EFFECTS OF OIL PRICE SHOCKS ON TAX REVENUE AND GOVERNMENT EXPENDITURE IN KENYA

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X50/7799/2017

RESEARCH PAPER SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ARTS IN ECONOMICS OF THE UNIVERSITY OF NAIROBI

NOVEMBER 2019

DECLARATION

I the undersigned, declare that this research paper is my original work and it has not

been presented in any other University or Institution for academic credit**.**

Signature……………………………. Date…………….

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This research paper has been submitted for examination with my approval as the
University supervisor

Signature………………………………. Date………………

DR. LAURA BARASA

DEDICATION

To my late Mother Florence Nyangasi and my entire family.

ACKNOWLEDGEMENTS

My sincere gratitude goes to everyone who supported me through this great journey. First, I thank God for granting me perfect health. Secondly, I appreciate my supervisor Dr. Laura Barasa for her great insights and dedication in making this a success. Mr. Calvin Afeti for his encouraging words and financial assistance. Lastly, my classmates at the University of Nairobi. Thank you.

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LIST OF ABBREVIATIONS AND ACRONYMS

ARDL- Autoregressive Distributive Lag

GDP - Gross Domestic Product

OECD- The Organization for Economic Co-operation and Development

OLS – Ordinary Least Squares

VAR- Vector Auto Regression

VECM-Vector Error Correction Model

SAP- Structural Adjustment Programs

ABSTRACT

To ensure fiscal sustainability, knowing the public spending and tax revenue nexus is vital. The mismatch between public expenditure and tax revenue has resulted in large and persistent budget shortfalls in Kenya. The main aim of this research was to analyze Kenya's public expenditure and tax revenue for the period 1980-2018. It specifically, investigated the causal link between tax revenue and public expenditure components as well as the effect of oil price shocks on this linkage. To achieve its objectives, the study employed the Vector Auto regression method. Annual time series sourced from Economic surveys and Statistical abstracts were used. The variables of interest were; development expenditure, recurrent expenditure, tax revenue, real GDP, world oil prices, and governance.

The Toda-Yamamoto causality test indicated the absence of a causal relationship between tax revenue and both capital and recurrent expenditures. In line with the fiscal neutrality hypothesis. Causality was found to run from recurrent expenditure to development expenditure. The generalized impulse response functions indicated that oil prices had both positive and negative effects on tax revenue, capital expenditure and recurrent expenditure. However, all these effects were nonsignificant in all periods for the three variables. This study recommends harmonization of the various institutions tasked with expenditure and revenue decisions as well as minimal political interference in fiscal processes. It further advocates for a cut in recurrent expenditures as part of the measures aimed at reducing the overall total expenditure.

CHAPTER ONE

INTRODUCTION

1.1 Background

Public expenditure and tax revenue nexus has received immense attention globally (Narayan and Narayan, 2006; Irandoust, 2018). This has been motivated by the fact that they are key fiscal instruments (budget components) that facilitate fiscal sustainability policies especially in the wake of budget deficits (Narayan and Narayan, 2006; Irandoust, 2018; Were, 2017). As a result, researchers have centered on the public spending and tax revenue causality in many nations (Osoro, 1997).

According to Narayan and Narayan (2006), it is imperative to have knowledge of the type of causal linkage between the two fiscal instruments. This is because of their policy relevance. For instance, if causality runs from revenue to public spending, then budget shortfalls are minimized by increasing government revenues. However, if public spending causes tax revenue, there is a need to reduce government spending. This is meant to prevent investors from shifting assets out of the nation in fear of future tax obligations. Additionally, if causality does not exist, extreme budget shortfalls occur in the case where growth in government expenditure is not equivalent to that of tax revenue.

Over time, nations have experienced abrupt changes in at least one macroeconomic variable due to internal or external factors. These abrupt changes are known as "shocks". Shocks hamper economic growth and efficiency of fiscal policy (Akindele and Fasoranti, 2017). The level of public spending and the amount of revenue collected are prone to both external and internal shocks. The extent of the

effect of shocks on these fiscal instruments relies on the nation's socio-economic and governance structure (Capistr and Ramos-francia, 2011). The major concern has been centered on external shocks such as oil price shocks due to their unanticipated nature and negative impact.

Notably, external shocks have been associated with unexpected changes in government expenditure and revenue in various nations thus worsening the budget deficit. For instance, considering oil is a prime source of energy, changes in world oil prices have been mentioned to impact both oil buying and selling nations in different ways. For the importing countries, a hike in oil-costs has a trickledown effect in form of; increased production costs and reduced consumption, hence, reduced income that is associated with increased inflation which in turn results in increased spending and reduced tax revenue, thus a budget deficit increase (Berument, Ceylan, and Dogan 2016). However, for oil trading countries, a hike in oil prices represents a rise in oil revenue. Kenya discovered oil in March 2012 and made her first ever export in August 2019.

Kenya has witnessed both external and internal shocks that have impacted on government expenditure and revenue collected. This has resulted in chronic and persistent budget deficits that have choked economic growth (Muriithi & Moyi, 2003). Examples of internal shocks include; the 1992 tribal clashes, 2007/08 post-election violence, 1984 drought, 1998 El Nino rains as well as the 2010 constitution. Some of the external shocks are oil price shocks and terror attacks.

It is not easy to pinpoint the best deficit minimizing policies to be adopted by just visualizing the tax revenue and expenditure trends. Therefore, understanding their causal relationship is desirable. Apart from studying the connection between public spending and tax collections, it is imperative to explore the influence of shocks on the public expenditure and tax collections to facilitate relevant fiscal sustainability policies. This study, therefore, assessed the causal association between public expenditure and tax receipts plus the effects of oil price shocks on this nexus in Kenya.

1.1.1 Trends in government expenditure and tax revenue in Kenya

Kenya has experienced an upward trend in both tax revenue and total government spending. However, total government expenditure has exceeded tax revenue collected. This has led to a persistent rise in fiscal deficits. Figure 1.1 illustrates public spending and tax collections trend from 1980 to 2018.

Figure 1. 1: Trend in total government expenditure and tax revenue
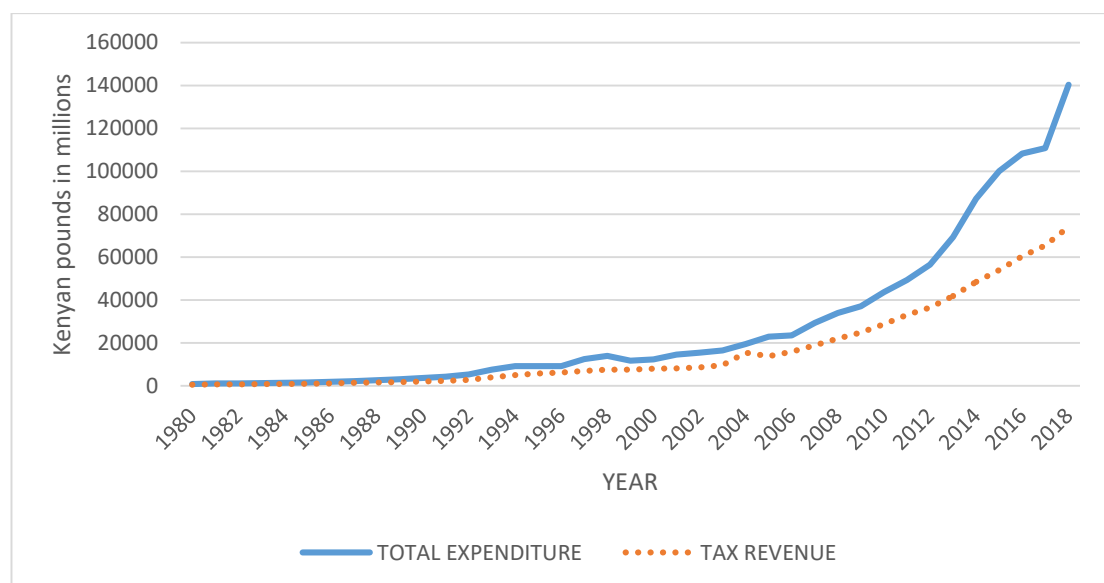
Source: Author (2019), using data from *Economic surveys* (Various issues)

Lower government expenditures were reported between 1980 and 1990. This may be attributed to the SAPs and Sessional paper 1 of 1986 that advocated for minimal government interventions within the economy.

As from 2007, the difference between total expenditure and tax revenue had a persistent increase. This, therefore, worsened the budget deficit situation in Kenya. The tax revenue and government expenditure gap could be ascribed to various aspects. For instance, the 2010 constitution that was associated with fiscal decentralization, changes in government and political structures as well as internal shocks such as post-election violence as well as fluctuations in world oil prices.

1.1.2 The trend in recurrent and development expenditure in Kenya

Kenya's recurrent and development expenditures have witnessed an upward trend since 1980. However, recurrent expenditure has exceeded development expenditure over the years. This is demonstrated in figure 1.2.

Figure 1. 2: Trend in recurrent and development expenditure
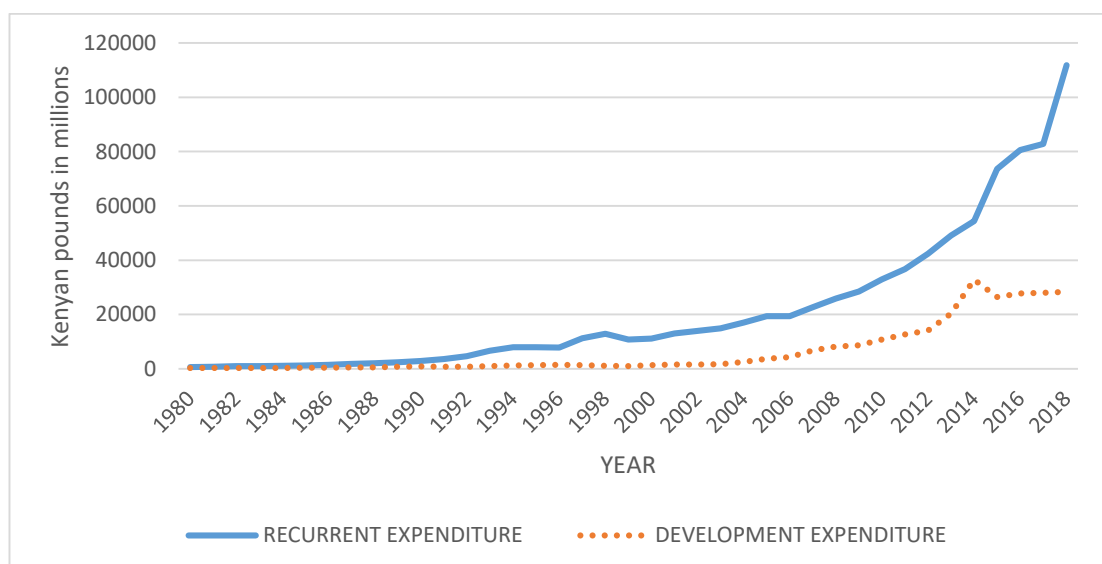
Source: Author (2019), using data from *Economic surveys* (Various issues)

Overall, low development expenditures were witnessed between 1980 and 2002. From 2003, development expenditure experienced an upward trend. This may be attributed to NARC's government-heavy investment on infrastructural projects such as the Thika Superhighway. A further sharp increase in development expenditure was experienced in 2013. This may be attributed to fiscal decentralization associated with the enactment of the 2010 constitution.

High recurrent expenditures were witnessed during election years. Figure 2 shows that high recurrent expenditures were witnessed in 1992, 1997, 2002, 2013 and 2017. This may be attributed to the funds required to finance the general elections. In 2013, recurrent expenditure peaked. This is after the first devolved government was elected following the implementation of the 2010 constitution.

1.1.3 Overview of tax revenue and government expenditure in Kenya

Kenya's public expenditure and tax revenue have evolved. This can be linked to various policy frameworks that are enshrined in different sessional papers and fiscal blueprints.

Sessional Paper "African Socialism and its Application to planning in Kenya" was created in 1965 (Republic of Kenya, 1965). It advocated for progressive taxation as well as a rise in public spending to enable the economy to grow. This was enhanced through the abolishment of the hut tax that was in existence since the colonial era and adoption of Graduated Personal Tax (GPT) that was later abolished in 1973 (Wawire, 2006). In 1970, the collection of taxes was taken over by the central government. However, fiscal deficits arose in the 1970s because of foreign and domestic shocks that impacted the nation's fiscal sustainability (Muriithi & Moyi, 2003).   They

included the oil crisis of 1973/1974. In 1973, sales tax replaced the GPT to increase tax revenue (Wawire, 2006).

In the 1980s, the Bretton Woods institutions introduced Structural Adjustment Policies (SAPs) in Kenya. These advocated for minimal government interventions and facilitated the freedom of market forces. The 1986 Sessional Paper "Economic Management for Renewed Growth" complemented the SAPs and had profound implications on the nation's fiscal policy. It suggested a fall in development expenditure. This was meant to facilitate a budget deficit that did not exceed 2.5 per cent as part of the Gross Domestic Product (GDP) (Republic of Kenya, 1986). However, despite the government's initiative, fiscal policy problems persisted necessitating tax reforms.

In January 1990, Value Added Tax (VAT) substituted the sales tax (Republic of Kenya, 1990). VAT was favored because of its potential to generate more revenues just as its affordable administration costs (Muriithi & Moyi, 2003). In 1995, parliament instituted the Kenya Revenue Authority (KRA). The purpose was to merge the distinct tax collection arms-collection and mobilization (Republic of Kenya, 1995).

The NARC administration implemented the Economic Recovery Strategy (ERS) in June 2003. This was meant to guide economic policies between 2003 and 2007. It stipulated various tax and government expenditure reforms so as to minimize the budget shortfall to 3.7 per cent of GDP by 2005/06. To achieve this, it aimed at; a fall in total government outlays, concentrate on infrastructural expenditures as well as outlays that aimed at reducing poverty. This was to be associated with tax reforms

aimed at widening the tax capacity so as to achieve minimum revenue that is 21 per cent of GDP (Republic of Kenya, 2003).

Vision 2030 succeeded the ERS in 2007. This is a 22 years' blueprint divided into successive Medium Term Plans (MTP) of five years each. Its main objective is to provide quality life to Kenyan citizens through a newly transformed industrialized nation by 2030 (Republic of Kenya, 2007). To facilitate this, it is centered on improved revenue collection as well as expenditure on key infrastructural projects such as roads.

Kenya enacted a new constitution in 2010 that resulted in major political, economic and administration transformations. It instituted a devolved system of government that comprised of 47 county governments, bicameral parliament as well as constitutional offices such as; Commission on Revenue Allocation (CRA), Salaries and Remuneration Commission (SRC) as well as independent offices such as the Office of the Controller budgets (OCOB) (Republic of Kenya, 2011). The Central government was mandated to decide on both direct and indirect taxes while the county governments were limited to entertainment, property as well as other taxes that were deemed feasible. Increased public roles and institutions resulted in increased government's recurrent expenditure (Republic of Kenya, 2011).

Budget deficits have continued to hamper Kenya's fiscal sustainability. Total government spending exceeds total tax revenue - the primary source of public funding. This is despite the various policy frameworks that have been instituted.

1.1.4 Budget deficits

The major implications associated with budget deficits have always been on the methods used in their financing (Kosimbei, 2009). Methods such as; printing of

new currency, external borrowing, and local borrowing have been faulted for various reasons. Printing currency has been associated with increased inflation. Local borrowing has been linked to starving private investors savings necessary for investment. External borrowing risks a nation's independence due to terms and conditions associated with them. Further, debt servicing of on principal and interest amounts increase the recurrent expenditure (Osoro, 1997; Osoro, 2016).

However, there are different arguments in support of and against budget deficits. Keynes (1936), in support of budget deficits, argued that government spending is necessary during a recession since it increases total demand. This, in turn, leads to increased employment and private savings thus a rise in output. On the other front, the Neoclassicals argued that budget deficits choked private investment thus limiting economic growth. Further, the Ricardian equivalence theorem asserted that budget shortfalls corresponded equally with private savings. Therefore, they had no harm (Kosimbei, 2009).

Despite the existence of divergent views concerning budget deficits, there is a need for nations to regulate their budget deficits within recommended levels. This is meant to minimize the implications associated with the methods used to finance the budget shortfalls as well as ensure sustained economic growth in the wake of shocks.

1.2 Problem statement

Kenya has experienced a large and persistent budget deficit that is detrimental to her fiscal sustainability and attainment of Vision 2030. Kenya's total government expenditure has exceeded tax revenue especially after devolution was implemented. Further, Kenya has experienced internal and external shocks that have impacted on her

revenue collection and level of spending. Despite austerity measures and tax reforms, Kenya's budget shortfall as a percentage of GDP still exceeds the three per cent ceiling recommended by the East African Community Monetary Union (EACMU) protocol in 2013. In the fiscal year 2017/18, Kenya witnessed a budget shortfall of 7.2 per cent of GDP, this corresponded with four percentage points above the recommended ceiling (Republic of Kenya, 2018). The need to reduce budget deficits to recommended levels is necessitated by the detrimental effects associated with methods used to finance budget deficits. For instance; reduced private investment as a result of domestic government borrowing that depletes available funds for private investors to borrow, high accumulated debt levels that affect current and future generations through debt servicing, high inflation as a result of money printing, and loss of a nation's sovereignty due to the terms and conditions associated with external loans.

Previous studies on Kenya's public expenditure and tax revenue nexus concentrated solely on total government expenditure. None of the studies disaggregated government outlay into capital and recurrent expenditure. Moreover, none of the studies factored in the influence of oil price disturbances and political regimes (governance) on tax collections and public spending. To enhance past studies, this study utilized the two public spending components-recurrent and development, contrasting with previous ones that emphasized on total outlay. This is because the two components of expenditure are not always in equal proportion and therefore, knowledge on their specific causal relationship with tax revenue is desired. It additionally, factored in the influence of the sudden shifts in oil costs and political

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changes on the relationship. These, therefore form the major contributions of this study.

1.3 Research questions
The study set out to answer the following questions;

1. What is the causal relationship between tax revenue and government expenditure in Kenya?

2. What is the effect of oil price shocks on tax receipts and government expenditure in Kenya?

3. What are the policy implications of this study?

1.4 Objectives
This study set out to analyze Kenya's government expenditure and tax revenue. Specifically, it sought to;

1. Investigate the causal link between recurrent spending, development expenditure and tax revenue in Kenya.

2. Analyze the effect of oil price shocks on recurrent spending, development spending, and tax revenue.

3. Draw policy implications based on the findings.

1.5 Significance of the study
This research contributes on the available literature and policy. First, by examining the causal link between tax collections and government spending, this paper draws relevant policy required in attaining the recommended budget deficit levels. Secondly, by understanding the effect of external and internal shocks on the fiscal instruments, this study enables policymakers to formulate policies to be adapted when economic disturbances occur. Thirdly, this paper advances current literature on public

spending and tax revenue nexus by; utilizing a multivariate model and using updated and up-to-date time series data.

1.6 Scope and organization of the study

This paper covers the period from 1980 to 2018. The period is chosen because; it is sufficiently long to accomplish the aims of this research just as it covers a period where major political and economic transformations had a great impact on the public expenditure and tax collections. They include; the SAPs of 1980, general elections, different political regimes, Vision 2030 and the 2010 constitution.

The study is constituted in the following manner: Chapter one introduces the paper, Chapter two scrutinizes both the theoretical and empirical literature, chapter three covers the approach, chapter four covers the empirical findings and chapter five, summarizes and provides policy suggestions.

2.1 Introduction

This section explores the theoretical and empirical literature on the association between government spending and taxes in both industrialized and developing nations. Theoretical literature includes; theories that explain changes in government outlay as well as a review of various hypotheses that elucidate the government expenditure and tax revenue link. The empirical literature presents a scrutiny of past empirical studies for both industrialized and non-industrialized nations.

2.2 Theoretical literature

2.2.1 Adolf Wagner's law of increasing state activity

This theory is accredited to the German economist, Adolf Wagner. He examined public expenditure patterns in various nations and eventually concluded that changes in government expenditure relied on economic growth. It was founded on some notions. First, the state needed to adjust its current laws so as to accommodate changes in expenditure. Secondly, economic growth was associated with spillover effects that demanded government intervention. Thirdly, there was a positive connection between income and public demand for social amenities. Therefore, as the economy grew the state made adjustments in its spending.

Wagner's law has been criticized for neglecting the function of the private sector in the economy.

2.2.2 Peacock and Wiseman theory

According to Peacock and Wiseman (1979), public expenditure is determined by the amount of tax that citizens are willing to pay during ordinary times. During unusual occurrences such as wars, drought, and floods, the public is willing to accept

an increase in taxes to cater for the high expenditure levels. However, taxes do not resume back to their initial levels after the unusual occurrence is over, implying a permanent tax increase. The occurrence of the new disturbance, in turn, leads to further increased expenditures. This is because the general public is willing and able to tolerate the new tax burden. This process was referred to as the displacement effect.

Generally, this theory asserts that growth in government expenditure is irregular. This is due to the discrete changes in the amount of tax that taxpayers are willing to pay which is occasioned by shocks. This, therefore, implies that in the absence of unexpected events, then public spending would grow slowly.

The Peacock and Wiseman theory has been criticized based on the fact that governments can increase expenditure due to finances from donor funds, sale of assets or even borrowing.

The connection between public expenditure and tax receipts has been a major topic of global interest. This has been necessitated by efforts by policy makers aimed at reducing budget deficits. As a result, various hypotheses on the causal association between public spending and tax revenue have been explored. They include;

2.2.3.1 Tax and spend hypothesis

It proposes that an adjustment in tax impacts the dimension of public expenditure. This is propelled by the notion that the government's willingness to spend is constrained by the quantity of funds at its disposal. This implies that increased expenditures unmatched by tax increase will lead to large budget deficits.

Various scholars have had divergent opinions with respect to this hypothesis. Friedman (1978), argued that public expenditure and tax receipts impacted each other

positively. In this way, a tax increase(decrease) would cause government spending to increase(decrease). He proposed a cut in taxes as an effective remedy in narrowing down the budget deficit. This is on the grounds that a cut in taxes will prompt a cut in government expenditure.

Buchanan and Wagner (1977) concluded that government expenditure and tax impacted each other negatively. This suggested that reduced revenues would lead to increased government expenditure. They argued that citizens experienced fiscal illusion. Consequently, reduced taxes would trigger the society to assume that government's expenses on services have reduced and hence they will demand more. The reduced tax and increased government expenditure would cause a budget shortfall. They recommended cut in outlay and revenue expansion as a solution to the fiscal shortfall.

2.2.3.2 Spend and tax hypothesis

It opines that adjustments in public expenditure influences taxes. That is, governments determine the level of spending first then adjust taxes to match it. This hypothesis is in line with Peacock and Wiseman (1979) argument that public spending is equivalent to the amount of tax that the taxpayers are willing to pay during normal times. This meant that the tolerable tax burden on the taxpayers was not too high.

Barro (1979), had sentiments based on this hypothesis. In light of the Ricardian equivalence theory, he questioned the existence of fiscal illusion within the public. He argued that government debt is a postponement or a reschedule of the tax burden to a nation's citizens. This is because the foundations of the Ricardian equivalence hypothesis affirm that; due to the government's budget constraint, its spending must

be equivalent to revenue collected implying that deficits do not persist in the long run. The general public too was regarded to be rational with the ability to expect future tax levels to be high. Therefore, the general public takes advantage of this by decreasing its demand for government services.

This hypothesis recommends a cut in public spending as a feasible approach in narrowing the budget deficit.

2.2.3.3 Fiscal synchronization hypothesis

It was introduced by Musgrave (1966), and Meltzer and Richard (1981). They argued that public expenditure and tax policies are conducted in tandem. This implies that a two-way causal connection exists between public spending and tax. This signifies that the government evaluates the feasibility of public projects based on a cost-benefit analysis, hence, it compares the marginal benefits against the marginal cost of its activities before it undertakes one.

This hypothesis suggests working on both the level of public spending and tax in solving the budget shortfall problem.

2.2.3.4 Institutional separation hypothesis

It was initiated by Baghestani and McNown (1994). They argued that tax and public spending are neutral to each other hence, there was no causal link between them. The argument was founded on the basis that government institutions that decided on taxes and government expenditure were different and independent. Changes in tax revenue and government expenditure are thus accounted for by economic growth. This scenario implies that if government expenditure is not monitored then budget deficits are prone to be large.

This hypothesis recommends the harmonization of the independent institutions as a solution to the budget deficit problem.

2.3 Empirical literature

Dizaji (2014), studied the effect of oil disturbances on public spending and revenue nexus in Iran. The study sought to determine the connection between government outlays and revenue, as well as how oil shocks affected this linkage. The variables were; oil prices, oil revenue, total government expenditure, capital expenditure, recurrent expenditure, total government revenue, money supply, Consumer Price Index (CPI) and war. To accomplish the intended purpose, the study utilized the unrestricted Vector Autoregression (VAR), structural VAR (SVAR), Vector Error Correction (VECM), impulse response functions and variance decomposition analysis. The findings indicated that revenue caused spending even when the different components of government expenditure were considered. Furthermore, total revenues and current spending were found to be susceptible to oil revenue in the short run. The study concluded that shocks in oil revenue had a great impact on Iran's economy. The current study greatly borrows a leaf from Dizaji (2014) by studying Kenya's case. It, however, further utilizes the Toda-Yamamoto causality test to explain the causal association.

Narayan and Narayan (2006) utilized the Toda-Yamamoto technique to determine the causal link between public expenditure and taxes for 12 low-income nations. The variables were public spending, tax revenue, and GDP. They found out that in Haiti, government spending caused taxes. The taxes cause spending approach was supported by Mauritius, El Salvador, Chile, and Venezuela, while fiscal separation

was experienced in Peru, Guatemala, South Africa, Uruguay, Ecuador. The study concluded that countries that experienced the spend-tax hypothesis were prone to reduce private sector growth.

Mehrara, Pahlavani, & Elyasi, (2011), explored the connection between public spending and tax for 40 Asian countries over the period 1995-2008. The study employed the Kao panel cointegration test, stationarity test, and causality test. The variables were revenue, public expenditure and GDP. The findings indicated that fiscal synchronization existed within the 40 nations.

Owoye and Onafowora (2010), used the ARDL bounds test and Toda-Yamamoto procedures to find out the government spending and taxes connection within the Organization for Economic Co-operation and Development (OECD) for European as well as Non-European countries. Results indicated that the tax-spend hypothesis was present in 8 out of 22 countries, fiscal synchronization in 5 out of 22 countries with institutional separation existing in 12 countries in the long run. Fiscal synchronization was evident in 5 out of the 22 countries within the short run. The causal findings differed within the study with respect to the period.

Based on quarterly time series data, Luković & Grbić (2014), assessed the connection between government spending and tax in Serbia. The variables were public spending, tax revenue, and GDP. They applied the Toda-Yamamoto (1995) causality test. The results indicated that government spending caused taxes. The study recommended reduced public spending as a solution to the budget deficit.

Ghartey (2010), investigated the connection between public outlay and taxes for three sub-Saharan nations; Kenya, Nigeria and South Africa over the periods 1970-2006, 1965-2006 and 1960-2007 respectively. The variables used were public expenditure, tax revenue, and GDP. The methods applied were Auto Regressive Distributed Lag (ARDL) error correction model and the Granger causality test. In nominal terms, it was discovered that fiscal synchronization existed within the three countries in the long term while fiscal independence existed in the short term. In real terms, he concluded that taxes caused spending for Kenya while fiscal synchronization existed in Nigeria and South Africa in the long run. For the three nations, taxes caused spending in the short run.

Obeng (2015) explored tax and government expenditure nexus in Ghana between 1980-2013. The variables used were taxes and spending. The study applied the Johansen cointegration test, Ordinary Least Squares (OLS), VAR model and Granger causality. The study concluded that there was a link between spending and taxes in the long and short runs. The causality test indicated that taxes caused spending in Ghana. The study indicated that "starving the beast" policies were inefficient since fiscal illusion was missing in Ghana.

Adedokun (2018), examined the effect of oil disturbances on public expenditure and tax revenue link in Nigeria. This was for the period 1981 to 2014. The variables used were; oil revenue, money supply, public spending, and total revenue. The study employed the SVAR, VAR, VECM, impulse response, and variance decomposition analysis to achieve intended objectives. The findings indicated that

spending caused taxes. Further, oil shocks had an immense impact on public spending that was transmitted to other variables in the long term. The study concluded that Nigeria's dependence on oil revenue posed risks on its sustainability to shocks. It, therefore, recommended for a mixed economy.

Olalekan and Adedokun (2017) used the Johansen cointegration test, VECM, Granger causality test and block endogeneity to explore the taxes and outlays linkage in Nigeria over the period 1980-2014. They found out that spending and taxes had a long run connection. They concluded that tax caused spending in the study period. This study indicated the Nigerian government was in the right through its policies geared at increasing taxes and preventing fiscal leakages.

Aregbeyen et al. (2013), employed the Dynamic Ordinary Least Squares (DOLS) method and the Engle-Granger two-step method for error correction to explore the tax and government spending linkage in both Ghana and Nigeria within the duration, 1980-2010. The results indicated the presence of fiscal synchronization in both countries. Moreover, expenditure had an adverse effect on revenue for Nigeria while a positive effect was reported in the case of Ghana.

Maranga (2013) studied the government expenditure-tax revenue causal linkage in Kenya. Nominal monthly data covering the duration of June 1999 to September 2013 were analyzed. The variables utilized were public spending and tax revenue. The methods were bounds approach tests to cointegration, ARDL error correction model and Granger causality test. The results showed a long run connection between spending and taxes with public spending and taxes causing each other.

However, it failed to account for changes in prices, since it relied on the nominal monthly time series. A weakness this study aims to address.

Kiminyei (2014) used real annual data to explore the nexus between taxes, public spending as well as public debt within Kenya over the period 1960-2012. The methods were the VECM model, Johansen Cointegration test and Granger causality test. The results supported the presence of a long term connection between State spending and taxes and the existence of spend revenue hypothesis. However, this study did not disaggregate government expenditure as well as incorporate GDP.

Gorod (2013) investigated the public expenditure and tax nexus in Kenya. The period of the study was 1980-2012. The variables used were total public spending and tax. The study utilized the Granger causality analysis via the VECM approach. The study found out that the spend and tax hypothesis existed in Kenya. However, the study did not disaggregate government expenditure as well as factor in other variables that influence tax revenue and level of public spending. An enhancement this research made.

2.4 Overview of literature review

The existing schools of thoughts have elaborated conflicting arguments by the various scholars who aired their sentiments on the government expenditure-tax revenue linkage. For instance, under the tax and spend hypothesis, Friedman (1978) argued that tax and public spending had a positive influence on each other while Buchanan viewed a negative relationship. Elsewhere, while advocating for the spending causes taxes hypothesis, Barro rejected Buchanan's view that the public suffered from fiscal illusion.

Majority of the empirical studies reviewed pose mixed results even regarding the same country on the government expenditure and tax revenue association. This could be attributed to different sample periods, economic model and techniques, and frequency of observations. This study did not aim to conclusively solve the debate around the government outlays and tax revenue linkage in Kenya. It, however, incorporated other variables that affect both public expenditure and tax in order to advance the debate. The present study, therefore, disaggregated government expenditure into capital and recurrent as well as employed a multivariate model that included GDP, oil prices and political (governance) regimes. This is unlike past studies that relied only on total government expenditure. Further, this paper explores the effect of oil prices on public expenditure and tax revenue association in a non-oil dependent nation. Majority of the research have been carried out in oil-dependent countries.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This segment explains the approach utilized in analyzing Kenya's government expenditure and tax revenue. It entails theoretical and empirical approaches.

3.1 Theoretical framework

This paper embraced and relied on the Keynesian model of total demand in the product's market borrowed from Onwioduokit and Bassey (2013). This is specified as:

$$Y = C + I + G + X - M \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. (1)$$

Which is accompanied by behavioral conditions expressed as:

$$C = a + bY^d \qquad \text{where } b > 0: \text{Consumption function.}$$

$$Y^d = Y - T$$

$$I = \delta + \gamma i \quad \text{where } \gamma > 0$$

$$G = \bar{G}$$

$$X = s + \sigma e \quad \text{where } \sigma > 0$$

$$M = m + \theta Y^d \ , \theta > 0$$

Where, C =consumption, Y^d=disposable income, T =taxes, I =Investment, $G =$ exogenous government expenditure, X =Exports, M =imports, e=exchange rate, i=intrest rates.

Substitute the behavioral functions into equation 1 yields the equilibrium output (Y^*) specified as;

$$Y^* = \frac{A}{\lambda} + \frac{1}{\lambda}(\gamma i + \sigma e + G - (b - \theta)T) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . (2)$$

Where;

$$\lambda = 1 - b + \theta \qquad \text{while } A = a + \delta + s - m$$

Equation (2) implies that there exists a negative connection between taxes and output and a positive connection between government expenditure and output.

Since fiscal deficit is defined as government spending exceeding tax revenue, it is expressed as:

$$FD = G - T$$

Similarly, this can be expressed as;

$$F = G - (b - \theta)T \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . (3)$$

Where, $(b - \theta) = \beta$

Therefore, the fiscal deficit can be further illustrated as:

$$FD = G - \beta T \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . (4)$$

3.2 Model specification

The theoretical and empirical literature reviewed indicated that taxation and government spending are linked by two empirical models which have both variables acting as the dependent and independent factors. According to Aryegeben et al. (2013), they can be expressed as:

$$RTAX_t = f(\text{RGSP}_t) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots (5)$$

$$\text{RGSP}_t = f(\text{RTAX}_t) \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . (6)$$

whereby t signifies the period, RTAX is real taxation, and RGSP is real government spending.

This study adopted a multivariate VAR framework in analyzing Kenya's government expenditure and tax revenue. This is because VAR model is theory free and can capture links between multiple time series since it expresses a dependent factor as a function of its past values, plus current and past values of the remaining factors in a model in turns (Stock and Watson, 2001; Sims, 1980). All variables, therefore, were treated as dependent variables in this study. The reduced form VAR framework was employed. It utilized the Toda-Yamamoto causality test to test the causal link as well as the impulse response functions and variance decomposition methods to assess the effect of oil price shocks.

VAR model was expressed as;

$$Y_t = c + \sum_{k=1}^{p} \Pi_k Y_{t-k} + \epsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (8)$$

where c is n x 1 vector of constants, Π is n x n matrices of constants, Y_t is n x 1 vector of the dependent factors, p is the lag order and ϵ is a vector unrelated disturbance terms that have no mean and constant variance.

The reduced form of the VAR model estimated in this paper was specified in functional form as;

$$TR = f(RC, DE, GDP, OP, G) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (9)$$

Where; TR is tax revenue, RC is recurrent expenditure, DE is development expenditure, GDP is Gross Domestic Product, OP is the world oil prices, and G is a dummy variable to represent major reforms in government structure/political systems.

3.3 Data source

This paper utilized yearly time series secondary data; 1980-2018. This was extracted from economic surveys and statistical abstracts of various years, the International Monetary Fund (IMF), the World Bank and Statista database. The variables were; recurrent expenditure, capital expenditure, tax revenue, GDP, oil prices and governance. Government outlays and tax revenue were transformed into their real terms by dividing them by the CPI. This was meant to eliminate the effects of inflation. The variables were transformed into their natural logs in order to eliminate heteroscedasticity as well as reduce their scale.

3.4 Definition and measurement of variables

Variable	Description	Expected sign and literature source
Recurrent spending	Amount spent in running day to day government operations that is inclusive of debt service payments. It was expressed in Kenya shillings.	+ve (Peacock and Wiseman ,1979)
Development/Capital expenditure	Amount expended on assets that provide long term public goods such as roads, railways and hospitals. It was expressed in Kenya shillings.	+ve (Peacock and Wiseman ,1979)

Tax revenue	Government income acquired through taxation. It was expressed in Kenya Shillings.	+ve (Aryegeben et al. ,2013; Friedman, 1978)
Gross domestic product	Total output produced within the borders of a nation at a specific time. It represented economic growth. It was expressed in Kenya shillings.	+ve (Narayan and Narayan ,2006)
Oil prices	This the annual average world oil price per barrel expressed in Kenya shillings. It was divided by CPI so as to obtain real prices.	+ve (Berument, Ceylan, and Dogan 2016).
Governance	This is the change in government structure and electoral process. It was represented by a dummy variable that captured 1 in 1992, 2 in 2002, 3 in 2008, 4 in 2013 and 0 elsewhere.	+ve (Kosimbei,2009).

3.5 Pre-estimation tests
3.5.1 Unit root test

Stationarity tests were undertaken to find out if the series were stationary or not. It was meant to ascertain that the series were stationary, that is their mean and variance were time invariant. Failure to do this would result in spurious results which would have affected the inference. Both Augmented Dickey-Fuller (ADF) and Phillip Peron (PP) tests were utilized. Despite the ADF being the most common test, it suffers from autocorrelation and heteroscedasticity of the error terms. The Philip Peron test was considered because it is robust to heteroscedasticity in the error terms as well as it is unnecessary to define the lag length.

3.5.2 Toda and Yamamoto causality test

Toda and Yamamoto (1995), long run causality test was utilized to analyze the bearing of causal association between tax revenue and government outlay. The test was preferred since it guarantees an asymptotic distribution of the Wald statistic, paying little attention to the occasions the series were differenced to become stationary, or whether they are linked or not. This was done through the estimation of an augmented VAR model in levels. Cointegration test was therefore not necessary prior to the test. The null hypothesis was causal relationship does not exist against the alternative hypothesis of causal connection.

3.6 Estimation methods
3.6.1 Vector Autoregressive analysis

This study estimated the VAR model to achieve its objectives. The VAR model was best suited since it is theory-free (Sims,1980). The reduced form VAR model expressed in equation 9 was used. The variables included in the model were; recurrent spending, development spending, tax collections, GDP, oil prices and governance.

To effectively achieve the desired objectives, it was essential to find out the ideal number of previous values to be incorporated in the VAR model. Although long lag lengths are useful in capturing a lot of information, they tend to minimize the number of degrees of freedom. Therefore, it was essential to obtain the ideal lag length. The decision on the ideal quantity of previous values to be incorporated in the system was guided by various information criteria. The information criteria with the minimum (least) value were adopted.

3.6.2 Impulse response functions

Impulse response functions analyze the impact of an exogenous shock or innovation in a variable to one or more variables in a system as well as the period required for the impact to subside (L¨utkepohl, 2005). The use of the impulse response function is necessitated by the fact that the coefficients of the VAR model lack a meaningful interpretation (Njuru et al. 2013; Adedokun, 2018). The impulse response functions were thus conducted from the coefficients of the estimated VAR model in differences (stationary). This study embraced the generalized impulse response models propounded by Pesaran and Shin (1999). This approach is preferred over the standard impulse functions since its results do not rely on how the variables are ordered.

3.6.3 Diagnostic tests

A variety of tests were carried out on the VAR model to ascertain its reliability in making an inference. Jarque-Bera test was employed to check if the residuals were normally distributed, the LM test was employed to check if the residuals were autocorrelated, while the Eigenvalue stability test was utilized to verify if the model was well specified and appropriate.

CHAPTER FOUR

EMPIRICAL RESULTS

4.1 Introduction

This section provides the empirical results of this research. It particularly presents the summary statistics, stationarity test findings, Toda-Yamamoto causality test findings, impulse response functions, and the analysis of variance decomposition.

4.2 Descriptive statistics

Table 4.1 displays descriptive figures of the variables used in the analysis. The sample (1980-2018) captured 39 observations. GDP recorded the highest maximum value for an observation while oil prices had the least maximum value among the variables. Similarly, GDP had the largest minimum value for an observation while oil prices had the least minimum value for an observation.

GDP had the highest mean value of 14.574 while oil prices had the least average value of 8.382. The standard deviation indicated how the individual observations varied from their respective mean values. Development expenditure recorded the highest standard deviation while recurrent expenditure had the least.

Table 4. 1: Descriptive statistics

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
Oil prices	39	8.382	.420	7.480	9.130
Recurrent expenditure	39	13.181	.273	12.798	13.970
Development expenditure	39	11.696	.599	10.690	12.991
Tax revenue	39	12.892	.298	12.561	13.557
GDP	39	14.574	.410	13.941	15.383

4.3 Reporting the Empirical results

4.3.1 Unit root tests

      Time series data, first, requires ascertaining the stationarity of the variables. This study used the ADF and PP tests, to check on the stationarity status of the series. The null hypothesis indicated the presence of a unit root while the alternative hypothesis indicated its absence. The study found out that the series were non-stationary at levels. Hence, they were differenced to make them stationary. This indicates that the series were integrated of order 1 at the five percent significance level. The results for stationarity tests at levels and differences are displayed in tables 4.2 and 4.3 respectively.

Table 4. 2 : Unit root tests at levels

Variables	Test at levels	Unit root test				Comment
		ADF test		PP test		
		T statistic	Critical value (5%)	T statistic	Critical value (5%)	
Development expenditure	Intercept	-0.876	-2.943	-0.652	-2.941	Non-stationary
	Intercept & trend	-1.790	-3.537	-1.454	-3.533	Non-stationary
Recurrent expenditure	Intercept	1.870	-2.946	1.481	-2.941	Non-stationary
	Intercept & trend	0.350	-3.540	-1.070	-3.533	Non-stationary
Tax revenue	Intercept	0.969	-2.943	0.494	-2.941	Non-stationary
	Intercept & trend	-1.838	-3.535	-1.635	-3.533	Non-stationary
GDP	Intercept	1.421	-2.943	1.853	-2.941	Non-stationary
	Intercept & trend	-0.888	-3.537	-0.374	-3.533	Non-stationary
Oil prices	Intercept	-2.570	-2.941	-2.525	-2.941	Non-stationary
	Intercept & trend	2.498	-3.533	-2.448	-3.533	Non-stationary

Table 4. 3: Unit root tests at first differences

Variables	Test at differences	Unit root test				Comment
		ADF test		PP test		
		T statistic	Critical value (5%)	T statistic	Critical value (5%)	
Development expenditure	Intercept	-4.475	2.943	-4.491	-2.943	Stationary
	Intercept & trend	-4.728	-3.537	-4.672	-3.537	Stationary
Recurrent expenditure	Intercept	-5.622	2.946	-5.766	-2.943	Stationary
	Intercept & trend	6.131	3.540	-6.081	3.537	Stationary
Tax revenue	Intercept	-7.194	2.943	-7.210	-2.943	Stationary
	Intercept & trend	7.847	3.537	- 7.978	3.537	Stationary
GDP	Intercept	-3.320	-2.943	-3.320	-2.943	Stationary
	Intercept & trend	-3.735	-3.537	3.735	-3.537	Stationary
Oil prices	Intercept	-7.070	-2.943	-7.182	-2.943	Stationary
	Intercept & trend	-7.029	-3.537	-7.143	-3.537	Stationary

4.3.2 Optimal lag length

This was guided by various information criterions. The criteria with the most minimum value was adopted. The AIC information criteria was thus adopted. It indicated four lags as the ideal lag length. The VAR model was then subjected to various tests to ascertain it was well specified.

4.3.3 VAR specification and Diagnostics

It was essential to ensure that the VAR model to be estimated was well specified. This was prior to the use of the Toda-Yamamoto causality test, the impulse responses and variance decomposition. The VAR model was therefore subjected to; a check for residuals normality using the Jarque-Bera test, autocorrelation test using the LM test, and stability test based on the Eigen values. These were meant to ensure that the results were meaningful. The series included in the VAR model were stationary. The nonstationary series were differenced to achieve this.

The LM test was used to check if serial correlation existed. The null hypothesis was; absence of residual serial correlation. Since the autocorrelation test failed at four lags, it was important to adjust the lag length either through an increase or decrease of the lag length. This study, therefore, adopted three lags as the desired number of lags. This was further supported by the AIC criterion in the post estimation lag length selection test. The LM results accepted the null hypothesis at the 1 percent significance level at lag order 3. This implied the residuals were not autocorrelated.

The Jarque-Bera test was employed to examine if the residuals were normally distributed. The null hypothesis was the residuals were normally distributed, while the alternative hypothesis indicated that the residuals were not normally distributed. The

joint results rejected the null hypothesis at the 5 percent significance level. The rest of the variables excluding the log of tax revenue, individually, had a normal distribution. However, results for the Jarque-Bera were not reported.

The stability test indicated that the VAR model was stable at lag order 3 since all the eigenvalues were within the unit circle. This was further supported by the lag exclusion test that indicated that lag 3 was important at the 1 percent significance level. VAR model of order three was accepted to be well specified and therefore suitable to guarantee significant results.

4.3.4 Toda and Yamamoto causality test

This test was used to establish the causal link between spending components and tax revenue. It was preferred over the normal granger causality test because it guarantees an asymptotic distribution of the Wald statistic, paying little attention to the occasions the series were differenced to become stationary, or whether they are linked or not. Therefore, cointegration test was not mandatory.

The causality test was based on the augmented VAR model in levels. It required that the highest order of integration of the variables in the model be determined. This was found to be one, based on the stationarity tests conducted earlier. The additional lag on the VAR model was therefore, one. However, the modified Wald test was restricted only on the well specified VAR model of order 3. The null hypothesis was absence of causality against the alternative which was presence of causality. The modified Wald findings are displayed in Table 4.4.

The findings indicated the absence of causality between tax collections and the components of public expenditure (development and recurrent outlays). This validated the presence of the fiscal neutrality/institutional separation hypothesis within the sample period.

Unidirectional causality was reported to run from; recurrent expenditure to development expenditure, governance to development expenditure, tax revenue to governance, oil prices to governance, and tax revenue to oil prices.

Bidirectional causality was reported to exist between GDP and all the other variables, oil prices, and development expenditure, as well as oil prices and recurrent expenditure.

Table 4. 4: Modified Wald results

Equation	Excluded	Chi-square	Degrees of freedom	Probability>chi-square
Tax revenue	Recurrent	4.13	3	0.248
Tax revenue	Development	4.76	3	0.190
Tax revenue	GDP	14.14	3	0.003
Tax revenue	Oil prices	7.55	3	0.056
Tax revenue	Governance	3.16	3	0.368
Recurrent	Tax revenue	1.81	3	0.618
Recurrent	Development	6.41	3	0.093
Recurrent	GDP	13.01	3	0.005
Recurrent	Oil prices	15.01	3	0.002
Recurrent	Governance	14.17	3	0.003
Development	Tax revenue	4.71	3	0.194
Development	Recurrent	22.86	3	0.000
Development	GDP	25.03	3	0.000
Development	Oil prices	20.52	3	0.001
Development	Governance	17.28	3	0.001
GDP	Tax revenue	24.91	3	0.000
GDP	Recurrent	20.27	3	0.000
GDP	Development	36.18	3	0.000
GDP	Oil prices	9.72	3	0.027
GDP	Governance	12.08	3	0.007
Oil prices	Tax revenue	8.42	3	0.038
Oil prices	Recurrent	30.87	3	0.000
Oil prices	Development	16.98	3	0.000
Oil prices	Governance	5.77	3	12.340
Oil prices	GDP	16.98	3	0.001
Governance	Tax revenue	61.52	3	0.000
Governance	Development	1.16	3	0.762
Governance	Recurrent	8.95	3	0.030
Governance	GDP	35.32	3	0.000
Governance	Oil prices	29.65	3	0.000

4.3.5 Effect of oil price shocks on tax revenue

Oil price shocks have nonsignificant effects on tax revenue in all the periods. This is in line with the findings of Dizaji (2014) in Iran. World oil prices are exogenously determined. Oil prices, therefore, have minimal impact on non-oil dependent economies. Kenya hugely relies on tax revenue to finance its budget. The National Assembly approves the finance bill presented by the National Treasury so as to enhance tax revenue targets. This as well depends on the efficacy of KRA.

Response of tax revenue to oil prices
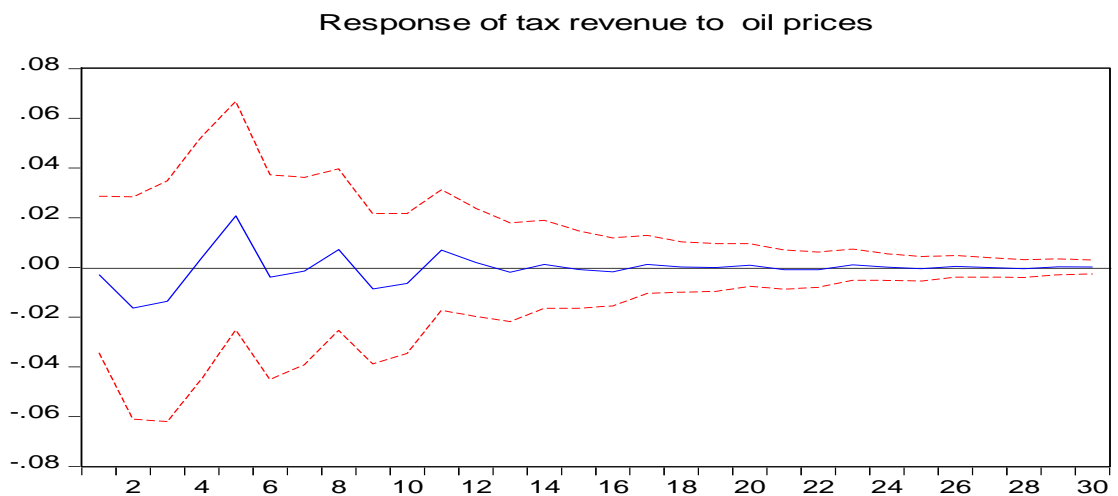
Source: Author (2019)

4.3.6 Effect of oil price shocks on recurrent expenditure

Response of recurrent expenditure to oil prices

Source: Author (2019)

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Oil price disturbances have nonsignificant effects on recurrent spending in all the periods. This is in line with the findings of Dizaji (2014). In Kenya, the National Assembly highly influences how funds are to be allocated for government expenditure. This is through the appropriations bill.

4.3.7 Effect of oil price shocks on development expenditure

Response of development expenditure to oil prices
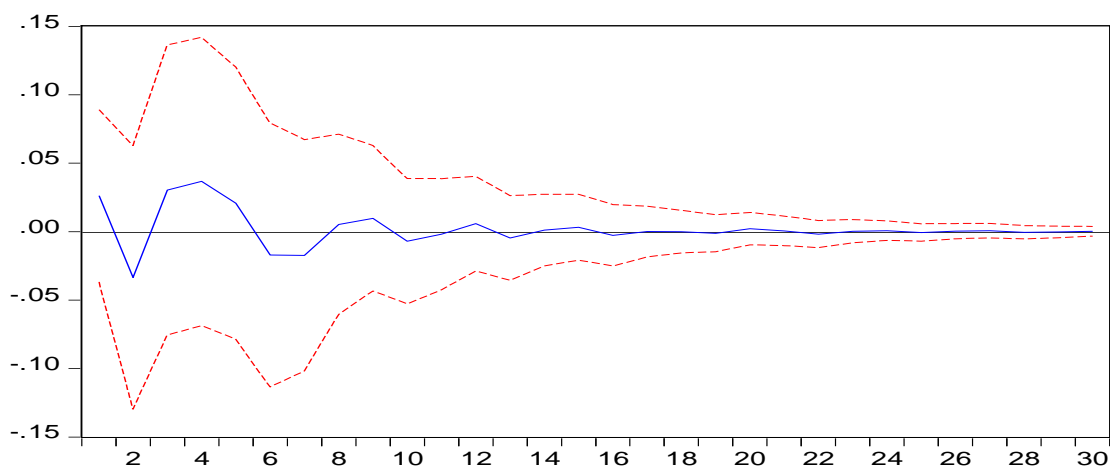
Source: Author (2019)

Oil price shocks have nonsignificant effects on recurrent spending in all the periods. This is in line with the findings of Dizaji (2014). In Kenya, the National Assembly highly influences how funds are to be allocated for government expenditure.

4.3.8 Variance decomposition analysis

The variance decomposition analysis was utilized to find out the share of variation in a variable as a result of its own disturbance as well as disturbances to other factors within the system. For all the variables, most of the variations within the first year are largely due to the variables' own trend.

For tax revenue, a large percentage of the variation in tax revenue is elucidated by itself in all the periods. GDP shocks have the highest explanatory power on tax revenue in the short term. However, this decreases gradually in the long run. Development expenditure shocks explain 17 percent of the variations in tax revenue in the long run. Implying that economic growth highly influences tax revenue in Kenya. Table 4.5 provides the variance decomposition findings for tax revenue.

Table 4.5: Variance decomposition of tax revenue

Period	S.E.	Oil	GDP	Governance	Development	Recurrent	Tax
1	0.093	0.094	23.130	4.737	7.949	4.585	59.504
2	0.104	2.541	18.871	4.343	7.199	3.885	63.161
4	0.116	3.516	18.247	5.310	17.233	4.286	51.408
6	0.120	6.409	17.333	5.147	17.431	4.803	48.877
8	0.127	6.022	15.705	4.698	17.753	7.198	48.624
10	0.129	6.516	15.520	5.048	17.841	7.994	47.081

For recurrent expenditure, most of the variations are explained by itself in all periods. Development expenditure shocks constitute 11 percent of the variations in the first period, posing the highest value in comparison to the remaining three variables within this period. However, in the long run GDP has the highest explanatory power at 19 percent. Implying that GDP greatly influences recurrent expenditure in Kenya. Table 4.6 provides the variance decomposition results for recurrent expenditure.

Table 4. 6: Variance decomposition of recurrent expenditure

Period	S.E.	Oil	GDP	Governance	Development	Recurrent	Tax
1	0.077	1.700	0.061	0.060	11.005	87.173	0.000
2	0.081	6.727	0.055	0.345	10.705	81.941	0.227
4	0.121	13.025	16.010	5.248	10.886	49.853	4.979
6	0.128	13.113	17.380	5.766	10.031	48.920	4.791
8	0.137	13.521	19.111	5.206	8.960	44.643	8.560
10	0.140	13.126	19.596	5.037	8.812	42.930	10.500

For development expenditure, largest share of variations was from GDP shocks at 25 percent in the opening period and 28 percent at the tenth period. Next was governance with 11.7 percent followed closely with recurrent expenditure at 10.5 percent. This implies that economic growth has a high influence on development expenditure. Table 4.7 provides the variance decomposition findings for development outlay.

Table 4. 7: Variance decomposition of development expenditure

Period	S.E.	Oil	GDP	Governance	Development	Recurrent	Tax
1	0.187	1.964	25.362	6.201	66.473	0.000	0.000
2	0.233	3.323	36.421	13.592	44.720	1.398	0.547
4	0.257	6.169	30.077	12.326	37.372	9.399	4.657
6	0.265	6.823	28.602	12.105	37.681	10.006	4.787
8	0.269	7.091	28.322	11.827	37.615	10.236	4.907
10	0.270	7.213	28.136	11.745	37.484	10.155	5.267

For GDP, apart from its variations being due its own shocks, huge portion of the other variations can be accounted for by shocks in oil prices at 18.05%, followed

by shocks in tax revenues at 14.7%, development expenditure at 13.9% then lastly governance at 10.4%. Table 4.8 presents the variance decomposition results for GDP.

Table 4. 8: Variance decomposition of GDP

Period	S.E.	Oil	GDP	Governance	Development	Recurrent	Tax
1	0.017	4.911	95.089	0.000	0.000	0.000	0.000
2	0.023	13.852	63.166	5.290	13.907	3.650	0.136
4	0.029	19.630	41.223	12.010	12.923	2.934	11.280
6	0.031	18.173	37.813	11.131	14.028	4.813	14.042
8	0.032	18.098	37.977	10.535	14.094	5.407	13.895
10	0.032	18.060	37.083	10.414	13.904	5.821	14.718

For oil prices, apart from huge variations being due to its own shocks, a large portion of the other variations can be explained by recurrent expenditure at 19.6 percent followed by GDP at 14.5%. Implying that recurrent expenditure has a huge influence on oil prices in Kenya. Table 4.9 presents the variance decomposition results for oil.

Table 4. 9: Variance decomposition of oil

Period	S.E.	Oil	GDP	Governance	Development	Recurrent	Tax
1	0.289	100.000	0.000	0.000	0.000	0.000	0.000
2	0.341	74.612	14.441	0.353	0.912	5.134	4.548
4	0.409	56.101	14.903	2.499	1.577	20.494	4.427
6	0.442	49.783	14.457	3.193	1.423	20.257	10.887
8	0.447	48.979	14.562	3.231	2.308	19.830	11.090
10	0.451	48.719	14.512	3.236	2.767	19.594	11.171

For governance, apart from its own shocks, most variations are explained by tax revenue shocks at 22 percent followed by oil price shocks at 16 per cent.

Development expenditure shocks has the least explanation on the variations in governance. This implies that tax revenue contributes highly on the governance or political administration changes in Kenya. Table 4.10 presents the variance decomposition results for governance.

Table 4. 10: Variance decomposition of Governance

Period	S.E.	Oil	GDP	Governance	Development	Recurrent	Tax
1	0.687	6.337	3.975	89.688	0.000	0.000	0.000
2	0.795	4.918	4.960	74.670	0.038	11.226	4.158
4	0.939	16.763	9.041	54.626	0.253	8.853	10.463
6	1.186	14.529	8.943	34.640	6.204	12.942	22.742
8	1.245	16.280	8.992	32.849	6.754	14.281	20.844
10	1.267	16.756	8.768	31.800	6.621	14.056	22.001

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

This section summarizes this study and infers on the basis of results. It further recommends policies based on the findings. Future possible areas for more study are further outlined.

5.2 Overview

This paper sought to analyze Kenya's public spending and tax collections from 1980 to 2018. Its particular aims were to; explore the causal link between tax revenue and public spending; analyze the effects of oil price shocks on the public expenditure and tax revenue association as well as draw policy implications. This study is vital in that it provides policy recommendations necessary for fiscal sustainability in the wake of persistent budget deficits in Kenya.

Unlike past studies conducted in Kenya, this study disaggregated government spending into recurrent and development expenditure. This was guided by the fact that the two expenditure components are not in equal proportions and therefore provides a more specific approach to the revenue and spending association.

To accomplish the desired aims, this study employed the VAR model. It utilized secondary data from the World Bank, IMF and various economic surveys for the period 1980 to 2018. Data utilized were tax revenue, recurrent expenditure, development expenditure, GDP, and world oil prices. The variables were converted into their real values so as to capture the effect of inflation. A dummy variable to reflect reforms in political systems was included in the model.

The first objective was to determine the causal link between tax receipts and the public spending components. The study utilized the Toda-Yamamoto causality test that is based on an augmented VAR model in levels. From the findings; recurrent expenditure caused development expenditure. A bidirectional causality existed between GDP and all other variables. The discoveries further demonstrated that causality was absent between public spending components and tax collections. This confirmed the presence of fiscal neutrality hypothesis in Kenya. This suggests that tax revenue and government expenditure are determined separately so that growth in these fiscal components can be attributed to growth in the economy. This contradicts the discoveries of; Ghartey (2010) who found that taxes caused spending, Kiminyei (2014) and Gorod (2013) who found that expenditure caused taxes, and Maranga (2013) who found the existence of fiscal synchronization hypothesis in Kenya.

The second objective was to investigate the effects of oil price shocks on recurrent spending, development spending and tax revenue. This was achieved through the examination of the impulse response functions and variance decompositions. The findings indicated that oil-costs disturbances had both positive and adverse effects on spending and tax receipts. However, in all the variables oil price effects were nonsignificant in all periods. Dizaji (2014), found the effects of oil prices in Iran to be nonsignificant in the long run in Iran while in Nigeria, Adedokun (2018) found that the oil price effects were significant.

5.3 Conclusion

Based on the findings, this study concludes that oil price shocks have nonsignificant effects on tax collections, recurrent expenditure and development

expenditure in Kenya. Furthermore, the results reveal that the fiscal neutrality hypothesis exists in Kenya. Implying that tax collections and government spending decisions are conducted separately. To minimize the budget deficits, it is desirable to harmonize the independent institutions tasked with revenue and spending decisions. The study also concludes that governance/political regimes highly influence the level of development spending.

5.4 Policy implications

This paper identifies various policy implications necessary for fiscal sustainability. It established the presence of fiscal neutrality hypothesis in Kenya. This indicates that worse budget deficits can be experienced if the rise in government expenditure is not matched with tax revenue. To minimize budget deficits, it is essential to harmonize institutions tasked with government spending and revenue decisions in the country- executive and legislature, as well as minimization of political interference in fiscal decisions.

Overtime, KRA has fallen short of the stipulated revenue targets. A realistic revenue target based on KRA's ability and capacity should be determined when making public spending decisions. The existence of causality running from governance/political to recurrent expenditure suggests politics/government regimes have great influence on the recurrent expenditure. This is usually associated with the increased wage bill in the country during different political regimes/systems. Parliament's decision-making has been faulted for being majorly influenced by the political inclinations of the majority of the members of parliament who have derailed the executive's fiscal plans by failing to pass crucial financial bills that do not favor

politicians (Kosimbei, 2009). Further, with the enactment of the 2010 constitution, the senate and National assembly have been embroiled in court battles on their supremacy and legislative powers.

Therefore, to reduce budget deficits, this study recommends harmonization of the various institutions tasked with expenditure and revenue decisions as well as minimal political interference in fiscal processes. It further advocates for a cut in recurrent expenditures as well as a review of the recommendations stipulated in the Controller of Budget and Auditor General reports. Forming part of the measures aimed at reducing the overall total expenditure. This is supported by causality running from recurrent expenditure to development expenditure. Despite development expenditure having a huge influence on economic growth, development projects decisions should be prioritized based on their overall net returns.

5.5 Further areas for research

This paper investigated the effect of an external shock (oil prices) on government expenditure and tax revenue nexus. Thus, it suggests further studies within this field to investigate the effect of internal shocks such as natural disasters and post-election violence on the government expenditure and revenue nexus.

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Diagnostic tests

Table A 1:VAR stability test
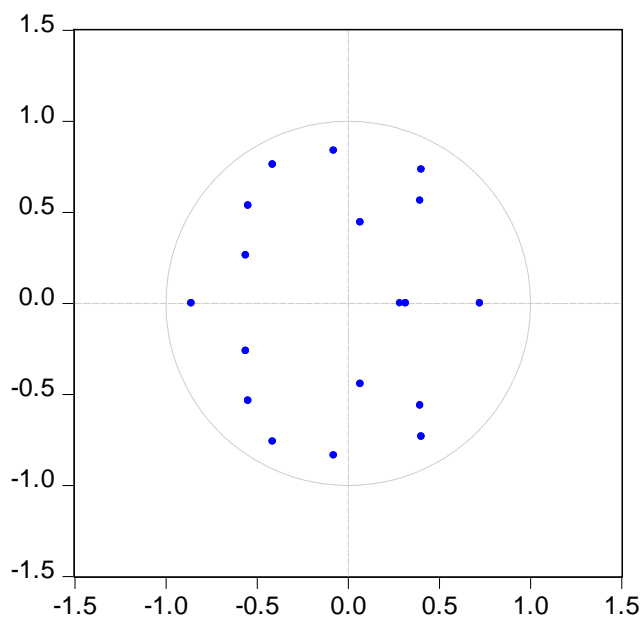
Inverse Roots of AR Characteristic Polynomial

Table A 2:Lag length selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	119.900	NA*	4.96e-11	-6.700	-6.431*	-6.608
1	149.721	47.363	7.39e-11	-6.337	-4.451	-5.694
2	182.597	40.610	1.10e-10	-6.153	-2.651	-4.959
3	230.461	42.234	1.02e-10	-6.851	-1.733	-5.105
4	308.708	41.424	4.15e-11*	-9.336*	-2.601	-7.039*

Table A 3:VAR residual serial correlation LM test

Null hypothesis: No serial correlation at lag

Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	23.954	36	0.938	0.533	(36, 24.7)	0.959
2	27.172	36	0.855	0.630	(36, 24.7)	0.899
3	28.709	36	0.801	0.680	(36, 24.7)	0.857

Table A 4: Lag exclusion test

	Tax revenue	Recurrent	Oil	GDP	Development	Governance	Joint
Lag 1	5.414	2.009	10.241	16.755	11.570	9.482	76.283
	[0.492]	[0.919]	[0.115]	[0.010]	[0.072]	[0.148]	[0.000]
Lag 2	5.110	19.673	6.749	5.983	5.635	9.683	64.775
	[0.530]	[0.003]	[0.345]	[0.425]	[0.465]	[0.139]	[0.002]
Lag 3	1.704	5.287	8.746	21.872	4.571	26.984	87.217
	[0.945]	[0.508]	[0.188]	[0.001]	[0.600]	[0.0001]	[0.0000]
Df	6	6	6	6	6	6	36

Probability values in brackets [ ]