongside favourable interest rates. Privatizing the manufacturing and banking sectors and allowing the movement of capital played a significant role in promoting this trend. (Mbugua, 2011). However, during the early 1990s, inflation rates began to rise, leading developed countries to formulate policies and strategies aimed at curbing inflation.

Private investments in Kenya have been below 25% since independence, which has been of great concern to policymakers since private investments have a key role in economic growth and development (Mbaye, 2014). The Kenyan government has adopted many policies to rejuvenate private investments, but this has not been successful. One of the measures employed involved raising interest rates, thereby rendering credit more costly, particularly for the private sector. Kenya's external private debt exhibited a gradual decline over time, reaching nil in 2005 ad remaining at that level until 2012. Starting in 2002, there was a notable focus on infrastructure development, with the government making substantial investments in this sector. This paradigm shift crowded out private sector investments (Njuru et al., 2013). Figure 1.3 illustrates the fluctuations in private investment throughout the years.

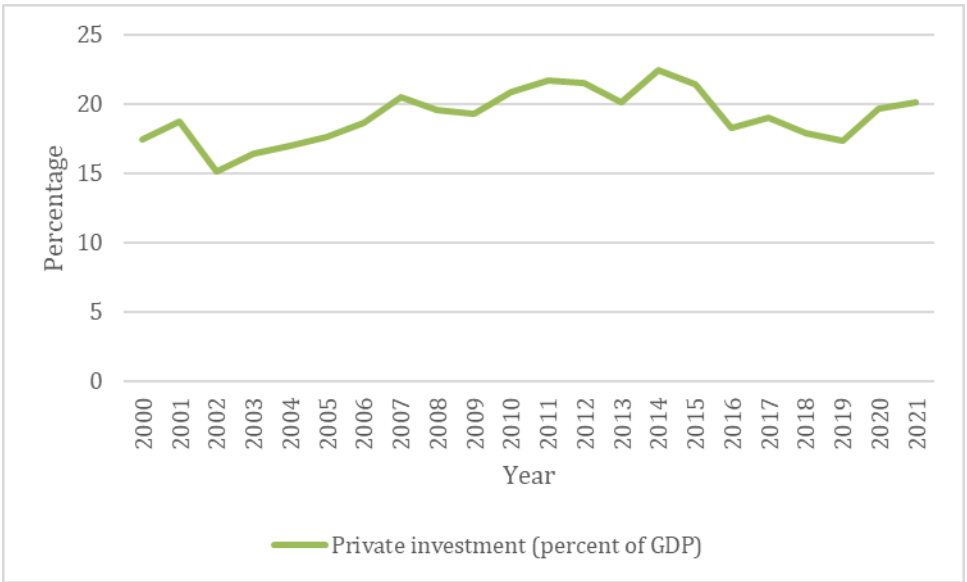

Figure 1.3: Private Investment in Kenya
Source: World Bank (2021)

From Figure 1.3, it can be observed that private investment in Kenya has been less than anticipated, with ratios of 25% to private investment as a percentage of GDP being expected (Njuru et al., 2014). Private sector investment has been less than twenty-five percent of the GDP from 2000 to 2021. The private sector showed an upward trend from 2003 to 2007, followed by a decline. It improved again from 2012 to 2014 but declined in 2014 before increasing in 2015. However, it has been decreasing since 2016 up to 2019.

The sluggish growth of private investment in Kenya has raised significant concerns. The investment levels of below 25% since independence have had an adverse impact on economic growth (Gikombo & Mbugua, 2018). This is because the tax collected from the sector will be low, and thus the revenue expected to boost economic activities will also be low (Gikombo & Mbugua, 2018). Over this period, there have been efforts by the government to improve the private sector. These attempts include liberalizing foreign trade and payments, reducing price distortions, and privatizing the public sector. However, despite these efforts, private investment has not been forthcoming. The overall trend in private investment in Kenya can be linked to the fiscal challenges associated with debt issues. (Bonizzi, Laskaridis & Griffiths, 2020). For scholars and policymakers, this decline in private investment is a major concern. Therefore, attention must be paid to how Kenya's state debt, private investment, and economic growth are related throughout a specific time period. Figure 1.4 below shows how these three variables have varied since 2000.

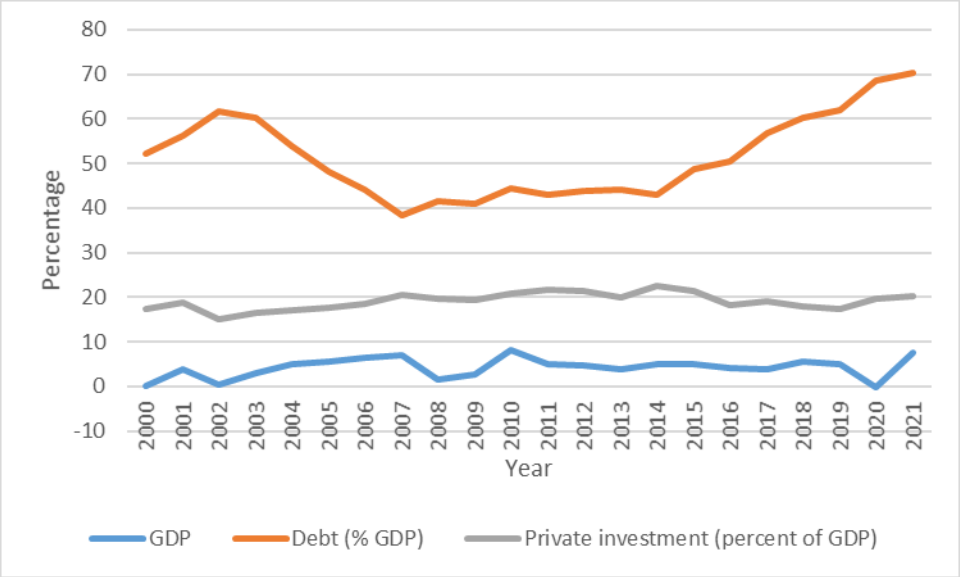

Figure 1.4: Private Investment, Debt and GDP in Kenya
Source: World Bank (2021), Central Bank of Kenya (2021)

Statement of the Problem

Kenya's pursuit of the goals outlined in the Kenya Vision 2030, particularly the objectives of increasing economic growth and private investment levels, faces challenges related to government borrowing and investment. Revenue collection through taxation falls short of financing the necessary investments, resulting in a reliance on both internal and external borrowing to stimulate economic growth (Monamodi, 2021). However, too much borrowing can lead to accumulation of debt, diverting monetary resources away from infrastructure and other economic projects, thereby hindering economic performance (Smith, 1985). This situation poses a problem for private investment as well since securing financing for their operations becomes increasingly challenging.

Private investment plays a crucial role in both emerging and developed economies, driving employment levels, technological advancements, and infrastructure development. Private sector investment is a fundamental component of achieving the goals set forth in Vision 2030 and the country's aspiration to become a middle-income nation. Nevertheless, private investment in Kenya faces numerous obstacles. Since the 1970s, domestic investment as a percentage of GDP has consistently remained below 25%. To bridge the gap between receipts and expenditure, the government has resorted to borrowing. However, excessive borrowing leads to a high public debt burden, which impedes private investment and slows down economic growth. As per World Bank (2022), Kenya's public debt stands at over Kshs. 8 trillion, accounting for over 60% of GDP. The rising public debt levels have raised concerns regarding their sustainability, justifying the researcher's aim to examine the effect of public debt on private investment and economic growth in Kenya.

Existing studies have contributed to the continuing discussions on the impact of public debt on private investments and economic growth. For instance, studies conducted in Nigeria (Bello, 2013) concluded that public debt crowded out private investment. Similarly, Kiptui (2005) conducted a study in Kenya using Ordinary Least Squares (OLS) regression and discovered a significant negative 'effect of debt financing on private investment. But, the use of OLS on time series data may produce spurious results. Oyieke (2011) employed OLS and discovered that debt servicing had a negligible effect on private investment in Kenya. Otieno (2015) also used OLS and demonstrated a crowding-out effect on private investment due to debt servicing. Many previous studies

have primarily concentrated on external debt and have not extensively delved into the influence of internal debt on private investment and long-term economic growth. Therefore, this research seeks to explore the interplay between public debt, private investment, and economic growth, with a particular focus on assessing the effect of internal debt on private investment and economic growth.

Critically demonstrating the true situation of the growing debt involves presenting a clear depiction of the debt growth from 2000 to 2021. The research focused on this period to examine the trajectory of Kenya's debt accumulation and highlight its implications for the economy. The problem of economic growth is evident in Kenya's struggle to achieve its envisioned goals of sustained and significant growth. The low private investment levels and the burden of growing public debt hinder the country's economic progress. This is reflected in the stagnant domestic investment levels, which have consistently remained below 25% of GDP, as well as the mounting public debt, which surpasses 60% of GDP. These factors pose a substantial challenge to economic growth and hinder the realization of Kenya's developmental aspirations.

General Objective of the Study

The general objective was to assess the effect of public debt on private investment and economic growth in Kenya.

Specific Objectives

i) To analyse the effect of public debt (domestic debt and foreign debt) on private investments in Kenya.
ii) To determine the effect of public debt on economic growth in Kenya.

Research Questions

i) What is the effect of public debt (domestic debt and foreign debt) on private investments in Kenya?
ii)What is the effect of public debt on economic growth in Kenya?

Significance of the Study

This research is significant to the government and its strategy making organs, private investors, scholars, academics and researchers. To the government and its policy making organs, the study findings are valuable in informing future policy decisions relating to private investments, economic growth and public debt. This research also supports the government plans to adjust the fiscal policies in a way to favour the private investments growth. This study is crucial because it substantiates on the impact of fiscal policy on growth of private sector which would help the government when they are designing on the effective fiscal policies so as achieve maximum growth of private sector in Kenya. This is because private sector contributes significantly to the GDP of Kenya, and there could be no growth of a country without the private sector.

The study findings are also be useful for private investors, as it would help them to understand the investment environment in Kenya and how fiscal policy decisions made by the government in relation to public debt can affect the investment climate. This would enable them to develop strategies to moderate the adverse effects of public debt.

Moreover, the study makes a significant contribution to new knowledge and might encourage researchers to assess the effectiveness of various government policies and recommend the best fiscal policies to adopt to achieve the desired economic goals.

Scope of the Study

The objective of this study was to investigate the effect of public debt on private investment and economic growth in Kenya. The research examined the impact of internal and external debt from 2000 to 2021. This timeframe was marked by escalating debt concerns resulting from sluggish export growth, overvaluation of exchange rates, and negative interest rates. Kenya was selected as the focal region for this study because it was the nation with the second-highest level of debt in Africa, with public debt amounting to over 60% of its GDP, following only Burundi, which had a debt-to-GDP ratio exceeding 70%.

II. Literature Review

Introduction

The literature review chapter offers a broad analysis of both empirical and theoretical literature relevant to the study, giving an overview of prior research conducted in the field. It explores various theories and documents research that explores the relationship between public debt, private investment, and economic growth. To establish a solid theoretical foundation for the study, pertinent economic theories are scrutinized. The chapter concludes with a summary of the reviewed literature, pinpointing any areas where gaps in research exist.

Theoretical Literature

There are several theories that can be used to connect public debt, private investment and economic growth. Despite the many theories on this subject, this research was based on four focal theories, given their outlying consequence to the study. They include the crowding out theory, the theory of real business cycle, the accelerator theory of investment and Harrod-Domar Growth model. These are discussed in the succeeding subunits.

Crowding Out Theory

Spencer and Yohe (1970) developed the crowding out theory, which suggests that when the government increases its involvement in the market, it can have a substantial impact on the market either on the demand or supply side. The crowding out effect is mostly discussed when the government demands more loanable funds, leading to a decrease in available funds to the private sector and an increase in interest rates. One common type of crowding out effect that is frequently discussed is when expansive fiscal policy results in reduced private sector investment spending (Blejer, 1984)

When the government uses a significant portion of its revenue to service external and internal public debt, it reduces the resources available to carry out other responsibilities, ultimately resulting in reduced economic growth. As a result, the government may resort to borrowing, which increases interest rates and further reduces the financial resources available to private investors, leading to decreased private sector investment.

Crowding out is founded on the assumption that when government borrowing increases, the financial sector reacts by increasing their lending to government due to the government's higher credit rating which reduces available funds for the private sector. Moreover, reduced supply of funds increases interest rates to restore equilibrium, which then leads to reduced borrowing by households and businesses, thus affecting the levels of investments that they make. Hudson (2011) further observes that the degree to which crowding out is contingent on the economic circumstances. In scenarios where the economy is at full employment, rising government deficits create intensified competition between the private sector and the government for limited financial resources. This can lead to reduced consumption and investment, due to higher interest rates. This theory was applied in this research to explain the public debt variable and how it could lead to the reduction of money supply, affecting private investments and economic growth.

Real Business Cycle Theory

The real business cycle theory developed by Long and Plosser (1983) explains the changes in investments in an economy. According to the theory, when the government increases its expenditure, levels of private investments also increase to cater for the increased consumption by the government. This is true regardless of whether the consumption is recurrent or development. This is because in these two types of spending, the government injects resources into the economy that stimulate returns, thus promoting investments (Pereira & Andraz, 2005).

The real business cycle theory contradicts the Investment-Savings (IS) and Liquidity Preference-Money Supply (LM) Model, which anticipates a decline in investment in response to increasing government expenditure shocks. The IS-LM model depicts that an upsurge in government spending through public debts leads to an increase in interest rates, which reduces investment if the increase in government spending is not accompanied by a corresponding boost in the money supply (Rebelo, 2005).

The real business cycle theory, takes consideration of this cycle. The theory suggests that when increased government spending results in a significant budget deficit covered mainly through foreign borrowing, it affects the debt levels and increases the debt liability. Similarly, the theory proposes that using domestic borrowing to finance government expenditure may adversely impact private investment by crowding out private investors and reducing savings (Kormendi, 1983). This happens when private investors are pushed out of financial markets by financial institutions since they prefer lending to the government instead. If there is adequate liquidity, financing government spending through public borrowing may not negatively affect private investment. Conversely, if expenditure is funded through taxes, the rise in taxation reduces after-tax returns for private investors, thus harming private investment (Pereira & Andraz, 2005). The real business cycle theory was used to explain the cycle through which government spending through borrowing could impact economic growth in the short and long run. This can hence affect private investments depending on the money supply in the economy.

The Harrod–Domar Growth Model

By the end of the 1930s and 1940s, two Keynesian economists, Sir Roy Harrod in Britain and Evsey D. Domar in North America, independently developed an analysis of economic growth that is known as the Harrod-Domar model. This model developed by Domar (1946) and Harrod (1939) established a logical reference point that outlined the situation evidenced by the economic situation of the time, which was reflected in the economic disasters caused by the great depression of the late twenties. The model analyses the reasons and factors that

initiate the speed of growth, namely labour growth rate, productivity of labour, capital growth or rate of investment and saving, and the productivity of capital. It proposes improvements for the growth of an economy through full employment, sustained balance and equilibrium.

The long-term analysis of Harrod (1939)-Domar (1946) is a dynamic extension of the simplest real (short-term) Keynesian model. Harrod and Domar developed their models separately, exploring the conditions of balanced growth (where all variables, capital, labour, and GDP, grow at the same rate) in an economy, analyzing the requirements to maintain full employment of productive factors over time. However, since their theories and results are basically the same, these two models are usually presented as one single theory known as Harrod-Domar growth model.

Initially, Harrod (1939) discussed the concept of a guaranteed growth rate. According to Harrod, the guaranteed growth rate refers to the investment rate that keeps the growth rate of demand (true product) equal to the supply growth rate (potential output). It is the rate at which entrepreneurs will be satisfied with their investment decisions, and at that rate, entrepreneurs would be willing to promote an investment that allows them to continue sustaining this growth. Moreover, demand is essential for entrepreneurs to sell their production and maintain the same growth rate. By maintaining a guaranteed growth rate, full employment of capital is ensured, but the full utilization of labour is not guaranteed.

Taking into account the technical requirements, a production trajectory that satisfies these requirements is a trajectory to full employment, given by:

$Y(t) = \mu L(t) = (\mu L_0)e^{nt} = Y_0^{PE}e^{nt}$

Where $Y_0^{PE} = \mu L_0$ is the initial production which, when carried out, uses the entire labour force L_0 at the initial instant t_0. However, for the rate that Harrod (1939) called the natural growth rate, an economy that starts at some point from a situation of full employment $Y_0 = Y_0^{PE}$ will remain forever at full employment if the guaranteed growth rate is equivalent to the natural growth rate.

This model shows that except for the case in which an economy by chance starts from full employment (that is, in the case that at the initial moment the guaranteed growth rate coincides with the natural growth rate, $sv = n$), the model predicts that the economy would be on a "knife edge", that is: any variation in the parameters that disrupts the equality between the guaranteed growth rate and the natural rate will result in the economy moving away from equilibrium in the long run. This economy risks two unintended outcomes: perpetual growth in unemployment (in the case where $sv < n$) or perpetual growth of idle capital (in the case where $sv > n$). It is also important to keep in mind that Harrod-Domar-style growth shows no tendency to remain or converge towards a steady state.

In conclusion, the growth rate of an economy's output is determined by the savings rate multiplied by the marginal product of capital, with the depreciation rate subtracted. In the Harrod-Domar model, enhancing the marginal product of capital, raising the savings rate, or decreasing the depreciation rate all contribute to a higher rate of production growth.

The Harrod-Domar model was initially created to assist in analysing business cycles and was later adapted to explain economic growth. It asserted that economic growth is contingent on the availability of capital and labor, and increased investment leads to capital accumulation (Siddiqui & Armstrong, 2018). This concept also had implications for Less Economically Developed Nations (LEDCs) where labor is abundant but physical capital is limited, and economic growth is slow. Since the average wages in LEDCs are insufficient to support high savings rates, there is limited capital stock accumulation through investment.

The model suggests that measures to boost investment by increasing savings and using technological advancements are necessary for economic growth (Easterly, 1997). Similar to Keynesian ideas, the model suggests that an economy does not naturally experience stable growth rates and full employment. In other words, by supporting short-term Keynesian ideas, this theory takes as its central axis the conditions necessary for the balance between saving and investment in a growing economy. In such a case, one of the final suggestions of the Harrod-Domar model is to direct savings and investment to guarantee sufficient investment to prevent excessive unemployment. Since economies are not stable, actions to redirect investment on the path of sustained and balanced growth as an alternative to tackle unemployment are needed.

The Accelerator Theory of Investment

This theory, which was established by Clark (1917), helps to explain changes in national income or how national output causes investment to change. The investment accelerator model assumes that the main reason for investing for businesses is to change the optimal level of capital, which, in turn, is proportional to output. This makes it possible to formulate conclusions about the degree of applicability of this model to explain investment behaviour in various countries. This theory is one of the first attempts to explain investment behaviour on aggregate and assumes that the main reason that enterprises make investments is a change in the optimal level of capital (Kumar, 2015). The results of various studies (such as Fiorito, 2007; Zerbo & Hien, 2020) indicate a relatively successful empirical application of the accelerator theory of investment. However, it should be

established that the accelerator model appeared as a model devoid of theoretical justification, which led to the appearance of various modifications.

It is clear that theories of economic growth are concerned with analyzing the functioning of the economic system over time, emphasizing, above all, the behaviour of production within it. In this direction, they study the conditions that must exist so that, in addition to the growth of production, the economy tends to maintain macroeconomic balance. Of course, it can be deduced from the study of economic growth that the starting point of these theories corresponds to the attempt to revitalize neoclassical approaches since they consider the effect of investment on the productive capacity of economies (Nostbakken et al., 2011).

As an attempt to provide theoretical justification using the neoclassical approach, the approach proposed by Grossman (1972) can be considered. Grossman considers limiting the firm's output on the demand side, where the volume of products sold on the market is determined by demand. A competitive firm, in neoclassical analysis, believes that it can realize an arbitrary amount of output at a given price, can only reason so if demand in the market is equal to or greater than supply. If supply exceeds demand, then the firm, according to Grossman, will no longer be able to consider output as a variable that it can choose, but will consider it an asset.

A firm plans to produce a specific amount of output by using the available capital and employing enough labour. Grossman characterizes the investment demand function by using the concept of a target stock of capital, which is optimal in the long term. The investment function in the Grossman model has a crucial feature that it depends on the output through the capital target value. With an increase in output, the required capital level also rises, leading to greater investment.

However, the accelerator model assumes that investments depend not on the level of output, but on the change in output. Due to the static expectations of the firm, each period assumes that demand-constrained output in the future will always be at the same level as it is at the moment. Therefore, when the actual output changes, firms adjust their expectations by changing their capital targets and, consequently, investment decisions. It should be noted that in this model, a transition in the rate of growth of output does not affect investments instantly.

Empirical Literature

Effect of Public Debt on Private Investments

Hideaki, M. (2015) conducted an analysis to assess the impact of public debt on private investment in Japan. Utilizing integration analysis methods, the study determined that internal public debt did not have a significant impact on the Republic of Japan. This suggests that the substantial level of private investment in Japan was supported by the absence of interest charges on its domestically borrowed funds, which, in turn, encouraged and motivated private investors to make abundant investments. Nevertheless, the study was done in Japan, a developed country, and the findings might differ in Kenya due to the differing economic conditions in the two countries.

Khan, Waeni, and Amura (2012) carried out a study focusing on the effectss of public debt on both economic growth and private investment. Their research used the simple regression model and ordinary least squares. The study indicated that the increasing debt had an adverse effect on private investment. The researchers suggested reducing reliance on external debt, because it had adverse effects on private investment in Eritrea, leading to a slowdown in economic growth. This research was conducted in Eritrea and not in Kenya, meaning the findings could differ due to the varying economic conditions.

A study by Wahid (2020) in Pakistan noted that when debt levels increase as a proportion to GDP, debt servicing had a negative interconnection with private investments. The research also established that annual debt payments made by the government of Pakistan to multilateral financial and private creditors had a negative effect on private investments. The study revealed that debt servicing to bilateral creditors and non-concessional debt had positive impact on private investment. The findings are however not comparative to those of Kiptui (2005) and Bello, Nagwari and Saulawa (2013) who both established that public debt were negatively related private investments.

Kamundia (2015) did a research on the impacts of public debt on private investment and economic growth in Kenya. The author employed the Granger Causality Test and found that public debt had a negative influence on private investment. Between 1963 and 1970, private investment experienced gradual growth, primarily due to the government's commitment to fostering investment. However, from 1971 to 1977, there was a gradual decline, attributed to factors such as the oil crisis and the 1974 drought. In 1978, there was a significant increase in domestic private investment, attributed to factors like dissolution of the East African Community (EAC) and the coffee boom in 1977, which adversely affected private investment. Subsequently, there was a decline in investment from 1978 to 1994. However, in 1995, there was a notable resurgence in investment thanks to the effective execution of recovery and sustainability policies by the Kenyan government.

Akomolafe, Achwuku, Bosede, and Oni (2015) discovered that internal debt has a positive effect on private investments in Nigeria. This means that the government of Nigeria may benefit from financing its budget deficits through domestic borrowing rather than relying on external borrowing.

Makau, Njuru and Ocharo (2018), noted that Kenya's total public debt reached Ksh5.1 trillion, with Ksh2.5 trillion being domestic debt and Ksh2.6 trillion of foreign or external debt. This has significant implications for investments in Kenya, as it crowds out private investments and hampers public and private investment through debt servicing. Prudent borrowing for development projects can foster both public and private investment growth, leading to job creation and economic stimulation. Kenya's Vision 2030 objectives, initiated in 2008, face challenges related to private investment crowding, stemming from domestic market interest rate hikes due to public borrowing and public sector competition in the production of investment goods. These debt problems have been intensified by reliance on primary exports, balance of payment deficits, exchange rate overvaluation, low export growth, and low interest rates.

Effect of Public Debt on Economic Growth

Burnside (2000) observed that debt can be advantageous for a country when used for productive investments. Properly utilized, it can contribute to economic stability and attract capital inflows, which, in turn, positively affect domestic savings and stimulate investment demand. The findings indicated that both internal debts and overall public debts had a stimulating effect on economic growth.

Khan, Mirajul-haq and Anwar (2014) noted that developing economies relies on public debt to finance its expenditure and to accelerate economic growth. Traditional economists consider public debt a big hindrance in the way of growth as it crowds out private investment in long run and thus growth is slowed down. The study was an attempt to empirically test this hypothesis while taking Pakistan economy as a case study. Sample period of the study was spanning from 1972 to 2013 and for estimation purposes, Autoregressive Distributed Lag (ARDL) was employed. Empirical results of the study show that the direct impacts of public debt on economic growth is positive but statistically insignificant, showing no direct role of public debt on economic growth while indirectly through crowding out of private investment the economic growth process become slow down. These results support crowding out and debt overhang hypothesis of public debt. Moreover, the significance of Error Correction Term (ECM) demonstrated the presence of a stable long-run relationship and indicated that the disequilibrium is corrected with high speed of adjustment. It was suggested that government needs to create such type of environment which encourage capital inflows and utilize this capital for a productive purpose to overcome the crowding out effects of public debt.

Ndemange (2018) noted that Kenya's GDP has shown a consistent increase over time, growing from 10 billion U.S. dollars in 1984 to approximately 60 billion U.S. dollars in 2014. However, in 1994, the GDP dropped below 10 billion U.S. dollars, primarily due to high debt servicing and low capital formation. This is known as the "debt overhang" period.

During a debt overhang, a country only experiences partial benefits from the rise in exports or output as a portion of the increase is directed towards servicing the debt, benefiting the lenders. This debt overhang essentially functions as a high marginal tax on the debtor country, reducing returns on investments and discouraging the formation of domestic capital. Even when the government holds all external debt, there are still negative effects on economic growth stemming from this disincentive.

It is crucial to investigate whether external debt and the ability to service that debt are impacting Kenya's economic growth through a decline in investment.

Mbalu and Matanda (2021) found a positive correlation between gross domestic product and external debt. Their research revealed that a 1% increase in external debtleads to a 0.9% rise in GDP.

When a country heavily borrows from foreign sources, it suggests a struggle to generate sufficient revenue to sustain its operations. External public debt can be beneficial for economic growth when used effectively. However, accumulating such debt over an extended period without appropriate precautions and consistent payment measures can lead to a "debt overhang" situation, where the debtor country becomes perpetually dependent on its creditors.

In the case of Kenya, concerns have arisen due to the increasing external debt and debt servicing payments. People are worried about the sustainability of the debt and its potential impact on government service delivery. The level of external debt in Kenya has been steadily increasing. since 1977, peaking in 1999 before declining. The events of the 1980s had a negative effect on the country's GDP, but from 1992 onwards, GDP began to increase, showing a sustained upward trend.

Overview of Literature

The study has found that private investments in Kenya are expected to fuel the realization of Vision 2030. Evidence from reviewed literature, however, shows that the increased government expenditure in Kenya had not resulted in simultaneous increase in investments. This calls for economic policies to spur private investments in these key priority sectors. Many other empirical findings also support that the highest debt service payments crowd out private investment, reducing economic growth. From the reviewed studies, various gaps are seen in methodologies and contexts where the studies were carried out. Studies such as Khan and Reinhart (1990),

Debrun and Kinda (2013), In their research, Khan et al. (2014) used a combination of theoretical literature and empirical study. Studies have employed mixed structural Vector Auto Regressions (VAR), event analysis, Vector Error Correction Models (VECM) and standard vector auto-regression, running across different timelines as the current study. In addressing this gap, this study used VECM, with the statistical relationship between the variables missing in the studies reviewed in Kenya.

Based on the theories, it has been seen that the theories explain bust and economic boom by the assumption that output influence investors, which is not entirely true. Critics assert that the theories confuse economic growth for economic development while, economic growth is a subset of economic development. The theories imply that poor countries ought to borrow money to finance capital investments in order to spur economic progress, but this frequently results in payback issues down the road. This study therefore modified the theories and compared the relationships that exist, as discussed in the next chapter.

III. Methodology

Introduction

This chapter provides a comprehensive overview of the research design, theoretical framework, model specification, variable definitions and measurements, data sources and types, time series characteristics, and the data analysis methods used.

Research Design

This research used a correlational research design to explain the effect of public debt on private investments and the effect of public debt on economic growth in Kenya. According to Fraenkel et al. (2016) this research design examines associations amongst variables without being controlled or manipulated by the investigator.

Theoretical Framework

This study used the Crowding out Theory by Spencer and Yohe (1970) and the Harrod-Domar Growth Model. The Crowding out Theory explains the situation where increased government expenses may lead to a decline in private investment expenditure. This framework has been used by previous scholars, such as Balcerzak and Rogalska (2014) and Atabaev et al. (2018), to explain the effect of public debt on private investments. According to Spencer and Yohe (1970), when the government increases its spending and demands more loanable funds, interest rates rise, and the supply of loanable funds decrease, affecting money supply for the private sector. The adopted model has the following format.

Crowding out (Real or Nominal)

This relationship implies that:

$$\frac{dY}{dG}\Big|_{dM=0} \approx \frac{d(Y^*-G^*)}{dG^*}\Big|_{dM=0}$$

Y = total spending, G= Government spending through debts, and M = money supply.

The crowding out theory can be further explained by the following linear forms of equation:

I = Y-C-G

Where;

C=a+c(Y—T) +wM

Therefore, I = Y-[a+c(Y-T) +wM]-G

Investment can also be given by: I=d-ei

Since government spending in this model is purely through public debts, government spending can be substituted with public debt (D) as follows;

This implies that I=d-ei = Y-[a+c(Y-T) +wM]-D……3.0

Where Y = income, C = consumption, I = investment, D = public debt, T = tax yield, M = total money supply, c = marginal propensity to consume, w = a wealth parameter, e = an investment parameter, a = intercept term, d = intercept term. This model will be used to answer the first specific objective.

The second objective of the research will be explained using the Harrod-Domar Growth Model. Based on the Harrod-Domar Growth Model, the dynamic behaviour of capital, GDP and consumption is analyzed. The production function is assumed to be of fixed technical coefficients (fixed proportions), 1⁄and > 0 and 1⁄μ > 0, for the factors of production "K" and "L". This suggests that, to produce one unit of a product, capital and labor must always be employed in unchanging or fixed ratios: k = K L⁄ = μ ν⁄. Consequently, the assumption is that, to produce one unit of the good, 1⁄ν units of capital are needed and 1⁄μ units of labour. Therefore, to produce "X" units of good, the model will need X ν⁄ units of capital and X μ⁄ units of labour. In other words, K = X ν⁄ are the

capital requirements and L = X μ′ are the labour requirements to produce "X" units of the good. This production function tells us that if K > X ν′ or L > X μ′, the respective excess will remain idle.
Analytically, the production function is:
X = F(K, L) = min(νK, μL) ……3.1

It follows from the equation that: If in the economy it is true that K < μL ⇒ (and μ′)K < L. Then, the production will be given by X = νK and the labour required for the optimal production level will be L = X μ′= (ν μ′)K. In this case, capital determines the existing labour and level of production in the economy is higher than the quantity required for the ideal level of production. In this case, the surplus labour, L − (and μ′)K > 0, will remain idle.

If in economics it is true that K = μL ⇒ (ν μ′)K = L. Then, the production will be given by X = νK = μL and the work required for the optimal production level will be L = X μ′= (ν μ′)K. Therefore, it is true that K L′= μ ν′. In this case, there are no excess stocks of labour or capital that are not used. That is, if k = K L′= μ ν′ the productive factors of the economy are fully utilized. If in the economy it is true that μL < νK ⇒ (μ ν′)L < K. Then, the production will be given by X = μL and the capital required for the optimal production level will be K = X ν′= (μ ν′)L. In this case, labour determines the production level and the amount of capital existing in the economy is more than the amount required for the optimum level of production. In this case, the surplus capital, K − (μ ν′)L > 0, will remain idle.

Consumption is supposed to be given by a canonical function of long-term Keynesian consumption. That is, it is assumed that the consumption function depends on income and that it has constant and identical medium and marginal propensities to consume. Specifically, it is assumed that:
C(Y) = C = cY, 0 < c < 1

It is also assumed that the saving function has constant and identical medium and marginal propensities to save. That is, it turns out that:
S(Y) = S = (1 − c)Y = sY, 0 < s < 1

The equation above tells us that a constant "s" ratio of income "Y" is dedicated to saving. However, the savings gap can lead to challenges in repaying external debt in the future.. Finally, the stock of capital and labour grow over time. Capital grows due to investment or borrowing (debts) and labour due to population growth (which is assumed to be exponential and whose growth rate "n" is exogenously given). These circumstances give the model a dynamic character that can be used to predict economic growth using capital (investment or debts) and labour.
E = (1 − c)E + K + L……3.2

According to Attard (2019), the extended production function that results from this function adds government debt as a third growth variable to the two other control variables that are indicators of economic growth;
E = f - D + K + L……3.3
Where here E represents economic growth using GDP and f is the constant

Model Specification
For objective one, the study modified equation 3.0 from the theoretical framework, as follows;
I = Y-[a+c(Y-T) +wM]-D
I = Y - [a + c(Y - T) + wM - b1(Dd) - b2(Df)] + *u* ……3.4

Equation 3.0 from the theoretical framework of Spencer and Yohe (1970) captures the relationship between private investment (I) and other determinants like income (Y), tax yield (T), Total money supply (M), and public debt (D). In the modified equation (3.4), the study has included two additional variables related to public debt: domestic debt (Dd) and foreign debt (Df). The variables b1 and b2 represent the respective coefficients for domestic debt and foreign debt, indicating their impact on private investment (I). This equation allows for the analysis of how public debt, influences private investment in Kenya. The modification in equation 3.4 also introduces an error term (*u*) to account for unobserved factors or random variation that may influence the relationship between the variables.
For objective two, the equation from 3.3 (Attard, 2019) was modified by adding other variables as follows:
E = f - D + K + L
E = f + K + L - b3(Dd) - b4(Df) + *u* ……3.5

The modification of equation 3.5 from Attard's (2019) theoretical framework accounts for the specific factors under investigation. The study has modified Equation 3.5 by including the variables related to public debt. In addition to the original variables (f, D, K, and L), the study has incorporated the coefficients b3 and b4 to represent the effect of foreign debt (Df) and domestic debt (Dd) on economic growth (E) in Kenya. This equation allows for the assessment of how public debt affects the economic growth of the country. The addition of the error term (*u*) also accounts for unobserved factors that may influence the relationship between the variables.

Definition and Measurement of Variables

The study variables were measured and defined as shown in Table 3.1.

Table 3.1: Definition and Measurement of Variables

Variable	Definition	Measurement
Public debt (D)	The sum total of external debt and domestic debt	Kenyan shillings
Economic growth (E)	An increase of people's real income	Percentage of GDP growth
Private investment (I)	Money contributed by organizations or different investors, instead of by a governmental agency	Real and nominal GDP in Kenyan shillings and as a percentage to GDP
Total money supply (M)	All money in circulation	Kenyan shillings
Income (Y)	Money received through investments	Kenyan shillings
Tax yield (T)	The amount of tax raised for the taxing authority from a particular tax	Kenyan shillings
Wealth parameter (W)	Value of all the assets of worth owned by individuals, organizations, or country.	Kenyan shillings
Consumption (C)	Amount used to purchase goods and services by the public	Kenyan shillings
Labour (L)	Employment requirements to produce "Y" units of the good	Kenyan shillings
Capital (K)	Money requirements to produce "Y" units of the good	Kenyan shillings

Data Types and Sources

The study used secondary data, including yearly reports, published research, and library sources such as the Kenya National Economic Survey (KNES) reports, the Central Bank of Kenya (2022), and the World Bank Development Indicators database. Secondary data were collected for the period from 2000 to 2021.

Time Series Properties and Diagnostic Tests

Time Series Properties

The study began by conducting a unit root test to check for stationarity, using the Augmented Dickey-Fuller (ADF) and Philips and Perron (PP) tests. Following this, co-integration tests were performed using the Johansen co-integration test.

Model Diagnostics Tests

The following diagnostic tests were done:

Multicollinearity tests were completed to test for correlations between the independent variables, using the Variance Inflation Factors (VIF). Jarque-Bera test tested for normality. In addition, the Ramsey reset test examined the presence of omitted variables. Heteroscedasticity tests were performed using the Breusch-Pagan test. The Breusch-Godfrey serial correlation LM test was used to check for autocorrelation.

Data Analysis

To address the first objective of examining the impact of public debt on private investments in Kenya, we employed Equation 3.4. Vector Error Correction Model (VECM) was utilized to estimate the model parameters, taking into account the results derived from cointegration analysis. Equation 3.5 was estimated using VECM to explore the influence of public debt on the economic growth of Kenya. Once estimations were complete, the variable coefficients were analysed to elucidate how changes in the independent variables contributed to variations in the dependent variable. A negative coefficient signified an unfavourable effect on the dependent variable, whereas a positive coefficient signified the opposite.

IV. Empirical Findings

Introduction

The main goal of this research was to assess how public debt influences both private investment and economic growth of Kenya. To accomplish this, the study had two distinct goals. The first objective was to investigate the impact of public debt, encompassing both domestic and foreign debt, on private investments within Kenya. The second objective was to gauge the influence of public debt on Kenya's overall economic growth**.** This chapter is organized in a systematic manner, employing a structured approach that encompasses descriptive analysis, time series analysis, and diagnostic tests applied to the models under examination. Furthermore, this chapter includes the presentation of findings and in-depth discussions that are tailored to address the set objectives.

Descriptive Statistics

Table 4.1 offers a concise overview of descriptive statistics for a range of economic indicators in Kenya. These statistics furnish details regarding each variable, encompassing the number of observations (Obs), the min and max values, the mean, and the standard deviation (Std. Deviation).

Table 4.1: Summary Descriptive Statistics

	Obs	Minimum	Maximum	Mean	Std. Deviation
Foreign Debts (Kshs Million)	22	3188942.94	47501080.65	14418813.7073	13526352.25800
Domestic Debts (Kshs Million)	22	1586191.52	45245253.62	13880055.4450	12967807.67836
Economic growth (GDP %)	22	-.25	8.06	4.2432	2.30617
Private investment (% of GDP)	22	15.14	22.43	19.1650	1.89261
Total money supply (Kshs Million)	22	530147.00	3420499.00	1818789.2273	1011618.53637
Income (Kshs Million)	22	93039.00	1885694.50	619602.9757	505453.33739
Tax yield (Kshs Million)	22	522431.00	9581353.93	4227013.0611	3088006.24595
Wealth parameter (Kshs Million)	22	3222495.00	41426294.08	15751175.8095	12286791.87690
Consumption (Kshs Million)	22	230384.00	4042175.22	1808726.7532	1208772.22343
Labour (Kshs Million)	22	237996.00	3218624.80	1460924.7691	908035.42730
Capital (Kshs Million)	22	79545.00	3467174.36	1461310.9507	1219842.43892

Source: Research Data (2023).

The study found that foreign debts in Kenya range from a minimum of Kshs 3,188,942.94 million to a maximum of Kshs 47,501,080.65 million. The average foreign debt is approximately Kshs 14,418,813.71 million, with a relatively high standard deviation of Kshs 13,526,352.26 million. This indicates a significant variation in the amount of foreign debts held by Kenya over the observed period (2000-2021). For the domestic debts in Kenya, they range from a minimum of Kshs 1,586,191.52 million to a maximum of Kshs 45,245,253.62 million. The mean domestic debt is approximately Kshs 13,880,055.45 million, with a standard deviation of Kshs 12,967,807.68 million. This implies notable fluctuations in domestic debt levels throughout the study period.

It can also be observed that the economic growth rate in Kenya ranges from a minimum of -0.25% to a maximum of 8.06%. The average economic growth rate stands at 4.24%, with a standard deviation of 2.31%. This suggests a moderate level of variability in economic growth over the observed period, with some years experiencing negative growth and others exhibiting robust expansion. As a percentage of GDP, private investments range from 15.14% to 22.43%, with an average of 19.17%. The standard deviation is relatively low at 1.89%, indicating a relatively stable private investment level compared to other variables.

The total money supply in Kenya ranges from Kshs 530,147 million to Kshs 3,420,499 million. The average total money supply is approximately Kshs 1,818,789.23 million, with a standard deviation of Kshs 1,011,618.54 million. This demonstrates a considerable variation in the money supply throughout the observed period. In addition, income levels in Kenya range from Kshs 93,039 million to Kshs 1,885,694.50 million. The average income is approximately Kshs 619,602.98 million, with a standard deviation of Kshs 505,453.34 million. This reflects a wide range of income disparities within the country.

Tax yield in Kenya ranged from Kshs 522,431 million to Kshs 9,581,353.93 million. The average tax yield is approximately Kshs 4,227,013.06 million, with a standard deviation of Kshs 3,088,006.25 million. This is a big variation. On the other hand, the wealth parameter ranges from Kshs 3,222,495 million to Kshs 41,426,294.08 million. This reflects a significant variation in the wealth held by individuals, organizations, and the country as a whole. Consumption levels also range from Kshs 230,384 million to Kshs 4,042,175.22 million. The average consumption expenditure is approximately Kshs 1,808,726.75 million, with a standard deviation of Kshs 1,208,772.22 million. This indicates notable variations in consumption patterns within the country.

Labour costs in Kenya range from Kshs 237,996 million to Kshs 3,218,624.80 million. The average labour cost is approximately Kshs 1,460,924.77 million, with a standard deviation of Kshs 908,035.43 million. This reflects variations in the expenses associated with labour within the country. Finally, capital expenditures range from Kshs 79,545 million to Kshs 3,467,174.36 million. The average capital expenditure is approximately Kshs 1,461,310.95 million, with a standard deviation of Kshs 1,219,842.44 million. This indicates variations in investment in capital goods and assets within the country.

In conclusion, the descriptive statistics for various economic indicators in Kenya from 2000 to 2021 reveal a mixed economic landscape characterized by significant variability. While private investment remains relatively stable, indicators such as foreign and domestic debts, income, tax yield, and wealth parameter exhibit substantial fluctuations. Economic growth shows moderate variability, with both positive and negative growth rates. These statistics underscore the complexity and diversity of Kenya's economic conditions.

Time Series Property Results

In order to examine the time series characteristics, several tests were employed, such as the PP and ADF tests. Subsequently, co-integration tests were conducted using the Johansen co-integration test.

Unit Roots Tests

The unit root test findings in Table 4.2, provide insights into the stationarity properties of the examined variables. These tests are crucial for understanding the time series characteristics and identifying whether the variables under consideration have unit roots or exhibit non-stationary behaviour.

Table 4.2: Unit Root Tests – Level and First Differencing

Variable	ADF test	PP test	1% Level	5% Level	10% Level	MacKinnon approximate p for Z(t)	Comment
Unit Root Tests – Level							
Foreign Debts	8.072	6.344	-3.750	-3.000	-2.630	1.0000	N/Stationary
Domestic Debts	16.212	17.006	-3.750	-3.000	-2.630	1.0000	N/Stationary
GDP	-4.686	-4.769	-3.750	-3.000	-2.630	0.0001	Stationary
Private investment	-2.148	-2.062	-3.750	-3.000	-2.630	0.2599	N/Stationary
Total money supply	0.785	0.625	-3.750	-3.000	-2.630	0.9882	N/Stationary
Income	1.087	1.762	-3.750	-3.000	-2.630	0.9983	N/Stationary
Tax yield	2.034	1.549	-3.750	-3.000	-2.630	0.9977	N/Stationary
Wealth parameter	4.807	3.576	-3.750	-3.000	-2.630	1.0000	N/Stationary
Consumption	0.969	1.284	-3.750	-3.000	-2.630	0.9965	N/Stationary
Labour	2.019	2.894	-3.750	-3.000	-2.630	1.0000	N/Stationary
Capital	-0.471	-0.314	-3.750	-3.000	-2.630	0.9235	N/Stationary
Unit Root Tests - First Differencing							
DForeign Debts	-3.569	-3.299	-3.750	-3.000	-2.630	0.0057	Stationary
DDomestic Debts	-6.621	-6.768	-3.750	-3.000	-2.630	0.0000	Stationary
DPrivate investment	-5.550	-5.633	-3.750	-3.000	-2.630	0.0000	Stationary
DTotal money supply	-2.914	-2.995	-3.750	-3.000	-2.630	0.0438	Stationary
DIncome	-3.895	-3.871	-3.750	-3.000	-2.630	0.0021	Stationary
DTax yield	-3.670	-3.718	-3.750	-3.000	-2.630	0.0031	Stationary
DWealth parameter	-3.080	-3.118	-3.750	-3.000	-2.630	0.0083	Stationary
DConsumption	-4.694	-4.686	-3.750	-3.000	-2.630	0.0001	Stationary
DLabour	-3.989	-4.010	-3.750	-3.000	-2.630	0.0014	Stationary
DCapital	-6.726	-6.580	-3.750	-3.000	-2.630	0.0000	Stationary

Source: Research Data (2023).

Regarding foreign debts and domestic debts, both the PP and ADF tests show that their test statistics are higher than the critical values at the 1%, 5%, and 10% significance levels. This implies that foreign debts and domestic debts in Kenya are non-stationary, as the test statistics do not fall within the critical value range. Conversely, the GDP variable demonstrates stationary behaviour, as both the ADF and PP test statistics fall below the critical values. This implies that GDP does not have a unit root and exhibits stable and predictable patterns over time.

On the other hand, private investment, total money supply, income, tax yield, wealth parameter, consumption, labour, and capital exhibit non-stationary characteristics. The test statistics for these variables do not fall below the critical values, indicating the presence of unit roots. This indicates that these variables have non-stationary patterns and exhibit time-dependent behaviour. Thus, the null hypothesis of non-stationarity is not rejected for these variables.

At first differencing, the unit root tests demonstrate that all variables have stationary characteristics. The test statistics for both the ADF and PP tests fall below the 1%, 5%, and 10% significance levels. This shows that after taking the first difference, the variables of foreign debts, domestic debts, private investment, total money supply, income, tax yield, wealth parameter, consumption, labour, and capital become stationary.

Cointegration Analysis

Cointegration among the variables was conducted through the Johansen co-integration test. The outcomes of this test and the identification of cointegration are displayed in Table 4.3. Detecting cointegration is of paramount significance as it helps establish the appropriateness and significance of the Vector Error Correction Model (VECM) for the analysis at hand.

Table 4.3: Johansen Cointegration tests

Johansen tests for co-integration (Objective 1)	
Trend: constant	Number of obs = 22
Sample: 2000 - 2021	Lags = 1

Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	6	-1523.1197	.	212.2022	94.15
1	17	-1483.566	0.97688	133.0948	68.52
2	26	-1457.0044	0.92031	79.9717	47.21
3	33	-1437.7298	0.84050	41.4225	29.68
4	38	-1425.1548	0.69809	16.2725	15.41
5	41	-1417.6488	0.51074	5.2605	3.76
6	42	-1417.0186	0.05826		
Johansen tests for cointegration (Objective 2)					
Trend: constant			Number of obs = 22		
Sample: 2000 - 2021			Lags = 1		
Maximum Rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	5	-1258.5562	.	147.2452	68.52
1	14	-1211.3671	0.98883	52.8669	47.21
2	21	-1196.9321	0.74710	29.9969	29.68
3	26	-1188.4072	0.55598	16.9472	15.41
4	29	-1185.3651	0.25153	4.8630	3.76
5	30	-1184.9337	0.04026		

Source: Research Data (2023)

In Objective 1, the trace statistic exceeds the 5% critical value for all ranks, indicating cointegration among the variables. This implies that the variables converge to a long-run equilibrium. Similarly, in Objective 2, the trace statistic also exceeds the critical value, supporting the existence of cointegration. Following the evidence of cointegration from the Johansen test, the VECM cointegration model can be employed to analyze both objective one and objective two. This model allows for the examination of the long-run dynamics and relationships between the focal variables in the study.

Effect of Public Debt on Private Investments

The first objective of the study was to explore the impact of public debt on private investments in Kenya. To address this objective, Equation 3.4 introduced the utilization of the Vector Error Correction Model (VECM) since the variables were identified as integrated of order 1 (I(1)). As a result, the VECM framework was employed to assess the impact of public debt on private investments. The results and parameter estimates from the vector error-correction model are presented in Table 4.4.

Table 4.4: Vector Error Correction Model for Public Debt and Private Investments

Dependent Variable: Private investment				
Date: 07/11/23 Time: 17:59				
Sample: 2000 2021				
Included observations: 22				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Private investment (I)	1			
Consumption (C)	.304	.0186	1.63	0.123
Income (Y)	.862	.0271	3.18	0.006
Tax yield (T)	-.188	.0878	-2.14	0.049
Wealth parameter (W)	.764	.0257	2.97	0.010
Total money supply (M)	.511	.0289	4.011	0.000
Domestic Debt (Dd)	-.738	.0619	-8.19	0.000
Foreign Debt (Df)	-.107	.0355	-8.72	0.000
C	-.633	.0082	-14.02	0.000
R-squared	0.7511	Mean dependent var		3.581988
Adjusted R-squared	0.6516	S.D. dependent var		1.248065
S.E. of regression	1.1172	Akaike info criterion		138.0465
Sum squared resid	75.222	Schwarz criterion		141.4817
Log likelihood	-73.465	Hannan-Quinn criter.		138.7171
F-statistic	7.55	Durbin-Watson stat		9.416795
Prob(F-statistic)	0.0007			

Source: Research Data (2023).

The results displayed in Table 4.4 yield valuable insights into the effect of public debt on private investments, as estimated through the VECM. Coefficients (β), t-statistics (t), and associated p-values (p) [β (t, p)] for each variable provide important information about their impact on the dependant variable.

In this study, the coefficient for consumption (C) is $\beta = 0.304$ ($t = 1.63$, $p = 0.123$), indicating a positive influence on private investment. This effect is statistically insignificant, as the p-value exceeds the typical threshold of significance. In contrast, income (Y) demonstrates a substantial and positive impact on private investment, with $\beta = 0.862$ ($t = 3.18$, $p = 0.006$). This implies that a unit increase in income corresponds to an increase of 0.862 units in private investment and is significant, indicating a robust relationship.

The analysis also revealed that tax yield (T) exhibits a negative effect on private investment, as indicated by a coefficient of $\beta = -0.188$ ($t = -2.14$, $p = 0.049$). This indicates that a one-unit increase in tax yield results in a reduction of 0.188 units in private investment. The wealth parameter (W) exerts a significant positive effect on private investment, with $\beta = 0.764$ ($t = 2.97$, $p = 0.010$). Consequently, an increase in the wealth parameter corresponds to a rise in private investment.

The total money supply (M) demonstrates a positive impact on private investment, as evidenced by a coefficient of $\beta = 0.511$ ($t = 4.011$, $p < 0.001$). This signifies that a rise in the total money supply results in higher private investment and this effect is statistically significant.

Both domestic debt (Dd) and foreign debt (Df) exhibit a negative and highly significant effects on private investment. Domestic debt has $\beta = -0.738$ ($t = -8.19$, $p = 0.000$), Indicating that a single-unit increase in domestic debt results in a 0.738-unit decrease in private investment. Likewise, foreign debt is associated with $\beta = -0.107$ ($t = -8.72$, $p = 0.000$), indicating a 0.107-unit decrease in private investment with a one-unit increase in foreign debt. The constant term (C) signifies the intercept, representing the baseline level of private investment when all independent variables are set to zero. In this case, the constant has $\beta = -0.633$ ($t = -14.02$, $p = 0.000$), indicating a highly significant negative effect.

To estimate the model: $I = Y - [a + c(Y - T) + wM + b1(Dd) + b2(Df)] + u$, using the coefficients obtained from the model in Table 4.4, the model becomes:

$I = Y - [0.633 + 0.304Y - 0.188T + 0.764(0.511M) - 0.738(Dd) - 0.107(Df)] + 0.0082$

The findings gleaned from the VECM analysis presented in Table 4.4 shed light on the connection between public debt and private investments in Kenya. These findings are in harmony with established economic theories and corroborate empirical evidence from previous research, offering a deeper understanding of this relationship.

Firstly, the coefficient for Domestic Debt (Dd) is highly significant ($t = -8.19$, $p = 0.000$) and negative ($\beta = -0.738$), indicating a robust and statistically significant negative correlation between domestic debt and private investment. This outcome is consistent with the well-recognized economic theory known as the crowding-out effect. When the government escalates its domestic borrowing, it crowds out private borrowers. This increased demand for funds results in elevated interest rates, rendering it more costly for private enterprises to secure loans and invest. As a result, private investment tends to decline. This finding is in accordance with economic studies conducted in various countries, including Pakistan, which observed that higher government debt levels relative to GDP have a detrimental impact on private investments (Jafri & Habib, 2013).

Similarly, the coefficient for Foreign Debt (Df) is highly significant ($t = -8.72$, $p = 0.000$) and negative ($\beta = -0.107$), indicating a notable and statistically significant negative correlation between foreign debt and private investment in Kenya. When the government borrows from foreign sources, it can potentially reduce the availability of foreign exchange in the market. This, in turn, may result in a depreciation of the domestic currency, leading to increased costs of importing goods and services, including capital goods necessary for private investment. The elevated import costs can negatively affect the private investments profitability, leading to a decline in private investment. This finding aligns with research conducted in other countries, which underscores the adverse impact of external debt on private investments (Khan et al., 2012).

The positive and significant coefficients for Wealth Parameter (W), Income (Y), and Total Money Supply (M) indicate that these variables have a favorable impact on private investment. Higher income levels, increased wealth, and a larger money supply are associated with elevated private investment. The positive coefficients for income, wealth, and money supply underscore the role of economic growth, wealth accumulation, and monetary conditions in encouraging private investments (Jafri & Habib, 2013; Khan et al., 2012). Additionally, while the coefficient for Tax Yield (T) is negative ($\beta = -0.188$) and statistically significant ($p = 0.049$), suggesting that higher taxes may discourage private investment to some extent, it is relatively smaller in magnitude compared to the debt. This implies that tax policies influence investment decisions to some degree, as postulated by Kamundia (2015).

In summary, the results of the current study align with previous research conducted in different countries, collectively offering evidence of a consistent influence of public debt on private investment. For instance, in Eritrea, Khan et al. (2012) that the increasing debt burden negatively affected private investment, highlighting the significance of diminishing dependence on external borrowing. Similarly, Jafri and Habib (2013) conducted a

study in Pakistan, demonstrating that the increase in debt levels was negatively associated with private investments. Furthermore, Kamundia (2015) analysed the effects of public debt on private investment in Kenya and discovered a negative influence, suggesting that both external and internal debts impeded private investment.

However, there are instances where public debt has no significant effect on private investment. For instance, Wakari et al. (2008) investigated the impact of public debt on private investment in Japan and found no substantial relationship between the two variables. Similarly, Akomolafe et al. (2015) investigated the effects of public debt on private investment in Nigeria and identified a positive relationship for private investments with internal debts. These variations in findings across different countries underscore the importance of considering specific economic contexts and conditions when assessing the effect of public debt on private investment.

Table 4.5: Normality Tests for Public Debt and Private Investments

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	Jarque-Bera	Probability
Private investment	22	0.6613	0.6059	0.98253	0.7887
Consumption	22	0.2735	0.1847	0.91524	0.1887
Income	22	0.0044	0.1183	0.80611	0.0124
Tax yield	22	0.2491	0.0580	0.88610	0.0864
Wealth parameter	22	0.1820	0.2342	0.87871	0.1664
Total money supply	22	0.1921	0.28912	0.89202	0.1902
Domestic Debt	22	0.0209	0.5370	0.83596	0.0647
Foreign Debt	22	0.0101	0.3917	0.76872	0.0365

Source: Research Data (2023).

Table 4.5 shows the results of normality tests done for the variables associated with public debt and private investments. Skewness, which gauges the symmetry of data distribution, and Kurtosis, which evaluates the sharpness or peakedness of the data distribution, was analyzed. The Jarque-Bera statistic was employed to assess the null hypothesis that the data conforms to a normal distribution, with associated probabilities (p-values) furnished to assess the significance of the test.

For all variables, the Jarque-Bera probabilities are relatively high, ranging from 0.0365 to 0.7887. These probabilities indicate no significant evidence to reject the null hypothesis of normality, suggesting data for the variables conforms to a normal distribution. In conclusion, the normality test results imply that the variables related to public debt and private investments exhibit characteristics of normal distribution, with slight right-skewness and moderate peakedness. These findings affirm that the assumption of normality is satisfied for these variables, thereby bolstering the reliability of statistical analyses and inferences based on these variables.

Table 4.6: Multicollinearity Tests for Public Debt and Private Investments

Variable	VIF	1/VIF
Consumption	2.50	0.4
Income	2.04	0.490196
Tax yield	3.32	0.301205
Wealth parameter	3.71	0.269542
Total money supply	2.99	0.334448
Domestic Debt	4.86	0.205761
Foreign Debt	1.63	0.613497

Source: Research Data (2023).

Table 4.6 presents multicollinearity test results conducted for variables related to public debt and private investments. In general, VIF values between 1 and 5 indicate that multicollinearity is not a significant issue. All the VIF values fall between 1.63 and 4.86. Therefore, based on the VIF values, there is no strong evidence of severe multicollinearity among the variables related to public debt and private investments in the study. This suggests that the variables are relatively independent of each other and that multicollinearity is not likely to significantly impact the analysis.

Table 4.7: Breusch-Pagan Heteroscedasticity Test for Public Debt and Private Investments

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity Ho: Constant variance	
chi2(1)	1.16
Prob > chi2	0.2815

Source: Research Data (2023)

Table 4.7 presents the Breusch-Pagan heteroscedasticity test results conducted for public debt and private investments. This test is employed to determine whether heteroscedasticity exists, which implies that the error term variance may vary at different independent variable levels. The null hypothesis (Ho) posits that the variance remains constant, indicating the absence of heteroscedasticity.

In this study, the test statistic is 1.16, and the associated probability (Prob > chi2) is 0.2815. Since the probability value exceeds the 0.05 significance level, there is no evident ground to reject the null hypothesis. This indicates that there isn't strong evidence to support the existence of heteroscedasticity in the data. Therefore, drawing from the Breusch-Pagan test results, it can be concluded that the assumption of constant variance is upheld concerning the effect of public debt on private investments in the study.

Table 4.8: Test for Serial Correlation for Public Debt and Private Investments

Breusch-Godfrey LM test for autocorrelation			
lags(p)	chi2	df	Prob > chi2
1	0.059	1	0.8075
H_0: no serial correlation			

Source: Research Data (2023).

Table 4.8 displays the outcomes of the Breusch-Godfrey LM test, which examines the presence of autocorrelation in the impact of public debt on private investments. The null hypothesis (H0) assumes no serial correlation, indicating that the error terms aren't correlated with each other. The study found that the test statistic for one lag (lags(p) = 1) is 0.059, and the associated probability (Prob > chi2) is 0.8075. Since the probability value is greater than the significance level (0.05), we fail to reject the null hypothesis. There is no sufficient evidence for presence of serial correlation in the data. Therefore, based on the Breusch-Godfrey LM test results, Based on the results, it can be concluded that there is no significant serial correlation in the impact of public debt on private investments in the study.

Table 4.9: Test for Omitted Variables for Public Debt and Private Investments

Ramsey Reset test Ho: model has no omitted variables	
F-statistic	2.41
Prob > F	0.1180

Source: Research Data (2023).

Table 4.9 outlines the findings of the Ramsey Reset test, which assesses the potential omission of variables in the model investigating the impact of public debt on private investments. Null hypothesis (Ho) shows the model does not have any omitted variables, meaning all relevant factors are included in the model.

The F-statistic was computed as 2.41, and the corresponding probability (Prob > F) stands at 0.1180. Given that the probability value exceeds the 0.05 significance level, there is insufficient proof to reject the null hypothesis. This indicates that there isn't enough evidence to substantiate the inclusion of omitted variables in the model. Consequently, based on the results of the Ramsey Reset test, it can be concluded that the model sufficiently encompasses all pertinent variables in the analysis of the impact of public debt on private investments.

Effect of Public Debt on Economic Growth

The study's second objective was to evaluate the impact of public debt on economic growth in Kenya. The coefficients, t-statistics, and p-values elucidate the effects of different variables on GDP.

Table 4.10: Vector Error Correction Model for Public Debt and Economic Growth

Dependent Variable: GDP				
Date: 07/12/23 Time: 09:14				
Sample: 2000 2021				
Included observations: 22				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP	1			
Capital (K)	.144	.0227	6.34	0.000
Labour (L)	-.594	.0797	-7.46	0.000
Domestic Debt (Dd)	-.722	.0118	-6.11	0.000
Foreign Debt (Df)	-.442	.0672	-6.57	0.000
C	-.573	.0057	14.02	0.000
R-squared	0.7231	Mean dependent var		3.437193
Adjusted R-squared	0.6832	S.D. dependent var		3.748773
S.E. of regression	5.7610	Akaike info criterion		116.0485

Sum squared resid	111.686	Schwarz criterion	117.9902
Log likelihood	-61.485	Hannan-Quinn criter.	116.4276
F-statistic	7.670	Durbin-Watson stat	7.937904
Prob(F-statistic)	0.006		

Source: Research Data (2023).

As presented in table 4.10, capital shows a significant and positive effect with a coefficient of β = 0.144 (t = 6.34, p = 0.000), suggesting that increased capital investment contributes to economic growth. In contrast, labour exhibits a negative and significant association with GDP, as indicated by a coefficient of β = -0.594 (t = -7.46, p = 0.000). This suggests that an increase in the labor cost might have an adverse effect on economic growth. Furthermore, both domestic debt (Dd) and foreign debt (Df) demonstrate negative and significant effect on GDP. Domestic debt has a coefficient of β = -0.722 (t = -6.11, p = 0.000), while foreign debt has a coefficient of β = -0.442 (t = -6.57, p = 0.000). These findings suggest that higher levels of both domestic and foreign debt are associated with lower economic growth. Lastly, the constant term (C) has a significant coefficient of β = -0.573 (t = 14.02, p = 0.000), representing the intercept in the model.

The estimated model, E = f + K + L - b3(Dd) - b4(Df) + u becomes;

E = -0.573 + 0.144K - 0.594L - 0.722(Dd) - 0.442(Df) + 0.0057

The findings from the VECM analysis in Table 4.10 indicate the significant and negative impact of both domestic and foreign debt, while also highlighting the roles played by other critical elements such as capital and labour.

Specifically, the study established that Domestic Debt (Dd) has a negative coefficient and is highly significant (β = -0.722, t = -6.11, p = 0.000), signifying a substantial adverse effect on economic growth. This negative relationship between economic growth and domestic debt is attributed to the crowding-out effect. This heightened competition for funds causes a rise in interest rates, rendering it more costly for businesses to secure loans and invest in capital and labor. Consequently, higher levels of domestic debt can deter private sector investments, which are pivotal for fostering economic growth (Ndemange, 2018).

Similarly, Foreign Debt (Df) exhibits a significant and negative coefficient (β = -0.442, t = -6.57, p = 0.000), in line with previous research (Khan et al., 2014). The link between economic growth and foreign debt is due to various factors, with one of them being the potential risk of foreign debt. When a large part of a country's debt is in foreign currencies, the economy faces exchange rate risks. A negative change in exchange rates can increase the costs of repaying foreign debt, leading to higher debt-related expenses and possibly diverting resources from productive investments. Additionally, repaying foreign debt requires foreign currency, which can increase the demand for foreign exchange, possibly causing the domestic currency to depreciate and causing inflationary pressures. These factors can collectively slow down economic growth. (Khan et al., 2014).

Conversely, Capital (K) has a positive and significant effect on economic growth (β = 0.144, t = 6.34, p = 0.000), which is consistent with economic theory. This finding aligns with economic theory, which suggests that increased capital investment contributes to economic growth by enhancing productivity and expanding a country's capacity for production (Ndemange, 2018). When businesses invest in new equipment, technology, and infrastructure, they become more efficient and competitive, which ultimately spurs economic growth. Labor (L), however, exhibits a negative and significant coefficient (β = -0.594, t = -7.46, p = 0.000). This result may indicate that an increase in labor costs, possibly due to higher wages or other labor-related expenses, negatively affects economic growth (Khan et al., 2014). Higher labor costs can reduce a firm's profitability and competitiveness, leading to lower investment in labor-intensive industries and, consequently, slower economic growth.

In summary, the study indicates that higher levels of both domestic and foreign debt can hinder economic growth. The results are consistent with previous research conducted by Khan et al. (2014) and Ndemange (2018), which also observed a negative impact of public debt on economic growth. Ndemange (2018) specifically noted that Kenya went through a period of debt overhang, characterized by high debt servicing costs and low capital formation, which hindered economic growth.

However, it's worth noting that the current study's findings differ from research conducted by Murkos et al. (2007) and Mbalu and Matanda (2021), which established a positive relationship between economic growth and public debt. Additionally, Khan et al. (2014) concluded that while the direct impacts of public debt on economic growth were positive, they were statistically insignificant, suggesting that public debt had no direct role in promoting economic growth.

These varying results underscore the complexity of the relationship between public debt and economic growth, which may be influenced by a range of factors, including the economic context and the specific conditions within each country. This study's findings add to the broader discussion about this significant economic issue and provide valuable insights for policymakers and researchers.

Table 4.11: Normality Tests for Public Debt and Economic Growth

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	Jarque-Bera	Probability
GDP	22	0.2503	0.9512	0.93697	0.4837
Capital	22	0.3509	0.0170	0.87531	0.4079
Labour	22	0.2523	0.2175	0.92561	0.2031
Domestic Debt	22	0.0209	0.5370	0.83596	0.0647
Foreign Debt	22	0.0101	0.3917	0.76872	0.3065

Source: Research Data (2023).

Table 4.11 presents the normality test results conducted for the variables connected to public debt and economic growth. The normality test p-values of the variables are as follows: Capital (p = 0.4079), GDP (p = 0.4837), Labour (p = 0.2031), Domestic Debt (p = 0.0647), and Foreign Debt (p = 0.3065). Based on the 0.05 significance level, none of the variables show significant departures from normality. The p-values for Capital, GDP, Labour, Domestic Debt, and Foreign Debt are all above the conventional threshold of 0.05, indicating that there is no strong evidence to suggest significant deviations from normality for these variables. Therefore, we can conclude that these variables follow a normal distribution.

Table 4.12: Multicollinearity Tests for Public Debt and Economic Growth

Variable	VIF	1/VIF
Capital	3.76	0.265957
Labour	2.13	0.469484
Domestic Debt	1.12	0.892857
Foreign Debt	2.98	0.33557

Source: Research Data (2023).

The multicollinearity tests for the variables in Table 4.12 indicate the following VIF values: Capital (VIF = 3.76), Labour (VIF = 2.13), Domestic Debt (VIF = 1.12), and Foreign Debt (VIF = 2.98). The VIF values represent the degree of multicollinearity between the variables. In this case, all variables have VIF values below 5, indicating that multicollinearity is not a significant issue in the model. Therefore, based on these results, it can be concluded that multicollinearity is not a problem in the effect of public debt on economic growth in this study.

Table 4.13: Breusch-Pagan Heteroscedasticity Test for Public Debt and Economic Growth

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity Ho: Constant variance	
chi2(1)	0.02
Prob > chi2	0.8918

Source: Research Data (2023)

The results of Breusch-Pagan Heteroscedasticity, as displayed in Table 4.13, reveal a chi-square statistic of 0.02 with a corresponding probability of 0.8918. In this test, the null hypothesis (Ho) supposes a constant variance, suggesting that the error terms exhibit homoscedasticity.

Because the p-value (0.8918) surpasses the 0.05 significance level, there is no valid reason to reject the null hypothesis. This shows that there is no evidence of heteroscedasticity in the model, signifying that the error terms variance remains consistent. Therefore, based on the Breusch-Pagan Heteroscedasticity Test results, it can be concluded that heteroscedasticity is not present.

Table 4.14: Test for Serial Correlation for Public Debt and Economic Growth

Breusch-Godfrey LM test for autocorrelation			
lags(p)	chi2	df	Prob > chi2
1	0.094	1	0.7588
H_0: no serial correlation			

Source: Research Data (2023).

Table 4.14, presents the Breusch-Godfrey LM test autocorrelation results. The chi-square statistic for the test is 0.094 with 1 degree of freedom, and the associated probability is 0.7588. In this test, the null hypothesis (H0) assumes there is no serial correlation, indicating that the residuals are independent and exhibit no autocorrelation. Since the p-value (0.7588) is higher than the 0.05 significance level, the null hypothesis is not rejected. This indicates no substantive indication of serial correlation in the residuals, implying the errors are not

correlated across different time periods. According to the results of the Breusch-Godfrey LM test, there is no significant serial correlation observed in the examination of how public debt affects economic growth in this study.

Table 4.15: Test for Omitted Variables for Public Debt and Economic Growth

Ramsey Reset test Ho: model has no omitted variables	
F-statistic	0.26
Prob > F	0.8554

Source: Research Data (2023).

The Ramsey Reset test results, shown in Table 4.15, involve a null hypothesis (Ho) assuming that the model includes all relevant variables, indicating that the existing independent variables sufficiently account for the dependent variable's variation. The F-statistic is 0.26 with a probability of 0.8554. Since the p-value (0.8554) is greater than the 0.05 significance level, we fail to reject the null hypothesis. This means there's no strong evidence of omitted variables in the model. Thus, it can be established that the existing independent variables effectively explains economic growth variation, and there's no need to add more variables based on the Ramsey Reset test results.

V. Summary, Conclusion And Policy Implications

Introduction

This chapter offers a thorough summary, conclusion, and policy implications derived from the study's findings. The research has examined the impact of public debt on private investment and economic growth in Kenya, yielding valuable insights that have direct relevance to policy decisions and the overall economic development of the country. The study makes a significant contribution to existing knowledge by offering insights into the specific dynamics of public debt, private investment, and economic growth in Kenya. Furthermore, the chapter suggests avenues for future research, encouraging further exploration of the mechanisms through which public debt affects private investment and economic growth.

Summary of the Study

The first objective of the study was to examine the effect of public debt and private investment in Kenya. The findings indicate a significant negative effect of domestic debt on private investment ($\beta = -0.738$, $p < 0.001$) and foreign debt on private investment ($\beta = -0.107$, $p < 0.001$). This means that with every one-unit increase in domestic and foreign debt, private investment decreases by 0.738 units and 0.107 units, respectively.. The analysis also considered other variables such as income ($\beta = 0.862$, $p = 0.006$), tax yield ($\beta = -0.188$, $p = 0.049$), and total money supply ($\beta = 0.511$, $p < 0.001$) which showed significant associations with private investment.

The second objective of this study was to examine the effect of public debt on economic growth in Kenya. The findings indicated a significant negative effect of both domestic debt ($\beta = -0.722$, $p < 0.001$) and foreign debt ($\beta = -0.442$, $p < 0.001$) on economic growth, suggesting that a rise in public debt is associated with a decrease in economic growth. Additionally, other factors such as capital ($\beta = 0.144$, $p < 0.001$) and labor ($\beta = -0.594$, $p < 0.001$) also exhibited significant associations with economic growth.

Conclusions

The analysis revealed a significant negative relationship effect of public debt on private investment, indicating that increased levels of public debt correspond to a reduction in private investment. This implies that too much reliance on public debt can crowd out private sector investments, potentially hindering economic development and growth in Kenya. Variables such as income, total money supply and tax yield were also found to have significant associations with private investment. There is therefore need for effective debt management strategies and policies that promote a favorable investment climate and encourage private sector participation in Kenya.

The analysis of the effect of public debt on economic growth in Kenya unveiled a significant negative effect of public debt on economic growth. This implies that higher levels of public debt can have negative effects on economic growth, potentially impeding the country’s overall development. The study also identified significant associations between economic growth and other variables, including capital, labor, domestic debt, and foreign debt. These findings emphasize the importance of prudent debt management practices to ensure sustainable economic growth.

Policy Implications/Practice

Based on the findings of the study, there are several policy implications concerning the effect of public debt on private investment in Kenya. Firstly, policymakers in the National Treasury and Economic Planning should prioritize prudent debt management practices to avoid excessive accumulation of public debt. It is crucial to implement effective monitoring and control mechanisms to ensure that borrowed funds are channeled towards productive investments that can generate sufficient returns to service the debt. Secondly, efforts should be made by policymakers to create a favorable investment climate that encourages private sector participation. This responsibility falls on entities such as the Ministry of Trade and Industry. It is suggested that policymakers in this ministry implement policies that reduce barriers to entry for businesses, provide incentives for private investment, and promote economic diversification. These measures can attract more private investments, leading to increased economic activity and job creation.

In terms of the effect of public debt on economic growth, policymakers should prioritize measures to control public debt levels and ensure that borrowing is directed towards projects with a potential to stimulate economic development and growth. This responsibility lies with the National Economic and Social Council, which consists of high-level decision-makers in the country. Additionally, strategies should be devised to boost domestic capital formation and attract foreign direct investment to complement public investments. This can be achieved through the implementation of policies that enhance productivity, improve infrastructure, and invest in human capital.

Contribution to Knowledge

This study has significantly added to the existing knowledge in the field of public debt, economic growth, and private investment, with a specific focus on Kenya. Firstly, it provides empirical evidence that enhances our comprehension of the interplay among these variables. The research has expanded our understanding of how public debt levels influence economic growth in Kenya and has offered valuable insights into the repercussions of public debt levels on private investment endeavours.

These findings are of great significance as they contribute to a more nuanced comprehension of the factors that influence economic growth and private investment decisions within the Kenyan context. Furthermore, these insights are valuable for policymakers, as they provide essential information for the development of effective strategies aimed at promoting private sector participation and fostering economic growth in Kenya.

Areas for Further Research

While this study has made valuable contributions to the understanding the connection between public debt, economic growth, and private investment in Kenya, there are still several areas that warrant further research. Further research can explore the the cause-and-effect links between public debt, economic growth, and private investment using advanced econometric techniques such as panel data analysis or instrumental variable approaches. In addition, future research could delve into sectoral analysis to understand how public debt affects different industries or sectors within the economy. Given concerns about the sustainability of public debt, future studies can focus on debt sustainability analysis. Researchers can assess the long-term implications of debt accumulation on fiscal sustainability and macroeconomic stability. Finally, comparative studies across countries or regions can offer valuable insights into the differences in the relationship between public debt, private investment, and economic growth.