EFFECTS OF MACROECONOMIC VARIABLES ON TAX REVENUE PERFORMANCE IN KENYA

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A Research Thesis Submitted in Partial Fulfillment of the Requirement for the Award of the Degree of Master of Science in Economics of Masinde Muliro University of Science and Technology

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DECLARATION

This thesis is my original work and has not been submitted for a degree in any other university or for any other award.

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CERTIFICATION

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DEDICATION

This work is dedicated with love to my family, my wife Lucy, daughters Shirley and Kristelle for bearing with me while away finishing this work. Your prayers, sacrifice towards my education, good parental guidance and immense support has made me who I am today. May you draw great inspiration from this work.

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ABSTRACT

For any government to effectively carry out its primary function and other subsidiary functions, it requires adequate funding. Taxation generates public funds to governments through structured approaches. The amount of tax revenue realized or expected by any state is determined and influenced by various economic factors ranging from micro to macro-economic. In Kenya, tax revenues have, for quite some time, remained low relative to the effort and tax policies in place. This study examined the effects of macroeconomic variables on tax revenue performance in Kenya using annual time series data of ten years for the period 2008 to 2018, to estimate a linear model of tax revenue performance and the selected macro-economic factors. The period is extensive enough to give accurate results. The study adopted a correlation research design which is a non-experimental research design technique that helps researchers establish a relationship between two closely connected variables. Secondary data from the Central Bank of Kenya, Kenya National Bureau of Statistics (KNBS), Kenya Revenue Authority (KRA) and World Bank were Collected and presented using tables and figures. The study carried out pre-estimation tests so as to validate the results. Unit Root Tests was done to detect for stationarity using Augmented Dickey Fuller (ADF) test, Cointegration was done to test for long run relationship between the dependent variable and the independent or predictor variables was done using Engle-Granger test. Multicollinearity test was done to find out if the predictor variables are highly correlated using Vector Integrating Factor (VIF), heteroscedasticity test was done to find out if residuals are equally distributed using Breusch-Pagan-Godfrey test. The data was collected using documentary analysis and analyzed using E-views. Time series data rules out the option of collecting biased data from primary sources, it also provides larger and higher-quality databases that would be unfeasible for any individual researcher to collect on their own. The study established that there is a link between the macroeconomic variables and tax revenue performance. It indicated that the coefficient of foreign direct investment (0.311568) and GDP per capita (0.8128243) from the model exhibited a statistically significant positive relationship with tax revenue performance, whereas the inflation (-0.183015) and unemployment rates (-0.343756) negatively influenced tax revenue performance in Kenya for the period of time under the study. The results also revealed that the model was good in terms of goodness of fit and overall significance with R^2value of (0.7371) and a probability value of 0.0000. These means that 73.71% of the variation in tax revenue is explained by the explanatory variables in the model while the other proportion 26.29% is explained by other factors not considered by this study. These findings inform the government and its tax administration on the initiatives and measures to adopt in improving revenue growth and performance. Initiatives to improve business environment, attracting foreign direct investments and enhancing GDP growth. To adopt appropriate measures to curb inflation and unemployment which are a deterrence tax revenue growth. The government should also develop strong mechanism to mobilize more resources for its revenue.

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ABBREVIATIONS AND ACRONYMS

AETRs	Average Effective Tax Rates
CPI	Consumer Price Index
CSAs	country-specific advantages
DTD	Domestic Taxes Department
ECM	Error correction model
FDI	Foreign Direct Investment
FSAs	Firm-specific advantages
GDP	Gross Domestic Product
IMF	International Monetary Fund
KRA	Kenya Revenue Authority
KNBS	Kenya National Bureau of Statistics
KIPPRA	Kenya Institute of Public Policy and Research Authority
LDCs	less Developed Countries
MNE	Multi-National Enterprise
METRs	Marginal Effective Tax Rates
M&A	Mergers and Acquisition
OECD	Organization for Economic Development
PAYE	Pay As You Earn
SSA	Sub-Saharan Countries
TMP	Tax Modernization Programs
UNCTAD	United Nation Conference on Trade and Development
VAT	Value Added Tax
WIR	World Invest Report

OPERATIONAL DEFINITION OF TERMS

Taxpayer: refers to individuals and non-individual entities registered to pay taxes.

Tax knowledge: an understanding of the essential tax policy concepts implemented within a country

Tax compliance: refers to the timely and accurate submission of tax remittance information to the revenue authority

Tax Base: Refers to the number of registered taxpayers on different tax obligations

Tax obligation: refers to the type of tax one is registered to pay to the authority e.g. VAT, PAYE, Presumptive tax, Income tax etc.

Turnover: refers to the total sales in a given period of time

Tax Rate. Refers to percentage rates on which tax is charged on various tax heads.

Tax Acts: Refers to the legislations that allows imposition of different taxes on income and other gains by both individuals and non-individuals

Tax Revenue Performance: Refers to the amount of tax revenues collected in a given period of time vís' a vís the set targets.

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

For any given state, one of the key functions is to raise tax revenue. In order to meet its fiscal obligations, government needs to increase revenue. Mashkoor (2010), confirmed that in as much as governments often use various methods of raising resources, taxation is the key and most important source of government revenue. In order for any state to fulfill its task effectively, it needs to raise funds in order to provide protection to its people, to provide justice or to run the state and to follow certain growth agendas (OECD, 2017)

For decade's taxes has been a subject of debate in the world as governments aim at increasing the accumulation of tax revenues so as to increase the income required for economic development without stripping away the foundation for taxation. Different countries rely on foreign direct investment (FDI) and taxes to improve the recovery of tax revenue (Deloitte,2013).Governments across the globe have the main challenge of constantly improving their people's welfare by introducing effective economic policies and programs (Hung,2017).

Globally, countries with a low-income tax gain or weak tax law compliance experienced tough times. International players such as the Organization for Economic Co-operation and Development (OECD), the World Bank and the G20 called for more concerted steps to tackle tax dodging and evasion. With the world facing the global financial and economic crises, the emphasis on tax havens to improve the openness of their tax regimes and put an end to unequal trade practices has been rising. For example Malaysia, Colombia and Vietnam have seen a downturn in tax performance as a

consequence of non-tax revenue rises since 2003-2015. Throughout Western Europe as well as in other previously socialist states in Eastern Europe and the former Soviet Union countries with high tax results predominate. The highest income countries with tax ratios below the trend line are the USA, Japan, Ireland and Switzerland by the European Commission in 2014.Bangladesh, Pakistan, Cambodia, Malaysia, Sri Lanka, India, Indonesia, Nepal and Philippines are among low-performers, as opposed to southern and southeast Asia. Most Latin America and the Caribbean countries are also below the standard, with the low-tax groups of Honduras, Venezuela, Paraguay, Panama, the Dominican Republic and Colombia. Brazil and Guyana are the only high tax payers in this zone (Pearson 2014).

Regionally, many developing African countries have problems generating public revenue. In Africa most government budgets have shortages that impede policy expenditures, which are essential to economic growth, in human and capital projects. Foreign monetary fund's support programs in African sub-Saharan countries have included steps for tax revenue growth and fiscal reform in these countries in recent years. Countries with relative high tax revenues tend to have high tax index. In Africa, goods and services taxes contributed to the biggest share in 2012 at 5.2 per cent of GDP, while international tax revenue accounted for 5 per cent of GDP and sales and income taxes accounted for 4.6 per cent of GDP (World Bank, 2014).Several sub-Saharan African countries have recently succeeded in reforming their tax systems, for example Benin has implemented a substantial tax and administrative reform plan contributing to changes in the framework of the tax system and a rise in the GDP-to-tax ratio. Similarly, countries such as Ghana, Burundi, Liberia, Morocco and Algeria were classified as high-tax countries in the study recently undertaken by the World Bank in Africa (World Bank, 2014), whilst central African countries (e.g. Sudan, Central

African Republic, Nigeria) are rated as low-tax performers who have been associated with higher death tolls in armed conflict and violence (OECD, 2013).

Taxation is the primary source of government spending funds in Kenya, like most developing nations. Report by the Institute of Economic Affairs reveals that tax revenue accounted for 80.4 per cent of total government taxes and grants between 1995 and 2004.They also argued that taxation was implemented to achieve two goals; to collect adequate tax revenue to fund public expenditure with far less borrowing; and, second, to leverage revenue in a manner that is rational and minimizes its disincentive impact on economic activities (Moyi, 2006).

Kenya has shifted over time from being a low tax burden country to a high tax burden country, yet the country faces the apparent need for more tax revenue to maintain public services. Notwithstanding improvements, tax authorities face significant obstacles in their main revenue collecting function. Nyaga (2016), in their study noted that although the tax reforms experiences seemed encouraging, there still existed gaps that needed further improvement. (Momanyi, 2013) the government of Kenya is always committed to a secured macro-economic atmosphere, though there have been persistent and an unstable deficit which has been a phenomenal to the economy entwined with a deteriorating economic growth. Considering the destabilizing impact of the deficits and the reality that, through the 1986 Sessional Paper No. 1 (GOK, 1986), the Government introduced steps to tackle the problem. The most prominent fiscal policy initiatives were the 1986 Tax Modernization Program (TMP), and the 1987 Budget Rationalization Program (Muriithi and Moyi, 2003).The former plan was aimed at increasing the revenue base of government while the latter included controlling spending by tight fiscal controls. Kenya has a number of tax forms as a way of raising revenue and the Kenya Revenue Authority continues to make changes to meet its goal

per financial year. (Harahap, 2018) in their study concluded that; for a government to increase its tax revenue, it has to ensure that macroeconomic conditions remain stable namely inflation, GDP and the exchange rate.

1.1.1. Foreign Direct Investment

Foreign Direct Investment can be defined as long term venture that incorporates the introduction of international funds into a company operating in a different nation other than that of the financier. The investor has a substantial degree of impact on the running of the firm and for practical functions the investor must have 10% of the level of ownership of the enterprise (UNCTAD, 2009).Foreign Direct Investment (FDI) is significant for output and trade in most of developing countries making it a major contributor to economic development in terms of investment, employment, and foreign exchange thus alleviating poverty in the host country (Ngotho,2014) .Therefore, countries have to work on developing favorable conditions to encourage foreign direct investment. For instance, many countries tend to reduce their corporate tax rates and offer other tax incentives with the aim of promoting FDI (Hayami & Godo, 2005)

Globally, FDI inflows to developing countries have improved both in quality and quantity in the recent past. According to Beck and Chaves (2010), most of the countries which brought down their corporate tax rates also expanded their tax bases by reviewing their capital deduction and other industrial deductions rules. India is an attractive destination for FDI. It comes second after China and ahead of the USA, Russia and Brazil globally. The rate of corporate tax charged in India is 40% for foreign companies and a surcharge of 2.5% of the tax. Japan, France, and Germany among others. All this is in regard to improving business environment for foreign investors.

The African continent has witnessed a dramatic decline in FDI inflows from $19 billion in 2001 to $11 billion in 2002 in 23 countries out of 53 countries on the continent. FDI has been influential in the oil producing countries. The countries of North and West Africa such as Mali, Algeria, Senegal, Nigeria and Tunisia generated more than half the 2002 FDI inflows. South African firms have made a considerable commitment to foreign investment abroad. (Uncoda, 2003).In total, Africa's FDI inflows decreased to $42.7 billion within three years. In North Africa the decline has primarily been due to the fall in FDI inflows. Alas, their inflows were interrupted by political stability, as did Egypt and Libya, the main beneficiaries of FDI inflows. The overall decline in FDI influxes to Africa has largely been due to a reduction in developed-country flows. On the other hand, inflows from 29 billion dollars in 2010 to 37 billion dollars by 2011 have risen. The turnaround was accentuated by a rebound from FDI to South Africa. One of the factors leading to the turnaround is the continued growth of commodity prices and the better economic condition for sub-Saharan Africa. The ventures have consistently produced good returns to mining industries as well as a rise of the middle class in utilities, such as banks, retail and telecommunications, which have nurtured FDI expansion. In 2011 the proportion of FDI facilities was raised.

FDI is a simple and well defined legal framework that the Kenyan parliament developed in the Foreign Investment Security and Investment Promotion Act of 2004. In the 2004 Investment Promotion Act the Investment Code under Kenya directs regulatory and legal processes in order to create an atmosphere of trade and investment that is more desirable. The Kenyan government benefits from foreign trade from a broad range of possibilities, such as the creation of jobs, foreign exchange profits, backward and potential connections and technology and skills transfer. Kenya was one

of East Africa's leading FDI destinations in the 1970's. In the 1970s, FDI balances rose to 10 million USD and in the 1980s to 80 million USD.Poor governance, poor economic practices, high tax rates along with graft and inadequate public service delivery have caused Kenya's small FDI flows since the beginning of the 1980s. That is why the global rise in FDI flows, which began in the mid-1990s, left Kenya out of the economic situation (UNCTAD 2005). At present, Kenya earned USD 1.6 billion FDIs in 2018, up from USD 1.2 billion in 2017.The total stock of FDI stood at USD 14.4 billion in 2018 (UNCTAD, 2019). In recent years the ICT sector has attracted the most FDI thanks to the arrival of the fiber optics in 2009-2010 (KNBS, 2010).

1.1.2 Per-Capita Income and Tax Revenue Performance

The GDP is equivalent to the sum value of the goods and services generated over a year in a region. Economic growth relates to the gradual increase in the number of goods and services produced over a given period of time in a specific economy. On the other hand, per-capita GDP is referred to as GDP divided by population. GDP per capita reflects an overall increase in the living standards of the typical person and/or nation population. Per capita GDP is a better indicator of a nation’s living standards since it adjusts for population. Therefore, per-capita income represents the relative condition of the population of the country. The average income for the people of a specific country is reflected in its index. This can be an incorrect figure because all of them from children to older people are included and the statistical outliers are not taken into consideration.

According to estimates from the World Bank, the Gross Domestic Product per capita in Kenya was last estimated at USD 1202.10 in 2018. This record is equal to 10% of the world average. Kenya received USD 829.09 of per capita GDP between 1960 and 2018

at an all-time peak of USD 1202.10 in 2018 with a previous high of USD 480.40 in 1961. As pictured in Figure 1.1 below

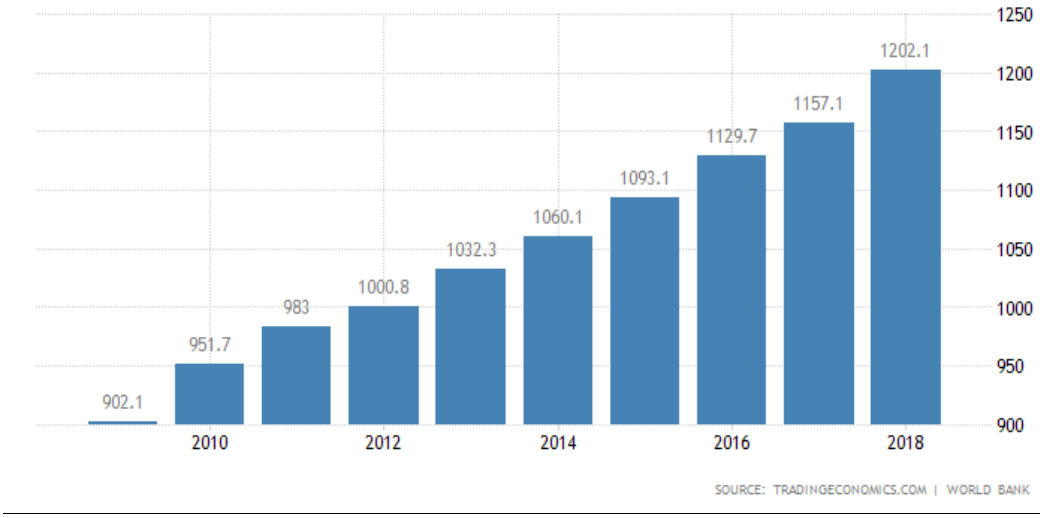


Figure 1. 1: Kenya GDP per capita (2010 – 2018)

Source: (Trading Economies.com/world bank)

Kenya has a market-based economy that runs a few state enterprises with a liberalized foreign trade framework. The major sectors include: farming, forestry, fishing, mining, manufacturing, energy, tourism and finance. As early as the year 2019, Kenya's GDP was projected to be $98,264 billion and its debt GDP to be $1,991. Economic prospects were good by the end of 2018, with GDP growth projected above 6%. This was mainly due to telecom, transport, construction and agricultural recovery. These improvements are supported by a large pool of highly educated professional workers and a high level of technology literacy and innovation. The GDP in Kenya has depicted an average growth rate of about 5 per cent. In the years 2010, 2011, and 2012, the growth rates were 5.8%, 4.4% and 4.6% respectively, KNBS 2013). The economy was expected to continue growing by 4.7% in 2013 and 5.2% in 2014 (Africa Economic Outlook, 2013).

1.1.3 Inflation and Tax Revenue Performance

Inflation refers to continuous increase in prices of goods and services in a given economy over a given period of time. The value of currency reduces as a result of this. The purchasing power of the currency decreases. Inflation is measured in units known as inflation rate, which is arrived at by the annualized percentage change in the general prices of goods and services. It is mostly constituted by the consumer price index over time. After the 2008 global financial crisis, the world economy has suffered tremendously and this has increased world inflation. The world's highest inflation reported over the last decade was in 2008, when it rose by more than 6.4 percent compared with the previous year (IMF, 2005).The global regions that have experienced the highest year-on-year inflation rate in past years are Middle East and North Africa, as well as Sub-Sahara African. Some countries that have experienced some of the highest inflation rates include Ukraine, Venezuela and Zimbabwe. In 2015 the inflation rate of industrialized countries was just about 0.35%; meanwhile the inflation rate in the Middle East and North Africa amounted to more than 6.2% (World Bank, 2005).

The inflation rate in East Africa was still an important macroeconomic stability indicator, persisted double in 2018, up 0.5% from 14.0% in 2017. However, if South Sudan's exceptionally high 104.1 percent is exempted, in 2018 it will lessen slightly to 10.9 percent by 2019 and 10.2 percent by 2020 (World Bank, 2018), and the region will have an average inflation rate estimated at 12.8 percent. Burundi and Ethiopia were equally high inflation levels, and Sudan, East Africa Economic Outlook (2019) remained extremely high (43.4 per cent in 2018).Burundi's expansionary monetary policy, which started with the socio-political recession of 2015 and focused to expedite refinancing by the commercial banks, keeps putting pressure on inflation with a view to

supporting productive investment in 2016 and 2017. At the end of 2018, inflation is expected to grow rapidly by 22.1% in 2019 and 23.1% in 2020, at 12.7%.

In Kenya inflation rate rises mainly due to upward pressure from; food and non-alcoholic beverages (6.98 percent vs. 6.33 percent in May), housing and utilities (4.07percent vs. 4.56 percent), transport (10.96 percent vs. 11.08 percent), clothing and footwear (2.05 percent vs. 2.12 percent), furnishings and household equipment (2.12 percent vs. 2.46 percent), restaurants and hotels (2.68 percent vs. 2.96 percent) and miscellaneous goods and services (2.95 percent vs. 2.92 percent). On a month to month basis, consumer prices dropped 0.69 percent, the largest decline since October last year, following a 0.07 decline in May. Food and non-alcoholic beverages slumped 1.60 percent, while other main components increased (KNBS, 2019). Inflation is directly related to tax performance as economist Milton Friedman said that, under certain circumstances, inflation can become an effective form of tax. If the government increases the rate of excise duty (tax on petrol/alcoholic drinks) as we have seen in the past years in Kenya, the prices of goods tend to go higher. This has often caused a temporary rise in the rate of inflation as was seen in the financial budget of 2016/2017 where the government increased excise tax of bottled water, beer and other beverages which made the inflation rise to 10 percent (GOK, 2016). Hence inflation has always caused taxes to increase since people tend to pay more for goods and services more than they should.

1.1.4 Unemployment and Tax Revenue Performance

Unemployment refers to circumstances in which people who pursue employment actively cannot find work. The unemployment rate is determined by the number of unemployed people divided by the number of jobs (ILO, 2019).Increased unemployment in an economy is a serious distress, leading to social and political

turmoil. Reduced unemployment rate indicates that a given economy has a high capability of producing near to its full capacity, maximize the output, driving wage growth and rising living standards over time. Such low rates of unemployment can also be sign of an overheating economy, inflationary pressures, and tight conditions for businesses affected by scarcity of workers.

Globally, according to the ILO report (2019) the world's unemployment rate has dropped to five percent, the lowest level since the global economic crisis in 2008. Slightly more than 172 million people globally were unemployed in 2018. That is about 2 million less than the previous year. The International Labor Organization expects the global unemployment rate of five percent to remain essentially unchanged over the next few years (2018-2023)

Regionally, the ILO reports only 4.5 percent of Sub-Saharan Africa's working age population is unemployed, with 60 percent employed .In North Africa, the youth unemployment rate is 25% but is even greater in Botswana, the Republic of the Congo, Senegal, and South Africa, among others (World Bank,2018). With 200 million people aged between 15 and 24, Africa has the largest population of young people in the world (ILO, 2019).However African governments are confronting unemployment in many different ways. In Senegal, the government launched a programme in February 2013 to create 30,000 jobs within a year and possibly 300,000 by 2017 (AfDB, 2018)

In Kenya, the unemployment rate measures the number of people actively looking for a job as a percentage of the labor force. Unemployment Rate in Kenya decreased to 9.30 percent in 2018 from 11.50 percent in 2017 Njoroge (2019). Unemployment Rate in Kenya has been varying from time to time. From 1991 until 2018 it was 10.75 percent, 12.20 percent in 2009 and 9.30 percent in 2018 as indicated in figure 2 below

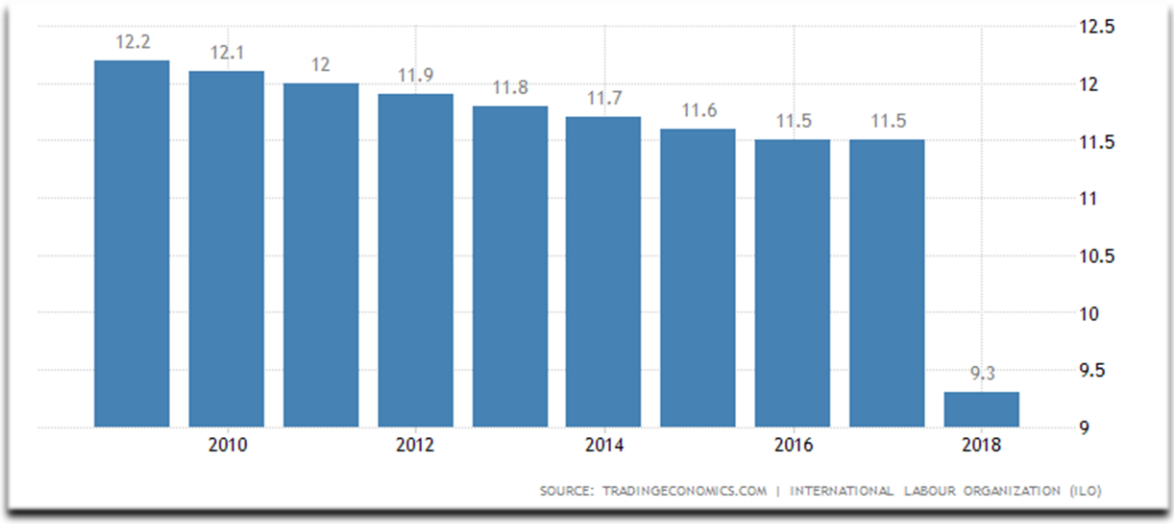


Figure 1. 2: Unemployment Rate in Kenya. (2010 – 2018)

Source: (Trading Economies.com/ILO)

1.1.5 Kenya's Total Public Debt

As at end June 2018, the outstanding total public debt was Ksh 5,047,234 million. Domestic debt was Kshs2, 478,835 million and external debt was Ksh 2,568,398 million. Domestic and external debt accounted for 48.0 per cent and 52.0 per cent of total public debt respectively at end of June 2019 compared to 49.1 percent and 50.9 percent respectively at end June 2018. There has been a tremendous increase in total public debt. This increase was as a result of public debt growing faster than the GDP. As at end June 2019 domestic debt was 29.3 per cent of GDP compared to 28.0 per cent in 2018, while external debt stood at 31.8 per cent of GDP, compared to 29.0 per cent of GDP in June 2018.

Table 1. 1: Trends in Kenya's Total Public Debt in (Ksh million)

DEBT TYPE	Jun-13	Jun-14	Jun-15	Jun-16	Jun-17	Jun-18	Jun-19
DOMESTIC DEBT							
Central Bank	39,170	65,700	63,335	99,856	54,506	110,782	109,607
Commercial Banks	524,505	617,221	730,419	927,307	1,142,889	1,266,457	1,414,431
Sub-total: Banks	563,675	682,921	793,754	1,027,163	1,197,395	1,377,239	1,524,038
Non-bank Financial Institutions	486,880	601,406	626,690	787,970	915,315	1,101,596	1,261,899
Total Domestic	**1,050,555**	**1,284,327**	**1,420,444**	**1,815,133**	**2,112,710**	**2,478,835**	**2,785,937**
As a % of GDP	23.4%	25.5%	24.4%	27.1%	27.6%	28.0%	29.3%
As a % of total debt	55.5%	53.0%	50.0%	50.3%	47.9%	49.1%	48.0%
EXTERNAL DEBT							
Bilateral	217,970	248,636	405,562	491,864	669,839.70	759,016.70	917,980.46
Multilateral	507,920	593,397	680,192	794,797.50	839,721.70	825,298.70	909,791.39
Commercial Banks	58,928	234,799	276,937	432,377	634,108.90	830,652.10	1,019,029.88
Suppliers Credits	15,207	16,452	16,628	16,628	15,303.10	16,725.20	16,931.81
Sub-Total	800,025	1,093,284	1,379,319	1,735,667	2,158,973.4	2,431,692.7	2,863,733.54
Bilateral	39,667	41,278	39,495	56,487	52,728.80	56,371.20	78,078.78
Multilateral	3,870	3,943	4,439	4,044	4,667.00	4,547.30	4,603.42
Commercial	0	0	0	0	77,783.80	75,787.50	76,723.73
Sub-Total	43,537	45,221	43,934	60,531	135,179.60	136,706	159,405.93
Total External debt	**843,562**	**1,138,505**	**1,423,252**	**1,796,198**	**2,294,153**	**2,568,398.7**	**3,023,139.47**
As a % of GDP	18.8%	22.6%	24.4%	26.8%	30.0%	29.0%	31.8%
As a % of total debt	44.5%	47.0%	50.0%	49.7%	52.1%	50.9%	52.0%
GRAND TOTAL	**1,894,117**	**2,422,832**	**2,843,696**	**3,611,331**	**4,406,863**	**5,047,234**	**5,809,076**
Total debt As a % of GDP	42.1%	48.0%	48.8%	53.8%	57.5%	57.1%	61.1%
GDP (in Kshs million)	4,496,000	5,044,236	5,831,528	6,709,671	7,658,138	8,845,854	9,510,446

Source: National Treasury and Central Bank of Kenya (2019)

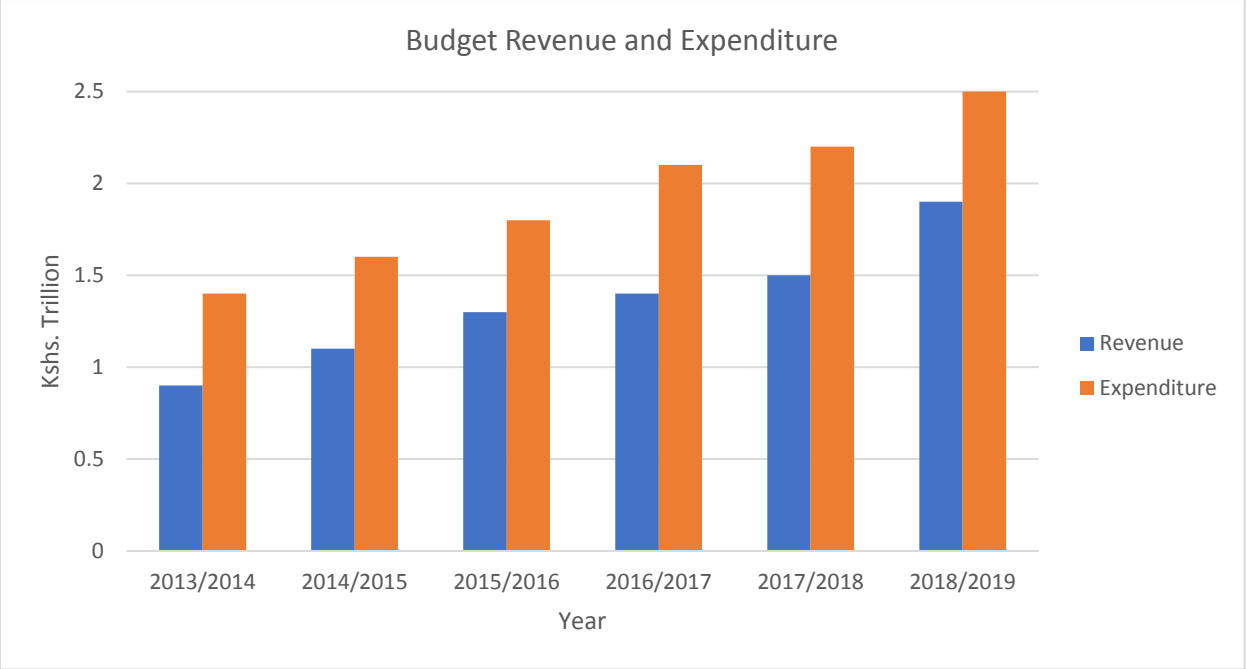


Figure 1. 3: Kenya's Fiscal Performance

Source: National Treasury, QEBR Q4, 2019

1.2. Statement of the Research Problem

As the government of Kenya strives to finance the Big Four Agenda –Food security, Affordable housing, Universal Health Care and increase in manufacturing, the fact that revenue collection has not matched the growth in expenditure is worrying. Despite of revenue collection registering a positive growth every year, targets set by the government haven't been realized. For instance the KRA had projected to collect Ksh.1.938 trillion in 2018/2019 but managed to collect Ksh.1.58 trillion with a shortfall of Ksh.358 billion. Still in 2019/2020 fiscal year the national treasury indicated tax revenue deficit of 6.2% of GDP (KRA, 2019).

Impact of tax revenue deficits in Kenya has caused the government to cut spending on capital projects including infrastructure, health and energy and raise taxes on corporate profits leading to high prices of goods, loss of jobs and low real tax revenues (Nyaga, 2016). For Kenya to be a middle income industrialized nation as stipulated in the vision 2030 and the government big four development Agendas, revenue realized from taxation will play a key role in financing these projects.

Many Studies have been done on the effect of macro-economic variables on tax revenue, for instance interest rate and exchange rate but little emphasis has been placed on FDI, GDP per capita, Inflation and unemployment.

This study therefore sought to empirically investigate to what extent the selected macroeconomic variables affects the growth of tax revenue in Kenya in a bid to contribute knowledge and providing insight geared towards the realization of the nation's development goals.

1.3. Objectives of the study:

1.3.1 General objective

The overall objective of this study was to examine the effect of macro-economic variables on tax revenue performance in Kenya.

1.3.2 Specific objective

The study sought to address the following specific objectives:

i. To determine the effect of FDI on tax revenue performance in Kenya.
ii. To establish the effect of GDP per-capita on tax revenue performance in Kenya.
iii. To examine the effect of inflation on tax revenue performance in Kenya.
iv. To establish the effect of unemployment on tax revenue performance in Kenya.

1.4 Research Hypotheses

The study tested the following null hypotheses:

$H0_1$: There is no statistically significant relationship between Foreign Direct Investment Inflows and tax revenue performance in Kenya

$H0_2$: There is no statistically significant relationship between GDP Per-Capita and tax revenue performance in Kenya

$H0_3$: There is no statistically significant relationship between inflation and tax revenue performance in Kenya

$H0_4$: There is no statistically significant relationship between unemployment and tax revenue performance in Kenya

1.5 Significance of the Study

The findings of the study form a basis for policy formulation in imputing appropriate tax amendments and curb the persistent revenue shortfalls. This study provides policy makers with an analytical framework which is useful in estimating the associated revenues of Government with the selected variables. The knowledge gained from this study will contribute to existing literature in the area of Government revenue and the selected macro-economic factors. It also helps tax authority in making decisions regarding determinants of tax revenue in Kenya is concerned.

The study also provides a comparative analysis on tax revenue performance and the variables of study. Other developing countries can use these analysis to improve their taxes and reduce budget deficits. The results of this study will also serve as a point of reference for further research in related studies.

1.6 Scope of the Study

The study limits itself on macroeconomic determinants on tax revenue performance in Kenya for a period 10 years starting from 2008 to 2018. The ten years was good enough to cater for any variation that may occur in yearly revenues collected over the time. In this period, the country experienced political changes and transition. The disposition of political stability posed challenges in the ease of doing business affecting both local and foreign investment inflows. The period covered is extensive and therefore more likely to give accurate results. The data for yearly revenue were obtained from the Kenya revenue authority.

1.7. Limitations of the Study

The study relied on data from numerous secondary sources for example World Bank and Kenya National Bureau of Statistics (KNBS). Reliability of data is key in research, with numerous sources of data reliability could easily be compromised. Great care was exercised to ensure that data is reliable and opted to choose reliable data from internationally recognized sources like World Bank, Kenya national bureau of statistics. The study compared the data from different sources and they were in agreement. It takes time to pull information from multiple sources. Collating the data into a reporting tool requires technical expertise and it also time-consuming. With strong data systems it was easier to overcome this challenge. It enabled easy access to real time information and presenting the output in an appealing format

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the study literature. It includes the overview of the documented information on the effects that macro-economic determinants such as GDP per capita, foreign direct investment, inflation and unemployment has on tax revenue performance. The review is a conclusive synthesis of theoretical development in the econometric analysis of the relationship between tax revenue performance and the four macro-economic determinants. It starts with theoretical literature and is followed closely by empirical literature and finally a conceptual framework showing the relationship between variables as discussed in our area of study.

2.2. Theoretical Literature Review

Various theories have been advanced to explain how some of the macro economic variables such as national income per capita, Foreign Direct investment (FDI) and inflation affect tax revenue performance. However this study will be anchored on Fiscal tax theory and the Neo-classical tax theory as discussed below.

2.2.1. Fiscal Tax theory

The theory was advanced by the neo-classical economists in the 1980's.The theory seeks to explain how Foreign direct investments, private sector investment and GDP growth influences the growth of tax revenues in a country (Gupta, 2007).The theory states that low tax rates and limited government spending stimulates the private sector and attract foreign direct investors thus flourishing the economy as a whole. The theory places much emphasis on tax cuts on personal income, savings and corporate profits (Feldstein,2008).The implication is that tax cuts on personal income cause an increase

in the supply of labor as individuals increase their work effort and work hours. Tax cuts on saving cause people to save more whereas tax cuts on corporate profits cause an increase business investment (Gachanja,2012). Increased labor supply, saving and investment lead to more aggregate supply and enhanced economic growth and tax revenue performance (Hansson & Olofsdotter,2010).The figure below illustrates the symbiotic relationship between tax rates and tax revenues

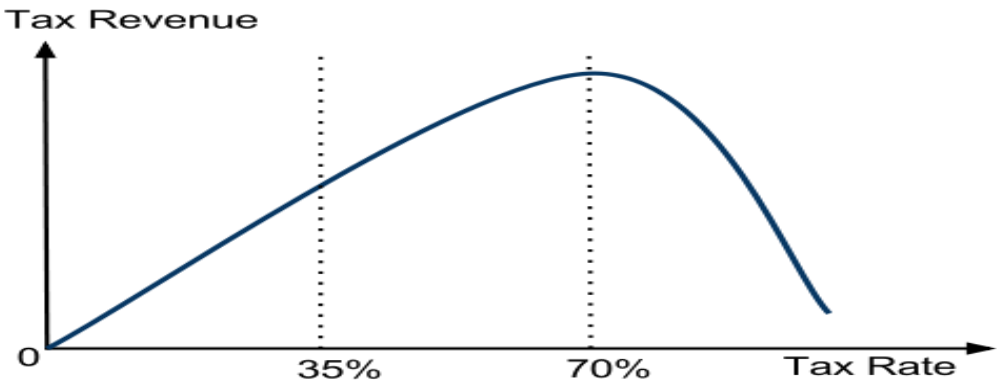


Figure 2.1: Graphical representation of Fiscal theory.

Source: (IMF Website, 2019)

As tax rates increase, tax revenues increase at first, but then decrease once rates get "too high" as people reduce their work effort or hide their income, foreign investors reduces their investments causing the economic growth rates to reduce (Maina, 2014) The above figure indicates that the tax rate which maximizes tax revenue is 70%, but this is just an illustration of the concept. The neo classical Economists believe that tax cuts will stimulate the economy by increasing the supply of labor, Private and foreign investments and thus bringing in additional tax revenues (Feldstein, 2008)

Most federal tax revenue comes from individuals' income, corporate profits, property and sales taxes (Mankiw, 2009). This study found relevance in this theory in pointing

out how tax rates affects foreign and private investment and the whole economic growth at large which in the long run have dwindling effects on the growth of tax revenue growth. The study sought to investigate how foreign direct investment and GDP per capita income affects the performance of tax revenue in Kenya and thus used the concepts of this theory in projecting the outcome of the results .The study was majorly anchored on this theory.

2.2.2 Keynesian Taxation Theory

Keynesian taxation theory was initiated by John Keynes in 1936.The theory seeks to explain how production and full employment stimulates economic growth. The theory states that for an economy to develop, special attention must be emphasized on market expansion and that the associated rise in consumption and demand leads to increase in industrial production and to a large extent leads to economic growth. According to the Keynesian economists, economic growth is related to monetary savings only in conditions of full employment because huge savings impede economic growth (Mankiw,2009).Savings are passive forms of income that are not invested in production. consequently, Keynes implied that extra savings should be deducted through taxation (Mankiw,2009).On the other hand high rates of unemployment reduces demand and production and in the long run impedes economic expansion (Folawewo&Adeboje,2017).Similarly high unemployment has retrogressive effects on growth of tax revenues (Aliyu,2012).First it leads to high poverty rates, low savings and low investments and production thus cyclically affecting all sectors in the economy thus lowering tax revenue collected by the government (Ditimi & Ifeakachukwu,2013).

Since 2014, Kenya has been ranked as a lower middle income country because its per capita GDP of 1,315.80 USD crossed a World Bank threshold of GNI per capita between $1,036 and $4,045 (WorldBank, 2014).While Kenya has a growing entrepreneurial middle class and steady growth, its economic development has been impaired by weak governance and corruption. Although reliable numbers are hard to find, unemployment and under-employment are extremely high, and could be near 40% of the population (KNBS, 2017).This theory was relevant in this study in explaining how unemployment affects the rates of tax revenue performance in the economy. The study therefore relied on this theory in foreshadowing the outcome of the results

2.3. Empirical Literature Review

There are a number of prior empirical researches, which analyzed Tax revenue performance in different countries and used a wide variety of estimation methodologies utilizing different potential determinants variables. This research focused on previous studies in which FDI, Unemployment and Inflation were considered as explanatory variables in the performance of tax revenue.

2.3.1 FDI and Tax Revenue Performance

Hansson and Olofsdotter (2010) did a study to analyze how foreign direct investment is affects corporate tax revenues. Using data on effective marginal and average corporate tax rates for all twenty-seven European Union member countries from 1995-2006, the study that FDI inflows positively affected the revenues from corporate tax. The study was majorly based in developed nations. This study therefore intended to find out how tax revenue performance in Kenya is affected by investments from foreigners.

Schoeman (2000) using a long- run co- integration equation conducted a study on the impact of FDI inflows on indirect tax revenue in South Africa from 1970-2000. Using probit and logit regression model, the findings showed that FDI inflows positively affected the growth of indirect taxes in South Africa and recommended that South African government should adjust fiscal policy by reducing tax rates on corporate profit in order to attract more foreign investors. The study above however only sought to find out how FDI inflows affects indirect taxes in South Africa which did not clearly indicate how overall tax performance of a country is affected by FDI inflows. This study intended to find out how overall tax revenue performance is affected by FDI particularly in Kenya

Nyamwange (2009) carried out a study to establish the main factors that influence FDI decisions in Kenya and to determine the impact of FDI on the economic growth in Kenya. The results of the study showed that FDI in Kenya is mainly determined by the size of market, taxation, macroeconomic factors and the level of human capital. Kinaro (2006) used a time series analysis in his study and the findings revealed that the determinants of FDI in Kenya include openness to trade, taxation, human capital, real exchange, inflation, and FDI in the previous periods. The studies above used panel data to evaluate how FDI is affected by taxation policies in the selected countries. This may not give comprehensive information on how other types of taxes may affect FDI such as labor income and consumption taxes in addition to corporate taxes. This current study employed time series data to analyze how tax revenue performance is affected by foreign investments in Kenya.

UNCTAD (2005) argued that the failure of Kenya to attract FDI is caused by rising corruption and governance, economic policy instability, structural reform and public service degradation and weak infrastructure. Previous studies have been thorough in bringing out the effects of tax rates on the amount of foreign direct investments that flow to different countries. They don't indicate what impact does foreign direct investments have on the tax revenue performance on global economies hence this paper will be explicit in bringing out the positive relationship between foreign direct investment and tax revenue performance in case study country Kenya.

2.3.2 GDP per Capita Income and Tax Revenue Performance

Arisoy and Unlukaplan (2010) focusing on the Turkish economy, investigated the relationship between direct and indirect tax performance and GDP pa capita income, using data from 1968-2006. The methodology used was the Ordinary Least Square, and GDP's pa capita income was identified to be strongly linked to indirect tax revenue. They deduced that indirect taxes in Turkey are substantially and positively correlated with GDP per capita income. The study was however limited to indirect and direct tax performance. This study focused on the overall performance of the tax revenue in Kenya as a result of change in GDP pa capita.

Gustavo et al. (2013) conducted a study on the effects of economic growth on tax revenue growth in Latin America from 2000-2012 .Using Restricted VAR approach the findings revealed that GDP growth positively influenced the overall growth of tax revenue output. The study discovered that the growth of personal income tax revenues were mainly related to Latin America's economic growth. The study was limited to economic growth at large. This current study aimed to find out how GDP per capita contributes to the overall performance of tax revenue specifically in Kenya.

Gupta (2007) analyzed the impact of GDP pa capita on tax revenue growth in Nigeria from 1995-2005 and found out that GDP pa capita income granger cause tax revenue performance in a positive way. The study employed Vector error correction model using secondary data. The study was carried out in Nigeria which is in different economic block with Kenya hence an updated study needed to be conducted in COMESA and EAC region which Kenya is a member state which this current study aimed to fill this gap.

Gachanja (2012) using time series data for the period 1971-2010 conducted a study on economic growth and taxes in Kenya. His study revealed existence of a positive relationship between the economic growth and taxes. All categories of taxes showed a positive correlation to GDP, with income tax having the highest effect. This study intends to clearly elaborate the trend of tax revenue performance in Kenya in relation to GDP pa capita income over the period under study. Similarly Oketch and Mburu (2011) did a research on how tax responds to changes in Kenya's national income as from 1986 to 2009 and discovered a buoyancy of 0.525 and an elasticity of 0.509. This study revealed that although there are many reforms that have been undertaken in Kenya since 1986, Kenya's tax system is yet to be responsive to the changes in economic growth. An updated study needed to be carried out using recent data which this current study has done.

In an assessment of tax revenue performance in Kenya, Wawire (1991) used per capita income as one of the determinants of tax revenue performance. Using time series data from 1958 to 1989 and applying OLS estimation techniques, the study found the coefficient of per capita income to be statistically significant at 5% level. Concluded that "it is the taxable surplus embodied in a higher stage of economic development that is proxy by the per capita income". In -spite of the findings, the study was conducted

long time ago when other key macroeconomic determinants such as technology were not effectively applied in production. This study aimed to find out how in the recent time (2008-2018) tax revenue performance have been affected by GDP per capita income.

2.3.3 Inflation and Tax Revenue Performance

Hansson & Olofsdotter, (2010) conducted a study on the impact of inflation and unemployment on tax revenue in the European Union (EU) using pooled data from 1998-2007.The study found out that simple linear correlation coefficient between inflation and unemployment with tax revenue performance was negative. This study however employed panel data which may not give detailed information on the study findings and recommendations to specific countries .This study intends to find out how tax revenue has been affected by inflation over a period of 10 years. 2008-2018 and suggests recommendation that would consider the situation of the Kenyan economy.

Okafor, (2012) conducted a study in Nigeria's on the impact of inflation on tax revenue performance from 2000-2010.The study used OLS model and VECM model to analyze the granger causality between the study variables and established that inflation negatively granger cause tax revenue performance in Nigeria. The study recommended that the Nigerian government should encourage expansionary fiscal policy in order to expand the economy and ensure price stability

Barasa (2009) carried out a study on causal relationship between inflation and tax revenue performance in Kenya from 1998-2008.The study found that inflation rates negatively affected the performance of tax revenue in Kenya .The study employed VECM model using secondary data and recommended that the government of Kenya

should encourage interest capping in order to curb the rising interest rates that results to rising rates of inflation .

Tumkou and Caroline (2012) conducted a study in Kenya on the effects of inflation on tax revenue performance in Kenya from 2001-20122 .The study using fisherian theory found out that inflation causes interest rates to rise hence affected the growth of tax revenues in the long run. Linear regression analysis was employed in the study with the help of secondary data. The study however only employed linear regression analysis which may not depict the long run relationship between the study variables. This current study employed VECM model which depicts the long run and short run causality between the study variables.

Kigume (2011) studied the relation between inflation and economic growth in Kenya from 1999-2010. The Philips framework was used in the study using secondary time series dat. These results demonstrated that there were inflation-related first and second lags, economic growth, climate shocks (e.g. drought), monetary policy interventions and external shocks such as oil prices. On the contrary, the first and second lags of economic growth only affected it. The Phillips method in this case was not valid because it had a short-term positive association between inflation and economic growth while the findings showed an inverse short-term relation and a similar long-term relation between inflation and economic growth in Kenya. This present analysis offers a roadmap for inflation in terms of the output of tax revenues over the study period.

2.3.4. Unemployment and Tax Revenue Performance

The first economist to study the empirical relationship between unemployment and economic growth was Arthur Okun. He assumed that a 1% growth rate increase over a trend growth rate would lead to a drop in unemployment of only 0.3%. In other words,

a 1 % increase in the unemployment rate will cause GDP growth to lose about 3%. This correlation indicates that GDP growth levels must be equal to growth prospects only in order to sustain the unemployment rate.

Oguze and Odim (2015) did a cost-effect research project and have an impact on the economic development of Nigeria. The study used data from the 1970-2010 time series, which included real GDP employment, interest rates, investment, imports and supply of money. The analysis employed the approach of least squares. The findings show that Nigeria's economic growth has had a negative impact on its fiscal returns. However, this study used a number of variables that make the results somewhat ambiguous. Likewise, the study focused only on unemployment in conjunction with economic development in general. These current study intents to find out how Unemployment specifically affects tax revenue performance in Kenya

Ditimi and Ifeakachukwu (2012) studied effect of unemployment on productivity and tax income growth in Nigeria from 1990-2010 using time series data. The findings showed that unemployment has a positive effect on economic development. The positive correlation between unemployment and economic growth was consistent with Aliyu's findings (2012), but contrasts with Ogueze and Odim's findings (2015). Aliyu (2012) analyzed output and unemployment dynamics of macroeconomic policies using data from 1970 to 2010. This study employed a linear model of Okun and found out that GDP and unemployment were negative in their short-term relationship, but there was a positive long-term correlation between GDP production and unemployment. However, this study was not key to factors such as how technology and improvements in the development of human capital may have influenced the rise in unemployment in the country above. This current study used recent 2008-2018 data in order to reduce data variations

Folawewo and Adeboje (2017) analyzed the relationship between macroeconomic variables (inflation rate, GDP growth, labor productivity, foreign direct investment, external debt. and unemployment) in relation to tax revenue performance in the Economic Community of West African States (ECOWAS). The research employed annual data estimation procedures for the duration of 1991-2014 using fixed-random effects and fully adjusted normal minimum squares (FMOLS). The results showed that GDP growth had a reduced but insignificant effect on unemployment and inflation, and that the Phillips hypothesis was not valid. The above research only examined the influence of unemployment on economic development, but does not clearly indicate how fiscal revenue is influenced by unemployment rate rates in the country. The study showed that labor productivity has positive effects on tax income efficiency. This study seeks to find out how unemployment affects the tax revenue performance particularly in Kenya for the period under study.

Umar and Zubairu (2012) described that there is a negative effect of unemployment on economic growth. Sackey and Osei (2006) concluded that younger people are more likely to be unemployed as compared to older people group due to lower labor market skill. Anyanwu (2013) found that young people have less experience as compared to old people due to which it is very difficult to gain the employment; they have to bear less salary and wages for same work as compared to older/experienced people. Shapiro and Stiglitz, (1984) have concluded that increasing the higher wages above the equilibrium wages as incentives to increase the efficiency of employee is the cause of unemployment. Efficiency wages model are kept higher above the market clearing wage with view to reducing employee turnover. Efficiency wages framework creates the difficulty for jobseekers to secure employment. Just like the above study by Folawewo and Adeboje (2017), this study only focused on the impact of unemployment

on economic growth. This study intends to find out how tax revenue is affected by unemployment in Kenya. This will contribute to the existing literature on tax revenue performance in relation to unemployment.

2.4. Summary and overview of the Literature Review

From the literature review on the effect of selected macroeconomic variables on government revenues, that the amount of Government revenue realized depends on potential taxation of the countries, FDI, inflation, GDP per-capita, and unemployment.

Hansson and Olofsdotter (2010), Angelo and Lehmann (2012), Schoeman (2000) and Opolot (2008 concluded that the effect of taxes on FDI is very strong. Nyamwange (2009) and Kinaro (2006) established that FDI in Kenya is mainly determined by the size of market, taxation, macroeconomic factors and the level of human capital. On the other hand Arisoy and Unlukaplan (2010), Gustavo *(*2013) and Gupta (2007) confirmed that GDP per capita income, net exports over imports and foreign aid significantly affect economy's tax revenue performance. Whereas in contrast, Gachanja (2012) ,Oketch and Mburu (2011) in a study on how tax revenue responds to changes in Kenya's GDP per capita income their findings revealed that although there are many reforms that have been undertaken in Kenya since 1986, Kenya's tax revenue performance is yet to be responsive to the changes in economic growth.

(Okafor, 2012) ,(Oladipupo and Obazee 2016) and (Hansson and Olofsdotter ,2010) focused on the relationship between unemployment and inflation using regression analysis of pooled data , it was established that the simple linear correlation coefficient between inflation and unemployment is negative leading to the conclusion that their relationship is not excessive and negative .(Daniels and Ejara, 2009), Oguze and Odim (2015) showed that the unemployment rate had a negative impact on Nigeria's

economic growth in terms of tax revenue performance. However, in contrast Ditimi and Ifeakachukwu (2013) investigated the impact that unemployment had on productivity and growth of tax revenue in Nigeria and the results suggested positive impact of unemployment to economic growth. The positive link between unemployment and economic growth was consistence to the findings of Alyu(2012).

In Kenya, there exists very little literature on the effects of macroeconomics determinants (FDI.GDP Per Capita, Inflation and Unemployment) on tax revenue performance. In regard to the literature review done in this study it is evident that the variables of measurement used in various studies focusing on both developed and developing economies show mixed results especially on the signs of the effect of the above macroeconomic determinants on tax revenue performance. This study focuses on the relationship of the above macroeconomic determinants to tax revenue performance in Kenya. The paper used time series data and Vector Error Correction Model to analyze the data

Table 2. 1: Summary Table of Empirical Review

Author/Year	Topic/Research Question	Research Design	Research Findings	Critique/Researc Gaps
Schoeman et al. (2000)	Effect of corporate tax rates on foreign direct investment. 'How is foreign direct investment affected by fiscal policy in South Africa'	-Cross-sectional -secondary data -. Ordinary Least Square technique	- fiscal policy variables such as tax have a negative effect on FDI flows to South Africa	-did not consider other factors that influence the decision on where to invest a foreign which includes business taxation, exchange rates, land and property rents/rates - Not focused on how tax revenue performance is affected by foreign investments
Oketch and Mburu (2011)	"Effects economic growth on tax revenue performance in Kenya."	-Time-series - secondary data -Regression analysis	-Kenya's tax revenue performance is yet to be responsive to the changes in economic growth -, a buoyancy of 0.525 -an elasticity of 0.509	-Contradicting findings -Generalized the effects of economic growth on tax revenue performance and not on individual macroeconomic variable
Arisoy and Unlukaplan (2010)	"The relationship between direct and indirect tax performance and GDP pa capita income"	Cross – sectional Secondary data Regression analysis	- GDP pa capita income is positively related to indirect tax revenue. -P>| t | = 0.002	- done in developed countries contradicting findings, hence raising concerns on the nature of the relationship between such variables in the developing economies

Continuation of table 2.1

Author/Year	Topic/Research Question	Research Design	Research Findings	Critique/Research Gaps
(Okafor, 2012).	"The trade-off between inflation and tax revenue in less developed economies".	-Cointegration and granger-causality test analysis -Cross – sectional	- money supply causes output and inflation-non-availability of cointegrating vector in the series used - (1%) change in inflation causes a decline of -0.019 (-1.9%) change in Government revenues.	-The researcher employed OLS deterministic model which cannot capture the long run and short run causality between the dependent and dependent variable
Folawewo and Adeboje (2017)	"The relationship between unemployment in relation to tax revenue performance in the Economic Community of West African States (ECOWAS)".	- Fixed-random effects -Fully modified ordinary least squares (FMOLS) - Panel data	-GDP growth has a reducing but insignificant effect on unemployment rate	-only investigated the impact of unemployment on economic growth which does not vividly indicate how tax revenue is affected by unemployment rates in a country -Panel data give generalized information -Recommendations not tailored to meet the needs of the individual countries

Source: (Author, 2019)

2.5. Conceptual Framework

This is an analytical method with a variety of meanings and variations. It is used to identify and coordinate ideas. Strong conceptual constructs capture and do so in a way that is easy to understand and to apply. According to Hossain's (1987) theory, fiscal-deficit-based policy for development cannot create sustainable long-term economic growth because inflation can be sustained that hamper long-term investments and reduce longer-term economic growth.

This anticipated relationship between the study variables is shown in the conceptual model described below. The factors characterized here are foreign direct investment, per-capita income, inflation and unemployment as independent variables while tax revenue performance as dependent variable.

Independent variables: The following conceptual framework shows how the independent variables influence the dependent variable. Independent variables have a positive or a negative effect on the dependent variable. This means that the dependent variable variance is therefore accounted for by the separate variables and gives a causal relationship between them. The independents influencing tax returns, which are dependent variable, include foreign direct investment, per capita income, inflation and unemployment.

Dependent variable: It is a variable of the researchers' primary interest. Through evaluating the dependent variable, solutions to the problem can be sought. The dependent variable is tax income performance, and the independent variables influence it.

The Figure below shows a diagrammatic representation of the relationship among the study variables.

Independent Variable

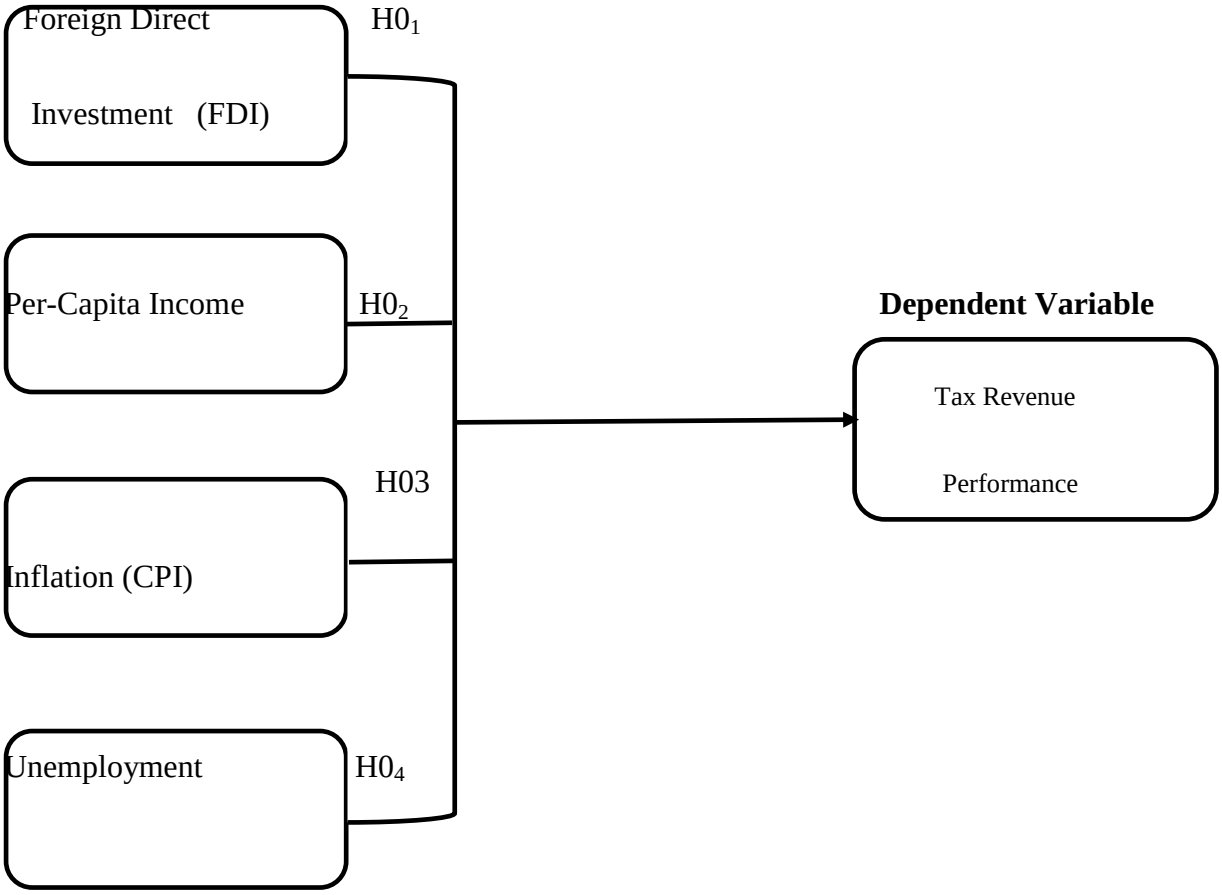


Figure 2. 2: Conceptual framework

Source: Author (2020)

CHAPTER THREE:

RESEARCH METHODOLOGY

3.1. Introduction

In this chapter, a substantial methodological base is presented. Specifically, the following are addressed; research design, study area, data collection procedures and data analysis procedures and presentation.

3.2. Research Design

The study builds on existing research studies and methodologies using correlation research design. Correlation research design measures the relationship between variables. The researcher doesn't control the variables under study. The main advantage of using this design is that it enables the researcher to collect much more data, results are more applicable to everyday life and allows researchers to determine the strength and direction of a relationship.

3.3. Study Area

This study was conducted in Kenya. Kenya is located between latitude 5^{o}N and 4.5^{o}S and longitudes 34^{O}E and 42^{O}E. The Global Positioning coordinates of Kenya shows that the country is bisected by the equator. Approximately half of Kenya is in the northern hemisphere. Kenya was selected for the study as it has had persistent revenue shortfalls leading to prolonged cycles of budget deficits. The study covered a period of ten years starting in 2008 to 2018.In this period, the country experienced political changes and transition. The disposition of political stability posed challenges in the

ease of doing business affecting both local and foreign investment inflows. The period covered is extensive and therefore more likely to give accurate results.

3.4. Data Collection

The main source of data was from secondary sources. It is the richest source of information available to those undertaking research works in diverse study areas. In addition, such public documents and official statistical data are freely available to the researcher. Secondary data was sourced from Kenya revenue authority and World Bank statistics indicators. Data on tax revenues for the period under study was collected from the annual records of revenue maintained by the Kenya Revenue Authority. The details were obtained from the authority because it is the tax collection agency and thus keeps track of the collected taxes. Annual Data on inflation rates was obtained from the data held by the Kenya National Bureau of Statistics. It is a semi-autonomous government entity that gathers, compiles and disseminates public data for statistical purposes and is thus reliable.

3.5. Data Analysis

Data was first tested using the pre diagnostic tests for consistency in measurement and checking the presence of outliers. Data was then run through STATA software for the purpose of analysis and interpretation. The software is preferred for time series analysis as it can be used to conduct various tests. Unit root test was conducted to evaluate shock effects by using Augmented Dickey Fuller (ADF) .The results showed the presence of unit root at levels but upon first differencing the data became stable. Linear relationships on the explanatory variables were tested using the correlation matrix. Autocorrelation and Multicollinearity test were performed and the results indicated absence of both autocorrelation and Multicollinearity. VECM analysis was then carried

out and the results showed that there was a positive long run relationship between the rate of tax revenue performance and the explanatory variables. Regression analysis was conducted and results indicated that a positive relationship between FDI inflows and GDP per capita income with the tax revenue performance whereas the relation between inflation and unemployment with the tax revenue performance was found to be negative.

3.6. Model Specification

To investigate the dynamic relationship between tax revenue performance and the four selected macroeconomic variables; GDP per-capita (*GDP*), Inflation (*INF*), FDI inflows (*FDI*) and Unemployment (*U*). This study specified a model which expresses tax revenue as a function of these macroeconomic variables. The model was specified as,

TAX REVENUE = f (GDP, INF, FDI, U) …… (1)

3.6.1. The Analytical Model

To establish if there was a relationship between the macro-economic factors (FDI, GDP per capita income inflation and unemployment) and tax revenue performance in Kenya, the researcher conducted a multiple regression analysis using the following model;

$$\mathbf{T = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Where; **T** = tax revenue performance measured as a percentage change of current tax revenue with the previous one. Tax revenue figures from the year 2008-2018 available on KRA website was used

α = Constants.

$\beta_1 \ldots \beta_4$ = the slope which represents the degree with which tax revenue performance changes as the independent variable change by one unit variable.

X_1 = Foreign Direct Investment (independent variable). Annual figures for the year 2008-2018 retrieved from KNBS website.

X_2 = GDP per capita Income (independent variable). Annual figures from the year 2008-2018 retrieved from World Bank website.

X_3=.Inflation (independent variable) was measured using Consumer Price Index (CPI). The annual figures for the year 2008-2018 are available on KNBS website.

X_4= Unemployment

ε = error term

3.7. Variables of the Study

Taxes: Tax is a mandatory government contribution which is payable both by individuals and businesses and does not relate to the benefit received (Hyman, 1987). The research measured the efficiency of tax revenues.

Foreign Direct Investment-Refers to investments that are intended to be sustainable and aimed at enterprises located outside of the investor's economy or country measured as a percentage of total GDP .As the rate of foreign investment increases in a nation due to favorable government policies, industries are expected to increase thereby creating more job opportunities. As a result, both direct and indirect taxes are expected to increase. Therefore, it is expected that growth in foreign direct investment will have a positive impact on tax revenue performance (Duncan, 2003)

Pa capita income: It refers to as the sum income from of all goods and services produced within that territory during a given year over the total population. Per capita income is measured as a ratio of total GDP over total population. Therefore, it is expected that growth of GDP will have a positive impact on tax revenue performance

Inflation: Inflation rate is included as a measure of overall economic stability of the country. It is measured using consumer price index (CPI) measured as a ratio of the CPI. The CPI puts into consideration the price of a basket of goods and services and compares them over time so as to measure the movement of prices. A rise in CPI, leads to a rise in inflation. As a result the purchasing power for investors is reduced. Investors prefer to invest in a more stable economy. High inflation rate therefore, was found to have a negative effect on revenue tax performance (Ayanwale and Bamire, 2004).

Unemployment: Unemployment is a term referring to individuals who are employable and seeking a job but are unable to find a job (ILO,2019).usually measured by the unemployment rate, which is the ratio of the number of unemployed people by the total number of people in the workforce (UNCTAD ,2019). High unemployment rates leads to poverty, low savings and investments and therefore it was expected that high unemployment rates affected tax revenue performance in a negative way (Aliyu, 2012).

3.8. Pre Estimation test

In this section, descriptive statistics such as mean, minimum, maximum and standard deviation has been discussed. Unit root tests, determination of the optimum lag length selection and Johansen test for cointegration test have also be discussed in the following sub-sections.

3.8.1Normality

This is a test used to determine if a data set is well-modeled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normally distributed. The study used the Jarque-Bera test to test for normality. J-B test is suitable for large data sets. Specifically, it tested the matches of the skewness and kurtosis of data to see if it matches a normal distribution. Normal distribution has a skewness of less than two and Kurtosis of less than three.

3.8.2 Testing for Unit roots

Time series data show trends of unit root(s) over time. It was therefore, necessary to determine the order of integration of time series data so as to establish the presence or absence of stationarity. If a time series was stationary, that is, of the order 0 denoted as I (0), its mean and variance at various lags remain the same no matter at what point one measures them. This means they are time invariant. On the other hand, a non-stationary time series which is of order 1 denoted as I (1) will have a time-varying mean or time-varying variance, or both. This study used the Augmented Dickey-Fuller (ADF) test to test whether the time series data was stationary or not. The null hypothesis is H0: $\delta = 0$ the alternative hypothesis is H1: < 0. If the computed ADF statistics is greater than the ADF critical value at a given significance level, do not reject the null hypothesis because unit root exists. If the computed ADF statistics is less than the ADF critical value, reject the null hypothesis because unit root does not exist thus the series is stationary. If the series are not stationary at given significance level, then all the series are differenced once to make them stationary (Gujarati, 2009).

3.8.3 Cointegration Test and Error Correction Model

Cointegration tests deal with the relationship of many variables whereby each has a unit root. The regression of two non-stationary time series variables would lead to spurious results. One way to guard against spurious regression is to find out if the time series are cointegrated. A set of variables are said to be cointegrated if there exists a long-term or equilibrium relationship between them. Two variables x and y are said to be cointegrated of order one, I (1) if both are integrated of order one and there exists a linear combination of the two variables that is stationary, I (0). The linear combination is given by either:

$Y_t = \alpha 0 + \beta 0 x_t + \mu 0_t$ .....Equation 1

$X_t = \alpha 1 + \beta 1 y_t + \mu 1_t$..... Equation 2

This study used the Engle and Granger test to test for Cointegration. Short-run deviations from equilibrium occur mostly due to random shocks, but these deviations are bounded since stabilizing mechanisms tend to bring the system back to equilibrium (Engle and Granger, 1987). The long run relationship among the levels of the variable is restored through the error correction mechanism. Engle and Granger Residual based test is a two-step procedure. The first step is to perform OLS regression to the series in levels and generate residuals. The second step is to perform a unit root test and save the residuals. If the residuals are stationary then, the two series are cointegrated. Therefore, an error correction mechanism (ECM) will be introduced to ensure a systematic disequilibrium adjustment process the where dependent and explanatory variables are prevented from drifting too far apart from their mean value.

3.8.4 Test for Autocorrelation

Autocorrelation occurs in time series data when the error is occurring at one period crosses over into another period. It may also occur when the error term relating to any observation is influenced by the error term relating to any other observation. The error term in the linear regression requires that successive values of the error term be sequentially independent (Mukras, 1993). The OLS estimators remain unbiased, consistent and asymptotically normally distributed in the presence of autocorrelation, but the estimators become inefficient. This study used Durbin-Watson Test to check for the presence of autocorrelation. The test involves testing of the hypothesis of absence of autocorrelation against the hypothesis of the presence of autocorrelation.

The null hypothesis states that the error term is free from autocorrelation while the alternative hypothesis shows the presence of autocorrelation in the error term (Gujarati, 2009).

3.8.5 Test for multi-collinearity

Multi-collinearity arises from the presence of interdependence or lack of independence among independent variables in a multivariate regression model. Multicollinearity poses difficulties only when intercorrelation among the independent variables is high. The degree of Multicollinearity is what matters since Multicollinearity is common among variables. All independent variables should be truly independent, and none affects the other independent variable for OLS regression to work. To test for the presence of Multicollinearity, this study used Variance Inflation Factor (VIF). In the

presence of high Multicollinearity, OLS estimates and their standard errors become very sensitive to changes in observational data (Gujarati, 2009).

3.8.6 Test for heteroscedasticity

Heteroscedasticity takes place when the variance of the error term keeps changing for all the values of independent variables.

$E(\varepsilon i2) = \zeta \varepsilon i2$ .....Equation 3

The error term can vary from one observation to another meaning the variance of error terms is dependent on the magnitude of the independent/explanatory variables.

$E(\varepsilon i2) = \zeta \varepsilon i2 = f(xi)$ .....Equation 4

The unbiased character of the OLS estimator is not affected by the presence of heteroscedasticity though it renders it inefficient. This is because in small samples OLS estimator will not have the minimum variance among the class of unbiased estimators and in large samples it will be asymptotically inefficient. This study used the Breush-Pagan test to check for the presence of heteroscedasticity (Gujarati, 2009).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This chapter provides the study findings and their interpretations. The analysis dwells on the assessment of the link that exists between tax revenue performance and the selected macroeconomic variables of the study (Foreign direct investment, GDP per capita income, inflation and unemployment). It begins by preliminary data findings by giving the descriptive statistics, to complex time series analysis such as correlation analysis, unit root tests among other tests upon which regression analysis was carried out.

4.1 Descriptive summary

The study adopted various statistical measures namely; mean, standard deviation, skewness and kurtosis were investigated using quarterly data from Kenya Revenue Authority (KRA) for the variables under study as attached in Appendix I. Mean is used to locate the center of the relative frequency distribution, kurtosis characterizes the relative peakedness or flatness of a distribution compared with the normal distribution, skewness characterizes the degree of asymmetry of a distribution around its mean while the standard deviation measures the spread of a set of observations. Other statistics include minima and maxima values as shown on Table 4.1 below.

Table 4. 1; Descriptive Statistics

Variables	Observations	Mean	Std. Dev	Min	Max	skewedness	kurtosis
Tax Revenue	44	963.058	359.784	471.097	1490.789	.1107783	1.51884
FDI	44	1111.058	386.6959	131.642	1704.125	-.428901	2.300713
Gdp per Capita	44	1044.443	91.02041	896.6402	1222.825	.2007324	2.024409
Inflation	44	8.247273	3.610454	2.3525	16.94719	.7899919	2.751334
Unemployment	44	11.83199	1.23415	7.99375	15.92646	.2596774	7.265386

Source: Author's Computation based on STATA 2019

From the above table, it is clear that there is high spread of data among variables. From its nature, it was so anticipated since time series data especially those, which include aggregates follows a random or stochastic process. The tax revenue performance had an average value of U$D 963.058 Million, least value of U$D 471.097 Million, maximum value of U$D 1490.789 Million standard deviation of U$D 359.784 Million , skewness value of 0.1107783 and Kurtosis value of 1.51884. Foreign direct investment had an average value of U$D 1111.058 Million, least value of, U$D 131.642 Million, the maximum value of U$D 1704.125 Million, the standard deviation of U$D 386.6959 Million, skewness-0.428901 value of and Kurtosis value of 2.300713. GDP per capita Income had an average value of U$D 1044.443 Million, least value of U$D 896.6402 Million, maximum value of U$D 1222.825 Million, standard deviation of U$D 91.02041 million, and skewness value of 0.2007324 and Kurtosis value of 2.024409.

Inflation had an average value of 8.247273, least value of 2.3525, maximum value of 16.94719 , the standard deviation of 3.610454 , skewness value of 0.7899919 and Kurtosis value of 2.751334 . Unemployment had an average value of 11.83199 least value of 7.99375, maximum value of 15.92646, and standard deviation of 1.23415, skewness value of 0.2596774 and Kurtosis value of 7.265386. From table 4.1, data for foreign direct investment was widely spread than other variables as indicated by standard deviation value of U$D 386.6959 Million. This is mainly because of the fluctuations in the investment caused by unfavorable conditions in economy such as corruption, high interest rates and political instability. It also had a large mean which is an indication of the fact that economy revolve around investment. GDP pa capita Income also had a large mean value because of the economy growth.

The range of data, which is the difference between the maximum value and minimum value was a huge gap which demonstrates different economic conditions that the Kenyan economy has been going through within the time period used in the study. Analysis of skewness showed that GDP per capita income, tax revenue performance, inflation and unemployment are asymmetrical to the right around their mean, while foreign direct investment is negatively skewed. Consequently, unemployment has the highest peaked repressor compared to other variables.

4.2: Correlation Matrix

The table below shows the pairwise correlation matrix between the dependent variable (tax revenue performance) and the explanatory variables (FDI, GDP per capita income, and inflation and unemployment rates)

Table 4. 2: Correlational Analysis table

Variables	Tax revenue	FDI	GDP per capita	Inflation	Unemployment
Tax revenue	1.0000				
FDI	0.578* 0.0074	1.0000			
GDP pa capita	0.9538* 0.0056	-0.0623* 0.00631	1.0000		
Inflation	-0.5774* 0.0000	-0.0926* 0.00549	-0.4226* 0.0043	1.0000	
Unemployment	-0.6972* 0.0000	-0.4902* 0.0007	-0.6060* 0.0000	0.6882* 0.0000	1.0000

Source: Author's Computation based on STATA 2019

Correlation analysis is used to examine the extent of the correlation of different pairs of variables under study. It measures the correlation coefficient between +1 and -1. This further predicts presence or absence of Multicollinearity which is considered to exist when there is perfect linear relationship between the variables under the study. The matrix was used for determining if the severity of the correlation of the pairs of variables was determined by highly collinear pairs of independent variables. Such bias arises when one or more sets of independent variables are positively correlated. Multicollinearity is considered present if the P-value of the coefficient of correlation equal or exceeds (0.05), as it may lead to flawed regression. As indicated by Correlational analysis in Table 4.2, the study found that there were no pairs of independent variables that had a P-value of correlation coefficient of more than (0.05) implying that the variables data were not highly collinear .

4.3 Stationarity

Stationarity means that the variable is composed of zero order, which makes it applicable to inference. Nonetheless, the lack of a root unit leads to a false assumption, making inference unenforceable and the model cannot therefore be included in the predictions. The unit root test was carried out on the various variables using the Augmented Dickey Fuller test. The test results are as shown in table 4.3 below

Table 4. 3: Test for Stationarity at levels

Variables	Test statistics z(t) value	Mackinnon approximate P- value	1% critical level	5% Critical Level	10% Critical Level
Tax revenue	-0.018	0.9570	-3.628	-2.950	-2.608
FDI	-1.640	0.4623	-3.628	-2.950	-2.608
GDP per capita	0.635	0.9885	--3.628	--2.950	-2.608
Inflation	-2.518	0.1112	-3.628	-2.950	-2.608
Unemployment	-1.874	0.3442	-3.628	-2.950	-2.608

Source: Author's Computation based on STATA 2019

Table 4.3 shows that all variables used in the study were non-stationary at levels since the Mackinnon p values were greater than 0.05 Tax revenue (p-value 0.9570 > 0.0500), FDI (P-value 0.4623>0.05), GDP per Capita (P-Value 0.9885>0.05) inflation (P-value 0.1112>0.05) and Unemployment (P-Value>0.05).The variables were therefore differenced and the results were as shown in the table 4.3.1

Table 4.3. 1: Test for Stationarity at First Difference

Variables	Test statistics z(t) value	Mackinnon approximate P value	1 % critical level	5% Critical Level	10% Critical Level
Tax revenue	-3.170	0.0218	-3.634	-2.952	-2.610
FDI	-6.022	0.000	-3.634	-2.952	-2.610
GDP per capita	-4.152	0.0008	-3.634	-2.952	-2.610
Inflation	-3.651	0.0049	-3.634	-2.952	-2.610
Unemployment	-1.806	0.3776	-3.634	-2.952	-2.610

Source: Author's computation (2019)

Table 4.3.1 shows that unemployment is still non-stationary in the first difference. This is because its test statistics is still greater than all significance levels. Also its Mackinnon p value was way above 0.05 values. However, the other variables; tax revenue, FDI, GDP per capita and inflation became stationary after first difference shown by (P Value <0.05) an implication that the variables had only one unit root. This showed that variables; tax revenue, FDI, GDP per Capita and Inflation had one unit root or were integrated of order 1 that is I (1). The non-stationary variable (Unemployment) was further differenced and the results were as shown in table 4.3.2.For unemployment it was not stationary at levels and first difference so second difference was carried out.

Table 4.3. 2: Test for Stationarity at Second Difference

Variable	Test statistics(t-test)	P value	1 % critical level	5% Critical Level	10% Critical Level
Unemployment	-6.386	0.000	-3.641	-2.955	-2.611

Source: Author's Computation based on STATA 2019

Table 4.3.2 revealed that unemployment became stationary after second difference. This is because its test statistic value (-6.386) is now less than all significance levels implying that the variable had two unit roots. This indicates that unemployment had two unit roots or is integrated of order 2 that is I (2). Since all variables have at least a unit root, there was need for the investigation of the presence of co-integration.

4.4 Determination of Optimum Lag Length

Before estimating Vector Autoregressive (VAR) or Vector Error Correction Model (VECM), it was important to identify lag length of unrestricted VAR order and VEC order. Since the two give same results, the study adopted unrestricted VAR order in identifying the lag length. The results for lag selection criteria were as discussed in table 4.4. Below

Table 4. 4; Vector Auto-regressive (VAR) Lag selection Criteria

Selection-order criteria
Sample: 6 - 44 Number of observations = 39

MAX RANK	LL	LR	DF	P	FPE	AIC	HQIC	SBIC
0	-1099.83				2.8e+18	56.6579	56.7344	56.8711
1	-990.379	218.9	25	0.000	3.7e+16*	52.3271*	52.7862*	53.6068*
2	-986.382	7.9932	25	0.999	1.2e+17	53.4042	54.246	55.7503
3	-980.871	11.022	25	0.993	3.8e+17	54.4037	55.628	57.8161
4	-929.318	103.11*	25	0.000	1.4e+17	53.042	54.6489	57.5208

Source: Author's Computation based on STATA 2019

From table 4.4, LR criteria showed that 4 lags should be considered. FPE criterion showed that 1 lag should be chosen. Regarding AIC, HQIC and SBIC, the guideline is

that the lower the value the better the model. In this case the four criteria showed that 1 lag should be chosen since all the four criteria recommended 1 lags. This therefore implied that the study considered 1 lag in the Johansen test of co-integration and VAR or VECM framework.

4.5 Co-integration Test

Two or more variables are said to co-integrate if they have a long rung equilibrium or relationship between them (Gujarati 2012).To carry out this test Johansen co-integration test was adopted and the results are as indicated in table 4.5

Table 4.5: Johansen Co-integration Test for Stationarity

Trend: Constant Lag-1		Number of observation = 42			Sample: 3-44
Maximum rank	Parms	LL	Eigen value	Trace statistic	5%critical Value
0	5	-1175.13		155.3030	68.52
1	14	-1120.71	0.92508	46.4664*	47.21
2	21	-1111.61	0.35183	28.2551	29.68
3	26	-1103.16	0.33124	11.3572	15.41
4	29	-1098.298	0.20670	1.6318	3.76
5	30	-1097.482	0.03811	.	.

Source: Author's Computation based on STATA 2019

From table 4.5, it is apparent that at least there is co-integrating vector between the variables. At maximum rank 0, the null hypothesis is that there is no co-integration while the alternative hypothesis is that there is co-integration. Since the trace statistic at this point (155.303) is greater than the critical value at 5 percent level of significance

(68.52), the null hypothesis is rejected. This lead to movement to maximum rank 1. At this point, the null hypothesis was that there was one co-integrating vector where alternative hypothesis suggested that there was more than one co-integrating vector. Since the trace statistic at this point (46.466) was less than the critical value at 5 percent level of significance (47.21), the null hypothesis was accepted. The process did not continue to the other ranks and therefore implied that there was one co-integrating equation.

4.6 Vector Error Correction Model (VECM)

The Vector error correction model (VECM) model was purposely applied to determine the dynamics in the short run and long run relationships and to show the speed of adjustment (the speed at which the dependent variable changes with a changes in the independent variables) of the error correction term towards its long-term adjustment path or to the point of convergence as a result of a temporary shocks. The coefficient(s) of the variables represent the short run elasticities in the VECM model (Lutkepohl, 2005; Lutkepohl and Kratzik, 2004). The *p* value close to zero indicates the model is significant. *'_ce1'*, represent the cointegrating equation to show the long-term relationship among the variables the cointegrating equation(s) must have a negative and significant sign attached to it at 5% level of confidence (refer to table 4.6)

Table 4. 6; Vector error correction model

Sample 6-44		**R Square**	**= 0.7813**		
No. of Observation-	**39**	**Prob >F**	**= 0.0000**		
	Coef.	**Std. Err.**	**z**	**P>|z|**	**[95% Conf. Interval**
D_dltxr					
_cel L1	-.218122	.0219691	-2.17	0.000	.0908394-047219
LD_dltxr	-.218122	0550395	-0.40	0.0192	-.1296 -.08606
LD_dlfdi	-.6744658	3294621	-20.47	0.000	-7.390 -6.098
LD_dinf	6104296	3.841346	0.16	0.874	-6.918 8.139
LD_dlgdp	.80929	.0167074	-0.95	0.344	-.04856 .0169
LD_ddune	-.3528668	.354401	-1.00	0.319	-1.047 .3418

Source; Author computation (2020)

The Vector error correction model(VECM) estimated the error correction term of the first cointegrating equation equals to -.218122 suggesting that there was a long term relationship running from Tax revenue to FDI, inflation, GDP Per capita and unemployment. This also indicated that previous years' errors or deviations from the long run relationship were corrected within current year at a convergence speed of 21.81 percent. The absolute value showed that 21.81 percent of long-run disequilibrium is adjusted from lagged period of error shocks. It also indicated that the past values of the variables affected the present values in the short run (Gujarati, 2009). The cointegrating equation was found to be statistically significant (p-value 0.000 <0.05).Based on these result of the cointegrating equation it was evident that there was

a significant long-term relationship running from Tax revenue to FDI, inflation, GDP Per capita and unemployment .Furthermore the second part of VECM model explains how the lagged values of foreign direct investment, Inflation, GDP per capita and Unemployment affects tax revenue performance in Kenya. Table 4.6 shows that the lagged coefficient of the first lagged difference of foreign direct investment is 0.6744658 which is statistically significant at 5 percent (p-value 0.000 < 0.050). This implies that a one percent change in the lagged difference of FDI leads to 0.6744658 increase in the current performance state of tax revenue performance whereas one percent change in the lagged difference of inflation will lead to 0.6104296 unit decrease in performance of tax revenue. Similarly one lagged difference of GDP Per capita will lead to 0.80929 unit increase in the state of tax revenue performance and one lagged difference of unemployment will lead to 0.3528668 decrease in the state of tax revenue performance. These results are similar to the findings of Ângelo and Lehmann (2012) and Gustavo et al. (2013) who established that foreign direct investments and GDP Per capita income have a significant long run relationship in the performance and growth of tax revenue On the other hand (Okafor, 2012), Barasa (2009) (Oladipupo and Obazee 2016) and Oguze and Odim (2015) established a negative long run relationship between Unemployment and inflation on tax revenue performance.

4. 7 Regression Analysis

From table 4.8, the results reveal that the model was good in terms of goodness of fit and overall significance with a (R^2) of 0.7371 and a probability value of 0.0000. This means that 73.71% of the variation in tax revenue is explained by the explanatory variables in the model while the other proportion 26.29% is explained by other factors

not considered by this study. Probability value of (0.0000) implies that the variables in the model are jointly significant in explaining tax revenue at 5% level of significance.

Table 4. 8: Regression Analysis Results

Source: Author's Computation (2019)

Dltxr	Coefficients	Std. Err.	Z	P>|z|	[95% Conf. Interval]	
Dlfdi	.311568	.1340745	2.32	0.001	-.1015635	-.0307501
Dinf	-.183015	.12269	-1.49	0.000	-.0128728	-.0077302
Dlgdp	.8128243	.3612513	2.25	0.030	-1.544789	-.0808595
Ddune	-.343756	.13589	-2.53	0.016	.0068416	.0619096
Cons	.0319441	.0099041	3.225	0.000	.0248441	.0390441

Number of obs = 42 F(4, 37) = 25.93	Prob > F = 0.0000 R-squared = 0.7371	Adj R-squared = 0.7087	Root MSE = 01313

The key objective of this paper is to establish the level of association between (FDI, inflation rates, GDP per capita, unemployment) and tax revenue performance. The necessary diagnostic tests have been carried out, and the logarithmic model shows a positive relationship between the two. The following is the regression equation obtained;

$Dltxr = .0319441 + .311568DlFDI_t - .183015DINF_t + .8128243DlGDP\ per\ capita_t - .343756DUNE_{t+} e_t$

Where Dltxr = Natural log of the first difference of tax revenue

DlFDI = Natural log of the first difference of foreign direct investment.

DINF = First difference of inflation rates.

DlGDP = Natural log of the first difference of gross domestic product per capita.

DUNE = First difference of unemployment.

e = the error term.

$_t$ = Time series data

The above estimating model shows that if all other explanatory factors are held constant, the annual FDI share of GDP will reduce by (.0319441) units.

4.7.1. Foreign Direct Investment (FDI)

The coefficient is positive hence the effect of foreign direct investment on tax revenue performance is statistically significant and exhibited positive sign as was expected. An increase in foreign direct investment by one unit would increase tax revenue performance by .311568 units. This observation can be explained by the fact that, as more investors are attracted into the country due to favorable business environment, low domestic interest rates and political stability, more industries are set up that contribute to increase in corporate tax .As growth and development of corporations increase in Kenya more tax is derived by taxing the corporate yielding more revenues for the government in form of Corporate Tax.

Schoeman et al. (2000) used a long- run co- integration equation for FDI in South Africa in a period of 30 years to analyze how government policy mainly deficit and taxes affects FDI. The study used deficit/GDP ratio to represent the government's fiscal discipline and the relative tax burden on investors in South Africa. The findings show that fiscal policy variables such as tax have a negative effect on FDI flows to South Africa Previous studies have shown how taxes in different jurisdictions affect foreign

direct investment flows in respective countries. Current study showed that there was a positive relation between FDI and tax revenue performance.

4.7.2. Inflation

The coefficient of inflation in the model above was found to have a negative impact on tax revenue performance at 5% level of significance. The coefficient of inflation in the model shows that a unit increase in inflation would decrease tax revenue by 0.183015 units. This was explained by Victor, (1996) and Gerald& Carroll (1999) stated three effects that inflation may have on tax revenue. A developing country's tax revenue is very elastic, when measured for the operating cycle, to the inflationary patterns in all tax collection sections. Heller (1980) checked the Aghevli and Khan (1978) hypothesis for a sample of 24 countries and concluded that the net effect of inflation on the budget deficit is not necessarily predictable as the inflation rate is higher, the higher the expenditure response and the lagging tax revenue the wider the gap between revenue and fiscal-period spending. It is evident from the previous and current studies that inflationary trends are inversely related to tax revenue performance. As inflation in Kenya has been rising over the years the taxes collected have also been negatively affected at different segments.

4.7.3. GDP per capita

The Coefficient in the model indicates that GDP per capita income is statistically significant and had expected positive impact on tax revenue performance. The coefficient of GDP per capita income in the model run shows that a unit increase in GDP per capita income would increase tax revenue by 0.8128243USD millions. The t-value was (2.25) which means that there was a positive relationship between GDP per capita income and tax revenue performance; this can be seen on the data.

According to Oketch and Mburu (2011) in a study on how tax revenue responds to changes in Kenya's national income as from 1986 to 2009, a buoyancy of 0.525 and an elasticity of 0.509 was discovered. In a similar study, Arisoy and Unlukaplan (2010) focusing on the Turkish economy, investigated the relationship between direct and indirect tax performance and GDP pa capita income, using data from 1968-2006. Ordinary Least Square technique was adopted and it was found that GDP pa capita income is positively related to indirect tax revenue. They concluded that indirect taxes are significantly and positively correlated with GDP per capita income in Turkey. It is evident from current and the studies above that GDP per capita income plays a key role in influencing tax revenue performance in Kenya.

4.7.4. Unemployment

The coefficient of unemployment showed that, unemployment is statistically significant at 5% level and exhibited the expected negative sign of unemployment on tax revenue performance as proxied by revenue collected within the stipulated time. The t-value was (-2.53) which mean that there was a negative relationship between unemployment rates and tax revenue performance. A unit increase in unemployment rate would result to a decrease of revenue collected by .343756 units. This confirms the government's effort to create more than a million jobs per year as this would result to revenues collected by Kenya Revenue Agency (KRA). Additionally, this suggests that an economy with high levels of employment would translate to increased incomes to people and healthy workforce, increased individual work efficiencies, and increased incomes and tax base. This was also explained by Solow (1956), that the output of an economy is determined by its Labour Force and the size and technological output of its

capital supply. Also, by Zagler and Durnecker (2003) who, explained that economic growth rate depends on the growth rate of the Labour Force.

4.8. Post Estimation Test

4.8.1 Multicollinearity

To test for Multicollinearity, Variance Inflation Factors (VIF) was examined. For VIF values greater than 10, Multicollinearity is deemed to be present (Nachtscheim, 2004). The VIF are calculated as shown below. Variance Inflation Factors

$VIF = {}^{1}/_{1-R^2}$

Where VIF= Variance Inflation Factor

R^2= Coefficient of Determination

${}^{1}/_{VIF}$= tolerance.

The VIF values are shown in table

Table 4. 9: Test for Multicollinearity using Variance Inflation Factor

Variable	VIF	1/VIF
Unemployment	1.76	0.567096
GDP per Capita	1.64	0.611337
Inflation	1.11	0.897962
FDI	1.01	0.990155
Mean VIF	1.38	

Source: Author's Computation based on STATA 2019

From table 4.9, it is evident that there was no Multicollinearity between unemployment, GDP per capita, Inflation and FDI. This is because all the variables had a VIF of less than 10.

4.8.2 Normality

Normality testing helps to determine how likely it is to be normally distributed to a random variable underlying the datasets. A range of normal tests are possible, including skewness of the kurtosis, Jarque-Bera and Shapiro Wilk Test. The study used skewness kurtosis tests for this analysis.

Skewness is a function of the symmetry of a random variable's probability distribution by its mean whereas kurtosis is the height and the center point relative to the standard bell curve.

4.8.3. Skewness

Table 4. 10 :Test for Skewness

Equation	Skewness	Chi^2	df	$Prob>chi^2$
D_dltxr	-.41181	1.131	1	0.28766
D_dlfdi	-.60891	2.472	1	0.11590
D_dinf	-.30966	0.639	1	0.42398
D_dlgdp	.76716	3.924	1	0.04761
D_ddune	.14818	0.146	1	0.70202
All	.	8.312	5	0.13988

Source: Author's Computation based on STATA 2019

From table 4.10 above it was established that the probability chi^2 value of skewness was above 0.05 for all variables. This is an indication that the amount and direction of distribution of variables around their means were asymptotically normally distributed. Hence the null hypothesis H_O- Data follows asymptotic normal distribution was accepted and the alternative hypothesis H1- Data does not follow asymptotic normal distribution was rejected.

4.8.4 Kurtosis

Table 4. 11.Test for Kurtosis

Equation	Kurtosis	Chi2	df	Prob>chi2
D_dltxr	6.7867	23.898	1	0.23190
D_dlfdi	5.6193	11.434	1	0.07720
D_dinf	4.8157	5.495	1	0.19080
D_dlgdp	3.8777	1.284	1	0.25718
D_dune	3.545	0.495	1	0.48170
ALL		42.606	5	0.00000

Source: Author's Computation based on STATA 2019

It can be established from the table 4.11 that all the probability chi2 values for kurtosis for all variables were greater than 0.05. This is an indication that the height and sharpness of the central peaks of all the variables were relative to that of a standard bell curve. Thus the null hypothesis H_0- Data follows asymptotic normal distribution was

accepted and the alternative hypothesis H_1- Data does not follow asymptotic normal distribution was rejected.

4.9.5 Test for serial correlation /Auto correlation

Autocorrelation occurs in time series data when the error term occurring at one period crosses over into another period. It may also occur when the error term relating to any observation is influenced by the error term relating to any other observation. The error term in the linear regression requires that successive values of the error term be sequentially independent (Mukras, 1993). This study used Breusch-Godfrey LM test to check for the presence of autocorrelation. The test involved testing of the null hypothesis of absence of autocorrelation against the alternative hypothesis of the presence of autocorrelation. That is; H_0: $\rho > 0.05$ H_1: $\rho < 0.05$

The null hypothesis states that the error term is free from autocorrelation while the alternative hypothesis shows the presence of autocorrelation in the error term (Gujarati, 2009).

Table 4. 12:Breusch-Godfrey LM test for Autocorrelation

Lags(p)	Chi 2	Df	Prob> chi2
1	23.65 H_o- no serial correlation	1	0.08

Source: Author's Computation based on STATA 2019

From the table 4.12 it can be observed that the Prob> chi 2 is greater than 0.05 indicating no presence of serial correlation at 5% level of confidence. Therefore at this

point the null hypothesis is accepted at 5% level of significance while the alternative hypothesis is rejected.

4.9.6 Test for Heteroscedasticity

Heteroscedasticity takes place when the variance of the error term keeps changing for all the values of independent variables.

$E(\varepsilon i2) = \zeta \varepsilon i2$..... (Equation 1)

The error term can vary from one observation to another meaning the variance of error terms is dependent on the magnitude of the independent/explanatory variables.

$E(\varepsilon i2) = \zeta \varepsilon i2 = f(xi)$..... (Equation 2)

The unbiased character of the OLS estimator is not affected by the presence of heteroscedasticity though it renders it inefficient. This is because in small samples OLS estimator we will not have the minimum variance among the class of unbiased estimators and in large samples it will be asymptotically inefficient. This study used the Breusch-Pagan test to check for the presence of heteroscedasticity (Gujarati, 2009).

Table 4. 13: Breusch- Pagan / Cook-Weisberg test for Heteroscedasticity

Chi 2 (1)	3.10
Prob > chi 2 Ho: Constant variance Variables: fitted values of dltxr	0.0782

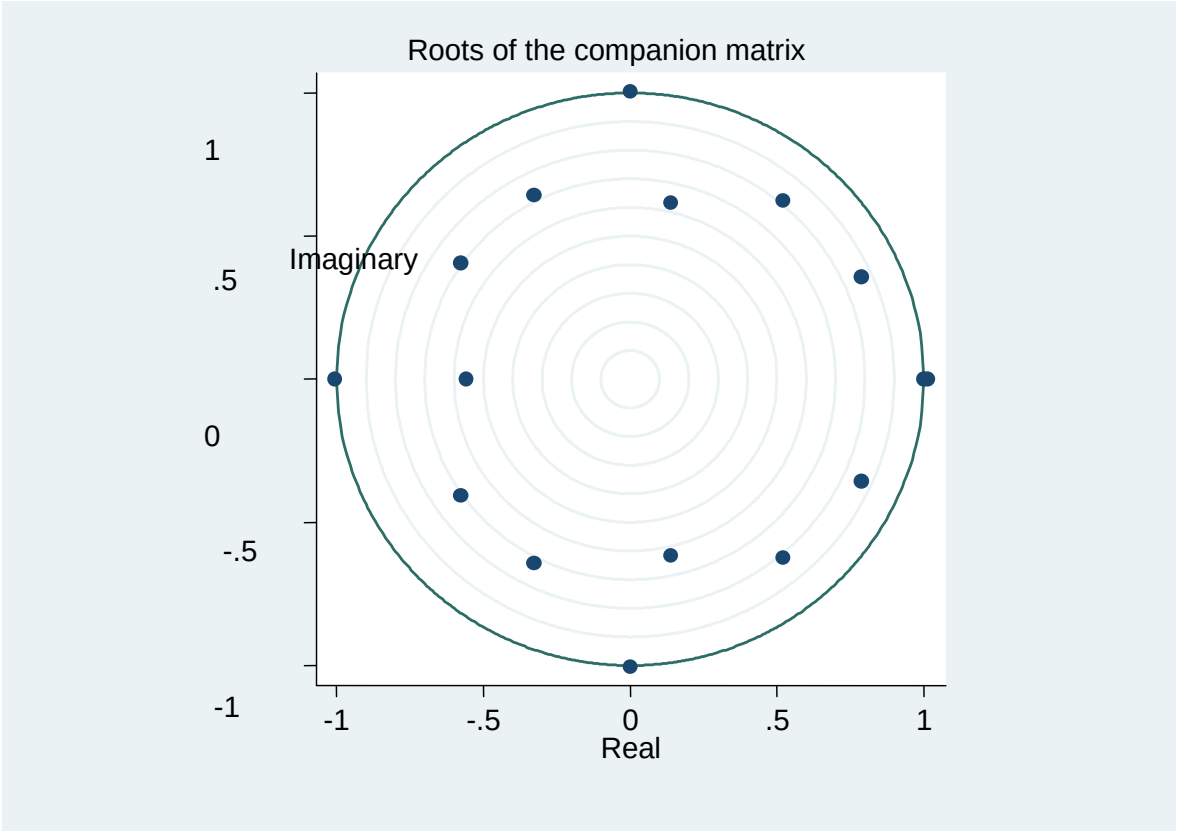
Source: Author's Computation based on STATA 2019

Heteroscedasticity is checked by observing the Prob> chi 2 value. If it is less than 0.05 then the null hypothesis (H_o- error variance are equal) is rejected and the alternative hypothesis (H_1-error variance are multiplicative of one or more variables) is accepted.

From the table 4.13 it can be observed that the Prob > chi 2 value is greater than 0.05 (Prob > chi 2 =0.0782) therefore indicating that heteroscedasticity is absent hence the null hypothesis is accepted and the alternative hypothesis is rejected.

4.9.7 Model Stability Test by Use of Graph Method

Figure 4 shows that all the values lie inside the circle and this confirms that indeed the used regression model for analysis was stable.



Source: Researcher, 2019

Figure 4. 1: The VECM specification imposes 1 unit modulus

CHAPTER FIVE:

SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

5.1 Introduction

This chapter presents a summary of the study and policy recommendation based on the findings of the study. This chapter is comprised of four sections namely, summary and conclusions of the study, policy implications and recommendations, limitations of the study and recommendation of areas for future research.

5.2. Summary of the findings

The study investigated the impact of macroeconomic variables (FDI, GDP per capita inflation and unemployment) on tax revenue performance in Kenya. The study employed Vector Error Correction Model (VECM) method in analyzing time series data captured over the period 2008-2018. Time series properties of the data variables were investigated to ensure that reliable results were obtained. Pairwise correlation test was applied to test the level of correlation among the variables.

The study found that there were no pairs of independent variables that had a correlation coefficient of more than 0.05. This implied that correlation between independent variables was not present hence no need for differencing. Unit root test was also applied to test for Stationarity among the data which was found to be non-stationary at levels hence the need for first and second difference. Johansen cointegration test was used to test the number of cointegrating equations which were found to be two cointegrating equations. Regression analysis was also done to find out the coefficients and the statistical significance of the explanatory variables in relation to

the dependent variable. The summary of the findings per the objectives are briefly discussed.

5.2.1. Effects of FDI on tax revenue performance

The results revealed that foreign direct investment positively and moderately correlates with tax revenue performance as shown by correlation coefficient value of (0.578).FDI inflows also positively affect the rates of tax revenue performance in Kenya as indicated by a positive and significant coefficient of (0.311568) in the regression model. This observation can be explained by the fact that, as more investors are attracted into the country due to favorable business environment, low domestic interest rates and political stability, more industries are set up that contribute to increase in corporate tax.

5.2.2 Effects of GDP per Capita on Tax Revenue Performance

The results revealed that GDP per Capita income positively and strongly correlates with tax revenue performance as shown by correlation coefficient value of (0.9538). Similarly the regression coefficient of GDP per capita income showed that GDP per capita income strongly and positively affects the rates of tax revenue performance as indicated by a regression coefficient value of (0.8128) and (p-value -0.030)

5.2.3 Effects of Inflation on Tax revenue performance

In contrary, the correlation coefficient of inflation showed that inflation negatively and moderately correlates with tax revenue performance as shown by correlation coefficient value of (-0.5774) .Similarly the regression coefficient of inflation showed that inflation negatively affects the performance of tax revenue in Kenya as evidenced by regression coefficient of (-0.183) and (p-value = 0.000).The regression model showed

that a unit increase in inflation leads to a decrease in tax revenue performance by 0.183 units.

5.2.4 Effects of Unemployment on Tax Revenue Performance

The regression coefficient of unemployment (-0.3437) showed that, unemployment is statistically significant and exhibited the expected negative sign of unemployment on tax revenue performance. The results showed that a unit increase in unemployment rate would result to a decrease of revenue collected by 0.3437 units. This confirms the government's effort to create more than a million jobs per year as this would result to revenues collected by Kenya Revenue Agency (KRA). Additionally correlation coefficient of unemployment showed that unemployment negatively and moderately correlates with tax revenue performance as shown by correlation coefficient value of (0.6972) units

5.3. Conclusion

From the results and subsequent discussions, there is a link between the above macroeconomic variables and tax revenue performance. This finding indicates that both foreign direct investment and GDP per capita exhibited a statistically significant positive relationship with tax revenue performance, whereas the inflation and unemployment rates negatively influenced tax revenue performance in Kenya for the period of time under the study. Therefore, the null hypothesis that states that both FDI and GDP per capita income have no statistical significant effect on tax revenue performance was rejected.

In conclusion for the Kenya government to achieve both the big 4 agendas and the vision 2030 major funding from revenue collection is essential so as to reduce borrowing of development funds that results to increase in country's debt burden. However, in order to increase tax revenue performance, the unemployment and inflation rates have to be reduced. Similarly, better policies have to be put in place by the Kenya tax revenue authority in order to achieve maximum revenue collection.

5.4. Recommendations

Based on the study findings, the study established a positive relationship between FDI and tax revenue performance .Therefore based on the conclusion, the study recommends that the government of Kenya when considering improving tax revenue performance should encourage more fiscal expansionary policies which include reduced tax rates on corporate profits and increased government spending on manufacturing sector. This will attract more foreign investors to due to reduced profit tax and ease of doing business in the country.

Similarly the study concluded that GDP per capita income strongly and positively affects the performance of tax revenue in Kenya. Based on the conclusions, the study recommends that the government should support innovative activities by youths through creation of innovative labs .This would help to create more job opportunities for the youths. Similarly encourage public private partnerships between the county governments and private investors.

According to the study findings inflation was found to negatively influence the tax revenue performance in Kenya, therefore the Central bank of Kenya should ensure appropriate fiscal policies are put in place in order to moderate the fluctuations in exchange rates of the Kenyan currency against other foreign currencies .Similarly the

government should put more efforts in fighting corruption and political instability. Lastly lending interest rates should be monitored through periodical interest rates capping to prevent rising interest rates that result to increase in cost of production and prices of goods. This would help to prevents inflation rates in Kenya.

Lastly unemployment also had a negative impact on tax revenue performance. This implies that increase in unemployment rates reduces savings which shrinks funds available for investment. Therefore, the government should expand the informal sector by providing incentives and loans at low interest rates which will help to absorb both unskilled and skilled labor force. This will lead to increased Personal Income taxation because more people would be employed. Lastly the government should increase the county government share in the national budget to 35% of the annual budget. This is because through the county governance, more jobs opportunities have been created therefore increasing their share would translate into more job opportunities.

5.5 Areas for Further Research

The study recommends other studies to build on the study findings by incorporating the omitted variables that affect tax revenue performance such as exchange rates, trade liberalization and other variables apart from those considered in the model specification.

The study has used time series analysis and Vector Error Correction Method of estimation. A similar study can be done using panel data analysis and compare data from different countries as opposed to one country as is the case in this study.

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Appendix I: **Quarterly Data**

YEAR	FDI	GDP	INF	TXR	UNE
2008Q1	797.2568	1032.116	16.94719	4.71E+08	15.92646
2008Q2	131.642	990.104	15.74031	4.75E+08	14.91625
2008Q3	428.4014	955.8648	14.49656	4.83E+08	14.04679
2008Q4	882.8733	929.3989	13.21594	4.93E+08	13.31808
2009Q1	1231.774	910.7062	11.89844	5.07E+08	12.7301
2009Q2	1475.103	899.7866	10.54406	5.23E+08	12.28287
2009Q3	1612.861	896.6402	9.152813	5.43E+08	11.97638
2009Q4	1645.047	901.267	7.724688	5.65E+08	11.81064
2010Q1	1222.365	935.9594	3.687813	6.13E+08	12.1375
2010Q2	1183.127	947.2156	3.214688	6.32E+08	12.1125
2010Q3	1178.036	957.3281	3.733438	6.44E+08	12.0875
2010Q4	1207.092	966.2969	5.244063	6.51E+08	12.0625
2011Q1	1406.147	973.3719	12.46844	6.1E+08	12.0375
2011Q2	1449.157	980.3531	14.07406	6.21E+08	12.0125
2011Q3	1471.974	986.4906	14.78281	6.41E+08	11.9875
2011Q4	1474.597	991.7844	14.59469	6.72E+08	11.9625
2012Q1	1436.401	991.9844	11.20188	7.39E+08	11.9375
2012Q2	1406.888	997.2906	10.14313	7.8E+08	11.9125
2012Q3	1365.433	1003.453	9.110625	8.21E+08	11.8875
2012Q4	1312.034	1010.472	8.104375	8.62E+08	11.8625
2013Q1	1222.543	1021.066	6.39625	9.12E+08	11.8375
2013Q2	1154.919	1028.709	5.73375	9.49E+08	11.8125
2013Q3	1085.013	1036.122	5.38875	9.82E+08	11.7875
2013Q4	1012.825	1043.303	5.36125	1.01E+09	11.7625
2014Q1	917.545	1048.863	6.673125	1.03E+09	11.7375
2014Q2	849.1155	1056.138	6.871875	1.05E+09	11.7125
2014Q3	786.7272	1063.738	6.979375	1.08E	11.6875
2014Q4	730.3802	1071.663	6.995625	1.11E+09	11.6625
2015Q1	654.1106	1080.163	6.689375	1.15E+09	11.6375
2015Q2	620.2317	1088.638	6.615625	1.18E+09	11.6125
2015Q3	602.7795	1097.338	6.543125	1.22E+09	11.5875
2015Q4	601.7542	1106.263	6.471875	1.26E+09	11.5625
2016Q1	575.031	1117.413	6.0925	1.32E+09	11.52188
2016Q2	623.7092	1125.988	6.1475	1.35E+09	11.50313

2016Q3	705.6641	1133.988	6.3275	1.38E+09	11.49063
2016Q4	820.8957	1141.413	6.6325	1.41E+09	11.48438
2017Q1	1090.638	1144.075	8.1625	1.41E+09	11.84375
2017Q2	1223.929	1152.025	8.2775	1.43E+09	11.70625
2017Q3	1342.004	1161.075	8.0775	1.44E+09	11.43125
2017Q4	1444.862	1171.225	7.5625	1.46E+09	11.01875
2018Q1	1532.503	1182.475	6.7325	1.47E+09	10.46875
2018Q2	1604.927	1194.825	5.5875	1.47E+09	9.78125
2018Q3	1662.134	1208.275	4.1275	1.48E+09	8.95625
2018Q4	1704.125	1222.825	2.3525	1.49E+09	7.99375

SOURCE (KRA 2019)

Appendix II: Map of Kenya

Source: Government of Kenya (2019)

Appendix III: Research Permit

REPUBLIC OF KENYA

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RESEARCH

This is to Certify that Sr. KELVIN WEKESA NALYANYA of Masinde Muliro University of Science and Technology, has been
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