EFFECT OF TAX REVENUE GROWTH ON ECONOMIC GROWTH IN KENYA.

BY:

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DECLARATION

This proposal is my original work and has not been presented elsewhere for a degree or any other award.

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This proposal was prepared under my supervision as a university supervisor

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DEDICATION

To my beloved sons Gatambia and Munge

ACKNOWLEDGEMENT

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
AIC	Akaike's Information criterion
ARCH	Autoregressive Conditional Heteroskedasticity
ARDL	Autoregressive Distributed Lag
BG	Breusch-Godfrey
BOP	Balance of Payments
CBK	Central Bank of Kenya
COVID	Coronavirus Disease
DWH	Durbin–Wu–Hausman
EAC	East African Community
EMDE	Emerging Market and Developing Economies
ERSWEC	Economic Recovery Strategy for Wealth and Employment Creation
EU	European Union
FDI	Foreign Direct Investment
FPE	Final Prediction Error
GDP	Gross Domestic Product
GNP	Gross National Product
HQIC	Hannan–Quinn information criterion
INFR	Inflation Rate
INTR	Interest Rate
ITMS	Integrated Tax Management Systems
KES	Kenya Shilling
KNBS	Kenya National Bureau of Statistics
KRA	Kenya Revenue Authority
LHS	Left Hand Side
LR	Likelihood-ratio
MNC	Multi National Corporation
NGO	Non-Governmental Organization
NPEP	National Poverty Eradication Plan
NX	Net Exports
OECD	Organization for Economic Development Countries
OLS	Ordinary Least Squares
PAYE	Pay As You Earn
PIN	Personal Identification Number
PRSP	Poverty Reduction Strategy Paper
RHS	Right Hand Side
RTGS	Real Time Gross Settlement

SBIC	Schwarz's Bayesian information criterion
TMP	Tax Modernization Program
TO	Trade Openness
TR	Total Revenue
UK	United Kingdom
VAR	Vector Autoregressive
VAT	Value Added Tax
VECM	Vector Error Correction Model
VIF	Variance Inflation Factor
WDI	World Development Indicators
WHT	Withholding Tax

ABSTRACT

The current paper sought to investigate effect of total tax revenue growth on economic growth in Kenya. Specifically, the research sought to evaluate the effect of total tax revenue growth on economic growth in Kenya while controlling for covariate and to offer policy solutions. Analysis was done using VECM and the findings are that tax revenue growth, interest rate, inflation, net FDI to GDP ratio and net exports to GDP ratio have a favorable effect on economic growth. The study utilized a 33-year time series data from 1990 to 2022 sourced form the World Development Indicator. We recommend that tax revenue growth rate should take into account the projected economic growth. Taking such consideration can help boost economic growth and achieve set growth. Secondly, the inflation rate should be set at a favourable level that will boost investment and hence enhance economic growth. We recommend moderate rather than higher interest rate. Finally, there should be policy intervention and mechanism that should be put in place in order to lower the negative net exports to reduce more leakages in the economy to boost economic growth.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The standard of life of a nation's citizens has long been measured in terms of its economic progress, despite ambiguous criticism (Barrington-Leigh & Escande, 2018; Sirowy & Inkeles, 2017; Spash, 2021). According to Weil (2016), economic growth is defined as an increase in a country's entire production of services and goods. Economic growth is the increase in a country's overall output of products or services (Urbano & Aparicio, 2016; Stiglitz, 2016; Sarkodie & Strezov, 2019; McCombie & Thirlwall, 2016; Haraguchi et al., 2017). When people take part in the process of resource allocation and reorganization, which produces increased value, economic progress is evident (Urbano & Aparicio, 2016; Stiglitz, 2016; Sarkodie & Strezov, 2019).

Economic growth is simply concerned with the quantitative assessment of things and services created, with no explanation of how they are produced (de La Grandville, 2017; Coe & Yeung, 2015; Clarke, 2017; Petersen et al., 2018). Either real value, considering an increase in prices, or nominal amount, ignoring prices, can be used to quantify economic growth (Coe & Yeung, 2015; Clarke, 2017; Petersen et al., 2018). The most common way for estimating this adjustment is to compute the percentage increase of GDP. Gains in monetary value are employed to assess economic growth; other development-related aspects are ignored (Ayres & Warr, 2006; de La Grandville, 2017; Coe & Yeung, 2015; Clarke, 2017; Petersen et al., 2018).

Economic growth trends might be positive or negative (Panayotou, 2016; Aghion, et al., 2016; Destek, 2016; Cecchetti & Kharroubi, 2019). When the economy experiences negative growth, it

is in a state of contraction or decline (Panayotou, 2016; Aghion, et al., 2016; Destek, 2016; Cecchetti & Kharroubi, 2019). Negative growth is commonly linked to times of depressing economic growth. Gross national product (GNP) is a metric that is occasionally used instead of gross domestic product (Panayotou, 2016; Aghion, et al., 2016; Destek, 2016; Cecchetti & Kharroubi, 2019). To facilitate the comparison of several countries, it is common practice to express statistical data in a unified currency. This can be achieved through utilization the most recent purchasing power parity or even the exchange rate. Subsequently, to facilitate the comparison of countries with varying population numbers, the per capita metric is utilized. It is typical to represent the GDP or GNP in "real" terms, which have been adjusted for inflation, to take into account variations to the purchasing power of currency, such as decline or increase in prices. This is done to provide a more accurate representation of economic output, as opposed to relying just on the nominal or current figures that are compiled in a given year (Panayotou, 2016; Aghion, et al., 2016; Destek, 2016; Cecchetti & Kharroubi, 2019).

The global economy has contracted on average by 0.77% over the past six years (Niepmann & Schmidt-Eisenlohr, 2017). World real GDP growth rate expanded by 3.6% in 2017, decelerated by 3.6% in 2018, decelerated by 2.9% in 2019, decelerated by 4.2% in 2020, expanded by 5.9% in 2021 and decelerated by 3.4% in 2022 (Caseloads, R. (2022; Gern et al., 2022a; Gern et al., 2022b; Gern et al., 2023). In 2017, the global economy saw a widespread rebound leading to the fastest expansion backed by data from the financial world wide crisis in 2008 (Caseloads, R. (2022; Gern et al., 2022a; Gern et al., 2022b; Gern et al., 2023). The enhanced performance was primarily bolstered by a recovery in both private and public investments, an increase in international trade facilitated by favorable financing costs, a rise in profits, an improvement in business and consumer confidence, and a diminishing impact of the decline in oil and commodity prices observed between

2014 and 2016 (Stern et al., 2020; Makin & Layton, 2021; Wang et al., 2023). This can be attributed mostly to significant capital expenditures and strong external demand resulting from heightened household incomes and company investments in both the United States of America and the euro region. The slowing observed in the year 2018 can be attributed to the presence of uncertainties arising from political and geopolitical conflicts encountered in certain nations (Stern et al., 2020; Makin & Layton, 2021; Wang et al., 2023). Additionally, the reduction was influenced by trade tensions, more stringent financial conditions in certain countries, and increased energy prices. The observed decline in economic expansion for the year 2019 was observed in both advanced economies, with a special emphasis on the Euro Area, as well as in Emerging Market and Developing Economies (EMDEs). The primary factors contributing to this phenomenon were mostly associated with persistent policy uncertainty, reductions in international trade and investment, and a deceleration in labor productivity. The lack of clarity in policy resulted in trade tensions between China and the United States, as well as between the UK and EU, with the manufacturing sector experiencing the most significant impact.

The COVID-19's arrival and the subsequent slowdown in economic activity are the main causes of the drop observed in 2020. The Coronavirus pandemic's arrival resulted in a noteworthy drop in oil prices and an air of instability in the financial markets. The period was marked by an unparalleled health and economic crisis due to the pandemic, as containment measures were implemented to minimize the transmission of the virus, resulting in significant disruptions to various activities. The expansion of global real GDP in 2021 was facilitated by the easing of containment restrictions implemented to mitigate the transmission of the COVID-19 virus. Consequently, there was a notable enhancement in international trade, accompanied by heightened engagement in the industrial and services domains across many economies.

The moderate expansion witnessed can be attributed to the enforcement of more stringent monetary measures in various regions in response to the Coronavirus pandemic. Additionally, resurgence of the virus in China and the ongoing conflict between Russia and Ukraine contributed to noteworthy increases in energy and food costs. The deceleration in economic development during 2022 was evident across a broad spectrum of countries, encompassing the Advanced Economies, Emerging Markets as well as the Developing Economies (EMDEs). Sanctions imposition on Russia, coupled with the subsequent suspension of its gas supplies to Europe, had a detrimental consequence on economic progress on industrialized economies.

Growth of EMDEs faced hindrances, among them the appreciation of US currency as well as the outbreak of the COVID-19 epidemic in China. These events adversely affected global supply chains, given China's significant role in international trade. Over the specified timeframe, the real GDP of the East Africa Community experienced a mean increase rate at 4.0%. Notably, the increase rates for the years 2018, 2019, 2020, 2021, and 2022 were recorded at 6.6%, 6.2%, -0.2%, 6.7%, and 4.9%, respectively. In 2017, the GDP within nations in East Africa (EAC-5), comprising five member countries, remained unchanged at a rate of 5.4 %. The GDP (real) of Rwanda and Tanzania is projected to have experienced notable growth rates of 6.2% and 6.5%, respectively. The growth observed in 2018 can be attributed to the significant recovery of the agricultural sector in Kenya, Uganda, and Rwanda following the drought experienced in the preceding year of 2017. The East Africa Community members faced various impacts as a result of the Coronavirus pandemic.

These included adverse effects on tourism revenues, declining commodity prices, and reduced financial inflows, hence exacerbating the fiscal and current account imbalances within the region. Furthermore, the region saw adverse impacts on food production and trade distribution occasioned

by interruptions in supply systems. In subsequent year there was a notable increase in growth, which was facilitated by advantageous meteorological circumstances across the majority of countries in the region. Consequently, this led to a substantial surplus in cereal production. The slowing observed in the growth rate during the year 2022 can be attributed, in part, to the disruption experienced in global supply networks. This disruption, along with lower agricultural operations and stricter policies, resulted in declines in household demand.

The economy of Kenya experienced a growth rate of 4.9 percent in 2017, which was lower than the revised growth rate of 5.9 percent observed in 2016. The deceleration in the economic performance can be partially attributed to the presence of uncertainty stemming from a prolonged duration of election campaigns, over and above the impacts of unfavorable weather conditions. The occurrence of a pervasive drought in the fourth quarter of 2016, coupled by partially diminished lengthy rains in 2017, had adverse effects on agricultural output, livestock husbandry, and hydro-electric power generation. The downturn in economic growth during the period was also influenced by a decline in the pace at which the non- public sector was taking up loans. Nevertheless, in 2018, the economy exhibited signs of recuperation following the adverse impacts of the prolonged drought and the uncertainties stemming from the preceding general elections held in 2017. The primary factor contributing to the growth was the rise in agricultural production, the increasing pace of manufacturing activity, the ongoing growth of transportation infrastructure, and the dynamic performance of the service sector. The agricultural sector saw favorable conditions due to adequate and evenly distributed rainfall across the entire nation. In a similar vein, the heightened levels of precipitation had a notable impact on the production of power, so fostering a favorable environment for economic expansion. The economic activity in 2019 exhibited robustness, as growth was observed in several areas of the economy, particularly in service-

oriented sectors. The upsurge of the Coronavirus pandemic in 2019 and then subsequent implementation of containment measures have resulted in a deceleration of economic growth. The government's primary focus was based on the imperative to protect the lives of Kenyan citizens and residents, while simultaneously reducing the economic effect of the coronavirus pandemic. As a result, the health crisis necessitated the application of temporary restriction controls with the objective of mitigating the transmission of the virus, which subsequently led to significant adverse effects on several pivotal sectors of the economy. The implemented temporary measures encompassed restrictions on both local and foreign travel, limitations on movement to and from specific counties and zones, as well as the shutdown of educational institutions, recreational establishments, and dining establishments. The imposition of movement restrictions and the necessity of practicing social distancing resulted in a disruption of the labor supply, while a decrease in household disposable incomes contributed to a decline in the market need and use of services as well as products. Consequently, a significant number of firms, particularly those operating in the tourism and educational sectors, experienced closures throughout the second quarter of 2020. The economy exhibited a notable rebound after the severe repercussions of the COVID-19 pandemic, experiencing a growth rate of 7.5 percent in the year 2021. In the year 2022, the economy continued to experience the upward trajectory that commenced in 2021, following the rebound from the aftermath of the Coronavirus pandemic. Nevertheless, the extent of this rise was considerably dampened by a decrease in agricultural output, which can be attributed to unfavorable weather conditions throughout the year. Because it has an effect on all economies, paying taxes is a topic of worldwide importance. Taxes have existed for a very long period. According to Ojong et al. (2016), when the Pharisees questioned Jesus about whether it was appropriate to pay taxes or not, He underlined the necessity of doing so in Matthew 22:17–21. The

implication of his statement, "therefore render unto Caesar the things which are Caesar's and to God the things which are to God's," is that all citizens of a country should be obliged to pay taxes, regardless of their social position or religious views.

According to Ngerebo & Masa (2012), tax is a non-negotiable but required payment paid to the government by citizens (corporations and people) on a variety of grounds and rates. The basis for this payment is not a straightforward exchange of goods and services. Because no citizen directly influences the structure of the payment base and rates, it is not negotiable. It is a method of generating income for the government's ongoing operations. Direct or indirect taxes are the two categories for taxes. Instead of taxing an individual's purchases of goods and services, direct taxes are assessed against their income. Taxes that are imposed on products and services rather than on income are known as indirect taxes.

Taxation is linked to a country's economic growth. A tax structure is critical for achieving economic growth. Every nation levies taxes on its residents and institutions in an effort to fulfill long-term goals including funding development initiatives and fostering economic growth (Musgrave, 1997). Ojede & Yamarik (2012) also observe that fiscal authorities have used this relationship between taxes and country output to promote economic growth and development. Theoretically, there is disagreement on whether taxes encourage economic growth. Some argue that taxation fosters economic growth while others opine that it is a burden on their hard-earned income and property. This depends on the benefits one derives from taxation compared to the taxes paid.

In numerous Sub-Saharan African nations, including Kenya, taxation stands as the primary income source. Consequently, a correlation is presumed to exist between Kenya's tax system and the

expansion of its economy. This study aims to elucidate the impact of heightened tax revenues on economic growth.

1.1.1 Economic Growth in Kenya

Following the coffee boom, Kenya experienced its highest GDP growth rates ever, 9.4% and 10.8% in 1977 and 1978, respectively. After the oil deadlock in the Middle East which increased cost of unrefined oil, these rates fell to 3.7% in 1979, but they averaged 5% between 1980 and 1989. In 1981, real investment increased, and the agriculture sector performed well, contributing to this development. The extreme lack of rain in 1983 and 1984, that decimated the agricultural production, and the coup d'etat in 1982, which slowed investment, are two causes that caused the growth rate to decrease to less than 2% between 1982 and 1984. In the 1990s, trends showed a steady drop that peaked at 0.1% in 1993 and reached a negative 0.3% in 2000. These dismal GDP growth rates were made possible by the collapse of the major agricultural subsectors, the restriction on donor money that followed the first multiparty elections in 1992, which prompted a drop in actual investment. Kenya's economic growth rate is depicted in the line graph below.

Figure 1: Kenya's Real GDP Growth Rate Trend (1980-2021)

Real GDP Growth (Annual Percentage Change)
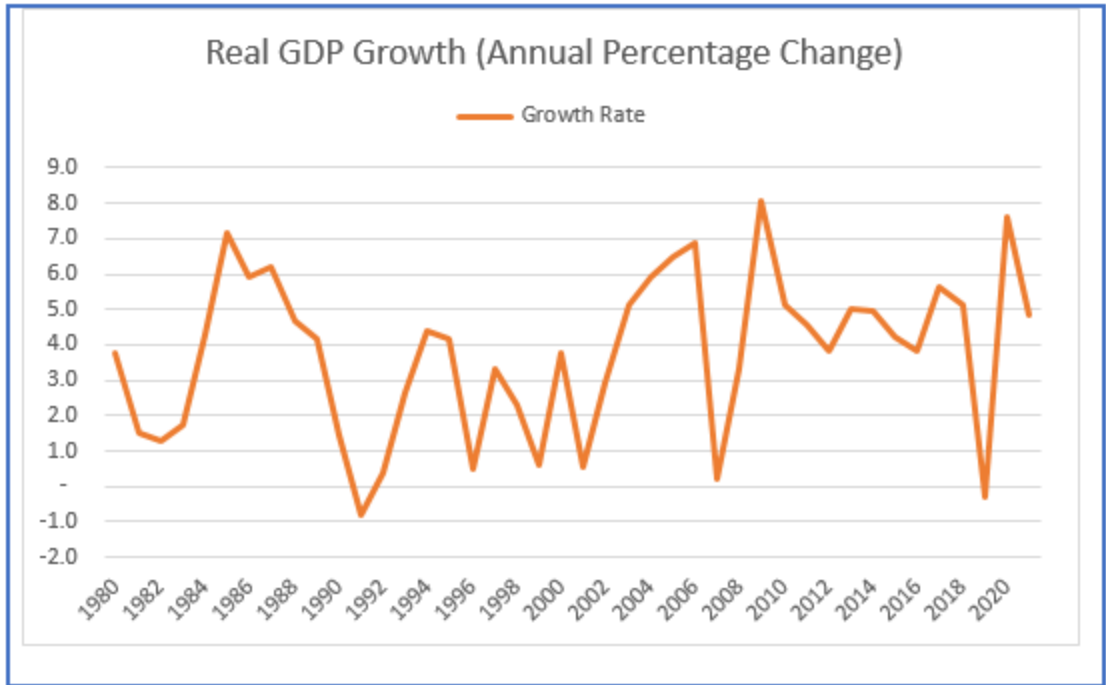
Source: Author's Computation

The National Poverty Eradication Plan (NPEP) 1999-2015, the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC) 2003-2010, the Poverty Reduction Strategy Paper (PRSP) 2000-2003,and Vision 2030 are examples of long-term macroeconomic policy frameworks created by the government. Between 1986 and 2000, the Republic of Kenya established a goal annual economic growth rate of 5.6% (GoK, 1986). As the economy improved and growth accelerated to an annual pace of little more than 4%, political upheaval and poorly implemented economic liberalization led the economy to worsen and inflation to rise, hitting an all-time high of 46% in 1994. Economic growth increased once government austerity measures were put in place and outside development help, particularly financial aid, resumed. The economic slowdown that followed the an extreme weather condition (known as El Nino) in 1997-1998 and significantly damaged agriculture and electric power production led in a -0.6% recessionary decrease in 2000, implying that the recovery was only temporary. Kenya has experienced steady

economic growth since the year 2000, with factors such as enhanced investor confidence post an administration switch in 2003 and prudent economic practices playing a role. This includes strategic measures like elevated government expenditure on public infrastructure projects and the implementation of free elementary education. Notably, despite the challenges posed by the disputed presidential election results in December 2007, which led to instability and economic disruptions, the growth trajectory in economic development only saw a modest increase of 1.5% in 2008 Even worse, the collapse of financial institutions in the biggest economy worldwide (United States) contributed to a worldwide financial crisis that had a big effect on the local economy. The rebound that started in 2009 was quite modest, coming in at 2.6% in its first year, before expanding to a more substantial 5.6% in 2010. Both the decline in the value of the local Shilling from KES 78.03 to a dollar at the end of 2010 to over KES by 2011 and the outlook for the Kenyan economy were gloomy. However, in the first half of 2011, soaring food and fuel prices caused inflation to surpass the single-digit threshold and reach 12.95 in May 2011. In 2018, Kenya's GDP expanded by 5.65%, up 1.81% from the previous year. In 2019, it was 5.11%, while in 2020, it was -0.3%. This dramatic decline was caused by the COVID-19 outbreak. Following that, GDP climbed to 7.52% in 2021.

1.1.2   Taxation in Kenya

1.1.2.1 Reforms on taxes in Kenya

Kenya has implemented several changes on matters concerning tax in an effort to make the nation's tax system more effective, efficient, and equitable. According to the results of Eissa & Jack (2009), public finances were distributed between 1963 and the early 1980s through an uncoordinated collection of taxes and levies that were left over from the British colonial government and augmented by foreign aid. The nation experienced its inaugural substantial fiscal crisis due to the

crisis brought about by the 1970s oil shock. In response, modest tax measures like as sales taxes and trade taxes were enacted to create extra fiscal resources and reduce the growing BoP deficit payments. Income taxes were thought to have redistributive roles in the 1970s, the top marginal personal income tax rate is 65%, with levies starting at 10% on the first unit of currency. Domestic corporations were taxed at a rate of 45 percent, while foreign businesses were taxed at a rate of 52 percent. The lowest amount of personal income tax was collected by the highest tax categories, per Karingi et al. (2005), likely as a result of low worker productivity. In the 1980s, the budget deficit steadily widened and from 1986 to 1993, it averaged more than 6% of GDP. The Kenyan government implemented Tax Modernization Programme (TMP) in 1986 with the goals of enlarging the tax base and defining the criteria for public spending. Although this goal was later changed to 28% in 1992, the TMP's primary goal was to increase the revenue to GDP ratio from twenty-two percent in 1986 to twenty-four percent by the middle of the 1990s (Muriithi & Moyi, 2003). Income taxes accounted for almost one-third of total collections in the late 1970s and between late 1990s, altering the overall structure of tax collection. The reduction in reliance on import taxes can be attributed to the abandoning of protectionist tariff policies and the integration of East African economies. Excise taxes, which are mostly paid on alcoholic beverages, tobacco goods, and petroleum items, increased from 10% to 16% of total revenues during the same time period, helping to somewhat offset this shift. Since its inception in the beginning 1990s, when it contributed to 36% of taxes, the VAT's share of tax collection has declined to 25% as of 2001. The particular changes include:

i)   **Reforms in Customs Administration**

According to Muriithi & Moyi (2003) during this reform period, major changes were made to Kenya's customs duties with the goals of reducing duty exemptions, promoting exports,

restructuring the tariff system, and improving customs charges administration. The goal was to create an environment conducive to a liberalized market and increase foreign direct investment. The highest tariff rate dropped from 170% to 25% between 1987 and 1998, and there are now just 5 rate bands total, including duty-free. This resulted in a decrease in the mean rate from 40% to 16%. The exemption system had exhibited excessive leniency before 1991, prompting the implementation of measures to curb this. These included narrowing the scope of goods exempted from taxation, allowing tax deductions for imports made by all Parastatals, eliminating discretionary exemptions in 1992 and agricultural commodity assistance exemptions in 1995. Between 1994 and 1998, the non-governmental organization (NGO) sector was the focus of measures like as NGO exemption limits, bonding requirements for big aid-funded imports, and post-project reconciliation processes. To qualify for income tax exemption, NGOs and humanitarian groups were required to register. Reforms to increase export capacity were also implemented, including duty/VAT exemptions on direct and indirect imports of raw materials used in export manufacturing, tax exemptions on goods intended for the domestic market, and the provision of inputs for international aid-supported projects. Export subsidies, export processing zones, complete import liberalization, and full foreign exchange liberalization were all used to stimulate exports. Efforts were made to strengthen the administrative capacity of the tax system through activities such as the reinstatement of the discriminate scrutiny system and the restoration of surveillance and scrutinization duties. Starting in 1996, further efforts were undertaken at the Mombasa port to improve transit controls systems, change pre-shipment inspection programs, implement warehouse controls, and strengthen cargo control procedures.

ii)   **Reforms pertaining VAT and excise duty**.

Kenya implemented VAT in 1990 to replace the current sales tax system. The decision was based on the idea that VAT provided higher revenue-generating potential as well as more cost-effective, efficient, and timely collection and administration operations. Since 1991, several measures have been implemented to enhance and streamline the VAT system, such as transitioning certain goods to ad valorem rates and expanding the scope of VAT to encompass a wider range of services. The taxation regime for retail sales changed in 1990 when a manufacturer-level VAT that included business services was implemented. As a result, between 1990 and 1995, the scope of VAT that was applied to retail goods significantly expanded. The definition of "goods" was changed to exclude the delivery of tangible immovable property as well as all intangible assets. The definition of the service sector has been expanded to encompass a variety of commercial services, such as those provided by hotels and restaurants, as well as those related to Conferences, advertising, telecommunications, construction, transportation, equipment leasing, repair and maintenance, and personal services are examples of industries. The maximum VAT rate was reduced from almost 150% to 15%, the rate bands were narrowed, and the minimum turnover level for mandatory registration was raised. Taxpayers were greatly concerned with the VAT tax refund mechanism, and in the middle of the 1990s, administrative changes were made to improve the system's efficacy and efficiency. The use of stricter verification processes and the clearing of the significant backlog of claims have both been made possible by the adoption of improved managerial tactics. Since 1991, there has been a growth in the scope of excise levies, which currently encompass both imports and domestic output. Excise taxes have been rationalized to include the tax on upscale goods including wine, beer, spirits, mineral water, cigarettes, matches, high-end passenger vehicles, minibuses, as well as automotive fuels and cosmetics.

iii)   Tax on income reforms:

Taxation on income is one type of direct taxation that is levied on a range of types of income, including business, employment, rental, pension, and investment income. Income tax reform's primary purpose is to improve revenue by widening the taxation base and decreasing the highest taxation rates. The highest marginal tax rate for individuals experienced a significant reduction from 65% in 1987 to 32.5% in 1998. In 1997, a simplified system for basic tax allowances (tax credits) was introduced, which included a single credit per individual. The corporate tax structure underwent modifications from 1989 to 1998, reducing the highest tax rate from 45% to 32.5%. This was achieved through unifying the structure across various forms of companies and aiming to decrease and standardize marginal tax rates for both corporations and individuals. The integration of the income tax structure involved transitioning from a classical taxation system to a single-stage tax system, restricting dividend taxation to a conclusive tax, and implementing a complementary tax to ensure all business distributions are derived from already taxed income. The personal identifying number (PIN) was reintroduced for tax assessment purposes to enhance tax information management and facilitate the accurate capture of corresponding tax obligations. Royalties, interest income from debt instrument discounts, payments to independent contractors without PINs, and payments to self-employed individuals are now all included in the system of withholding taxes. In addition to being a final tax upon receipt by a person from a financial institution, the withholding tax rate on interest has raised from 10% to 15%. A few strategies used to increase the income tax base include employer-provided perks, a PAYE amnesty in 1993, presumed income taxation of some agricultural commodities, and gains from foreign exchange trades. Presumptive income tax was introduced in an effort to better include farmers in the tax system and encourage tax compliance. The Income Tax Act offers individuals personal help, and continuous increases were seen between 1990 and 1997. Family benefit, single benefit, and

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insurance benefit have been covered by only personal benefit of up to Ksh7, 200. These increases raised the threshold for when income tax is due each month from Ksh6, 000 to Ksh8, 000.

iv) Organizational reforms

TMP sought to increase the speed and accuracy of Kenya's tax collecting procedures. The Ministry of Finance was home to the five departments that made up tax administration apparatus. So as to remedy flaws in the tax system, lessen tax evasion, and include more eligible taxpayers in the tax framework, Kenya Revenue Authority was set up in mid 1990s. To achieve this, financial resources were allocated to enhance the remuneration systems of tax officials and enhance the identification and removal of personnel who exhibit incompetence or engage in corrupt practices. The iTax system was introduced in 2014 to facilitate online tax payment and return filing for taxpayers. The iTax system aims to use technology to enhance collection of tax income, broaden the number of taxpayers, and streamline tax compliance procedures by implementing automated domestic tax administration. Before iTax, the KRA used a manual or semi-automated tax administration heritage system. This system was replaced in 2009 by Integrated Tax Management System (ITMS) that allowed taxpayers to pay their taxes directly to KRA's nominated banks using the Real Time Gross Settlement (RTGS) system. Taxpayers were required to provide copies of RTGS documents as evidence of tax payment to KRA offices for official receipts. One of the challenges faced with legacy systems was the precision of records and data maintained by the KRA regarding taxpayers. Despite these challenges, the implementation of iTax has resulted in significant growth in tax revenue for the KRA.

Subsequent to the implementation of tax changes with a particular focus on indirect taxation, there was a notable increase in the aggregate tax revenue generated. The reforms encompassed the implementation of stricter tax regulations and procedures, the broadening of the tax base, and the

augmentation of audit capabilities. The following graph illustrates the trajectory of Kenya's tax revenue from the years 1980 to 2022. The tax revenue has exhibited a consistent upward trend over a period of time.

Figure 2: Kenya's Tax Growth Rate Trend (1980-2022)
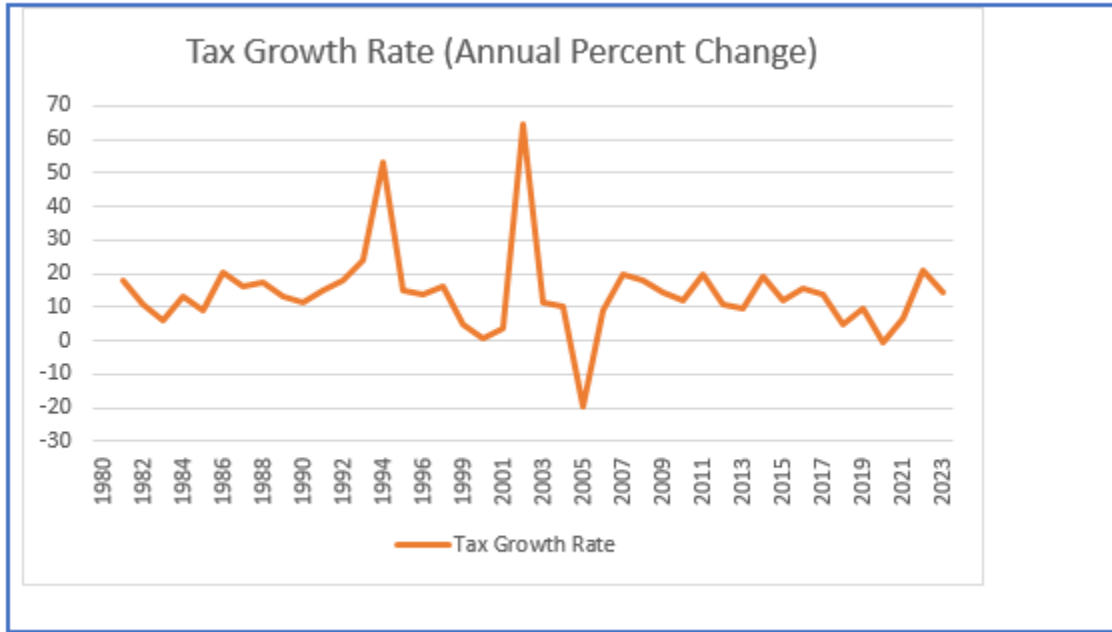
Source: Author's Computation

1.1.2.2 Taxes in Kenya

Kenya's government imposes a wide range of taxes on its inhabitants, including both direct and indirect taxes. In addition to income tax (personal and corporate), indirect tax money consists VAT, customs duty, excise duty, as shown below.

i)   Income Tax

According to Kairanya (2016), the income tax was enacted in 1937, during a period of sustained growth in the industrial and commercial sectors. Furthermore, the demand for manufactured items in the area had expanded considerably, bolstering the case for taxing the earnings of these

businesses. The 10% corporate gains tax, which was intended to be applicable to any trade, corporation, profession, or vocation for so long as it was practiced, was enacted in July 1941 along with two additional regulations to tax excess earnings.

Income tax, according to the Income Tax Act of 2010, is a tax assessed on an individual's total income for each income year, regardless of residence. Income tax, a form of direct tax, is levied against both individuals and corporations. Individual tax rates range from 10% to 30%, while the standard corporate tax rate for residents is 30%. According to Gale and Samwick (2014), while tax policy can impact economic decisions, tax cuts are very unlikely to lead to a healthier economy. Rate reductions raise people's disposable income from their present state of activity while also increasing the after-tax return on investing, working, and saving, reducing people's need to labour, save, and invest. The initial effect, also known as substitution effects, usually boosts productive activity in a specific setting, whereas the second impact, also known as income effects, usually depresses it. If tax cuts are not matched by expenditure cutbacks, the government will borrow more, which would impair long-term development.

ii)   Value Added Tax (VAT)

When taxable goods or services are purchased, a specific kind of consumption tax known as VAT is levied. Kenya's prior VAT Act under Cap 476 enacted in 2010 was repealed and replaced by the VAT Act 2013 that currently governs it. The statutes contained in this Act serve as guidelines for the tax's implementation, administration, collection, and enforcement. Since 1989, when it replaced the sales tax, VAT has been in place in Kenya. The decision to switch from sales tax to VAT was made primarily in response to problems with the sales tax that were found. The single-stage sales tax collection system, which results in a larger revenue loss from tax evasion than VAT,

some of the issues were that the sales base is lower than the VAT base and that sales tax is a tax on tax. (Kairanya, 2016).

The last recipient of tax incidence under the VAT system is the end user. The individual who purchases the taxable supplies for personal use is not eligible to make an input VAT claim, thus they are responsible for paying the input tax. Every transaction in the manufacturing and distribution chain is subject to the tax, however the majority of taxpayers are permitted to write off the input tax they paid. A particular nation's VAT rates fluctuate over time. In Kenya, the normal rate for the provision of locally produced products and services is presently 16%, while the rate for exporting goods and services is 0%.

iii)   Import duty

Omar et al (2021) defines import duty as a trade tax applied in line with the preset tariffs manual book on goods that are imported into the nation or exported from the nation. It also includes freight and insurance. Around 1923, Kenyan customs taxes were first levied. There must be a uniform external tariff for EAC.

Due to the increased cost of imported products, which is expected to decrease imports while raising demand for domestic goods, import duties may have an effect on the economy's performance. Import taxes may also let domestic industries to charge greater prices due to increased production costs. Tariffs on imported goods would be imposed by a developing country's government in industries where growth is desired. This would raise import costs, establish a home market for locally made goods, and preserve those businesses from extinction due to more aggressive pricing.

iv)   Excise duty

The excise tax, like customs duty, was first imposed in the country in 1923. Excise duty also forms a fraction of the indirect income levied against locally produced and sold goods and services. It is a consumptive tax that is levied on both the manufacture of products and the delivery of services. It was once thought to be a "sin tax" levied on a select few goods whose excessive usage was detrimental to the environment, the economy, or social issues. These products were charged exorbitant prices so that the government could mitigate their effects on the consumers and other impacted parties. As a result, the general populace believed that the sinner was being punished as atonement for their transgressions. Later, the excise charge was extended to cover luxury products. Excise duty is a transactional tax in that it is not based on profitability and must be incurred in order to be collected, such as during the manufacture or sale of a good.

Kenya imposes excise taxes on a broad array consisting service and good, such as soft beverages, automobiles, mobile phone services, various types of polythene bags, beer, wine, cigars, and cigarettes. The Excise Duty Act of 2015 currently oversees its administration, which was previously handled by the Customs and Excise Act of 2010.

The graph below is a trend of Kenya's tax revenue for the last ten years. From the graph, tax revenue has been increasing with time. Income tax contributes the most to the tax revenue, followed by VAT then excise duty and then import duty. This growth is ascribed to the government's desire to earn more money in order to settle the growing debt load incurred as a result of infrastructure and other developmental activities.

Figure 3: Kenya's Tax Revenue Trend (2012-2021)

Kenyas Tax Revenue Trend (2012-2021)
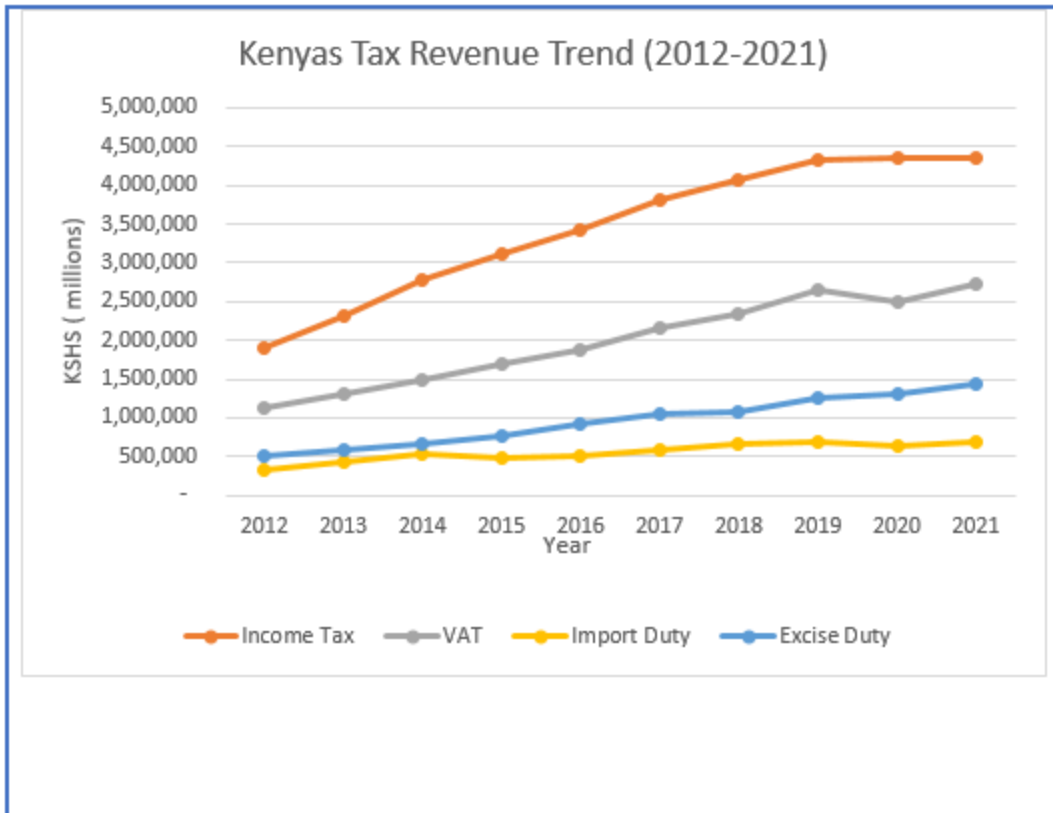
Source: Author's Computation

1.1.3 Tax, Economic growth Link.

Muriithi (2013) observes that, taxes have an effect on the growth of an economy since they raise funds for various government expenditures. In order to encourage tax collection, the government needs to place more emphasis on governance. Ilyas & Siddiqi (2010) point out that taxes is a crucial instrument in the government's arsenal for covering expenses and accomplishing long-term economic objectives. Forecasting growth trends can be aided by understanding taxes. The total amount of taxation is a significant factor in determining variances in economic growth. Increased government efficiency and the control of corruption, according to Ouma (2019), would allow for greater tax compliance, reduced tax avoidance and evasion, halt illicit flows, and reduce illegal coordination between tax payers and tax collectors, thereby depriving the government of much-needed money.

Second, the government needs to plan and put into effect changes that would strengthen the tax system and better connect it to economic expansion. Although government spending directly affects economic expansion, it is impossible for the same to cover its costs without raising money. The most favored method of generating revenue is taxation. Taxation causes the economy to contract by diminishing families' ability and inclination to save and invest. This decreases the amount of disposable income available to them. Raising taxes to fund expenditure reduces one's ability to invest and create employment. For local and international investors, taxes increase the cost of conducting business. Taxes have the power to either positively or negatively impact economic growth by generating revenue to offset their expenditures. Without the collecting of tax money, economic progress is not feasible. Therefore, using tax income to collect money will affect how quickly the economy grows, either accelerating it or slowing it down. The idea is to strike the correct balance. The graph below depicts a comparative comparison of Kenya's tax income and GDP growth trends over a certain time period. Noteworthy is the fact that the increase in tax revenue has surpassed the increase in GDP by a factor of two.

Figure 4: Comparison of Tax Revenue and GDP Growth Rates (1980-2022)
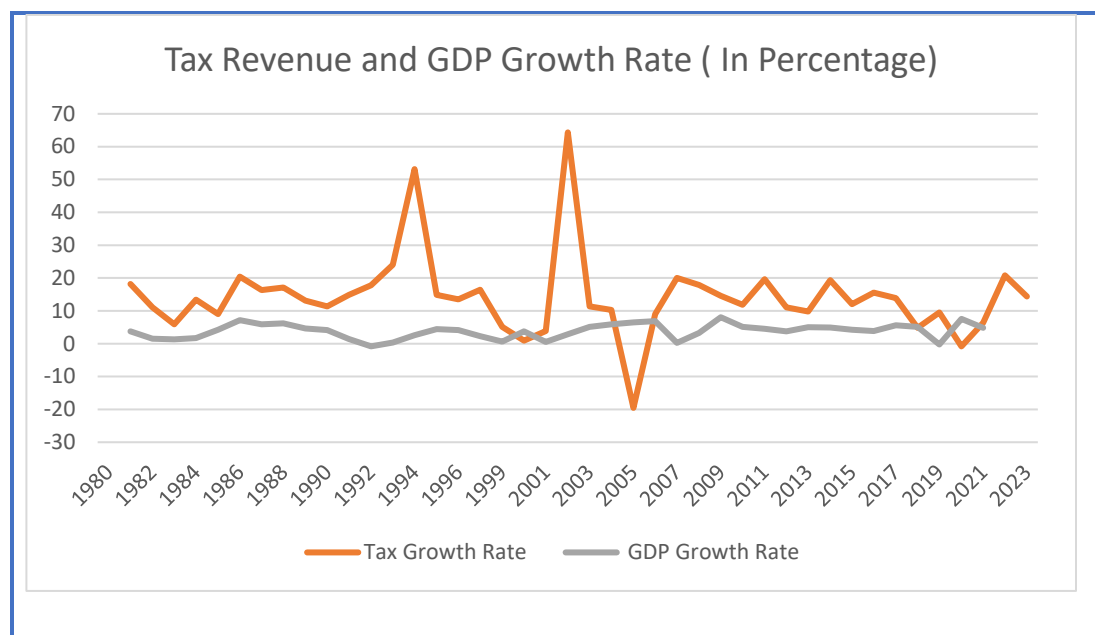
Source: Author's Computation.

1.2 Statement of the Problem

According to data from 2016 to 2022, Kenya's tax revenue has grown on average by 10% over the past eight years. Tax revenue increased by 14% in the fiscal year 2016–17; 5% in 2017–18; 10% in 2018–19; -1% in 2019–2020; 6% in 2020–2021; 21% in 2021–2022; and it is anticipated to rise by 14.4% in the fiscal year 2022–2023. Due to the government's implementation of an economic stimulus program, which included lowering various tax rates, to protect its residents from the COVID-19 pandemic's impacts, less tax revenue was collected in 2019 and 2020. The government has been expanding its tax base and raising tax rates in recent years through the finance bill in order to raise more money through taxes in order to pay for its capital and ongoing expenses, which will spur economic growth. This has been done by imposing turn over tax on income, withholding tax on reinsurance premiums, VAT on imported services, VAT on purchases made on digital platforms, excise duty on gambling activities, increased excise duty on cigarettes, spirits, and

wines, increased excise duty on imported gas cylinders, increased excise duty on imported sugar confectionary and chocolate, increased VAT on imported services, the implementation of a 1% minimum tax on business gross revenue, a 3% tax on digital services, a 15% rise in capital gains tax, and excise taxes on fruit juices, bottled water, cosmetics, and beauty items.

During the same time period, GDP grew on average at a rate of 4.5%, with growth rates of 3.8% in 2017, 5.6% in 2018, 5.1% in 2019, -0.3% in 2020, 7.6% in 2021, and 4.8% in 2022. Due to the COVID-19 epidemic, there was a significant fall in 2020. The pace at which GDP is increasing is not in line with the pace of increase in tax revenue. According to data, increase in Kenya's tax collection rate exceeds a twofold increase in GDP growth. Taxation does not appear to promote economic growth, which is the main issue. The question that this research seeks to address is how taxes influences economic growth, given that economic growth in Kenya has consistently lagged behind tax revenue growth.

1.3 Research Questions.

This research aimed to investigate the following questions:

i)   What is the effect of tax revenue growth on economic growth in Kenya?

ii)   What has been the pattern of growth for various tax revenue in Kenya.

iii)   What policy implications can be derived from the research findings that the Government can potentially implement?

1.4 Objectives of the Study.

The general objective of the study is to find out the effect of tax revenue growth on economic growth in Kenya.

The specific objectives of the study are:

i)   To determine the growth of various tax revenue in Kenya.

ii)   To evaluate the effect of total tax revenue growth on economic growth in Kenya while controlling for covariate.

iii)   Following an analysis of the impact of total tax income in Kenya, present a range of policy solutions.

1.5   Significance of the Study.

The current study is vital in aiding in policy interventions aimed at achieving Kenya's long run vision

A country like Kenya would also gain a lot by simulating a tax system that may boost economic growth. Kenya has the difficult problem of paying initiatives to reduce poverty and offering incentives for economic growth while simultaneously making up for income shortages in a slow-growing economy. Future researchers and academics who do additional study on this issue will find the analysis of the relationship between the increase in tax revenue and Kenya's economic growth to be of great use since it will add to the body of general knowledge and serve as a source of reference. The findings of this study will give decision-makers a strong foundation for creating tax policy recommendations and decisions that are meant to generate the most effective and biggest revenue collection through taxes at levels and rates that benefit the economy.

1.6   Organization of the paper.

From this introductory section, the next two chapters present the literature review (chapter 2) and methodologies applied to obtain the study research questions (chapter 3). Chapter 4 is included (analysis and discussion of the findings) and chapter 5 (which shall be the summary of key findings, recommendations based on study findings) and areas for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This subsection shows literatures reviewed (theory and recent scholarly materials). An overview of the two is then done.

2.2 Theoretical review

2.2.1 Solow's Theory of Economic Growth

Economic growth is predicated on the addition of all capitals (that include both human and physical) while adhering to their returns to scale that exhibit idea diminishing over time, according to the Solow (1956) model of economic growth theory. The size and technical output of an economy's capital supply, denoted as y, as well as its labor force, all influence how much is produced in that economy. To illustrate connection between taxation and economic expansion/decline, utilize the succeeding growth model in which changes in real GDP is determined by changes in both human and physical capital, and some error terms.

With the use of this theoretical framework, we can see how a nation's tax policy indirectly affects the five variables listed on the on the equation 2.1, which in turn affects real GDP growth. A high tax rate on corporate and individual income has the potential to discourage investment, to start with (k). In addition, it is possible that elevated tax rates could have a detrimental impact on the expansion of the labor supply ($\dot{m}$). This could occur through the discouragement of individuals from participating in the workforce, reducing the number of hours worked, or distorting their choice of vocation or pursuit of education, skills, and training. Furthermore, it is crucial to note that tax policy can impede the expansion of productivity () by affecting both the formation of

venture capital for "high-tech" companies and the conduct of research and development. These activities have the ability to provide advantageous externalities that will eventually increase the productivity of the present work force and per capital.

In the Solow Model, economic growth is intuitively propelled by three primary elements: capital accumulation, build-up of labor, and technological advancements. The model posits a convergence to a steady state where the growth rate stabilizes. The introduction of taxation as a variable affecting capital accumulation adds a layer to this framework. Tax policies play an important duty in determining decisions related to savings and investments, consequently influencing the trajectory of the capital stock and, by extension, economic growth.

Equally, tax revenue growth can be linked to the amount of savings and investment in the nation. Higher tax rates may reduce the incentive to save and invest, leading to lower capital accumulation and potentially slowing economic growth. Thus, analyzing how changes in tax revenue growth rates affect the dynamic equilibrium of the economy is key. This involves considering how alterations in taxation influence the convergence to the steady state and the long-term growth trajectory. Further, consider the Laffer Curve concept within the Solow Model framework. There is an ideal taxation rate that maximizes government income as shown by Laffer Curve. Explore how deviations from this optimal rate can impact economic growth and how different types of taxes (e.g., income tax, consumption tax) impact various components of the Solow Model differently. For instance, income taxes may affect savings and investment, while consumption taxes may influence spending patterns.

In summary, the implementation of high labor taxes may play a counterproductive effect on human capital allocation efficiency by discouraging individuals from pursuing work in industries with high social production but high tax burdens. To put it simply, countries with high tax rates may

have lower values of and, which would hinder economic advancement (E. M. Engen & Skinner, 1992).

2.2.2 Benefit Tax Theory

Regardless of whether it is the public or commercial sector, people should pay for what they receive. The demand for public goods should determine price and income elasticity, which in turn should determine the proper tax formula based on ability to pay. Therefore, a progressive, regressive, proportional, or digressive tax system would be acceptable. This theory has a key flaw in that it assumes that a citizen's profit from consuming a social good is known, but because public goods are indivisible, the benefits cannot be known. This assumption, according to Ahuja (2012), is false since it is impossible to measure the advantages that a person receives from using the government's services. People can profit from public goods regardless of whether they contributed to their purchase thanks to the benefit approach to taxation.

The theory proposes that individuals and businesses ought to be taxed in accordance with the advantages they derive from government services. It advocates for a system where those who receive greater benefits from public goods and services shoulder a larger portion of the tax burden. Although the Benefit Theory is commonly linked with discussions in public finance, its direct application to the tax revenue growth, economic growth link entails various considerations.

Under the Benefit Theory, taxes are justified to fund public goods that benefit society as a whole. This can include infrastructure, education, and healthcare. Analyze how tax revenue growth contributes to increased investment in these public goods, and how such investments, in turn, impact economic growth. Equally, assessing how tax revenue growth, guided by the Benefit Theory, influences the provision of public services that enhance economic productivity is vital. For example, investments in education can lead to a more skilled workforce, positively impacting

economic growth.

The theory also consider how different taxes may be applied to fund specific services based on the benefit they provide. For instance, taxes allocated to education might have different economic implications compared to those allocated to healthcare or infrastructure. Further, this theory can be used to examine the concept of externalities in the context of public services. Taxes may be used to address negative externalities or promote positive externalities, and understanding how these impacts economic growth is essential.

Additionally, the Benefit Theory, when applied to taxation, addresses issues of social and economic equity. Notwithstanding, the Benefit Theory aligns with the concept of public-private partnerships. When we consider the role of user fees and charges in the Benefit Theory, some argue that individuals directly benefiting from specific government services should pay user fees.. Additionally, the tax system guided by the Benefit Theory contributes to long-term economic planning.

Applying the Benefit Theory of taxation to the nexus between tax revenue growth and economic growth involves a nuanced examination of how tax revenue is allocated to public goods and services and how these allocations, in turn, influence the broader economy. It's an interdisciplinary approach that bridges public finance, economics, and public policy considerations.

2.2.2 Keynesian Theory

According to the conventional Keynesian theory, changes in the rate of return and disposable income caused by fiscal policies have an impact on people's consumption and savings. A rise in disposable revenue due to tax decrease would lead to an increase in private spending (Kairanya, 2016). Because consumers would hoard money rather than spend it in anticipation of a future tax

hike, tax cuts, according to the Ricardian equivalence theory, will have no effect on consumer expenditure.

Increased Government expenditure financed by higher taxes can feed inflationary tendencies, which is bad for capital accumulation. This is due to the increased ambiguity around both the advantages of present savings as well as the relative prices of the future, which are crucial for investment returns. Inflationary pressures provide exceptionally low real interest rates for savers, limiting investment and restricting the flow of money. In contrast, high projected inflation drives portfolios to shift away to increase investment and, as a result, economic growth, from actual cash balances to real capital. The Tobin-Mundell effect explains this.

2.2.3 Endogenous Growth Model

Romer's endogenous growth hypothesis argues that a nation's economic expansion/decline is dependent on internal factors within the economy, as opposed to external influences. According to this theory, internal forces[1] will result in more efficient manufacturing techniques and new technologies, are what drive economic progress. The more a nation invests in its people, the faster its economy expands. The endogenous growth model's proponents therefore call for the government to encourage innovation, give incentives, and expand its investment in human resources.

The human capital endogenous concept developed by Romer and Lucas in 1988 and 1989 deem skillfulness as an economic growth impetus through technology absorption.

According to Romer et al., (1989), development of new ideas increases the returns to scale of all factors production thus leading to economic growth. Romer grouped ideas as nonrival and all

other factors of production as rival creating a growth model based on spillovers in a competitively monopolistic market. In imperfect competition patenting incentivize people to search for new ideas. Based on this theory, we can conclude that FDI spur economic growth through technological spillover effects on domestic firms.

Lucas (1988) focus on human capital investment accumulation attributable to training. He classifies human capital effects as either internal, related to individual productivity improvement, or external related to spillover on other workers' productivity. He opined that investment in personnel has long-term influence on economic stimulus since education and training will enhance the production process efficiency hence productivity level. According to him, one can either can opt to concentrate on current production or invest in research and accumulation of skills which will increase productivity level and wages ultimately.

The endogenous growth models bankroll the supply leading hypothesis through innovation and technological spillover effects which improve the level of productivity and absorption capacity (Borensztein et al., 1998).

The theory also contends that long-term economic growth rates are influenced by policy decisions. The policies may be implemented using monetary or fiscal means. Taxation is a fiscal policy tool relevant to the topic of our investigation. Taxes are another endogenous driver. For instance, if the government wants to upgrade its infrastructure and technology, it will boost expenditure by raising more money. Our primary study topic, "How does taxation affect economic growth in Kenya?" is addressed using the endogenous growth model.

2.2.4. Exogenous Growth Model

The model was developed in 1950 by Solow and Swan. Technological progress is deemed as economic growth's causal determinant through increase in per capita output. The model assumes a constant population growth rate and production technology with proportional returns to scale. It predicts conditional convergence approaching a steady state equilibrium whereupon population, savings and capital depreciation rates compare to investment.

According to Solow (1956), FDI's influence on economic growth is short-term assignable to diminishing returns to capital aftermath and the fact that increase in capital stock and financial capital formation are bound to reach a steady state (Brems, 1970). The Solow growth models view investment as the necessary condition for economic growth.

2.2.5. Dependency Theory

Dos SANTOS (1970), Gunder Frank (1974), (Amin, 1974) and Immanuel Wallerstein (1974) are the proponents of the dependency theory. The theory depicts an inverse accord linking FDI to economic growth. It postulates the creation of monopolies hence crowding out local firms. This leads to underemployment of the country's productive sources (Borschier and Chase-Dunn, 1985). The MNCs tend to disarticulate the economic growth process through skewed production aimed at niche-market exports (Amin, 1974; Armstrong and Read, 2000). Additionally, they can negatively affect the host country's BOP through profit repatriation (Agbebi & Virtanen, 2017) and creation of enclaves which shield residents from enjoying the benefits Inconclusion, the theoretical perspective can be categorized positive, negative and dependent aspects. Positive aspect is depicted in the Modern Economic Growth theories where advanced technologies and new ideas through R & D lead to economic growth. The Negative aspect is depicted in the Dependency theory where FDI ameliorate economic growth through crowding out, preferential tax treatment of

MNCs, increased balance of payments risks due to repatriation of profit and creation of monopolies due to skewed investments (Rahman, 2015; Adams, 2009).

2.3 Empirical Review

Numerous investigations of the connection between taxation, other macroeconomic variables and economic expansion have been conducted. The following studies were conducted, among others: In a 1980–2007 research, Ali et al. (2018) delved into the connection of Kenya's tax income and economic progress. GDP was the dependent variable, with tax revenue and grant money serving as explanatory variables. The method of OLS was used to examine the data. According to the research, tax income positively affects economic growth in a statistically meaningful way, but grants and other sources of assistance have the opposite effect.

In a study published in 2015, Macek (2015) studied how a variety of tax regimes influenced economic growth. Regression analysis was utilized in this study to look at data from OECD nations betwixt 2000 and 2011. The study's conlusions suggest that economic and political leaders should cut corporation and individual income taxes to encourage economic growth in OECD nations. Increased indirect tax collections should be made up for the resulting decline in income tax receipts.

Gacanja (2012) investigated the link between Kenya's economic progress and tax receipts from 1991 to 2011. Cointegration and Granger Causality analyses were utilized in the research to show the connection between economic expansion and tax income. The findings demonstrated a substantial relationship between these variables. All tax components, including income tax, import taxes, excise taxes, and value added tax, increased GDP. Additionally, a two-way association

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between economic expansion and excise taxes was shown via the Granger Causality test.

Johansson et al. (2008) examined the ways in which Organization for Economic Development Countries (OECD) countries design their tax systems to promote economic development. Corporation taxation is the most dangerous to economic expansion, thereafter individual taxation and lastly consumer taxation. Mobile home property taxes that are continually assessed appear to have the least negative consequences. The article reviewed data from particular enterprises and industrial sectors to show how, in some cases, changing taxes within each of the major tax categories may result in considerable efficiency benefits.

Marsden (1983)'s study from a comprehensive analysis conducted across 20 countries indicates that regions with lower tax rates have observed a more accelerated increase in investment, productivity, employment, and government services. Moreover, these regions have also exhibited superior growth rates, all while ensuring that the less privileged members of society are not subjected to discriminatory practices. OLS was used in data analysis.

Skinner and Engen (1992) examined data for 107 nations from 1970 to 1985 and discovered that balanced-budget increases in government expenditure and taxation are anticipated to diminish production growth rates. They also argue that labor income taxes, unlike corporation, interest, and trade taxes, may have a distinct influence on production growth. Labor supply elasticity defines how labor taxes effect the short run gain in output; while long term impact is unknown. OLS technique was used to examine the data.

Juma (2012) conducted a research with the intention of evaluating the effect of FDI on economic expansion in Sub Saharan Africa spanning from 1980 to 2009. OLS technique was utilized, with real GDP growth being the dependent factor and gross FDI inflows as the primary explanatory

factor. The conclusion of the paper indicated a notable relation betwixt economic development and FDI in the examined region.

Akalpler & Adil (2017) employed VECM Model to analyze the FDI impact on Singapore's economic growth from 1980 to 2014. The results found no connection. Asheghian (2016) evaluated the link between Iran's GDP growth and its determining elements from 1971 to 2007 The findings suggest an absence of causality. In a study by Awunyo-Vitor and Sackey (2018), the link betwixt Ghana's agricultural FDI and economic expansion was examined using the VECM model spanning from 1975 to 2017. The results affirmed the lack of causality. Similarly, Siddikee and Rahman (2021) analyzed data from Bangladesh, encompassing FDI, labor, financial progress, economic progress, and capital formation spanning from 1990 to 2018. Applying VECM Model, the study confirms causality absence. This study proposes financial depth and direction of FDI directed towards capital intensive projects instead of focusing on infrastructural development only.

There is a group of studies on cross-sectional data analyzed individually with different results. Gupta & Singh (2016) employed VECM model to scrutinize causal linkage of economic growth and FDI over the period 1992 to 2013. The results confirmed a demand following hypothesis in China, India and Brazil and lack of causality in Russia and South Africa.

Onafowora & Owoye (2019) employed ARDL Model in analyzing public debt, growth and FDI connection from 1975 - 2015 for five Caribbean countries. The results confirmed supply leading hypothesis in Jamaica and Trinidad and Tobago, demand following hypothesis in Barbados and Dominican Republic and feedback hypothesis in the Bahamas. Nupehewa et al., (2022) employed Dumitrescu and Hurlin tests to analyze economic growth and FDI causality in one hundred and seventeen economies from 2010 to 2020. The results confirm demand following hypothesis in the

American region, feedback hypothesis worldwide and in Asian area and neutrality hypothesis in Mediterranean, Oceanian European and African regions.

Kinuthia and Murshed (2015) explored the factors influencing the FDI's effect on economic progress through a parallel analysis of Kenya and Malaysia. Using a vector autoregressive model spanning from 1960 to 2009, the paper underscored the significant impact of FDI onto Malaysia's industrial success. In contrast, no discernible impact was observed on Kenya's economic growth.

In a distinct inquiry, Odhiambo (2022) utilized the Autoregressive Distributed Lag (ARDL) model with Kenyan data, investigating the causative linkages among Foreign Direct Investment, economic progress, trade openness, and financial depth spanning 38 years (1980 to 2018). The results endorsed hypothesis that follows demand, indicating that economic progress is influenced by FDI. Zekarias (2016) concentrated on examining the relation betwixt FDI and growth in the economy in Eastern Africa. The paper put to use panel data spanning from 1980 through 2013, employing the dynamic generalized method of moments for analysis. The dependent variable, gross domestic product (GDP), was examined in conjunction with independent factors such as primary school enrollment (representing human capital), labor force (represented by the population aged 15 to 64), and infrastructure (measured by the number of mobile cellular subscriptions). The study also considered gross fixed capital creation, comprising both domestic private investment and FDI. Notably, the findings indicated a tangible impact of FDI on economic growth.

Mahmoodi & Mahmoodi (2016) scrutinized FDI, economic growth and exports linkage in 8 European emerging nations and 8 emerging economies in Asia through 1992 - 2013. Using VECM technique on real GDP per capita, Foreign Direct Investment, Exports, Interest, exchange rates, they confirmed feedback hypothesis. Ahmad et al., (2018) and Pradhan et al., (2017) revealed corresponding effect. Ahmad et al., (2018) used VECM model on exports, economic growth and

FDI for five ASEAN countries from 1981 to 2013 while Pradhan et al., (2017)covered nineteen Eurozone countries from 1988 to 2013. Owusu-Nantwi & Erickson (2019) employed VECM model to explore South America's economic growth and FDI relationship from 1980 to 2015. The study found a symbiotic relationship.

Banday et al., (2021) analyzed the connection linking FDI, trade openness to GDP of BRICS economies from 1990 to 2018. Using ARDL model, the study confirms a feedback hypothesis. Qureshi et al., (2021) employed PVAR model to explore economic growth, corruption and FDI correlation. The analysis covered 54 industrialized and emerging economies from 1996 to 2018 and revealed a collaborative synergy. Saidi et al., (2021) used GMM estimator on forty-six developing countries from 2000 to 2016 and found comparable results.

Akadiri et al., (2020) scrutinized trade openness, economic growth and FDI link in 25 African nations from 1980 - 2018. Applying Dumitrescu and Hurlin Granger causality tests economic growth and FDI were discovered to be mutually dependent. It proposes restructuring of FDI and trade policies to encourage positive spillover beyond agrarian establishments hence long-run economic progress.

Owusu (2021) applied ARDL model to analyze causal correlation linking Namibia's economic growth and FDI from 1990-2016. The study reveals a bidirectional causality and propose incentive provision to encourage innovation in the private sector. Similar results were found by Mugableh (2021) and Florence et al., (2017) using Vector Error Correction Model. Florence et al., (2017) covered Nigeria from 1984 to 2015 while Mugableh (2021) covered Jordan from 1980 to 2018.

Ek's (2007) inquiry into the impact of FDI on China's performance of the economy throughout 1994 to 2003 unveiled a substantial and positive out-turn of FDI on economic performance. In a

parallel vein, Saungweme and Odhiambo (2021) investigated the repercussions of inflation on Kenya's economic advancement utilizing time series data throughout 1970 to 2019. Utilizing the multivariate Granger-causality test and ARDL limits testing, they examined inflation, financial stability, trade openness, public spending, investment, and FDI as interpretive variables. The dependent variable in their analysis was real GDP per capita. The paper established a noteworthy and negative sequel of inflation on long-term economic progress.

Barro (2013) conducted regression work utilizing data from approximately 100 different nations spanning throughout 1960 to 1990 to analyze the consequence of inflation on economic performance. The study revealed that a 10% yearly increase in average inflation is related to a 0.20%–0.30% decline in the rate of growth of per capita real GDP. Additionally, this inflationary pressure steers the decline in the ratio of investment to GDP of around 0.40% to 0.60%.

In a study by Olugbenga and Dada (2020), inflation's effect on Nigeria's economic progress was investigated. The autoregressive distributed lag model was put to use to examine various factors affecting the economy, including real GDP, inflation, interest rates, currency exchange rates, economic openness, broad money, and government consumptive expenditure. The study, covering the duration from the 1980s to 2018, concluded that while real exchange rate and inflation had detrimental effects on Nigerian economic growth, money supply and interest rates had positive effects.

Tegegne (2021) utilized time series data found in the Ethiopian National Bank Annual Report spanning from 2002 to 2017 to show the effect of broad money supply on growth in the economy in Ethiopia. The Vector Autoregressive framework and a causation test were employed to analyze the short causal relation betwixt Ethiopia's real GDP growth and its broad money supply. The outcome indicated a positive and statistically noteworthy influence of an increased broad money

supply on real GDP growth of Ethiopia in the short term, although no long-term relationship was identified.

Chude & Chude (2016) employed the OLS technique and data sourced from Nigerian central bank to show the effects of broad supply of money on Nigeria's growth in the economy from 1987 to 2010. The study utilized additional confirmatory quantitative tests such as co-integration, the VAR Granger causality test, ADF test, and KPSS. The findings revealed a strong and positive link betwixt the broad money and growth in economy of Nigeria, suggesting that M2 dominates the relationship between prices and output.

Sultana (2023) conducted research on the correlation between monetary policy and growth of the economy in Bangladesh throughout 1990 to 2018. Using ordinary least squares technique, she assessed the impact of independent variables such as broad money, inflation, the rate of interest, exchange rate, remittance inflow, and BOP on GDP. The study found that inflation, interest rates, and a large money supply contribute positively to growth in the economy during the specified time frame.

Keho (2017) examined the effect of trade openness on rate of economic growth in Cote d'Ivoire from 1965 through 2014, utilizing labor, trade openness, and capital stock as regressors. Toda and Yamamoto Granger causality tests and the Autoregressive Distributed Lag limits test for cointegration were employed. The results suggested that, over both short and long terms, trade openness promotes economic expansion, and there exists a strong and beneficial complementary relationship betwixt trade openness and capital development supporting economic expansion.

Hye et al. (2016) looked into the long-term relation between trade openness and growth of the economy in China utilizing an endogenous economic development model covering 1975 through

to 2009. The study applied the rolling regression approach and ARDL cointegration technique. Results stipulated a favorable long- and short-run relation betwixt trade openness and economic expansion.

Hye & Lau (2014) examined the influence of trade openness in India on long- and short-run relation between trade openness and economic expansion. Employing a new endogenous growth model, an autoregressive distributive lag model, and the rolling window regression method, the study found a strong long-run relation between physical and human capital and growth of the economy. However, the index of trade openness showed a long-run detrimental influence on growth of the economy.

Otieno (2015) carried out research to determine how lending interest rates affect Kenya's economic expansion. The study design employed a causal approach. Real GDP was the dependent variable, while the interbank loan rate was the independent variable. The study's conclusions indicate a conflict between the interest rates on interbank lending and economic expansion.

In research he conducted, Mutinda (2014) examined how loan interest rates impacted the expansion of Kenya's economy. Data for this study was given by the KNBS and the CBK. The data was collected from 2003 to 2012 across a ten-year span. The research was carried out using the OLS regression technique. GDP was the dependent variable in the research, while the regressors were inflation, real exchange rate, real interest rate, budget deficit, and gross investment. The results show that interest rates, deficits in government spending, inflation, real exchange rates, and economic growth are all negatively correlated. The investigation also discovered a useful connection.

In his study, Kairanya (2016) delved into the effect of both direct and indirect taxes on Kenya's

economic expansion. His primary findings revealed that, based on the coefficient of determination, factors such as interest rates, foreign direct investment, net exports, indirect taxes, direct taxes, and other taxes collectively explained 96.8% of the variance in GDP. The results further revealed a statistically notable adverse relation betwixt Kenya's indirect taxes and short-term economic growth. Conversely, both foreign direct investment (FDI) and net exports coefficients were highly significant, exerting a short-term impact on growth of economy in Kenya. The investigation, spanning between 1975 until 2014, employed time series data and focused on uncovering these effects. The Ordinary Least Square (OLS) technique was utilized to unveil the long-term cointegration equation, and pre-estimation tests were conducted to assess homoscedasticity, autocorrelation, multicollinearity, and normality of the variables.

2.4 Overview of the Review

Taxes play a pivotal role in either impeding or fostering welfare, thereby exerting lasting effects on growth. Sustainable economic development becomes challenging when the tax code exacerbates the disparity between the affluent and the less privileged. For the sake of fairness and societal well-being, it is crucial to meticulously design income and profit taxes in a progressive manner, aligning with the levels of earnings and profits. The literature review underscores the undeniable influence of taxes, an integral component of governmental fiscal policy, on a nation's pace of economic growth. The ongoing debate revolves around discerning whether taxes yield a detrimental or beneficial effect on the development of the economy.

Sarker & Khan (2020) investigated the causal connection of FDI and Bangladesh GDP administering ARDL model on data from 1972–2017. The study revealed one-sided causality where economic growth attracts FDI inflows. Employing VECM model, Hobbs et al., (2021)

evaluated the association among Albania's growth of the economy, trade and FDI covering the period 1992-2017. It found that economic growth allure FDI inflows. It proposed redesigning of policies to encourage FDI that is export-oriented and uses technology as well as the growth of globally competitive specialized industries.

Gokmen (2021) utilized the VECM model to explore the relation betwixt Turkey's FDI and economic expansion spanning between 1970 and 2019. The paper found beneficial relation between economic growth and FDI inflows, suggesting the gravity of allocating resources to productive sectoral establishments. Hossain & Hossain (2023), employing a vector autoregressive (VAR) model, explored the causal connection betwixt FDI and China's economy throughout 1981 to 2020. Findings proposed that growth in the economy induces FDI inflows in the country, emphasizing the need for policies for growth in the economy that prioritize sustaining growth above luring foreign direct investment.

The "Feed-back Hypothesis," positing a bi-directional causal relationship, suggests a self-perpetuating circuit connecting FDI to economic growth. Iamsiraroj (2016) analyzed 124 countries using the Durbin–Wu–Hausman (DWH) endogeneity test to explore the relation betwixt economic growth and FDI covering 1971 throughout 2010. The study supported the feedback hypothesis and recommended government intervention in maintaining stability, a well-educated workforce, sound monetary policies, and the removal of trade sanctions. Suliman et al. (2018), utilizing GMM estimators and the Durbin-Wu-Hausman (DWH) test, investigated the endogenous relationship between FDI and growth in the economy covering 1980 throughout 2011, revealing a bidirectional causality in ESCWA countries. Flora & Agrawal (2016) applied the VECM to analyze the relation between economic expansion and FDI in five Asian economies from 1985 to 2011, yielding similar results.

Studies by Ali et al. (2018) and Gacanja (2012) indicated a beneficial relation between taxes and growth of the economy, while Juma (2012), Zekarias (2016), and Ek (2007) demonstrated a favorable association between FDI and development of the economy. On the contrary, Macek (2015), Johansson et al. (2008), Marsden (1983), and Skinner & Engen (1992) indicated a detrimental correlation betwixt taxes and growth of the economy. Saungweme & Odhiambo (2021), Barro (2013), and Olugbenga & Dada (2020) collectively demonstrated an unfavorable correlation between inflation and growth of the economy, while Otieno (2015) and Mutinda (2014) found an unfavorable relation betwixt economic expansion and interest rates.

While numerous research has concentrated on the effects of specific taxation systems on Kenya's economic performance, Njogu (2015) examined influence of Kenya's VAT on economic expansion. Some studies, like Kadenge (2021) and Gacanja (2012), did not include a control variable in their analyses. Muriithi (2013) included non-tax revenues as control variables but used analysis of variance for model robustness and variable interrelationships. Kairanya (2016) highlighted the composition of tax income from direct and indirect sources. In this context, the paper introduces more control variables, consolidates all taxes into a single tax revenue, and employs both pre and post-estimation tests, contributing to the existing expertise in this area.

CHAPTER THREE

METHODOLOGY

3.1 Introduction.

An overview of the study's structure of theory employed in the paper is provided in this section. Discussions have also included data sources, variable definition and measurement, econometric specification, and econometric concerns.

3.2 Theoretical Framework.

The frameworks created by Lee & Gordon (2005) and Engen & Skinner (1996) for their studies on taxes and economic development serve as the basis for this investigation. Engen & Skinner (1996) structure their study using accounting paradigm developed by Solow (1956). Solow's technique states that an economy's production, y, that's typically gauged by GDP, is given by its economic wealth, including the magnitude and technical productivity of the capital stock, k, as well as the size and skill of its work force, m. A nation with abundant resources may be anticipated to produce more per capita than one with scarce resources due to the size of its (per capita) capital stock, technological advancements, and higher worker skill levels, or human capital, which is the productivity of these general economic inputs. The production growth rate of the economy was categorized by Engen and Skinner (1996) as follows:

$$\dot{y}_i = \alpha_i \dot{k}_i + \beta_i \dot{m}_i + \mu_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where $\dot{y}_i$ stands for growth rate of real GDP in nation *i*, and $\dot{k}_i$ represents change in capital stock over time. The variable μ_i gauges the total productivity growth of the economy, whereas the letter

ṁ$_i$ represents the percentage growth rate of the effective labor force over time. The coefficients indicating the output elasticity of labor is β$_i$ while α$_i$ indicates the marginal productivity of capital.

Based on this theoretical framework, Engen & Skinner (1996) proposed potential effects of taxes on production growth on each variable on RHS of equation 1. High taxes may lower levels of investments, reduce research & development (R&D) and discourage labor force which will slow economic growth.

Engen & Skinner (1996) applied two mechanisms to show how taxation might affect economic growth. The first is that, along a potentially drawn-out transition path to long run equilibrium, it would be expected that short-term output growth rates will also vary when the structure of taxation changes. In relation to EGMs, the second issue occurs. The continuous growth rate of the Solow model is substituted in these models by the rate at the steady-state condition that can diverge over time as a result of government spending and tax policies, which are stifled down by technological advancements and increases in labour productivity. The endogenous growth approach can emphasize the "learn by doing" and "spillover" effects that might emerge from decisions made by a company to invest in R&D, cash, or in individuals' human capital. The pace of production growth in these models may then be affected by taxes in a long-lasting, persistent manner. However, it is still unclear how these levies affect the rate of economic growth.

Using the same concept as Engen & Skinner (1996), Lee & Gordon (2005) gave a specifivation of the below econometric model in an effort to scrutinize the effect of taxation on the rate of rise of per capita economic growth.

$$\frac{\dot{f}}{f} = \dot{a} + + \alpha\left(\frac{\dot{k}}{k}\right) + \beta\left(\frac{\dot{h}}{h}\right) + \dot{\eta} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (2)$$

In order for the tax effects on entrepreneurship to be obvious here, any productivity increase brought on by entrepreneurial activity should take place in the first period. Equation (2)'s second and third components, which take into account variations in the ratio of capital-labor and the typical degree of education for each employee. These may be partially a result of recent modifications to the tax code. They directly took into account the new workers' educational background. Any effect of the tax law, after accounting for education, includes implications aside from those affecting education. The third term somewhat accounts for any cyclical fluctuations in output that could theoretically be related to tax rates.

Their fundamental specification is as follows:

$$GR_i = \beta_0 + \beta_1\tau_i + \beta_2 t_i + \beta_3 S_i + X_y + e_i \quad\text{.. (3)}$$

Where the LHS gives the dependent variable while RHS gives key explanatory variables.

3.3 Model Specification.

This paper made use of the analytical structure created by Engen & Skinner (1996) as well as the revised version specified by Lee & Gordon (2005). Using a modified version of Lee & Gordon's (2005) research, it has been found that growth of the economy and taxation income growth are correlated in Kenya. Incorporating factors beyond taxation, this study also considered net exports, inflation, interest rates, broad money, trade openness and foreign direct investment. While these variables influence a nation's rate of growth, they do not directly impact the make-up of taxation income. Consequently, the interplay between growth of economy, taxation, and different regulatory elements can be understood as follows:

GDP_Growth = F(TR, INFR, FDI, INTR, NX, TO, M$_2$)

Where:

GDP = Gross Domestic Product growth rate

TR = Tax Revenue   rate

FDI = Foreign Direct Investment to GDP ratio

INFR = Inflation Rate

NX = Net Exports to GDP ratio

M_2 = Money supply or broad money

TO = Trade openess which is proxied by sum of imports and exports to GDP ratio

A yearly time series dataset on Kenyan's taxes, GDP, FDI, inflation, interest rates, Trade openness, money supply and net exports for the years 1990 to 2022 was utilized in the empirical study. The specific estimable economic model then;

$$GDP = \alpha + \beta_0 TR + \beta_1 FDI + \beta_2 INFR + \beta_3 INTR + \beta_4 NX + \beta_5 M_2 + \beta_6 TO + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Table 1: Variable definitions, variable measurements and variable priori expected Sign

Variable	Definition	Measurement	Expected Sign
GDP Growth rate	Entire output made in the nation by all citizens.	Annual growth rate of real GDP	Dependent Variable
Tax Revenue Growth	This is the tax revenue collection from all sources such as on	Annual growth rate of total tax revenue	+ve (Ali et al. (2018) +ve (Gacanja (2012) −ve (Macek (2015) −ve (Marsden (1983) } Indeterminate

	I. "Income and profits, II. Taxes levied on goods and services, III. Taxes on the ownership and transfer of property and IV. Other taxes."		
Inflation rate	Increase in the price of goods and services over time.	Annual growth rate of Consumer Price Index	Saungweme & Odhiambo (2021) Olugbenga & Dada (2020) $\Big\}$ Negative Barro (2012)
Net FDI Inflows to GDP ratio	This is the net Capital inflows that an economy gets from	The net FDI to GDP ratio	Juma (2012) Zekerias (2016) $\Big\}$ Positive Ek (2007)

	foreign countries in order to promote economic development to GDP ratio		
Interest Rate	rate at which commercial banks levy charges on private investors who seek to borrow funds from them.	Lending rate imposed by commercial banks on loans extended to investors	−ve (Otieno (2015) −ve (Mutinda (2014) } Indeterminate +ve (Olugbenga & Dada (2020)
Net Exports to GDP ratio	Difference in trade transactions between a nation's exports to foreign countries and its purchases from foreign countries indicated as a ratio to G.DP	net exports to G.DP ratio	Kairanya (2016)} Positive
Financial system deepening	This is the financial system as the share of GDP in Kenya	Proxied by M_2 as a share of GDP).	+ve (Sultana (2023) +ve (Tegegene (2021) } Positive +ve (Chude & Chude (2016)

Trade Openness	This is the trade openness	Measured as sum of imports and exports to GDP ratio	+ve (Keho (2017) +ve (Hye et al. (2016) $\Big\}$ Indeterminate −ve (Hye & Lau (2014)

3.5 Diagnostic Tests

Several checks of diagnosis were used to ensure the validity of the analysis, including multicollinearity, autocorrelation, normality, and stationarity tests. When econometric issues were identified, appropriate corrective measures were implemented. A correlation analysis was conducted to gauge the strength of the relationships betwixt the variables. Diagnostic tests encompassed the Shapiro-Wilk Normality test, Augmented Dickey Fuller (ADF) test for stationarity assessment, Breusch-Godfrey test to detect autocorrelation, and the Variance Inflation Factor (VIF) test for multicollinearity examination. The F-test and t-tests were utilized to evaluate the overall relevance of the framework and the individual significance of each regressor. A detailed discussion of these diagnostic tests is provided below.

3.5.1. Normality Test

In a standard linear regression model, it is essential for the error component to adhere to a normal distribution with a mean of zero. This assumption holds significance as the calculated coefficients are dependent on these error terms in a linear fashion. Therefore, when the error terms demonstrate a normal distribution with a mean of zero and variance, the resulting coefficients also conform to a normal distribution with population parameter and population variance.

In the Classical Linear Regression (CLR) model, it is imperative for the error term (or disturbance term) to adhere to a normal distribution with a mean of zero. This assumption is significant because the estimated coefficients are a linear function of the error terms. In the equation:

$Y=\beta X+\epsilon$

where β computed as:

$\hat{\beta} = (X'X)^{-1} [(X'Y)]$

and $Y = \beta X + \epsilon$, therefore:

$\hat{\beta} = (X'X)^{-1} [X'(\beta X + \epsilon)]$

This simplifies to:

$\hat{\beta} = (X'X)^{-1} [(X'X\beta)] + (X'X)^{-1} \epsilon$

Thus, assuming that the error terms is i.i.d with a zero mean and variance, the estimated coefficients will also exhibit a normal distribution with population parameter and population variance. To test the normality test in this study, the Shapiro Wilk test was used with the following hypothesis: The null hypothesis posits normally distributed disturbance terms, while the alternative suggests non-normally distributed error terms (Wakyereza, 2017). That is

H_0: normality of error terms

H_1: non-normally of error terms

3.5.2. Multicollinearity Test

The use of linear regression models requires that the explanatory variables used in the regression should be linearly independent of each other. Perfect multicollinearity may lead to singularity of

the explanatory variable matrix. This has a potential of having no inverse of the (X'X) matrix. Recall, $\hat{\beta}=(X'X)^{-1}(X'Y)$. Thus linearly dependent variables may result to inconsistency of estimated parameters which cannot be relied on. In this study, the Variance Inflation Factor test was used.

3.5.3. Heteroscedasticity Test

When there's a difference in the errors among the explanatory variables, heteroscedasticity is present. A simple fact that they exist renders statistical significance tests worthless since they rely on the presumption of uncorrelated and consistent modeling errors. For the purpose of proving the presence of heteroscedasticity, the Breusch-Pagan test was used (Khaled, Lin, Han, Zhao, & Hao, 2019). The homoscedasticity assumption is upheld if the p-value is greater than 0.05. When the homoscedasticity assumption is violated, the data are transformed and weighted least square regression is applied.

3.5.4. Unit Root Test

Macro-economic data is vulnerable to fluctuations, particularly due to the trending characteristics of time series data. To address potential spurious inferences, deterministic factors such as intercept and linear trend terms are included. The Augmented Dickey-Fuller (ADF) test, developed by Dickey and Fuller (1981), was employed to evaluate the stationarity of the data. A series is deemed stationary when it exhibits restricted variance, a stable mean, tends to revert to the equilibrium mean value, and possesses an order of integration (I) equal to 0. Conversely, a series is considered non-stationary if there is covariance and an unstable mean. Non-stationary variables can be transformed into stationary ones through differencing to achieve an order of integration (I) equal to 0.

ADF test hypothesis are;

$H_0: \beta = 0$ (Non-stationary series)

$H_1: \beta \neq 0$ 0 (Stationary series)

In the Augmented Dickey Fuller (ADF) test, the test statistic is evaluated against the t-critical value. If the t-statistic is lower than the t-critical value, we reject the null hypothesis. Conversely, if the t-statistic is higher than the t-critical value, we accept the hypothesis of non-stationarity.

3.5.5. Cointegration Test

After confirming stationarity, the analysis proceeded to explore the presence of short and long term links among the variables, utilizing the Autoregressive Distributed Lag (ARDL) Bounds test. Originally introduced by Pesaran and Shin (1999), expanded upon by Pesaran et al. (2001), and subsequently enhanced by McNown et al. (2018), the ARDL model is considered more advantageous than Johansen and Juselius (1992) and Engle and Granger (1987). This model is applicable to series integrated of orders I (0), I (1), or fractionally, showcasing its versatility. Moreover, it proves to be unbiased and more efficient in both small and large datasets (Ali et al., 2021; D. Asteriou et al., 2021). The test adheres to the F-distribution outlined by Narayan and Narayan (2005) and incorporates critical values suggested by Pesaran and Timmermann (2005). The Augmented ARDL involves t-tests and F-tests on the coefficients of lagged variables.

3.5.6. Granger Causality

The Toda, Yamamoto, Dolado, and Lütkepohl (TYDL, hereafter) test, developed by Toda and Yamamoto (1995) and further refined by Dolado and Lütkepohl (1996), introduces the Modified Wald test (MWald) statistic. This statistic follows an asymptotic Chi-squared distribution with m

degrees of freedom. The TYDL test demonstrates superiority over ordinary Granger causality tests in three crucial aspects. Firstly, it is applicable regardless of the order of integration, whether at I (0), I (1), or fractionally integrated. Notably, there is no need for pre-testing Cointegration properties, thus avoiding bias. Lastly, the test results remain reliable even with a small sample size (Herzer et al., 2008). The TYDL procedure involves deciding the maximum order of integration, establishing an ideal lag order (K), subsequently estimating the VAR model, and ultimately determining causal linkages using the MWald test statistic.

3.6. Data Sources

This research made use of secondary yearly time series statistics for the economy of Kenya for the years 1990 to 2022. The websites of the Central Bank of Kenya (CBK) and the World Bank Data Bank were used to collect data on foreign direct investment (FDI), inflation, and interest rates, money supply and trade openess while the Kenya Bureau of Statistics (KNBS) website was used to collect information on GDP and taxes.

3.7. Analysis strategy

In a time series analysis, common estimation techniques involve the choice between VAR model and VECM or ARDL and ARCH models. While ARDL and ARCH models are meant for forecasting, ARDL requires that variables in the models should be at least stationary at first difference. Since in this study some variables were stationary at second difference, ARDL model was deemed unappropriated. The ARCH model was also not suitable since were not forecasting economic growth. The choice between VAR and VECM is based on whether the variables have Cointegration or not. A VAR model, which predicts a short run relationship is appropriate when Cointegration among variable do not exist. Otherwise, VECM is the appropriate model.

CHAPTER FOUR:

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.0 Introduction

In this section, we embark on the analysis of the data, commencing with the descriptive statistics of the variables incorporated in the model. The significance of these descriptive statistics lies in providing a foundational point for our analysis, aiding in the identification of potential outliers in the data, and offering a concise overview of the primary characteristics of the data. This encompasses vital details such as the number of observations, mean, standard deviation, and the minimum and maximum values of the data.

All data related to the eight variables—Gross Domestic Product growth rate, Tax revenue growth rate, Net Foreign Direct Investment to Gross Domestic Product ratio, Financial system depth, Trade openness, inflation rate, Interest rate, and Net export to Gross Domestic Product ratio—are sourced from the World Development Indicator (WDI) website. The study designates Gross Domestic Product growth rate as the dependent variable, with the Tax revenue growth rate serving as the primary explanatory variable of interest. The remaining explanatory variables function as control variables. Statistical analysis is conducted using STATA version 14, with the presentation and discussion of findings for each section preceding the Tables or Figures. In the subsequent subsection, we present and discuss the descriptive statistics of the variables, both dependent and explanatory.

4.1 Descriptive statistics

In this subsection, we conduct descriptive statistics primarily to delve into the characteristics of the data employed in this analysis. This involves examining general characteristics such as the

average variable, its standard deviation, and its minimum and maximum values throughout the study duration. Plausible explanations for trends in certain instances are also explored.

From the finding in Table 2, gross domestic product of the Kenya grew at an average growth rate of about 3.57% with a standard deviation of about 2.33%. The minimum GDP growth rate was about -1.08% while the maximum growth rate was about 8.06%. This is in confirmation of what we had discussed in the introductory chapter, where we had shown that Kenya, like any other economy has undergone business cycle with peak such as during the coffee boom of between 1977-78 and trough such during the severe droughts of 1983 and 1984, which decimated the agricultural sector, and the coup d'etat in 1982, which slowed investment, are two causes that caused the growth rate to decrease to less than 2% between 1982 and 1984.

Tax revenue, on the hand is the main source of government funds in Kenya. From Table 2, tax revenue grew approximately at 15.67% with a standard deviation of about 2.24%. Further we observe that the minimum and maximum growth of tax revenue growth during the study duration period was about 9.33% and 17.99% respectively.

The net Foreign Direct Investment to Gross Domestic Product for Kenya during the study period is found to be about 77.97%. However, a large standard deviation of about 80.28% reflects that Foreign Direct Investment is highly volatile in Kenya. Foreign Direct Investment plays a vital role as the dynamic element of Gross Domestic Product, thus being highly volatile can play a counterproductive role in GDP growth.

The interest rate (in our case, we used the landing interest rate) was averagely 18.73% with a standard deviation of about 6.86%. The minimum and maximum interest rate during the study period was about 11.38% and 36.24% respectively. Further, the findings reveals that, the next

export to gross domestic product ratio was about -9.02% implying that on average, Kenyan import values exceeded export values. Plausibly, this results from the country's specialization in exporting of raw materials that have little value and importing machineries for expansive agricultural backed economy. Additionally, the study shows that the inflation rate was on average 88.52% with a higher standard deviation of about 67.43%.

On average, the financial system depth (proxied as M_2 as a share of GDP) of Kenya was found to be about 34.93% with standard deviation of 4.49%. This high standard deviation reflects heterogeneity on financial system deepening on the country over time as further reflected by a minimum financial system depth of 26.7% and a maximum depth of 42.8%. The financial system of a country plays a crucial role in its economic development. The differences between a low financial system-dependent economy, a moderately dependent one, and a highly dependent one are substantial. Notably, in a low financial system-dependent economy, the reliance on formal financial institutions is minimal. People may primarily rely on informal channels like family, friends, or local moneylenders for financial transactions and credit. The lack of a well-established banking system can hinder economic growth, as businesses and individuals may struggle to access capital and financial services. However, in a moderately dependent financial system, there is a balance between formal and informal channels. People have access to basic banking services, but informal methods may still be prevalent. This level of dependence indicates a transitional phase where the financial infrastructure is developing, but there might still be gaps in accessibility and efficiency. Equally, a high financial system-dependent economy is characterized by a well-established and sophisticated financial system. Formal banking institutions, capital markets, and other financial intermediaries play a significant role. Individuals and businesses have easy access to a wide range of financial services, including loans, investments, and insurance. This robust

financial infrastructure can fuel economic growth by facilitating capital flow and risk management.

From our rest, Kenya is still in the low category though in some instance, it has reached the

moderate category

Table 2: Descriptive statistics

VARIABLES	Observations	The mean	The standard deviation	Minimum value	Maximum value
GDP growth rate	33	3.56547	2.33348	-1.08	8.058
Tax revenue growth	33	15.67068	2.237352	9.325	17.985
Net FDI to GDP ratio	33	.7797403	.802801	.0408334	3.094711
Interest rate	33	18.73401	6.859328	11.37701	36.24
Net export to GDP ratio	33	-.0902156	.0454665	-.1610355	-.0161509
Inflation rate	33	88.52045	67.43228	8.66902	228.7383
Money supply (M_2)	33	34.93191	4.491253	26.7	42.8
Trade openness	33	.0020604	.0008483	.0009357	.0037243

Source: author's computation

4.2 Diagnostic tests

4.2.1 Normality test

The first diagnostic test we carry in this analysis is the normality test. As mentioned in chapter

three, normal distribution of the error terms plays a crucial inferential implication on the

distribution of the parameters of the linear model. This assumption was critical given that this study utilizes general linear models (specifically Ordinary Least Square regression) which by itself assumes that the errors in the model are normally distributed. To do this, a Shapiro-Wilk test was conducted and the result in Table 3 shows non-normality result of variables used in the analysis (i.e. P-Value < 0.05) except Gross Domestic Product growth rate, trade openness and Net export to GDP ratio. However, our sample was significantly large (33 years) and thus we assume that the "large sample property assumptions" that states that "as a sample approaches infinity, it tend to assume a normal distribution" holds. Therefore, non-normality of many of our variables was not a problem.

Table 3: Shapiro-Wilk Test for normality

Variables/County	Obs	W	V	Z	Prob>z
GDP growth rate	33	0.95466	1.548	0.909	0.18173
Tax revenue growth	33	0.81373	6.359	3.848	0.0000
Net FDI to GDP ratio	33	0.77810	7.575	4.212	0.00001
Interest rate	33	0.85050	5.104	3.390	0.00035
Net export to GDP ratio	33	0.93591	2.188	1.629	0.05170
Inflation rate	33	0.89641	3.536	2.627	0.00430
Money supply (M2)	33	0.94705	2.372	1.836	0.03321
Trade openness	33	0.92051	3.561	2.699	0.00348

4.2.1.1. Visual representation of the normality of the variables

In this subsection, we computed the visual representation of the normality test and superimposed with a normal distribution. We observe that both Gross domestic product growth (in Figure 4) and Net export to gross domestic product growth (in Figure 8) are normally distributed while Tax revenue growth (in Figure 5), net foreign direct investment inflow to Gross Domestic product growth (in Figure 6) and Interest rates (in Figure 7) are non-normally distributed ,

Figure 4: Normality distribution of GDP growth rate
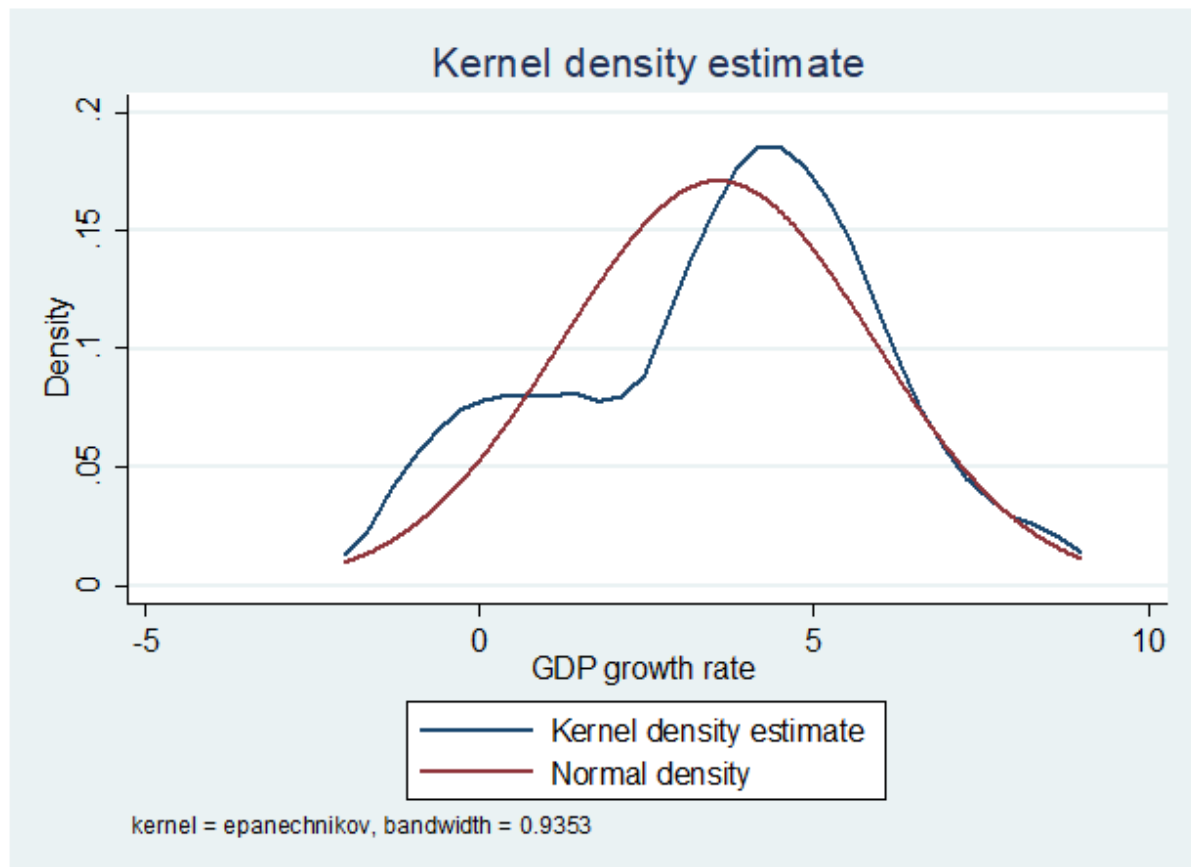
Figure 5: Normality distribution of Tax revenue growth rate
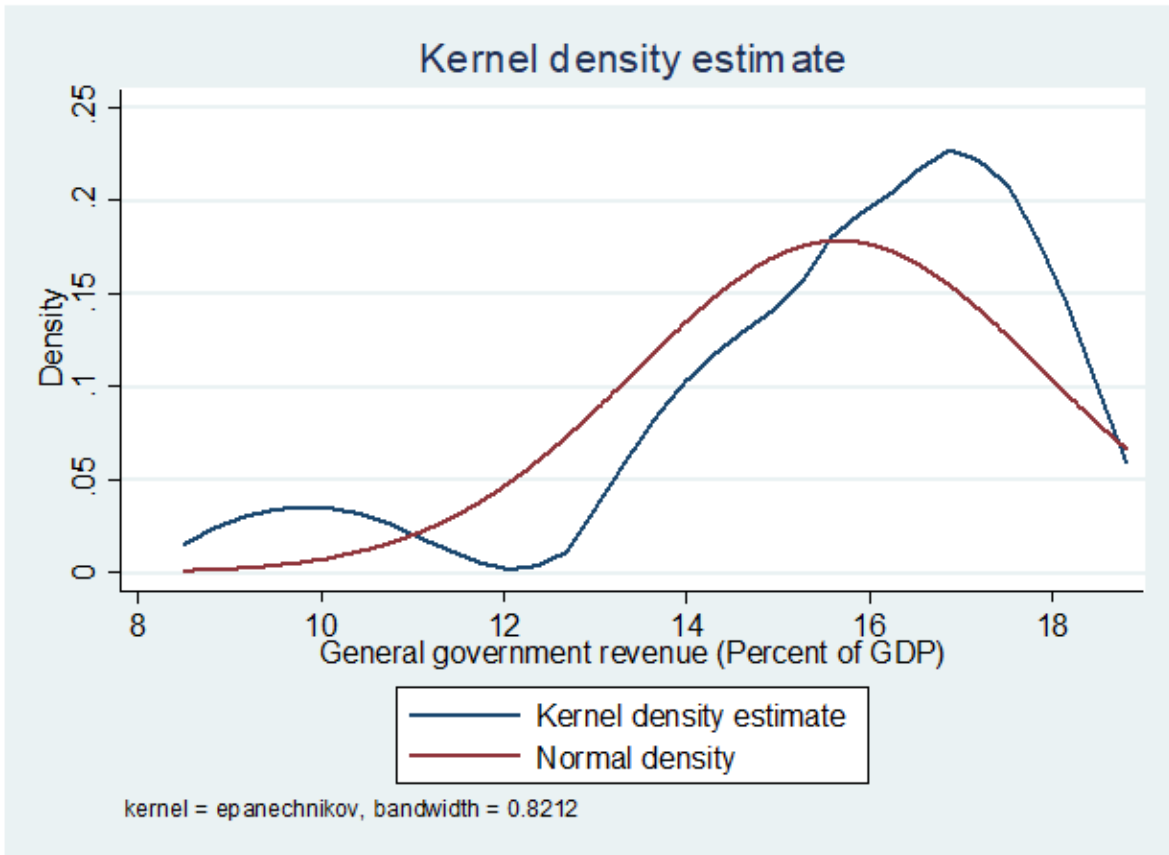
Figure 6: Normality distribution of Net FDI to GDP ratio

kernel = epanechnikov, bandwidth = 0.2047
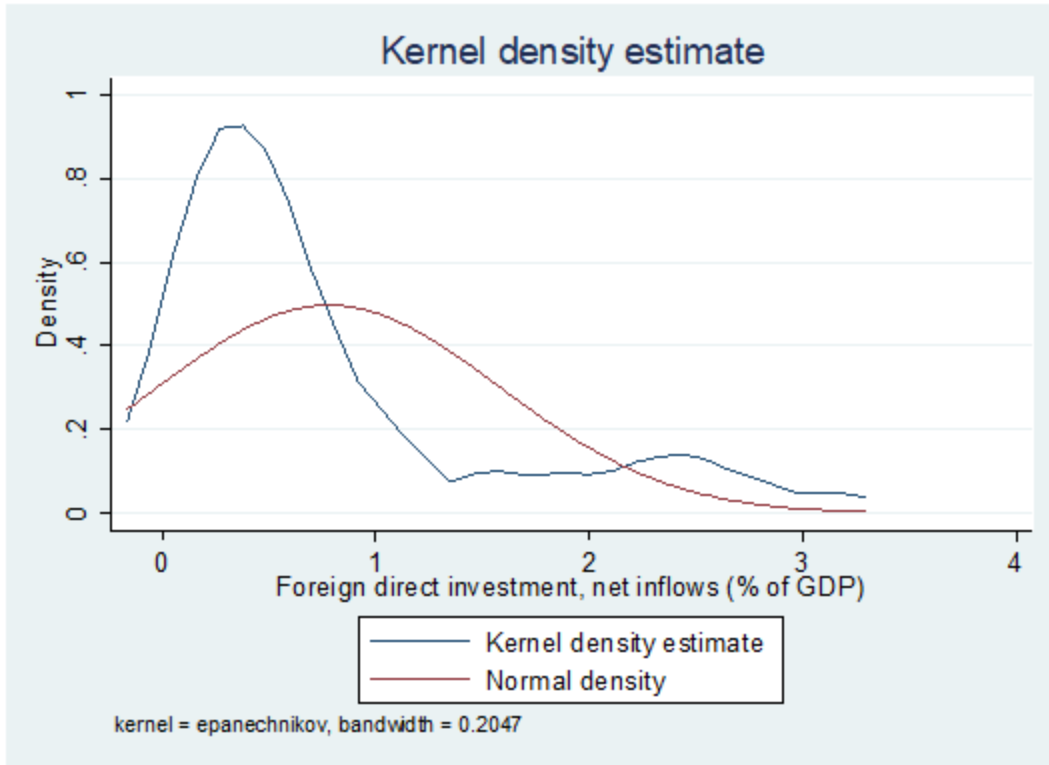
Figure 7: Normality distribution of interest rate

kernel = epanechnikov, bandwidth = 2.4639
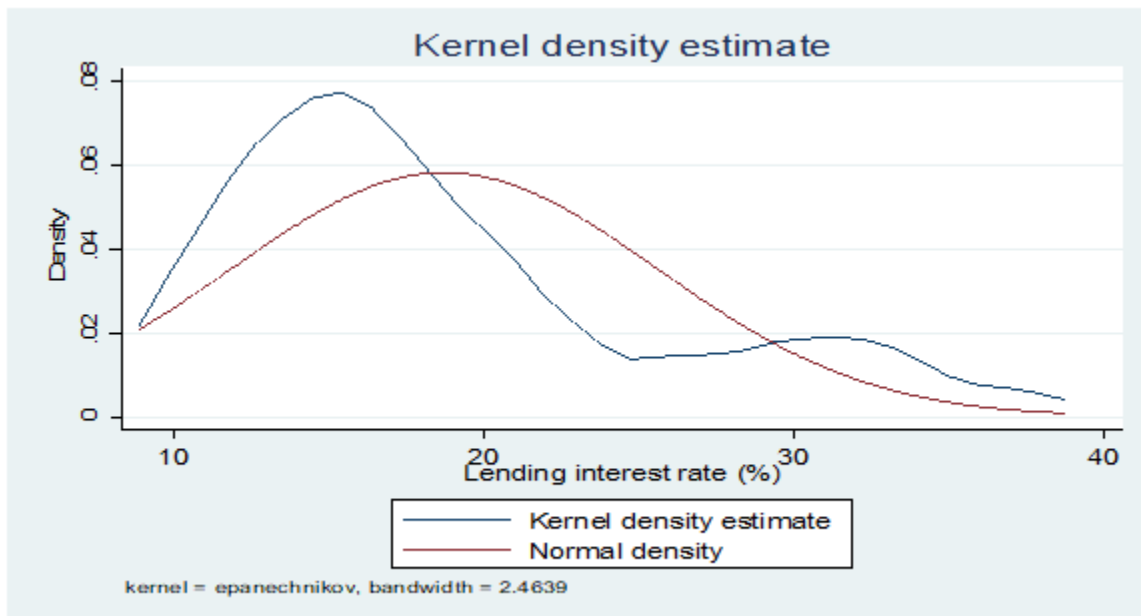
Figure 8: Normality distribution of Net export to GDP ratio

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.0203
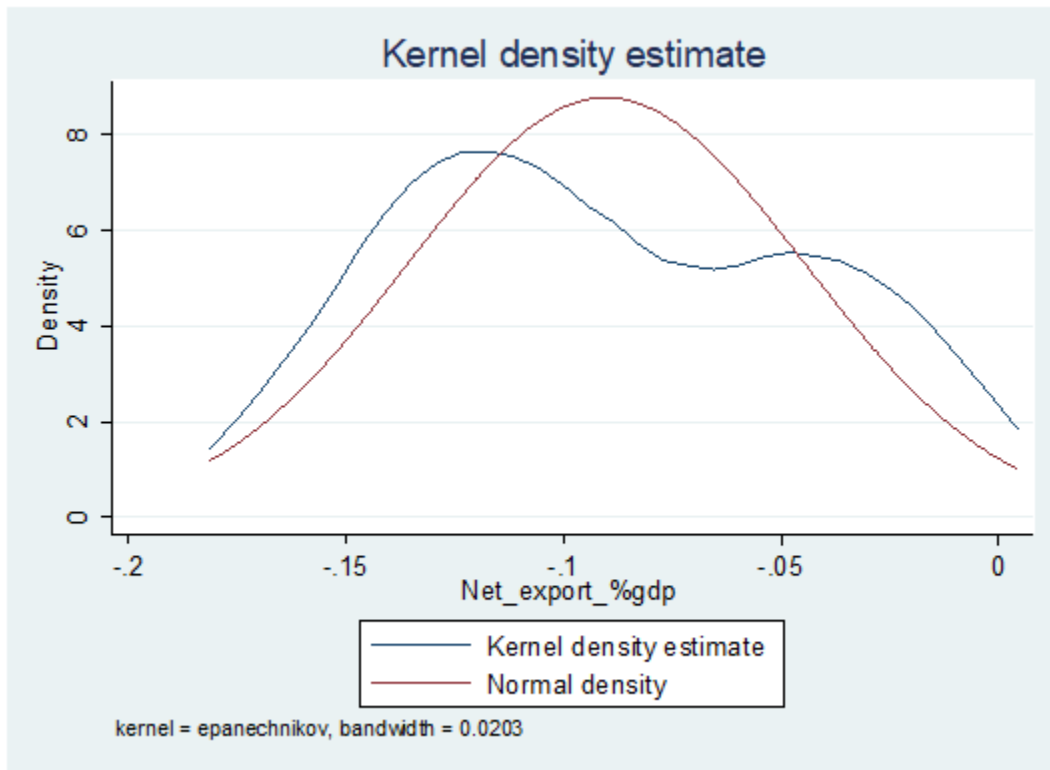
Figure 9Normality distribution of inflation rate

Kernel density estimate

kernel = epanechnikov, bandwidth = 30.1583
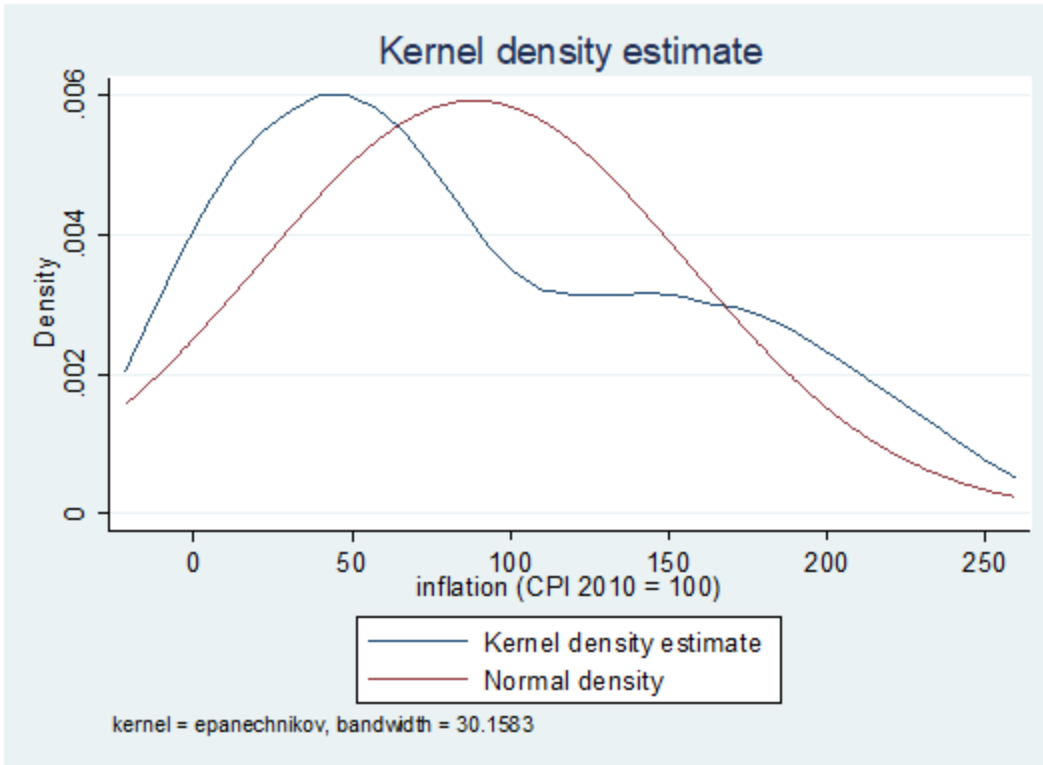
4.2.3. Correlation Analysis

To investigate the relationships within our model, we conducted a correlation analysis. This analysis not only allowed us to explore the associations between two or more variables but also quantified the strength and direction of these relationships. The rationale behind the correlation matrix in this study was twofold: firstly, to unveil the pattern of the variables of interest and secondly, to assess whether a linear regression analysis is feasible for our study. In the first instance, our aim was to ascertain whether the variables in the model exhibited positive or negative correlations and whether these correlations were strong or weak. From a diagnostic perspective, theory suggests that if variables are highly correlated, linear regression estimates may be unreliable due to potential multicollinearity

The outcomes presented in Table 5 highlight that all variables of interest display low correlations, each falling below 50%, except for the correlation between tax revenue growth and gross domestic product growth rate. Notably, this study unveils a positive correlation between tax revenue growth and gross domestic product growth rate, signifying that these two macroeconomic variables move in the same direction. The Net Foreign Direct Investment to gross domestic product ratio is observed to have a weak but positive association with gross domestic product growth rate, implying that they move in the same direction.

Interest rates exhibit a negative correlation with gross domestic product growth rate, indicating an inverse relationship between these two macroeconomic variables. Similarly, the net export to GDP ratio displays a weak negative association with gross domestic product growth rate, implying that negative net export to gross domestic product growth moves in the opposite direction to gross domestic product growth rate.

Financial system depth was found to have a positive but weak association with gross domestic product growth. This implies that as trade openness is vital from economic growth of a nation. Further, the study finding reveals that money supply has a positive but weak association with gross domestic product growth, implying that an increase in the supply of money speeds up the rate of economic growth.

Lastly, the inflation rate is found to have a positive and weak association with gross domestic product growth rate, suggesting that both inflation rate and gross domestic product growth rate move in the same direction. Refer to Table 5 for detailed results.

Table 4: Correlation matrix

	GDP growth rate	Tax revenue growth	Net FDI to GDP ratio	Interest rate	Net export to GDP ratio	Inflation rate	Money supply (M2)	Trade openness
GDP growth rate	1.0000							
Tax revenue growth	0.6337	1.0000						
Net FDI to GDP ratio	0.1505	0.1277	1.0000					
Interest rate	-0.3938	-0.4585	-0.0124	1.000				
Net export to GDP ratio	-0.367	-0.6684	-0.389	0.1626	1.0000			
Inflation rate	0.3955	0.6468	0.1615	-0.635	-0.631	1.0000		
Money supply (M2)	0.3507	0.5920	-0.223	-0.2462	-0.398	0.4692	1.0000	
Trade openness	0.4136	0.7018	0.2647	-0.3800	-0.773	0.6565	0.3467	1.0000

4.2.4. Multicollinearity

The VIF test involves conducting a regression followed by a VIF command in Stata. Conclusions are then derived by considering the magnitude of the VIF values. A VIF value below 10 suggests that a variable is not afflicted by multicollinearity. Conversely, if the VIF exceeds 10, multicollinearity is deemed to exist. The results from Table 6 indicate that the mean VIF is below 10, and all individual variables have a VIF below the threshold of 10. Therefore, we can confidently conclude that multicollinearity is not a significant issue in this study.

Table 5: multicollinearity test

	VIF	1/VIF
Tax revenue growth	2.44	0.409796
Net FDI to GDP ratio	1.24	0.807904
Interest rate	2.22	0.451324
Net export to GDP ratio	3.19	0.313907
Inflation rate	3.27	0.306123
Money supply (M2)	2.07	0.483998
Trade openness	3.16	0.316748
Mean VIF	5.15	

4.3.5. Autocorrelation

In Chapter Three, one of the pre-estimation tests discussed is autocorrelation, a common issue in time series data and a violation of OLS assumptions. Autocorrelation in econometrics signifies a scenario where the current error term is correlated with preceding error terms, expressed

mathematically as $E(\mu\_i, \mu\_j) = 0$, where $i \neq j$. The existence of autocorrelation in time series data violates the properties of constant mean and variance for OLS estimators (Wooldridge, 2016). While it doesn't affect the unbiasedness of estimates, it does compromise the precision of coefficients.

To assess autocorrelation, this study utilized the Breusch-Godfrey (BG) serial correlation Lagrange multiplier. The hypotheses for the BG test are formulated absence of autocorrelation as null hypothesis against the alternative of its presence

The BG test outshines the Durbin-Watson test, especially in identifying autocorrelation in autoregressive AR (1) processes. In contrast to the Durbin-Watson test, the Breusch-Godfrey test has the capability to detect autocorrelation in AR (p) processes where p is 2 and above, showcasing its broader applicability (Dougherty, 2016). The outcomes presented in Table 7 signify the rejection of the null hypothesis, prompting the conclusion that serial autocorrelation is not a noteworthy concern in our dataset.

Table 6: Breusch-Godfrey (BG) serial correlation Lagrange multiplier

Lags (p)	Chi^2	df	Prob> Chi^2
4	9.255	4	0.0050

4.3.6. Unit root test

Augmented Dickey-Fuller is used to test whether the variables in this study are non-stationary or stationary. According to the ADF test, a variable is deemed stationary when its t-statistic is smaller than the t-critical value.

Table 7: ADF test at all levels results

	Test Statistic	1% critical value	5% critical value	10% critical value	Status
GDP growth rate	-1.994	-3.702	-2.980	-2.622	Non stationary
Tax revenue growth	-1.793	-3.702	-2.980	-2.622	Non stationary
Net FDI to GDP ratio	-4.448	-3.702	-2.980	-2.622	Stationary
Interest rate	-1.119	-3.702	-2.980	-2.622	Non stationary
Net export to GDP ratio	-1.994	-3.702	-2.980	-2.622	Non stationary
Inflation rate	5.709	-3.702	-2.980	-2.622	Non stationary
Tradeopness	-1.548	-3.607	-2.941	-2.605	Non stationary
Money supply (M2)	-2.228	-3.607	-2.941	-2.605	Non stationary

Table 8 illustrates that only Net Foreign Direct Investment exhibits stationarity at all levels, with its test statistic (-4.448) falling below the critical value at the specified levels. In contrast, Gross Domestic Product growth rate, Tax Revenue growth, trade openness, Financial system depth, Interest Rate, Net Export to Gross Domestic Ratio, and Inflation Rate display non-stationarity. Consequently, taking the first difference produces the results presented in Table 9.

Table 8: ADF test results for first differenced

	Test Statistic	1% critical value	5% critical value	10% critical value	Status

D_GDP growth rate	-8.320	-3.709	-2.983	-2.623	Stationary
D_Tax revenue growth	-5.498	-3.709	-2.983	-2.623	Stationary
D_Interest rate	-5.607	-3.709	-2.983	-2.623	Stationary
D_Net export to GDP ratio	-5.287	-3.709	-2.983	-2.623	Stationary
D_Inflation rate	-2.519	-3.709	-2.983	-2.623	Non stationary
D_Money Supply	-7.721	-3.614	-2.944	-2.606	Stationary
D_Tradeopness	-6.064	-3.614	-2.944	-2.606	Stationary

Table 9 above illustrates that all variables initially non-stationary at order zero become stationary at order one, i.e., I (1), except for Inflation Rate. Further analysis involving the second differencing for Inflation Rate demonstrates its stationarity at the second difference, as indicated in Table 10 below.

Table 9: ADF test results for second difference

	Test Statistic	1% critical value	5% critical value	10% critical value	Status
DD_Inflation rate	-7.893	-3.716	-2.986	-2.624	Stationary

4.3.7. Testing for Cointegration

Cointegration emerges when two variables display a long-run equilibrium relationship. Typically, when individual economic variables are non-stationary, there is a likelihood of Cointegration. The Cointegration test serves as an initial assessment for time series data, aiming to address spurious regression situations associated with non-stationary data. Essentially, the existence of a Cointegration relationship implies that regressing non-stationary series in their levels produces meaningful and non-spurious results. In this study, the Engel-Granger (1987) test was utilized to examine Cointegration. According to Engel-Granger (1987), if the residuals are stationary, then the variables in the model are considered Cointegrated.

Table 10: Engle-Granger Test for C integration

	Test Statistic	1% critical value	5% critical value	10% critical value	Status
Residual	-9.114	-3.723	-2.989	-2.625	Stationary

Table 11 indicates that the t-values of the test statistics fall below all critical levels, leading to the rejection of the null hypothesis suggesting no Cointegration among the variables. Consequently, this implies that the variables in the model exhibit a long-run equilibrium relationship. Such a finding suggests that regressing the non-stationary series in their levels will yield meaningful and non-spurious results.

4.3. Regression analysis

In a time series analysis, common estimation techniques involve the choice between VAR model and VECM or ARDL and ARCH models. While ARDL and ARCH models are meant for forecasting, ARDL requires that variables in the models should be at least stationary at first difference. Since in this study some variables were stationary at second difference, ARDL model was deemed unappropriated. The ARCH model was also not suitable since were not forecasting economic growth. The choice between VAR and VECM is based on whether the variables have Cointegration or not. A VAR model, which predicts a short run relationship is appropriate when Cointegration among variable do not exist. Otherwise, VECM is the appropriate model.

In this study, ARDL model was rule out because some variables (such as inflation) were integrated of order 2, violating the threshold of stationary at levels or first difference. The ARCH model was also rule out because the study did not seek to predict the growth path of the dependent variable. Since there existed Cointegration, the VECM model become appropriate as opposed to VAR model. Thus, in this study, regression is done using VECM and the result is compared to OLS since it is the BEST when the variables are stationary. OLS result is used as a robustness check and this regression is done after making non-stationary variables to be stationary.

4.3.1. Regression using VECM

4.3.1.1. Selecting the number of lags

To establish Cointegration Vector Error Correction Models (VECMs), the determination of the appropriate number of lags becomes essential. In this study, we apply the methodologies approach proposed by Tsay (1984) techniques employing the *varsoc command he used in the* identification of the lag order in a VAR model with I(1) variables. The result in Table 11, we shall utilize three lags in our multivariate model mainly due to the fact that all the tests (Hannan–Quinn information

criterion (HQIC) method, Schwarz's Bayesian information criterion (SBIC) method, Akaike's information criterion (AIC) and sequential likelihood-ratio (LR)) chose three lags except the final prediction error (FPE) test.

Table 11: Lag selection criteria

```
.  varsoc gdp_growth tax_rev_growth net_FDI_inflow interest_rate net_export infla

   Selection-order criteria
   Sample:  1996 - 2022                              Number of obs      =         27

   lag      LL       LR       df     p      FPE        AIC        HQIC        SBIC

    0    -771.868                          2.7e+16   57.6939    57.7938     58.0299
    1    -609.674   324.39    49   0.000   7.0e+12   49.3092    50.1084     51.9969
    2    -527.403   164.54    49   0.000   1.4e+12   46.8447    48.3431      51.884
    3     579.527  2213.9     49   0.000   4.7e-21* -31.5205   -29.3228    -24.1295
    4    4886.2    8613.3*    49   0.000       .    -347.941*  -345.243*   -338.87*

   Endogenous:   gdp_growth tax_rev_growth net_FDI_inflow interest_rate
                 net_export inflation_rate tradeopenness
    Exogenous:   _cons
```

4.3.1.2. Johansen test for Cointegration

After determining the optimal lag from subsection 4.3.1.1, application of VECM requires that we have to test the Cointegration. To achieve this, utilize the Johansen test for Cointegration. From Table 12, we reject the null hypothesis of zero Cointegration (i.e trace statistic of 169.6730 is greater than the critical value of 124.24), the null hypothesis of at least one Cointegration (Cointegration (i.e trace statistic of 112.5142 is greater than the critical value of 94.15) and fail to reject the null hypothesis of at least two Cointegration factors Cointegration (i.e trace statistic of 66.2751 is less than the critical value of 68.52). This implies that there is at least two Cointegration variable with a long run relationship. Since Johansen test for Cointegration just indicate the presence of Cointegration without telling us which of the variable are Cointegrated and of what

direction, we proceed to run the VECM, which will reveal this variables and their causal relationship

Table 12:Johansen test for Cointegration

```
                    Johansen tests for cointegration
Trend: constant                                    Number of obs =     29
Sample:  1994 - 2022                                          Lags =      2
───────────────────────────────────────────────────────────────────────────
                                                        5%
maximum                                      trace    critical
  rank     parms       LL     eigenvalue   statistic   value
    0        56    -957.12848        .       169.6730   124.24
    1        69    -928.54908     0.86068    112.5142    94.15
    2        80    -905.42951     0.79698     66.2751*   68.52
    3        89    -890.52632     0.64221     36.4687    47.21
    4        96     -880.6243     0.49485     16.6646    29.68
    5       101    -874.43991     0.34722      4.2958    15.41
    6       104    -872.41529     0.13032      0.2466     3.76
    7       105    -872.29198     0.00847
───────────────────────────────────────────────────────────────────────────
```

4.3.2. VECM regression Result

For Cointegration "Cel" to affirm the long run relationship between economic growth rate and the exogenous variables the equation must be negative and significant. From Table 10, the coefficient of the "cel" is negative (-0. 2991) but weakly significant at 10% level of significant (p = 0.0800) . Therefore the two conditions have been met. This implies that there exist a long run relationship between economic growth and the variables of interest in our model.

The other result shown in Table 10 is the short run causality between economic growth and the explanatory variables of interest. The result reveals that there is a short run causality running from GDP growth to tax revenue growth and net export to GDP ratio.

Figure 10: VECM regression result

	Coef.	Std.	Err.	Z

D_gdp_growth _ce1				
L1	-.2990095	.1858733	-1.941	0.0800
GDP_growth LD.	-.241065	.204689	-1.18	0.239
tax_rev_growth LD.	1.690409	.5978735	2.83	0.005
net_FDI_inflow LD.	.554642	.7458274	0.74	0.457
interest_rate LD.	-.051699	. 2285457	-0.23	0.821
net_exporth LD.	9.17×10^{-10}	4.00×10^{-10}	2.29	0.022
inflation rate LD	.2228081	.1386435	1.61	0.108
D_Trade_opness LD.	-1047.753	1106.401	-0.95	0.344
Constant	-.1664896	1.330146	-0.13	0.900

To examine the impact of the exogenous variables on GDP growth rate, we use the Johansen normalization restriction output in Table 11.

Figure 11: Johansen normalization restriction

```
Identification:  beta is exactly identified

               Johansen normalization restriction imposed

          beta |    Coef.   Std. Err.     z     P>|z|     [95% Conf. Interval]

_ce1           |
     gdp_growth |        1          .       .       .            .          .
 tax_rev_growth | 2.210124   .4111057    5.38    0.000     1.404371   3.015876
 net_FDI_inflow | 3.106569   .5974143    5.20    0.000     1.935658   4.277479
  interest_rate |  .6101759  .0700437    8.71    0.000      .4728929   .747459
     net_export | 2.22e-09   2.81e-10    7.88    0.000     1.67e-09   2.77e-09
 inflation_rate |  .1128269  .0164221    6.87    0.000      .0806402  .1450135
broadmoneyofgdp |  .0007769  .1248991    0.01    0.995     -.2440208  .2455746
  D_Trade_opness |  920.5177  906.4493    1.02    0.310     -856.0902  2697.126
           _cons | -47.39981         .       .       .            .          .
```

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4.3.1. Interpretation of the result

Examining the outcomes presented in Table 11 the result reveals that key variables influencing economic growth during the study period include tax revenue growth, net foreign direct investment, interest rate an inflation rate. In particular, holding all other factors constant, a one percentage increase in the tax rate leads to approximately 2.21% increase in economic growth. Further, holding all other factors constant, a one unit increase in net foreign direct investment inflow leads to about 3.12% increase in economic growth rate. Additionally, the result shows that if all other factors were held constant, a one percent increase in interest rate leads to an approximate 0.61% increase in economic growth rate. Finally, we found out that when all other factors were held constant, a one percentage increase in inflation rate led to an equivalent 0.11% increase in economic growth.

4.3.2. Discussion of the findings

The effects of interest rates, inflation rates, net foreign direct investment (FDI) inflow, tax revenue growth, and net exports on economic growth rate can vary and are subject to complex interactions. Notably, it's important to note that the relationships between these factors and economic growth are dynamic and can be influenced by various external factors, policy decisions, and global economic conditions. Additionally, the impact of these variables may differ based on the specific characteristics of a country's economy.

Our study finding reveals that increase in tax rate increases economic growth. This was against our priori prediction of a negative relationship. Factually, increased tax revenue allows governments to invest in infrastructure, education, and public services, fostering economic development. Tax policies can influence consumer spending, impacting overall economic activity. Higher tax revenue allows governments to invest in infrastructure, education, and healthcare.

Public investments contribute to economic development and can enhance the overall business environment. This findings is in line with the study by Gacanja (2012), who in his study sought to evaluate the Cointegration and Granger Causality of all tax components, including income tax, import taxes, excise taxes, and value added tax on gross domestic product. Their findings found a positive association between all these taxes and gross domestic product growth increased. However, our study finding conflicts the findings of Macek (2015), Johansson et al. (2008), Marsden (1983) and Skinner and Engen (1992) who all showed that an increase in tax revenue (individually or at total level) led to a decline in the gross domestic product growth.

The findings reveals that interest rates and economic growth goes in the same direction. That is, an increase in interest rate increases economic growth. From a theoretical perspective high-interest rates are expected to discourage borrowing and investment as the cost of capital increases. Equally, higher interest rates may lead to a slowdown in economic activity by affecting consumer spending by increasing the cost of loans for items like homes and cars. However, some studies have shown that higher interest rates can incentivize saving as individuals earn more on their savings. This increased saving can be channeled into investments, providing capital for economic activities. So the real impact of interest rate is inconclusive. Our study shows that in fact, higher interest rates can boost economic growth.

Increase in inflation rate was found to increase economic growth during the study period. This finding is against our expectation that had suggested that higher inflation may erodes the purchasing power of money, reducing real incomes. This can lead to a decrease in consumer spending and overall economic growth. Central banks might raise interest rates to control inflation, impacting borrowing costs and, subsequently, investment. However, moderate inflation can

encourage spending as consumers are motivated to buy now rather than later when prices might be higher. This increased consumption can boost economic activity. This supports our findings.

Our findings further shows that increase in net foreign direct investment increases economic growth. Positive net foreign direct investment inflow indicates foreign investment, bringing in capital and technology, potentially boosting economic growth. Foreign direct investment can lead to job creation and increased productivity, contributing positively to the economy. Foreign direct investment brings in foreign capital, technology, and expertise, stimulating economic growth. This infusion of resources can lead to the development of new industries, job creation, and increased productivity. Hence, this supports our findings.

Lastly, an increase in net export was found to increase economic growth. This was according to our priori expectation where we predicted that a positive net export (exports exceeding imports) contributes to economic growth by increasing the country's overall output and creating jobs. Exchange rates can affect export competitiveness, influencing net exports. Positive net exports (exports exceeding imports) indicate increased production and demand for domestic goods and services, leading to economic growth. Growing exports often require increased production, leading to job creation and a positive impact on the labor market.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND POLICY IMPLICATIONS

5.1. Introduction

This is the last chapter of this research paper. In this chapter, we discuss the study's Key summary findings, highlight the key study conclusions, point out the study's policy implications and suggest some future areas in which research can be further be done in same area to enrich the frontier of knowledge.

5.2. Summary

This study's primary objective was to investigate the effect of tax revenue growth on economic growth in Kenya. More specifically, the study aimed at evaluating the effect of total tax revenue growth on Kenyan's gross domestic product growth rate between 1990 and 2022 while controlling for covariate as well as offering policy implication of the findings. The motivation for studying the effect of tax revenue growth on the economic growth rate is motivated by various factors, reflecting the intricate relationship between fiscal policies and overall economic performance. These factors include, but not limited to (i) Tax revenue is a primary source of government income in the Kenyan economy and hence understanding how changes in tax revenue impact economic growth is essential for policymakers in managing government finances and formulating effective fiscal policies. (ii) Analyzing the relationship between tax revenue growth and economic growth provides insights into the effectiveness of fiscal policies and therefore policymakers can assess whether changes in tax structures positively or negatively influence economic outcomes. (iii) Tax revenue funds government expenditures, including investments in infrastructure and hence

studying the effect on economic growth helps evaluate the role of taxation in facilitating capital formation, which is crucial for sustained economic development and (IV) Governments rely on tax revenue projections for budgetary planning and thus analyzing the relationship with economic growth aids in making informed decisions regarding resource allocation, ensuring that fiscal policies align with economic objectives.

To achieve the study's aims, the associated itself with the Solow's Theory of Economic growth, the Benefit Tax Theory, the Keynesian Theory, the Endogenous growth model and reviewed the existing theoretical literature pertinent to this study in order to identify and fill the knowledge gap left by related prior research. In addition, the study objectives were met using secondary data from the World Development Indicator 1990 to 2022 and an Ordinary Least Square regression model to determine the influence of tax revenue growth on gross domestic product growth rate. In order to avoid drawing incorrect conclusions, the residuals obtained from the model used in the study were subjected to pertinent diagnostic tests, including the Breusch Pagan test for heteroskedasticity, the Shapiro Wilk for normality test, and the Variance Inflation Factor test for multicollinearity.

Considering the study descriptive results, gross domestic product of the Kenya grew at an average growth rate of about 3.57%, net export to gross domestic product ratio was about -9.02% , inflation rate was on average 88.52%, tax revenue grew approximately at 15.67%, net foreign direct investment to gross domestic product was about 77.97 while interest rate was averagely 18.73%

For the inferential statistics, the result reveals that out of five explanatory effects of interest rates, inflation rates, net foreign direct investment (FDI) inflow, tax revenue growth, and net exports on economic growth rate can vary and are subject to complex interactions. Our study finding reveals that increase in tax rate increases economic growth. This was against our priori prediction of a

negative relationship. A plausibly reason for this observation lies on the fact that an increased tax revenue may allow governments to invest in infrastructure, education, and public services, fostering economic development. Equally, a tax policies can influence consumer spending, impacting overall economic activity and that higher tax revenue allows governments to invest in infrastructure, education, and healthcare. The findings also reveals that interest rates and economic growth goes in the same direction. That is, an increase in interest rate increases economic growth. Plausibly because higher interest rates can incentivize saving as individuals earn more on their savings. This increased saving can be channeled into investments, providing capital for economic activities. So the real impact of interest rate is inconclusive. Our study shows that in fact, higher interest rates can boost economic growth. Further, increase in inflation rate was found to increase economic growth during the study period. Plausibly, a moderate inflation can encourage spending as consumers are motivated to buy now rather than later when prices might be higher. This increased consumption can boost economic activity. Additionally our findings shows that increase in net foreign direct investment increases economic growth. Positive net foreign direct investment inflow indicates foreign investment, bringing in capital and technology, potentially boosting economic growth. Foreign direct investment can lead to job creation and increased productivity, contributing positively to the economy. Lastly, an increase in net export was found to increase economic growth. This was according to our priori expectation where we predicted that a positive net export (exports exceeding imports) contributes to economic growth by increasing the country's overall output and creating jobs. Exchange rates can affect export competitiveness, influencing net exports. Positive net exports (exports exceeding imports) indicate increased production and demand for domestic goods and services, leading to economic growth. Growing exports often require increased production, leading to job creation and a positive impact on the labor market.

5.3 Conclusion and Policy Implications

In conclusion, the study finding reveals that the key determinants of gross domestic product growth of Kenya during the study period are tax revenue growth, net FDI inflows, interest rates, net export to gross domestic ratio and inflation rate. All these macroeconomic variables were found to have a positive influence on gross domestic product growth, implying they have a significant increasing effect. In light of this finding, we recommend that tax revenue growth rate should take into account the projected economic growth. Taking such consideration can help boost economic growth and achieve set growth. Secondly, the inflation rate should be set at a favourable level that will boost investment and hence enhance economic growth. We recommend moderate rather than higher interest rate. Finally, there should be policy intervention and mechanism that should be put in place to reduce the negative net exports to reduce more leakages in the economy to boost economic growth.

5.4 Suggestion for Further Research

Further research on topics such as tax avoidance and evasion, tax compliance rates and tax literacy on Kenya's economic growth, and the impact of welfare on taxes is necessary. Subsequent investigations may also be conducted about the utilization of technology in tax collecting.

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Appendix

VECM result

OLS result