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**THE IMPACT OF TAX CHANGES ON NATIONAL DEBT: EVIDENCE
FROM KENYA**

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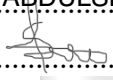
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ABSTRACT

The study was to establish the influence of changes in tax policies with regard to the fiscal policies on Kenya's national debt in relevance to economic growth and development. Using regression analysis, this study explored relationships between tax policies and debt levels by using data for 44 years. It put forward fiscal challenges facing Kenya in terms of rising debt-to-GDP ratio, inefficiencies in tax collection, and expenditure allocation. The study further reviewed related theories and empirical studies, which helped to identify the gaps in understanding how tax reforms affect debt management. The research described the quantitative approach used, including descriptive analysis, correlation, and diagnostic tests. The results showed that the independent variables have a strong positive relation with the national debt, where the regression R-value is 0.816, and the R^2 is 0.665; thus, the independent variables explained 66.5% of the variation in national debt. Out of these, the tax-to-GDP and debt-to-GDP ratios proved to be substantial determinants. At the same time, VAT and income tax had a very insignificant direct effect but were strongly correlated with other fiscal variables. Diagnostic evaluations validated the model's dependability, revealing that both multicollinearity and heteroscedasticity remained within acceptable limits alongside a mild positive autocorrelation (Durbin-Watson = 1.223). The investigation concluded that judicious tax reforms, effective revenue collection methods, and equitable expenditure policies were essential for achieving sustainable debt management in Kenya. Recommendations included the equitable expansion of the tax base to avoid overburdening low-income earners, enhancing compliance through modernized systems, reducing recurrent expenditures to prioritize development projects, and fostering economic growth to bring the debt-to-GDP ratio in line with international benchmarks. These findings offered actionable insights for policymakers to address Kenya's fiscal challenges and achieve long-term economic stability.

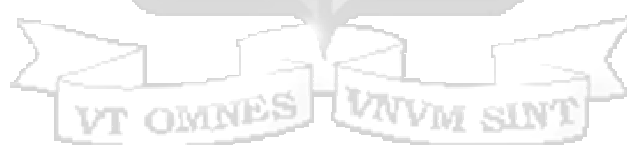


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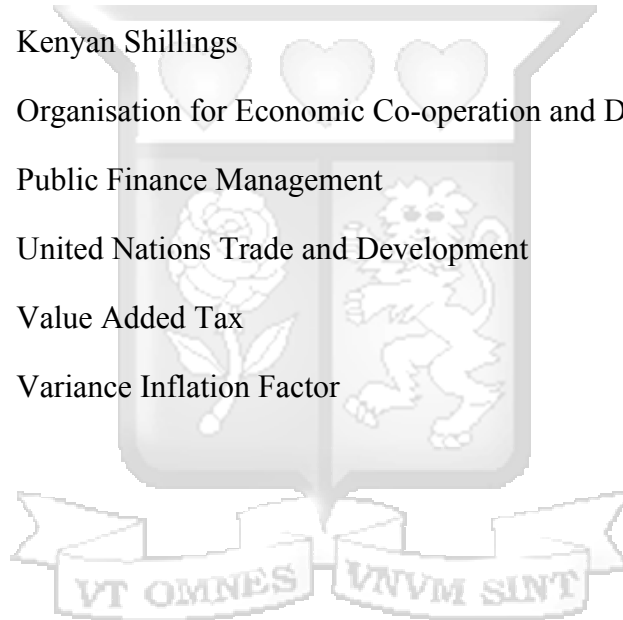
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LIST OF ABBREVIATIONS

ANOVA:	Analysis of Variance
CBK:	Central Bank of Kenya
DW:	Durbin-Watson
GDP:	Gross Domestic Product
IMF:	International Monetary Fund
ISO:	International Organization for Standardization
KNBS:	Kenya National Bureau of Statistics
KRA:	Kenya Revenue Authority
KSH:	Kenyan Shillings
OECD:	Organisation for Economic Co-operation and Development
PFM:	Public Finance Management
UNCTAD:	United Nations Trade and Development
VAT:	Value Added Tax
VIF:	Variance Inflation Factor



CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Tax policies in many developing countries are often aimed at raising enough taxes to support their economies. However, setting up a fair and efficient tax system can be extremely difficult for developing nations seeking to be integrated into the global economy (Ismail, 2020). Kenya, as a developing economy, faces numerous challenges in creating an efficient tax system. Theoretically, an ideal tax system is expected to enable a country to raise the necessary revenue without discouraging economic activity and without excessive government borrowing and debt (Ismail, 2020). However, Kenya currently faces formidable challenges in attempting to establish an efficient tax system. Studies show that while Kenya has experienced continuous growth in its economy in the past decade, it has had a weak fiscal path (Gachari & Korir, 2020). Kenya's fiscal rating as of 2018 was 3.5 lower than that of Rwanda and Uganda, but it is similar to that of Tanzania.

As the leading economy within the East African community, Kenya's fiscal policy rating should rank higher. In a more recent assessment of Kenya's fiscal policy, studies show that the composition of revenues and expenditures is unbalanced (Matheka & Etyang, 2023). According to one study, the gap between Kenya's recurrent expenditure and development expenditure continues to widen. Currently, recurrent expenditure is twice as much as development expenditure (Mukui et al., 2022). This trend has been witnessed for the past five years, creating a need for the government to review expenditure allocation. Similarly, reports show that the largest share of recurrent expenditure constitutes salaries and wages, at approximately 40% (Matheka & Etyang, 2023). Further, in the 2020/2021 fiscal year, recurrent expenditure accounted for close to 80% of the total government expenditure as opposed to the recommended 30% threshold specified in the Public Finance Management (PFM) Act 2012 (Matheka & Etyang, 2023). Evidently, Kenya needs to review its fiscal policies that affect its taxation and spending.

Historically, Kenya has witnessed economic growth but also experienced an increasing disparity between the rich and the poor as an influence of tax distribution. The tax laws that govern government expenditure and spending are amended annually during the national budget process through the financial bills (Juma et al., 2020). Over

the last two decades, these policies have significantly evolved, undergoing reforms aimed at modernizing the fiscal framework. Some of the changes witnessed include the introduction of new levies and taxes, such as the Value Added Tax (VAT), and the broadening of the Tax base (Juma et al., 2020). Taking an example of the recently proposed Financial Bill 2024, the government recommended the introduction of new taxes such as the Digital Service Tax and taxation of non-residents at 6% turnover in an aim to capture a population not included in the previous year and raise more revenue. Unfortunately, the recent efforts to increase the tax revenue have equally been faced with additional challenges, such as tax evasion amidst economic fluctuations (Njoroge, 2023). The changes witnessed in the Finance Bills yearly are evidence of a country aiming to streamline its tax collection and administration to adapt to domestic fiscal needs and global economic trends.

Nevertheless, as Kenya grapples with streamlining its fiscal policies and tax system, the implemented tax changes have an impact on the citizens, national budget, and expenditure. Consequently, it has an extended effect on the national debt, revealing a relationship between tax changes and national debt. According to one study, tax policies have a significant impact on national debt dynamics (Salmon, 2021). The causal relationship between these two concepts can lead to an increase or reduction in national debt. Theoretically, an increase in tax rate should result in reduced national debt (Salmon, 2021). However, empirical studies show that these results are dependent on how effective a country's tax system is, government spending patterns, and economic conditions (Salmon, 2021). As such, fiscal growth, economic growth, and institutional capacity challenges all impact tax changes and national debt by extension in numerous ways.

1.2 Problem Statement

Kenya is one of the fastest-growing economies not only within the Eastern African community but also in Sub-Saharan Africa. A report generated by the World Bank in 2023 revealed that the country's GDP growth rate was 5.4% in 2023 compared to 4.8% the previous year (World Bank, 2024). These statistics are evidence of a growing economy. However, the country faces significant debt challenges. Managing public debt has become a challenge for the government in the last decade, with the country's debt increasing significantly over the previous two years (Kiplangat, 2023). According to a report generated by the Central Bank of Kenya (CBK), the country's

debt averaged at approximately Ksh. 11 trillion as of December 2023, up from Ksh. 8.6 trillion in June 2022, with this amount predicted to increase in the next financial year (CBK, n.d.). Recently, the President of Kenya withdrew the proposed Financial Bill 2024, a decision that may have a significant impact on the country's expenditure, resulting in additional debt accruing. The rising debt amount has, in turn, affected the debt-to-GDP ratio to approximately 70%, which is 20% higher than the recommended 50% threshold recommended by the International Monetary Fund (Kiplangat, 2023). While this debt amount consists of both domestic and international debt, it raises questions on what the country can do to negate the high debt amount and the role that tax changes play in paying it.

While the government has been working to reduce its borrowing, the repayment pressure on the citizens, and interest rates, the burden will be borne by the taxpayers. The rising debt amount has become a concern to citizens, especially with regard to its implication for macroeconomic and fiscal stability (Kiplangat, 2023). There is also increasing concern about the government's ability to repay maturing bonds and accruing interests (Kiplangat, 2023). As the situation continues to deteriorate, the Kenyan shillings continue to depreciate as the price of imports rises, increasing associated expenditure. Additionally, government expenditure continues to rise each year, raising questions about the country's ability to pay off the increasing debt (Kiplangat, 2023). The government's spending increased from Ksh 3.027 trillion in the 2021/2022 financial year to Ksh. 3.221 trillion in the 2022/2023 financial year (Cowling, 2024). This figure was expected to increase for the 2023/2024 financial year, with the proposed amount standing at Ksh 3.914 trillion.

Without changes in spending rules and taxes, the national debt will keep increasing, and in the next decade, the national debt could triple in value. In an attempt to understand how to repay the national debt, this study investigates the impact that tax changes can have on the national debt. Studies argue that raising taxes and cutting spending can reduce national debt (Obiero & Topuz, 2022). However, the success of these measures is dependent on their sustainability in the long term. More recently, citizens of Kenya have held demonstrations to protest about the high cost of living and the proposed increase in levies and taxes. These demonstrations raise questions on the impact of tax changes on national debt and how viable the solution is in the short and long term.

1.3 Research Objectives

The relationship between tax changes and national debt has been a focus of study for decades. Managing national debt is a key concern for all governments globally due to its impact on a country's growth and economic stability. In Kenya, the dynamic between tax policy changes and national debt is shaping its fiscal sustainability. The main objective of this study is to investigate the impact of tax changes on national debt in Kenya. The specific objectives of this study are:

1. To compare Kenya's national debt trend over the last decade with international benchmarks.
2. To assess the effectiveness of Kenya's tax system and collection strategies as implemented by KRA in managing national debt.
3. To examine the relationship between tax rate changes and Kenya's national debt fluctuations in the last decade.

1.4 Research Questions

1. How does Kenya's national debt trend compare with international benchmarks?
2. How effective are Kenya's tax collection strategies in mitigating and managing national debt?
3. What is the relationship between tax rate changes and Kenya's national debt fluctuations in the last decade?

1.5 Significance of the Study

Kenya has increasingly accumulated its national debt in the past five years. This alarming increase in debt levels raises concerns for taxpayers and policymakers about its implications for macroeconomic and fiscal stability and sustainability. Given the failing institutional and regulatory framework of government debt management, it is crucial to develop a causal relation between tax changes in the country and the national debt. This study will provide insight into policy changes that will enable more effective debt management and reduce the debt burden on the taxpayers. Therefore, this study is crucial for policymakers and other researchers, offering solutions to the debt challenge that could enhance the country's economic development.

1.6 Chapter Summary

This chapter delved into the background of the research background, the research problem that warranted the research, research objectives and research questions, and why the research is significant.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction to Fiscal Policy and National Debt

Governments use fiscal policies to influence the economy, including government spending and taxation changes. The role of these policies gained prominence during the COVID-19 period and previous global economic crises (Benmelech & Tzur-Ilan, 2020). Governments had to step in to mitigate the impacts of the crises, jump-start growth, and support financial systems. Therefore, policymakers can equally leverage fiscal policies to influence how resources are used in a country. Fiscal policies equally influence tax rates to provide the necessary funding to support government projects and expenditures (Albassam, 2020). As such, there is a correlation between fiscal policies employed by a country, the tax raised, and the national debt. This chapter provides a comprehensive overview of the relevant theories, empirical evidence, research gaps, and conceptual frameworks associated with these concepts.

2.1.1 Definition and Importance of Fiscal Policy

Various authors define fiscal policy in different ways. According to Bonam et al. (2022), fiscal policies are tools used to stimulate an economy. The authors elucidate that fiscal policies can bring an economy back on track. This definition is echoed by Yanushevsky and Yanushevsky (2018), who define fiscal policies as using government spending and taxation to achieve macroeconomic goals. From these definitions, fiscal policy can be summarized as tax policies and spending programs used by the government to guide economies. Through fiscal policies, governments can influence economic growth, inflation, employment, and the aggregate demand for goods and services (Adegboyo et al., 2021). During a recession or a crisis, the government may lower tax rates and increase spending to spur the economy.

On the other hand, when a country is experiencing inflation, the government can increase taxes to reduce demand and cut spending. Fiscal policies can also be used to influence the private sector (Murungi et al., 2023). When spending within the private sector decreases, governments can tax less or spend more to increase the overall demand (Murungi et al., 2023). Similarly, the government can spend less and tax more to reduce the overall demand when the private sector spends too quickly and too much

on new investment projects. Fiscal policies can significantly impact the economy depending on how the government utilizes them (Murungi et al., 2023). Their use can also impact the demand for goods and services in an economy, depending on the rate of taxes.

2.1.2 Overview of National Debt and Its Significance in Economic Stability

The national debt can be defined as the amount of money borrowed by the federal government to manage the country's expenses over time. However, national debt matters as it can burden a country, especially regarding the higher interest rates accrued in the long term (Yamin et al., 2023). For many African countries, such as Kenya, the national debt is on an upward trend, threatening the country's economic future. Interests on national debts grow rapidly. According to a report generated in 2023, Kenya's debt increase rose by Ksh 231.6 billion (Central Bank of Kenya, 2023). The interest accrued adds pressure to the country's budget and government spending. As such, the government is required to pay this interest in addition to the principal loan. Unfortunately, the treasury expected the interest payments to rise to Ksh 900 billion in the 2023/2024 financial year.

Consequently, a country may spend more on interest costs than it does on domestic projects and programs. Rising debt slows economic growth and reduces business investment (Malovaná et al., 2023). It also erodes confidence in a country's currency and increases the expectation for higher inflation rates. In a third-world country like Kenya, the rising debt could leave the country at a higher risk of a fiscal crisis. It also leaves little flexibility to deal with recessions, crises, and unexpected events (Malovaná et al., 2023). Therefore, addressing national debt is essential to securing a country's economic future. This action could help a country pursue sensible reforms and sustainable solutions to long-term fiscal policies.

2.2 Theoretical Framework

Several existing theories explain the national debt and fiscal policy theories, attempting to explain the relationship between the two. Three key theories attempt to describe fiscal policy: Keynesian Theory, Austerity Theory of Fiscal Policy, and Barro's Theory of Debt Neutrality. These theories provide different perspectives on the impact of fiscal policies on a country's spending, inflation, and economic growth.

Each of them can act as a guide on decisions involving debt management, taxation, and government spending.

2.2.1 Keynesian Theory

Keynesians believe total economic spending impacts inflation, employment, and output. According to this macroeconomic Theory, a country's economy works through three key principles. First, changes in aggregate demand largely affect employment rates and output. This argument assumes that prices are relatively rigid (Eichengreen, 2020). Consequently, when an economy experiences spending fluctuations, the output equally changes. Therefore, if the government increases its spending and all the other spending components remain constant, the country may experience increased output (Eichengreen, 2020). On the other hand, this Theory argues that the impact of supply and demand on prices, especially wages, is slow. As a result, an economy may experience a shortage or surplus of labor at different times. Lastly, this Theory elucidates that public and private decisions affect an economy's aggregate demand (Eichengreen, 2020). For example, reducing consumer spending in the private sector may force the government to intervene and develop policies that stimulate the economy. Essentially, this Theory argues that an ideal economy would be partly operated by the government but guided by the private sector. Hence, when a country experiences economic difficulties, the government can step in and develop policies that boost economic activity, reduce taxes to stimulate demand, and increase spending.

2.2.2 Austerity Theory

On the other hand, this Theory, while controversial, elucidates the importance of fiscal policies and fostering economic growth. According to this Theory, fiscal and economic policies will often consist of spending cuts and tax increases. These actions enable the government to reduce its budget deficits (Botta, 2020). Theoretically, these measures can be used in an economy at any time, especially when the government is concerned about the expenditures exceeding the government revenues. Consequently, these strict policies imposed by the government can help reduce its budget deficit (Botta, 2020). Advocates of this Theory argue that the policies initiated to this effect can bring long-term stability to a country, thus reducing the national debt and future debt pressure and burden on the country and future generations.

2.2.3 Theory of Debt Neutrality

Barro's Theory of debt neutrality suggests that when a government increases its debt-financed government spending to stimulate the economy, demand remains constant as the public saves more in anticipation of rising tax rates that will be used to increase collection and pay off the debt (Sardoni, 2021). This economic Theory stipulates that an individual's consumption is determined by the present value of their income after tax for a lifetime. Therefore, it is difficult for the government to stimulate consumer spending as individuals assume that whatever is gained presently will be offset by rising taxes in the future (Sardoni, 2021). This Theory argues that whether a government chooses to increase its budget through raising taxes or borrowing has little impact on demand. Eventually, the debt-financed public spending affects the private sector's spending.

2.3 Empirical Evidence

2.3.1 Comparative Analysis of International Debt Trends

A recent report by the United Nations Trade and Development (UNCTAD) reveals that numerous governments globally utilize public debt to invest in and protect their citizens and finance their expenditures. The global debt reached \$97 trillion last year, with the debt of developing countries accounting for a third of this amount (UNCTAD, 2023). However, while this amount may seem nominal compared to the total amount, the report indicates that the debt amount of developing nations has risen twice since 2010. These statistics are evidence of increased borrowing by developing nations. As evidenced in Figure 1 below, Africa's debt amount has risen consistently over the last decade. Unfortunately, the borrowing costs for developing nations are higher, with many countries currently facing growing and high costs of external debt (UNCTAD, 2023). Evidence shows that developing regions borrow loans at rates that are twice or quadruple that of developed nations such as the United States.

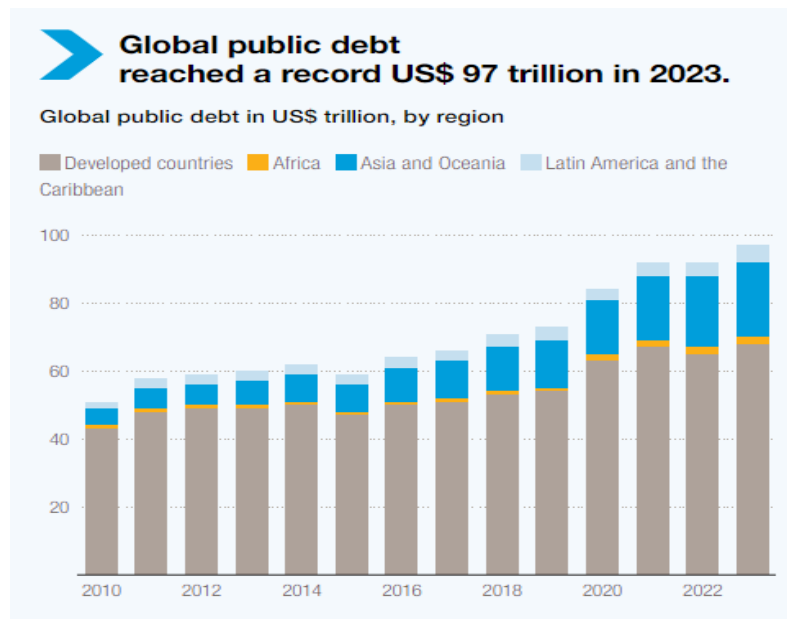


Figure 1: Global public debt in US\$

When you compare the rates to those of a developed nation such as Germany, a developing nation may be loaned up to 12 times higher. Taking Kenya as an example, the debt trend is not any different. It is forecasted to continuously increase and reach an all-time high of Ksh 17.5 trillion by 2029 (CEICdata.com). According to the latest data from the Central Bank of Kenya, Kenya's debt stood at Ksh 10.3 trillion, an additional Ksh 1.6 trillion from the previous financial year (UNCTAD, 2023). As of 2023, Kenya's debt-to-GDP ratio rose to 70.2%, which is 20% higher than the recommended threshold by the IMF. As evidenced in other developing nations, Kenya's borrowing rate is 13%, a level not seen since 2012 (UNCTAD, 2023). This rate is expected to increase in tandem with the monetary tightening stance. Unfortunately, this dynamic increases the interest rates attached to these loans and the resources needed to pay the creditors. As a result, developing nations may find it difficult to finance investments and local projects. A report by UNCTAD, 2023 has noted that over the recent years, many developing countries have seen a high increase in public debt due to high borrowing costs and reliance on external loans. Most developing nations borrow at higher interest rates than developed nations. It has, therefore, made managing debt and attaining fiscal sustainability more difficult for developing countries. Hayrullahoglu and Tuzun (2020) conducted a study that proved

that various OECD countries, of which Turkey is a member, implemented several progressive taxation policies that have contributed to the reasonable distribution of wealth and further reduced their national debt. They note that this has been achieved through increasing revenue by charging high rates to people earning higher incomes (a thing they do without overburdening low-income households).

A comparative analytical study undertaken by Liu and Zhang, 2023, noted that the Kenyan tax system is less progressive than most of the OECD countries, hence having a limited capacity to raise enough revenue to help reduce national debt. This situation is occasioned by Kenya's very regressive tax system, coupled with rampant tax evasion. This has made implementing fiscal reforms that could stabilize the country's finances difficult.

Malovaná et al. (2023) remark that developing countries are charged with much higher interest rates on the international markets than developed nations; this makes it more costly for developing nations to seek loans. In Kenya, interest rates were as high as 13 percent imposed on the government, much higher than that available to developed nations like the United States and Germany. This makes servicing more problematic and increases Kenya's fiscal deficit even further. This also pegs the high cost of borrowing with the credit rating issue for Kenya, which was downgraded by several international agencies recently. According to a World Bank report dated 2024, Kenya has been downgraded in credit rating due to concerns related to the country's capability to repay its debt. This made borrowing more expensive for Kenya, hence exacerbating the crisis further. This report reveals that unless Kenya improves fiscal management, the country will continue to face high borrowing costs; hence, debt sustainability in the long run is not achievable.

A study by Obiero and Topuz, 2022, observes that most developing countries have not managed external debt effectively because of a lack of transparency and accountability mechanisms in the public sector. The authors observe that unless something dramatic happens in how debt is managed, these countries will continue to have unsustainably high levels of debt that threaten their economic stability.

2.3.2 Overview of National Debt Trends

Over the decade, Kenya's national debt has been on an upward trend and currently stands at Ksh 10.6 trillion at the end of June 2024. It now represents a 70.1%

debt-to-GDP ratio, higher than that recommended by the International Monetary Fund threshold level at 50%. Therefore, the increased need to finance recurrent and development expenditures is attributed to increased government borrowing, which increased national debt. Increased government borrowing, which increased national debt, is thus attributed to an increased need to finance recurrent and development expenditures. The Kenyan government has borrowed in great increments from the domestic and international markets, which has resulted in an unsustainable burden of debt threatening economic stability in the country. In any case, such tendencies reflected the more general problem of many developing countries represented by states of Africa.

This is increasing debt largely attributed to fiscal imbalances in government expenditure. For instance, Mukui et al., 2022 indicate that there has been an increasing disparity between recurrent and development expenditures, where the former takes up as much as 80 percent of the national budget in Kenya. In this respect, the anomaly that has been identified places the government in an untenable position, with the feeling and reality that it must depend exclusively upon borrowings to fulfill its financial requirements. If not sorted out permanently, this problem will cause the country's debt growth and create problems paying back loans to successive generations. The growing debt also reflects that Kenya's fiscal policies have structural problems, which, to Date, have been difficult to correct amidst current reform efforts.

Developing nations have, therefore, been helpless under high interest rates that raise the cost of debt. Malovaná et al. (2023) observed that the period of low interest rates in developed economies built up debt accumulation in developing countries. Kenya did not miss joining the bandwagon, where many African countries took advantage of the low-interest loans during the period. When global monetary policy began to tighten, debt servicing costs grew rapidly. This has worsened the precarious fiscal situation that had already existed in Kenya, given that it is in this that the government is obliged to carve out the largest chunk of its budget to service its debt.

Apart from external factors, domestic factors have contributed to the rising levels of debt in Kenya. For instance, a study by (Gachari Korir, 2020) indicated that fiscal deficit levels have increased in Kenya due to inefficient public sector management and corrupt practices, compelling the government to increase borrowing above expectations. All these have increased the need for more borrowing while

weakening fiscal reforms that would work to reduce the national debt. In addition, other challenges Kenya faces include dependency on international financial institutions for budgetary support. According to a report released by the World Bank 2024, Kenya has received huge financial aid from the IMF and the World Bank in the last 10 years. However, with these loans come strings: the government usually has to institute unpopular measures of economic austerity, which has caused protests and political instability that resulted in the Gen Z revolution in Kenya. Meant to stabilize economies, such requirements most often only further heighten social tensions and impede economic growth.

Another factor that challenges debt is the government's inability to throttle recurrent spending. According to Matheka and Etyang (2023), recurrent expenditure entailing wages amounts to the lion's share of the national budget. This, as would be expected, leaves little room for investment in development projects that spur economic growth and reduce future borrowing needs. This calls for Kenya to decrease recurrent expenditure to break off the cycle of borrowing coupled with increasing debt.

2.3.3 Impact of Tax Policy Changes on National Debt

While tax policy is the most important channel through which countries regulate their indebtedness, experience in Kenya has shown that changes in tax rates are not enough to stem the rising debt burden. Salmon, in 2021, conducted a study focused on how tax policies relate to national debt. While theoretically, the countries imposing higher taxes should have low debt, this applies only to countries with efficient tax collection mechanisms and a stable economy. On the other hand, reforms like the introduction of VAT and Digital Service Tax faced many challenges during their implementation, reducing their effectiveness in Kenya in reducing debt. According to Liu and Zhang (2023), since economic shocks foreshocks, for example, caused by the COVID-19 pandemic taxable income, it would be hard for governments to raise revenues required for debt repayment. The pandemic in Kenya has caused wholesale job losses and the closure of businesses that reduce revenues to the government through taxes, increasing its need to borrow for stimulus packages and social safety nets.

According to Njoroge (2023), the level of tax evasion in Kenya has grossly decreased the merit of tax reforms promulgated to increase government revenues.

While the new taxes have been imposed, most business people and individuals have not paid taxes, thus undermining the government's effort to reduce the national debt. Indeed, this is a common problem in many developing countries, where weak enforcement mechanisms generally prevent observance. Thirdly, political instability has contributed to complicating the undertaking of tax reforms in Kenya. For instance, political interferences and corruption have weakened the capacity of the Kenya Revenue Authority to enforce tax policies effectively, argue Obiero and Topuz 2022. The frequent changes in government, added to a spate of public opposition to new taxes, have thus created a policy environment that is unpredictable and full of impediments to long-term fiscal planning.

To this end, Hayrullahoglu and Tuzun, 2020 note that such regressive taxes, like VAT, disproportionately affect the contribution of low-income households toward the national economy and hence reduce overall tax revenues. Overdependence on the VAT component in Kenya has shifted the burden of revenue generation to low-income people, which increases income inequality and stultifies economic growth processes. Also, structural weaknesses within the Kenyan tax system have further been a cause of the country's increasing debt. According to Ojo (2020), Kenya's tax administration includes outdated systems and a lack of transparency, which is illustrated by difficulties in tracking tax payments and compliance. These have resulted in widespread tax evasion and corruption, further reducing the effectiveness of the tax reforms in taming the nation's debt.

2.3.4 Role of Tax Policy in Achieving Fiscal Sustainability

Evidently, many developing nations, including Kenya, experience increasing debt. However, it is also key to understand tax policies' role in achieving fiscal sustainability. According to Olushola et al. (2023), Nigeria is one of the African countries that created the Fiscal Sustainability Act to advance the country's economic goals and enforce fiscal policies that align with the country's goals. This system was created to encourage efficient tax revenue collection (Olushola et al., 2023). Evidence from this study shows that policy actions aimed at increasing taxation capacity and tax revenues have worked in favor of the country, raising its productivity and impacting economic growth. Similarly, in another empirical investigation, findings showed that a country's fiscal capacity spurs development and growth (Ajeigbe et al., 2023). Further, the study reported that all taxes as a source of revenue are significantly related

and positive, except for taxes placed on goods and services (Ajeigbe et al., 2023). Evidently, improving taxes to finance local investment and development projects is key to alleviating poverty and creating jobs.

Additionally, research indicates that countries that have adopted progressive tax systems, taxing higher earning individuals' taxes, have more stabilized government finances and better income distribution. Hayrullahoglu and Tuzun (2020) examined several OECD countries and Turkey, assessing how progressive income taxation affects their government revenues and income distributions. The findings revealed that the progressive tax system was more effective than other tax systems in effectively redistributing wealth to low-income households (Hayrullahoglu & Tuzun, 2020). Governments fostered social equality and enhanced fiscal sustainability by tapping into the higher earning incomes. This tax system's effectiveness also positively impacted the tax policies developed in these regions. However, the biggest challenge to the progressive tax system's success in these regions was poorly structured tax systems. Consequently, many countries faced undermined fiscal stability even after shifting from other tax systems.

2.3.5 Effectiveness of Tax Collection Strategies in Debt Management

A progressive tax system's success depends on the fiscal policies and collection strategies in place. In a study conducted by Ojo (2020), findings revealed that enhancing tax enforcement in a country and compliance measures strengthen a government's fiscal position and increase revenue collection, reducing a country's reliance on debt. The study on Nigeria recognizes the dominant role of income tax in developing a country's economy. It also underscores the importance of suitable policies, legal frameworks, and regulations that create an enabling environment for revenue collection (Ojo, 2023). In a similar study conducted by Hallunovi and Vangjel in Albania, modifying a tax system can significantly impact the revenue collected. Albania was modifying its tax system, which included simplifying its tax structure and customizing it to suit the country's economy, improving tax revenue (Hallunovi & Vangjel, 2023).

As Ojo, 2020, explained, one of the major problems concerning tax administration in developing countries is that there are no mechanisms to enforce compliance with the laws. Many ways are sought to boost tax enforcement, but a huge

part of the population evades it. It does not allow the government to put in all the necessary revenues so that it would reduce the national debt.

Indeed, a study by Liu and Zhang (2023) documented that upgrading tax collection systems in developing countries is increasingly indispensable. Investigating fiscal sustainability in China, modernization to digitalized tax collection systems greatly increased compliance rates and raised government revenues. Indeed, such a reform would help Kenya move away from its highly archaic systems of tax collections, which have perpetuated inefficiencies and frustrated initiatives aimed at bringing down the national debt burden.

According to Njoroge, 2023, the stage at which tax laws in Kenya became incomprehensible and complex to the taxpayer was reached. In contrast, they had become non-viable in their application for individuals and business concerns. This also opened avenues for tax evasion and avoidance, narrowing the scope of effective tax collection. Besides simplifying the tax code, ensuring transparency and accountability are maintained in KRA is paramount if better tax collection is to be witnessed. Corruption and mismanagement of the tax authority in developing countries have grossly eroded efforts put forward toward improving tax collection, as Obiero and Topuz note in their 2022 study. They indicate that with increased publicity and reduced corruption, KRA can increase tax revenue and reduce reliance on external borrowing.

Hayrullahoglu and Tuzun (2020) illustrated that progressive taxes, in which a higher rate is levied against higher-income earners, have resulted in increased government revenues and reduced income inequalities among the populace. In this case, the implicationnya ought to try and emulate such policies as one way of improving its revenue intake without overburdening the low-income citizenry of the nation. On the other hand, Mukui et al. (2022) established that tax evasion in Kenya has been very high, where different businesses and entities fail to pay what they should. They noted that the country was unlikely to realize revenues that might help to pay off her national debt if enforcement mechanisms and penalties against evasion were not made more stringent.

Overall, the empirical literature reviewed explores debt dynamics on an international level within the context of tax collection strategies, tax policy reforms, and global benchmarks. Comparing Kenya's debt trends with international trends provided opportunities and challenges for fiscal sustainability in the country. It also

underscores the importance of tax policy reforms in enhancing revenue collection, especially in a country like Kenya, which utilizes progressive tax collection. Moreover, it highlighted the importance of the Kenya Revenue Authority (KRA) tax system and collection strategies in helping increase revenue collection and its impact on debt management practices and fiscal stability. The examination of empirical evidence provides the basis for suggesting tax reforms in Kenya and further understanding the relationship between tax policy changes and debt fluctuations in the country.

2.4 Research/Knowledge Gaps

Research gaps are unresolved field problems that reflect the lack of existing research on a topic or field. Identifying the research gaps in this field provides a basis for a direction for this study and future studies (Bans-Akutey & Tiimub, 2021). It provides a direction for new research and bridges gaps in existing research. This section discovered the knowledge gaps identified in this chapter.

2.4.1 Identified Gaps in the Literature

Despite the extensive research on fiscal policies and national debt, gaps need to be addressed. First, there is insufficient literature on the impacts of various fiscal policy measures on different economic sectors. Further, many of the studies give a general overview of the effects of fiscal policies. More studies should be conducted to assess individual fiscal policies and their impact on different taxation strategies and frameworks. In the context of developing nations such as Kenya, more studies should be done to capture its unique political, social, and economic dynamics. Few studies have been done to assess the impact of progressive taxation on Kenya's fiscal policies and tax revenue collection. Such studies could provide an informed viewpoint for legislators and policymakers. Additionally, while there are several theoretical studies on national debt, there is a need for more empirical studies that analyze the effectiveness of specific fiscal policies in achieving sustainable debt levels.

2.4.2 Areas Needing Further Research and Investigation

Future studies should address the identified gaps and enhance the understanding of fiscal studies and their impact on national debt levels. More empirical and longitudinal studies should be done to assess the continuous impact of fiscal policy reforms, adjustments in expenditure, and tax policy changes on national debt levels in developing and developed nations. Future studies can also be conducted among

developing countries, comparing how effective different fiscal policy strategies and frameworks have been within different contexts. Moreover, exploring the role of social, economic, and political factors and governance structures in different countries will provide a deeper understanding of how policies adopted fit within different contexts. Lastly, future studies should adopt innovative methodologies such as panel data analyses, which could offer a new perspective on the complex interactions between the study variables.

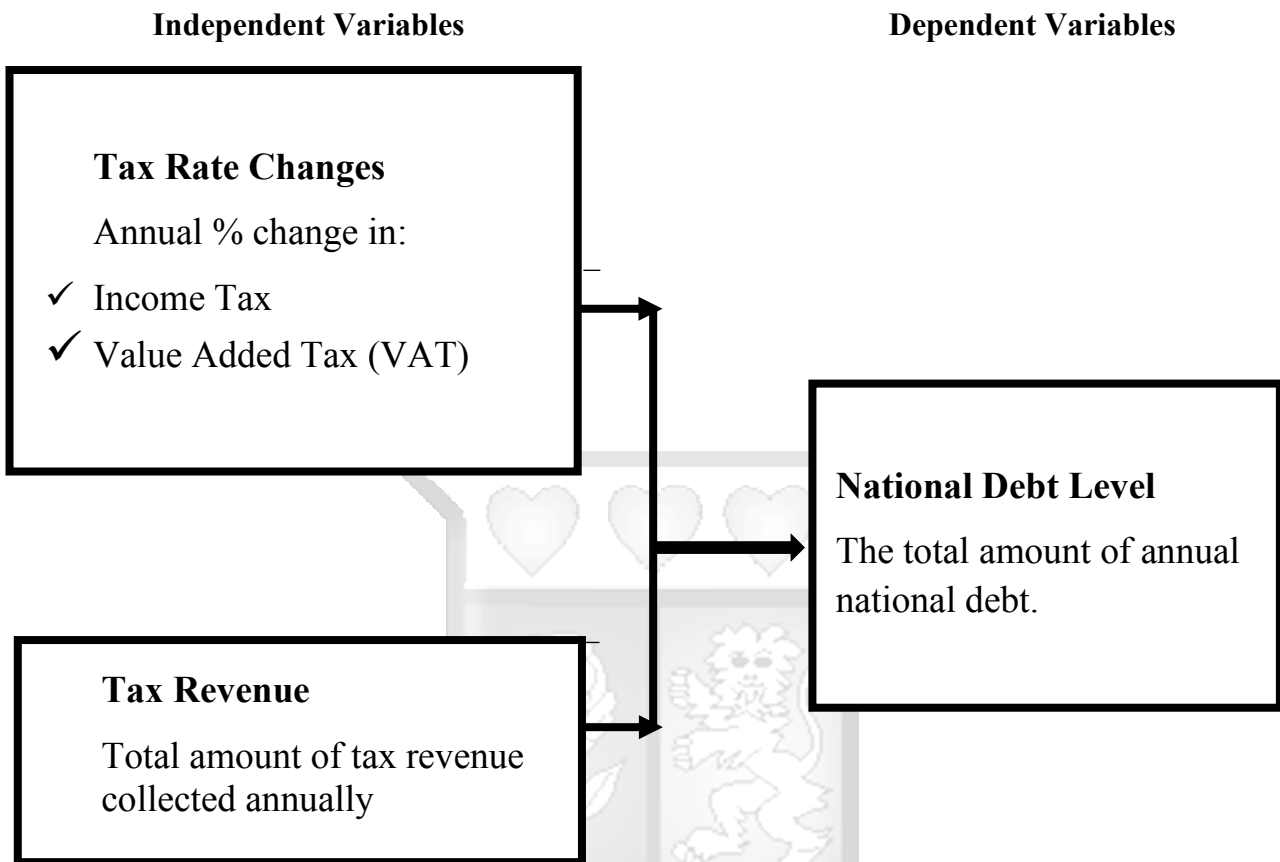
2.5 Conceptual Framework

A conceptual framework illustrates the relationship between the study variables. It enables researchers to define the relevant objectives that guide their research process and methodology, providing a map of how the conclusions will be drawn (Van der Waldt, 2020). It also guides the data collection and analysis process and is built on the identified theoretical framework and empirical studies. The researcher will utilize the conceptual framework elaborated below:

2.5.1 Conceptualizing the Link Between Tax Policy Changes National Debt

The researcher conceptualized the relationship between tax changes and national debt by considering how tax policies affect revenue collection and debt levels. The conceptual framework draws on the theories previously discussed and the empirical evidence. The researcher hypothesized that tax policy changes may stabilize the national debt over time. On the contrary, ineffective tax collection strategies and regressive tax policies could worsen the fiscal imbalance in a country and lead to unsustainable debt accumulation. This study aims to quantify the impact of these effects through regression analysis, thus providing empirical insight. The researcher will utilize data from KRA, KNBS, and the World Bank to identify relevant indicators related to Kenya's debt and macroeconomic factors, such as inflation rates and GDP growth rates, and develop a comprehensive data set that includes national debt indicators and tax-related variables. As such, the study variables were as indicated below:

Figure 2: Conceptual Framework



The specific data collected will be for the national debt levels (dependent variable), tax rate changes, and tax revenue (independent variables). Studies show that the amount of revenue collected in a country funds government expenditure. Revenue collection enables the government to finance development and local projects. However, insufficient revenue generated in a country forces the government to source additional financing through loans to support the country's fiscal budget. According to the KRA, Excise duty, import duty, income tax (PAYE), and Value Added Tax (VAT) are the primary sources of tax revenue. However, this study will focus on Income tax and VAT. Collecting data on annual % changes will shed light on the relationship between tax rate changes and total revenue collected annually. This data will also provide information on how tax rate changes and revenue collected influence national debt levels in an effort to support government expenditure during data analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter elaborated on the methodology used to examine the impact of tax changes on national debt in Kenya. It covered the research design, data sources, population, sampling methods, and analytical tools used.

3.1 Research Design

The choice of research design employed in a study should match the research objectives and be aimed toward collecting high-quality data. As such, the researcher adopted a quantitative approach to investigate the relationship between tax changes, policy reforms, and national debt levels in Kenya. The quantitative method was chosen due to its ability to analyze numerical data systematically and accurately. Further, using quantitative methods enabled the researcher to rigorously examine fiscal variables from available data on KRA and the World Bank dataset. The study equally adopted a descriptive and explanatory research design. These research designs enabled the researcher to define the topic in-depth and explain why the tax policy variables affect national debt levels the way they do (Skinner & Dancis, 2020). The research design allowed the researcher to understand and explore phenomena systematically through analysis and observation. Through the descriptive research design, the researcher summarized and depicted characteristics and trends within the study context and provided a comprehensive study overview. By combining the research design with the explanatory research design, the researcher understood the intricate relationships between these variables and contributed valuable insights to the field. Overall, the analysis of this historical data provided insights into the effectiveness of tax changes in managing debt levels and fiscal deficits.

3.2 Population and Sampling

Studies define population and sample in a myriad of ways. However, the underlying definition of population is the entire group that the researcher wants to infer. The study population comprised 51 fiscal years of annual records on tax rate changes, tax revenue, and national debt levels. On the other hand, a sample represents the specific group from which the researcher collects data (Casteel & Bridier, 2021). There are two types of sampling methods: non-probabilistic and probabilistic

sampling. For this study, the research adopted non-probabilistic sampling (purposive sampling). The type of data collected was secondary. Using Krejcie and Morgan's Table (1970), the research established a sample size of 44 fiscal years of annual records. The specific data collected were income tax, VAT, Debt to GDP ratio and total tax revenue (independent variables), and national debt levels (dependent variable). The data for the 44 years under study was collected from the KRA website, where the information on tax revenue and tax changes are published annually. National debt values were obtained from the Central Bank of Kenya website and the Kenya National Bureau of Statistics for the 44 years under study. As such, the researcher analyzed data over 44 years, including the annual records of the tax rate change, tax revenue, and national debt for the consecutive fiscal years. Kenya introduced the Sales Tax Act in 1973 and revised the tax rates since then.

3.2.1 Variable Definition and Measurement

Table 1: Variable Definition and Measurement

Variable	Source	Measure	Type of Variable	Literature Reference
National Debt Levels	CBK and KNBS	Debt-to-GDP ratio. The total amount of annual national debt.	Dependent Variable	(Gachari & Korir, 2020). (Kiplangat, 2023).
Tax Rate Changes	KRA	Annual % change in tax rates in: Income Tax Value Added Tax (VAT)	Independent Variable	(Juma et al., 2020)
Tax Revenue	KRA	Total amount of tax revenue collected annually	Independent Variable	(Juma et al., 2020)

The study included the selection and integration of comprehensive data sets provided by the KRA, KNBS, and CBK. The researcher opted to use 44 years of data for analysis because it allowed the researcher to deliberately select data that best

represents the fiscal phenomena the researcher aimed to study. Given the nature of the secondary data used in the study, data selection primarily revolved around selecting data based on various criteria, such as the study variables and period. The researcher identified and retrieved data points related to tax change variables such as tax revenue amounts and tax rate changes. The national debt variable involved dynamics, such as debt to GDP ratio and total debt levels over the 44 years.

The data within the 44-year timeframe represented the sample unit, leading to 44 annual data points for each variable under study. The 44-year period consists of major changes in Kenya's fiscal strategies, such as the change that arose from the 2010 Constitution and the change in government regimes. The 44-year period reflected the impact of multiple economic cycles, including fiscal expansion and contraction periods, which are crucial for analyzing the relationship between tax changes and national debt. The approach ensured that the data set represented the entire study objectives and captured significant variations influenced by Kenya's tax changes. The researcher had a specific objective in mind when selecting the study data, which was comprised of data spanning over 44 years for the study variables. The researcher used 44 years because Kenya has undergone significant tax reforms and fiscal policy changes within this timeframe.

3.3 Data Collection Methods

The data that was collected for this study was secondary. The researcher aimed to acquire the data from three main repositories: the Kenya Revenue Authority (KRA), the CBK website, and the KNBS. The secondary data used for this study covered a wide array of fiscal variables (tax rate changes and tax revenue) and economic indicators (national debt). The researcher collected available data over the last 44 years, focusing on tax rate changes and revenues realized. National debt measures such as total debt levels provided insight into the relationship between the independent and dependent variables. Through this data, the research got a clear understanding of the trends in the nation, a better overview of the country's economic performance in the last four decades, and the relationship between these variables.

Collecting data from KRA enabled extensive data extraction integrated with other systems, allowing the researcher to acquire real-time information. Further, KRA provided a myriad of data on Kenya, enabling the researcher to access historical data that was analyzed using predictive analysis for various periods: yearly, quarterly, and

monthly. On the other hand, the KNBS is one of Kenya's largest sources of open data, providing economic indicators like the GDP and public statistics. Additionally, its data and products are high quality, utilizing classifications, definitions, sources, methodologies, and internationally recognized and accepted standards (ISO Certification). As one of the largest sources of knowledge for developing nations, the data enabled the researcher to maintain the dataset's comprehensiveness, reliability, and accuracy.

The researcher accessed the data online, retrieved the structured files, and utilized statistical software (SPSS) to organize and aggregate the data efficiently. KRA's and KNBS's microdata library facilitated access to data already collected, compiled, analyzed, and published. The appropriateness and adequacy of the data collection instruments were maintained through adherence to data protocol and a rigorous validation process. Similarly, instruments such as fiscal policy documentation, tax revenue reports, and economic indicators used in the study were cross-referenced to verify accuracy and consistency. As a result, the researcher ensured the robust use of data suitable for meeting the study objectives. Overall, employing data from these three sources provided insight into the relationship between the variables, contributing information that enabled the researcher to conclude.

3.4 Data Analysis

Correlation analysis enabled the researchers to identify the correlation between the study variables and understand the complex relationship to determine the areas to focus on to achieve the desired results. Similarly, Regression was used to analyze the data collected. According to Kim and Oh (2021), regression analysis is a commonly used statistical method for determining the relationship between two variables. The model helps researchers understand how variables impact each other and the associated outcomes (Kim & Oh, 2021).

The data used in this study consisted of the following variables collected over 44 years:

1. National Debt Levels:
 - The total amount of annual national debt.
 - Debt-to-GDP ratio.

Sourced from the CBK and KNBS.

2. Tax Rate Changes:

- Income tax
- VAT.

Sourced from KRA.

- Tax Revenue:
- Total annual tax revenue collected.

Sourced from KRA.

As such, the researcher utilized regression analysis to conduct various regression examinations. Multiple regression analysis was well suited for the quantitative data, enabling the researcher to assess if the independent variables (tax rate changes and tax revenue) predicted the dependent variable (national debt level). The following regression equation was used:

Equation:

$$Y = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + \epsilon$$

Y= National Debt Level

B₀= Y-intercept

B₁ to B₄= regression coefficients

X₁= Income tax

X₂= Value Added Tax

X₃= Debt to GDP Ratio

X₄= Tax Revenue

ε= error term

The researcher specifically utilized the standard multiple linear regression analysis, which allowed the researcher to enter all the independent variables simultaneously. Through this feed, the researcher evaluated what the variables add to the prediction of the dependent variable. The F-test was also used to test whether the independent variables collectively predicted an increased or decreased national debt level. Also, using R-squared, the researcher was able to identify the magnitude of variance in national debt levels explained by changes in independent variables.

Aside from regression analysis, the researcher presented and summarized the study variables through descriptive statistics. This allowed the researcher to

understand the central tendencies of the data through measures such as standard deviation and mean, among others, according to Kim & Oh, 2021. This also made the results interpretable; hence, there is a better understanding of the study's outcomes. Lastly, the researcher utilized a time series analysis to analyze trends in the data. The data collected was longitudinal, and this analysis method enabled the researcher to identify potential cyclical patterns and trends in the data. The data analysis method was especially vital in understanding how tax policy changes affect fiscal outcomes over different economic cycles in the country.

1. To compare Kenya's national debt trend over the last decade with international benchmarks.

To achieve this objective, the researcher collected Kenya's national debt data from the CBK and KNBS and international debt data from the IMF and World Bank databases. The analysis involved comparing Kenya's debt trends with international benchmarks using trend analysis and ratio comparison. Descriptive statistics such as mean and standard deviation were used to summarize debt levels. Additionally, the graphical analysis uses time series plots to compare trends over the decade visually.

2. To assess the effectiveness of Kenya's tax system and collection strategies as implemented by KRA in managing national debt.

The researcher collected data on Kenya's tax policies and revenue collection from the KRA and data on national debt levels from CBK and KNBS. Achieving this objective included conducting a correlation analysis and regression analysis to evaluate the effectiveness of Kenya's tax system in managing the national debt.

3. to examine the relationship between tax rate changes and Kenya's national debt fluctuations in the last decade

The researcher gathered data on annual tax rate changes from KRA and national debt levels from CBK and KNBS. The researcher used multiple regression analysis to examine the relationship between these variables.

Overall, the rationale behind the choices was to enable the identification of causal relationships and determine the significance of each independent variable prediction. The time series analysis allowed the researcher to capture trends in the data. On the other hand, identifying causal relationships through regression analysis enabled the researcher to identify national debt level predictors and elucidate the

causal relationship through which tax rate and revenue changes impact the country's fiscal sustainability. Integrating these analytical techniques allowed the researcher to contribute empirical evidence on Kenya's importance and necessity of tax reforms.

3.4.1 Diagnostic test

3.4.1.1 Multicollinearity Test

Multicollinearity arises when the independent variables in a regression are highly correlated. This can distort the interpretation of the coefficients. The researcher calculated the VIF for each independent variable. Steps to calculate the VIF included:

- Run the regression model
- Calculate the R^2 value
- Calculate VIF using the formula:

$$VIF = \frac{1}{1-R^2}$$

A VIF value exceeding 10 indicated the presence of multicollinearity, necessitating corrective measures such as eliminating and combining correlated variables.

3.4.1.2 Test for Autocorrelation

Autocorrelation occurs when residuals from the regression model are correlated over time. The researcher employed the Durbin-Watson statistic to detect the presence of autocorrelation. This statistic is a test used to detect the presence of autocorrelation in the residuals of a regression.

Steps to calculate the Durbin-Watson statistic included:

- Run the Regression and obtain the residuals
- Compute differences between consecutive residuals e_t and e_{t-1}
- Square the differences
- Calculate the sum of squared residuals
- Compute the DW statistic using the formula:

$$DW = \frac{\sum_{t=2}^n (e_t - e_{t-1})^2}{\sum_{t=1}^n (e_t^2)}$$

Where:

- e_t is the residual at time t
- n is the number of observations

A Durbin-Watson value close to 2 indicated no autocorrelation, while values significantly different from 2 suggested positive and negative correlation. In cases where autocorrelation is present, time series models or generalized least squares are applied.

3.4.1.3 Heteroscedasticity Test

Heteroscedasticity refers to a situation where the variance of the residuals is not constant across all levels of the independent variables. Heteroscedasticity being present can lead to inefficient estimates. The researcher employed the Breusch-Pagan test to check for heteroscedasticity. To conduct this test, the researcher first ran the Regression and obtained the residuals, then performed the Breusch-Pagan test by regressing the squared residuals on the independent variables. If the test yields a significant p-value, it indicates the presence of heteroscedasticity. The researcher may use robust standard errors or transform the data to correct this.

3.4.1.4 Test for Normality

For a regression model to be valid, the research data should follow a normal distribution. If the data deviates from normality, it can lead to biased estimates. The researcher employed the Shapiro-Wilk test to check normality (Kiplangat, 2023). The researcher extracted the residuals after running the Regression and applied the Shapiro-Wilk test to conduct the normality test, which provided a p-value. If the p-value is less than 0.05, the null hypothesis of normality is rejected.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The section delves into the analysis and interpretation of data on Kenya's national debt and its determinants. It focused on trends of national debt, the impact of changes in tax policy, and comparative analysis with other countries. The paper further discussed the efficacy of tax-collecting strategies and fiscal policy in the national debt landscape. The chapter thoroughly assesses the main contributory variables to increased indebtedness in Kenya through Regression, correlation, and diagnostic tests.

4.2 Descriptive statistics

Table 2: Descriptive statistics

Descriptive Statistics			
	N	Mean	Std. Deviation
Tax-to-GDP (%)	44	22.50	12.85
VAT to GDP (%)	44	22.50	12.83
Income Tax to GDP	44	22.50	12.84
Debt to GDP Ratio	44	22.50	12.83
National Debt Level	44	22.50	12.80

The Descriptive analysis showed that the mean level of national debt was 22.50, with a standard deviation of 12.80. This means that the average level of national debt was moderate, but there was a great difference between the observed data. The tax-to-GDP ratio averaged 22.50 (SD = 12.85), indicating that the tax revenue generally accounted for about 22.5% of GDP. The standard deviation reflected considerable variability, driven by differences in tax structures across the analyzed data. On average, the VAT/GDP ratio is at a value of 22.50 while its standard deviation is 12.83, such that the quite high share of this tax with GDP is highly dispersed. Income tax as a GDP ratio has held, during this period under review, an average value of 22.50 and a standard deviation of 12.84, and the said outcomes reflect that, on average, it is an important source for total revenues in composing against GDP, with this being made with relevant and considerable variation.

The debt-to-GDP ratio had a mean of 22.50, with a standard deviation of 12.83. At an average of about 22.5% of GDP, debt levels indicated moderate levels of indebtedness. However, the received variability, as the standard deviation shows, depicts differences in the debt management policies and economic conditions in the observed years.

4.2.1 Normality Test

Table 3: Normality Test

	Variable	Test	Statistic	P Value
1	NationalDebtLevel	Shapiro-Wilk	0.9500	0.0551
2	TaxtoGDP	Shapiro-Wilk	0.9557	0.0897
3	VATtoGDP	Shapiro-Wilk	0.9531	0.0718
4	IncomeTaxtoGDP	Shapiro-Wilk	0.9539	0.0767
5	DebtttoGDPRatio	Shapiro-Wilk	0.9531	0.0721

The following analysis showed that the variables are normally distributed. Shapiro-Wilk's test was conducted to test the normality assumption of the variables for National Debt Level, Tax to GDP, VAT to GDP, Income Tax to GDP, and Debt to GDP Ratio. The test statistic value regarding the National Debt Level was 0.9500, and its p-value was 0.0551. That means the $p < 0.05$ normality assumption has not been violated. All other variables passed the normality test, as clearly seen in Figure 3, showing the Regression where the variables run very closely along the normal curve. The test statistics, along with the respective p-values of all other variables, are shown in Figure 4.

4.3 Diagnostic Test

4.3.1 Multicollinearity Test

Table 4: Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Tax-to-GDP (%)	.116	3.653
	VAT to GDP (%)	.002	4.512
	Income Tax to GDP	.002	3.611
	Debt to GDP Ratio	.423	2.365

In regard to the presence of multicollinearity, the Tax-to-GDP (%) variable showed a tolerance of 0.116 and a VIF of 3.653. The values implied low multicollinearity; hence, even though it is an indicator of the existence of some degree of relationship with other predictors, it is not strong enough to weaken the model's interpretability. The tolerance for the VAT-to-GDP (%) and income tax-to-GDP (%) variables was very low, having a value of 0.002, with VIFs at 4.512 and 3.611 correspondingly. The presence of multicollinearity was low, with the VIF values below the commonly accepted threshold of 10; the tolerance values showed that the predictors were highly related in a linear relationship with other predictors. The Debt-to-GDP Ratio had a tolerance value of 0.423 and a VIF of 2.365, both values well within common thresholds, and hence, this predictor had minimal to no effects of multicollinearity.

4.3.2 Test for Autocorrelation

Table 5: Test for Autocorrelation

Durbin-Watson
1.233

The Durbin-Watson statistic was calculated to be 1.223, suggesting the possibility of positive autocorrelation of the residuals. A Durbin-Watson close to 2 shows no autocorrelation, and values significantly less than 2, as seen in this analysis, represent a positive correlation between consecutive residuals. The research found that there was first-order autocorrelation of residuals of the initial regression model since one can observe from the fact that the Durbin-Watson statistic is outside the acceptable range. To eliminate this anomaly, the research utilized the Cochrane-Orcutt procedure, which is a commonly utilized iterative process focused on eliminating autocorrelation in linear regression models (Cochrane & Orcutt, 1949). Cochrane and Orcutt (1949) argued that this method involves transforming the original regression equation to involve the autocorrelated error term by adding the lagged value of the residuals. The new equation was then iteratively estimated to convergence, and unbiased and efficient parameter estimates were obtained.

4.3.4 Breusch-Pagan test

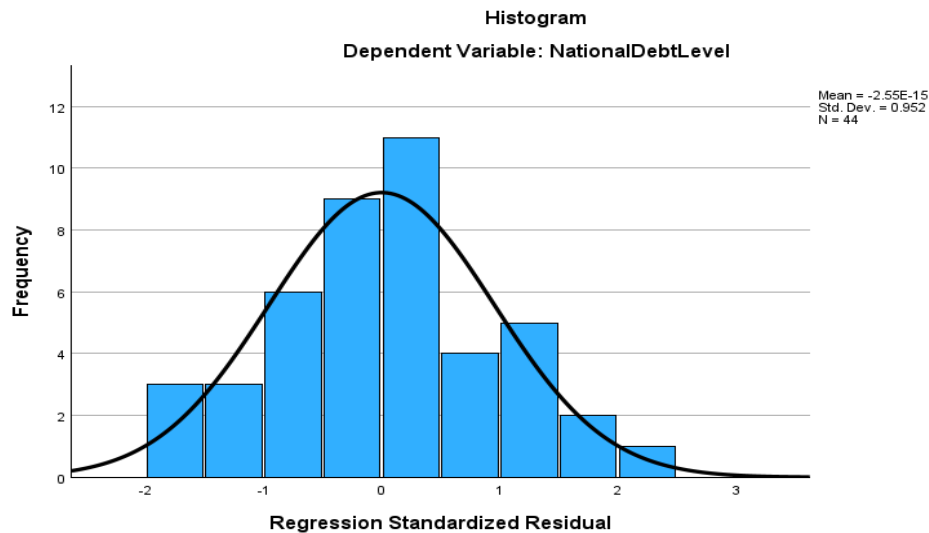
Table 6: Breusch-Pagan Test

Test	Test Statistic (LM)	p-value
Breusch-Pagan Test	7.7927	.0995

The heteroscedasticity of the model was checked using the Breusch-Pagan test. The result of the test gave a test statistic of 7.7927, with a p-value of 0.0995. Since the p-value was greater than the 0.05 significance level, the result was that there was no significant evidence of heteroscedasticity. It, therefore, meant that the model variance was a homoscedastic dispersion of the residuals that did not change across all levels of the independent variables. Because of this, the assumption of constant variance was met, and this means that estimates from the regression model were dependable.

4.3.5 Normality test for residuals

Figure 3: Normality test for residuals



The Regression standardized residuals histogram of the dependent variable National Debt Level revealed that the residuals followed nearly a normal distribution. The residual frequency distribution nearly approximated the superimposed normal curve, indicating that there were no significant deviations from normality. The mean of the residuals was near zero (Mean = -2.55E-15), and the standard deviation was fine (Std. Dev. = 0.952). The graphical results supported the finding of the Shapiro-Wilk test and further confirmed that the normality assumption had been met.

4.4 Correlation Analysis

There was a strong negative Pearson correlation at -0.855, $p < 0.001$, between VAT as a % of GDP and Tax Revenue as a % of GDP, as well as a strong negative Pearson correlation of -0.847, $p < 0.001$ between Income Tax as a % of GDP and Tax Revenue as a % of GDP. This suggested that the heightened VAT and Income Tax rates inversely affect the percent of tax revenue against GDP. In addition, Tax Revenue as a % of GDP showed a positive association with the National Debt level ($r = 0.721$, $p < 0.001$), which meant that the higher the tax revenue as a percentage of GDP, the higher the national debt. This is explained by increased government expenditure in Kenya. Pearson's correlation between VAT as a percentage of GDP and Income Tax as a percentage of GDP was very high at 0.961, $p < 0.001$, which showed that the

changes within VAT and income tax rates were closely related. VAT, on the other hand, was only moderately negatively correlated with the National Debt level, $r = -0.458$ and $p = 0.002$, which showed that when the VAT rates were increasing, then generally, the national debt was in a state of decrease.

Table 7: Correlation Analysis

Correlations						
		Tax Revenue as a % of GDP	VAT as a % of GDP	Income Tax as a % of GDP	Debt to GDP ratio	National Debt level
Tax Revenue as a % of GDP	Pearson Correlation	1	-.855**	-.847**	.281	.721**
	Sig. (2-tailed)		<.001	<.001	.065	<.001
	N	44	44	44	44	44
VAT as a % of GDP	Pearson Correlation	-.855**	1	.961**	.125	-.458**
	Sig. (2-tailed)	<.001		<.001	.419	.002
	N	44	44	44	44	44
Income Tax as a % of GDP	Pearson Correlation	-.847**	.999**	1	.137	-.451**
	Sig. (2-tailed)	<.001	<.001		.375	.002
	N	44	44	44	44	44
Debt to GDP ratio	Pearson Correlation	.281	.125	.137	1	.561**
	Sig. (2-tailed)	.065	.419	.375		<.001
	N	44	44	44	44	44
National Debt level	Pearson Correlation	.721**	-.458**	-.451**	.561**	1
	Sig. (2-tailed)	<.001	.002	.002	<.001	
	N	44	44	44	44	44
** . Correlation is significant at the 0.01 level (2-tailed).						
** . Correlation is significant at the 0.05 level (2-tailed).						

The debt-to-GDP ratio was weakly related to Tax Revenue as a % of GDP, $r = 0.281$, $p = 0.065$, underlining a moderate relationship between the variables. Inversely, debt-to-GDP was strongly positively related to the level of National Debt, $r = 0.561$, $p < 0.001$, with high ratios predictive of higher national debt. The debt-to-GDP ratio was insignificantly correlated with both the VAT share of GDP and the Income Tax share of GDP. This yielded a correlation of 0.125 , $p=0.419$ with VAT, and 0.137 , $p=0.375$ with Income Tax, therefore indicating a weak statistically insignificant correlation.

4.5 Regression Analysis

Table 8: Regression Analysis

Model Summary							
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics		
					R Square Change	F Change	df1
1	.816a	.665	.631	7.776920	.665	19.361	4

The model summary provided an overview, showing a very strong relationship between the independent variables and the dependent variable. Also, the correlation coefficient R was 0.816, indicating that there was a strong positive relation. The R Square value was 0.665, which meant approximately 66.5% variation in the dependent variable, which can be explained by the independent variables included in this model. The Adjusted R Square was 0.631, which, although lower due to the number of predictors, still indicated that most of the variances are accounted for. The F Change statistic was 19.361, $df1 = 4$, which revealed that the model was statistically significant. That is to say, it showed the meaningful relation of the independent variables under study with the dependent variable.

4.6 ANOVA Analysis

Table 9: ANOVA Analysis

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4683.761	4	1170.940	19.361	<.001 ^b
	Residual	2358.739	39	60.480		
	Total	7042.500	43			
a. Dependent Variable: National Debt (KES Trillion)						
b. Predictors: (Constant), Debt-to-GDP Ratio (%), Income Tax as % of GDP, Tax Revenue as % of GDP, VAT as % of GDP						

The regression sum of squares was 4683.761 on four degrees of freedom, with a mean square for the Regression of 1170.940. The F-statistic was 19.361, which was highly significant with a p-value of less than 0.001, hence indicating that overall, the model was significant. The residual sum of squares was 2358.739 on 39 degrees of freedom, with a mean square for the residual of 60.480. The total sum of squares was 7042.500 with 43 degrees of freedom. These results showed that the independent variables contributed significantly to explaining the variation in the National Debt level. Hence, the model was effective in explaining variation in the dependent variable.

4.7 Coefficients

Table 10: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-5.543	9.768		-.567	.574
	Tax-to-GDP (%)	.756	.272	.759	2.785	.008
	VAT to GDP (%)	1.351	2.064	1.354	.654	.517
	Income Tax to GDP %	-1.204	2.025	-1.208	-.594	.556
	Debt to GDP Ratio	.343	.142	.344	2.415	.021

The Tax-to-GDP (%) variable showed a positive and significant association with the dependent variable: $B = 0.756$, $t = 2.785$, $p = 0.008$. This thus inferred that increasing the value of Tax-to-GDP would lead to a significant positive change in the dependent variable. Contrarily, the VAT-to-GDP % influenced it positively but insignificantly, as shown by the $B = 1.351$, $t = 0.654$, $p = 0.517$. Because of this, changes in the VAT-to-GDP did not influence the dependent variable much. Also, the Income Tax-to-GDP % showed a negative relationship with an insignificant contribution; this was given out with $B = -1.204$, $t = -0.594$, and $p = 0.556$, which means not much considerable influence on the dependent variable. In contrast, the debt-to-GDP ratio was a statistically significant positive predictor of the dependent variable: $B = 0.343$, $t = 2.415$, $p = 0.021$. This explained that the higher the debt-to-GDP ratios, the higher the dependent variable, though at a modest magnitude. The resulting regression equation was:

$$Y = -5.543 + 0.756B_1 + 1.351B_2 - 1.204B_3 + 0.343B_4$$

Y is the dependent variable,
B1 is the Tax-to-GDP (%),
B2 is the VAT-to-GDP (%),
B3 is the Income Tax-to-GDP (%),
B4 is the debt-to-GDP ratio.

Results showed that Tax-to-GDP (%) was positively and significantly related to the dependent variable, represented by B1 and having a coefficient of 0.756. This means that with each increase in one unit of Tax-to-GDP, the dependent variable increases by 0.756 units. The VAT-to-GDP (%), represented by B2, was positively related but non-significant, having a coefficient of 1.351. Admittedly, although this would have suggested that with every single unit increase in VAT-to-GDP, the dependent variable would increase by 1.351 units, this effect was not significant as obtained from the high p-value. Income Tax-to-GDP (%) was negative but insignificant to the dependent variable, represented by B3 and a coefficient of -1.204. This implied that with every unit increase in the Income Tax-to-GDP, the dependent variable would decrease by 1.204 units, though the result was insignificant. From B4, it can be seen that the influence of the Debt-to-GDP Ratio was positive and modest; its coefficient was 0.343, implying that with a unit increase in the Debt-to-GDP ratio, the dependent variable increased, though small, by 0.343 units in a statistically significant way.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This section discussed in detail the explanation of the findings, giving a comprehensive discussion of the research results and their implications. The discussion has explored the complex interface between fiscal policy and national debt levels in Kenya, highlighting key drivers of the different tax components and debt ratios that define Kenya's financial outlook. The need to address fiscal inefficiencies was emphasized, with strategic measures put in place to ensure that debt is manageable sustainably.

5.1 Summary of Findings

The study focused on Kenya's national debt and its determinants, with an emphasis on trends and the impact of tax policy. Regression, correlation, and diagnostic tests were used to identify the most important contributors to the country's indebtedness. The diagnostic tests showed that the model used for the study was robust. Multicollinearity was checked, and all the variables were within the acceptable threshold of a variance inflation factor of 5. The tax-to-GDP ratio had a VIF of 3.653, showing moderate multicollinearity, while VAT-to-GDP and income tax-to-GDP ratios had slightly higher VIFs of 4.512 and 3.611, respectively. The debt-to-GDP ratio had a VIF of 2.365, showing very low multicollinearity; hence, the model is reliable. The autocorrelation was checked by the Durbin-Watson statistic, which was 1.223. Since the ideal threshold is less than 2, this value showed that there was mild positive autocorrelation in residuals. Shapiro-Wilk test confirmed the normal distribution of all variables since the p-values were greater than 0.05. Besides, the Breusch-Pagan test did not show heteroscedasticity, $p = 0.0995$, confirming the constant variance assumption.

The correlation analysis showed that significant relations existed between the variables. The tax revenue as a percentage of GDP was strongly negatively correlated with the VAT-to-GDP ratio ($r = -0.855$, $p < 0.001$) and income tax-to-GDP ratio ($r = -0.847$, $p < 0.001$). On the other hand, it was positively related to national debt, $r = 0.721$, $p < 0.001$. VAT and income tax rates were highly correlated, $r = 0.961$, $p <$

0.001. In addition, the national debt was strongly positively related to the debt-to-GDP ratio, with $r = 0.561$ and $p < 0.001$, but only weakly and insignificantly with VAT and income tax rates. Regression analysis showed that the model explained 66.5% of the variation in national debt, $R^2 = 0.665$. The significant predictors are the tax-to-GDP ratio, $B = 0.756$, $p = 0.008$, and the debt-to-GDP ratio, $B = 0.343$, $p = 0.021$, while in VAT-to-GDP and income tax-to-GDP ratios, it did not show any significant effects. ANOVA results confirmed the overall significance of the model: $F = 19.361$, $p < 0.001$.

5.2 Conclusion

Fiscal policies and the interplay between important economic indicators such as the tax-to-GDP ratio, VAT-to-GDP ratio, income tax-to-GDP ratio, and debt-to-GDP ratio influence Kenya's national debt. Regression analysis indicated that the tax-to-GDP ratio and the debt-to-GDP ratio are the strongest predictors of national debt, explaining a high variation of 66.5%. Though the ratios of VAT to GDP and income tax to GDP were insignificant, their high multicollinearity with other variables indicated that the components of taxes are connected within the larger fiscal framework. This study also found that Kenya's fiscal environment was characterized by acceptable levels of multicollinearity, $VIF < 5$, and no significant heteroscedasticity. However, mild positive autocorrelation, Durbin-Watson = 1.223, suggested some dependence in residual patterns.

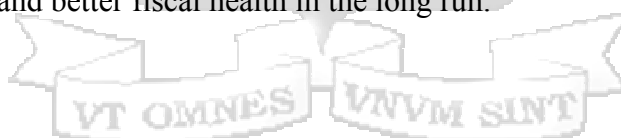
These findings underline the need for fiscal strategies that are carefully calibrated in order to manage national debt effectively. Strengthening tax policies, especially those touching on the tax-to-GDP ratio, could offer sustainable revenue generation without over-reliance on debt financing. Similarly, prudent management of the debt-to-GDP ratio may help stabilize fiscal pressures while maintaining economic growth. The study emphasizes that further analyses should focus on residual dependencies and the refinement of econometric models to ensure strength in policy recommendations. Overall, the results emphasize that the role of a fiscal strategy needs to be cohesive to balance tax revenue optimization with responsible debt management in order to secure Kenya's economic stability and growth trajectory.

5.3 Recommendations

Policymakers should take up the task of reviewing prevailing fiscal policies to ensure that the new tax revenues are being used efficiently for debt reduction rather than adding further to the country's national debt. In addition, fiscal practices need to be rearranged to meet the goal of reducing debt levels, which requires reconsideration of the priorities of government spending.

Measures to control the debt-to-GDP ratio need to be prioritized, as the study found a significant correlation between this indicator and national indebtedness. Some of these initiatives, which aim to reduce the debt burden relative to the country's economic output, include policies to stimulate economic growth and manage public-sector borrowing. This approach will ensure that the economy can sustain an increase in debt without generating adverse long-term effects.

Concerted efforts need to be directed toward balanced economic growth. Policies that will lead to private sector expansion contribute to widening the tax base with lesser increases in tax rates. By pursuing the creation of an appropriate growth environment, the government can generate more revenues in a sustaining manner that will assist in dealing with the national debt burden and simultaneously contribute to economic stability. If these are ideally carried out, the result will be a decrease in national debt and better fiscal health in the long run.



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