NEXUS BETWEEN INFLATION AND ECONOMIC GROWTH IN KENYA

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A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF APPLIED ECONOMICS IN THE SCHOOL OF BUSINESS, ECONOMICS AND TOURISM IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF ECONOMICS (COOPERATION & HUMAN DEVELOPMENT) OF KENYATTA UNIVERSITY

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DECLARATION

This research project is my original work and has not been presented for an award of any degree in any University.

Signed: _____ **Date:** ____ 14.02.2025_____

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K101/CTY/PT/31585/2015

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

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DEDICATION

This research project is specially dedicated to family, friends and anyone who supported this course.

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Thanks, and honor to the All-Powerful God for His immense grace and fortitude in this journey. This research project has come this far because of His boundless grace. Without my supervisor, Dr. James Maingi, whose constant direction is crucial in this path, this work would not be feasible. I express my profound gratitude to him for his unwavering efforts in making this work a success, his patience and support is always applauded and remembered.

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ABBREVIATIONS AND ACRONYMS

AD : Aggregate Demand

ADF : Augmented Dickey Fuller

AEs : Advanced economies.

ARDL : Auto-regression Distribution Lag

CBK : Central Bank of Kenya

CPI : Consumer Price Index

EAC : East Africa Community

ECM : Error Correction Model

EMDEs: Emerging and developing economies

GDP : Gross Domestic Product

GOK : Government of Kenya

IMF : International Monetary Fund

LICs : Low-income countries

KNBS : Kenya National Bureau of Statistics

OLS : Ordinary Least Square

VECM : Vector Error Correction Model

VIF : Variance Inflation Factor

OPERATIONAL DEFINITION OF TERMS

Core inflation- a measure of inflation that does not take into account energy and food prices.

Economic growth- A rise in the value of the country's output. It is expressed as a yearly GDP percentage.

Food inflation- The continuous increase in prices of food items.

Headline inflation- Is an economy's overall rate of inflation. It is determined by taking into account food and energy prices.

Inflation- A steady rise in the average level of prices. The rise is expressed as a percentage per year.

Investment- The sum of changes in inventories, acquisitions, and net fixed capital formation less the value of valuables disposed of. It is stated as a GDP percentage.

Non-food inflation- The general rise in prices of commodities other than food.

Savings- It is calculated by deducting final consumption costs from gross disposable income and then adjusting for pension savings. It is stated as a proportion of GDP.

ABSTRACT

The objective of Kenya's Vision 2030 is to attain and maintain an annual average economic growth rate of 10%. A steady and predictable macroeconomic climate is necessary for growth, investment, and development. The main categories of commodities and services that drive inflation in Kenya include food and non-food products. A deeper understanding of the intricate link between inflation and economic growth in Kenya is necessary to determine the appropriate economic policies that both preserve stable prices for goods and services and foster sustainable economic growth and development. The major goal of the study was to ascertain the connection between inflation and GDP growth in Kenya by establishing the relationship between the category of inflation that is unrelated to food and examining the impact of food inflation on economic growth. The study is premised on the Cobb-Douglas production function and the Solow growth model. Non-experimental research methodology together with time series data from the Kenya National Bureau of Statistics, Central Bank of Kenya, World Bank and other international organizations' databases covering the years 1980–2023 were used in the study. Before analysis, the variables were subjected to various diagnostic tests, such as residual testing, co-integration, correlation analysis, and stationarity tests. The study revealed that neither non-food inflation nor economic growth granger-causes each other whereas food inflation has a significant negative effect on economic growth. The study recommends that the government of Kenya through monetary policy authority should enact policies that are anti-inflationary by holding money circulating in the economy to check on inflation that sustains favorable economic growth in the country. Further, the government should also enact fiscal policies that control excessive taxation to avoid increase in the costs of food items which affects the levels of consumption, savings and investment necessary for economic growth.

CHAPTER ONE

BACKGROUND

1.1. Introduction

Kenya's Vision 2030 seeks to create a prosperous and competitive nation with a good quality of life for all Kenyans. The fundamental goal of the blueprint is to make Kenya a middle-income industrializing nation that accords all its citizens a high standard of living by the year 2030. Achieving and sustaining an average yearly economic growth rate of 10% is one of Kenya Vision 2030's primary goals (Republic of Kenya, 2007). This economic transformation initiative requires a strong foundation of important macroeconomic policies that promote an atmosphere favorable for growth, investment, and development necessary to achieve this level of sustained growth. The building of investor confidence, which in turn stimulates both domestic and foreign investments and ultimately leads to the creation of jobs, the reduction of poverty, and general economic growth, depends on a stable and predictable macroeconomic environment. To maintain macroeconomic stability, one must manage levels of debt, provide a stable currency, limit inflation, and promote prudent monetary and fiscal policies (IMF report, 2021). All these factors work together to create a stable economic environment that supports long-term investment and planning by both individuals and enterprises. High and fluctuating costs of necessities is a threat to the economy because they weaken the value of savings, discourage lending, diminish the real incomes of those on fixed incomes, and lower the currency's total buying power (Khan and Hanif, 2020).

Inflation, according to Arnold (2003), is the continued general increase in the costs of goods and services within an economy. Food and non-food products are the main categories of commodities and services that drive this persistent increase in Kenya. Several literatures have highlighted

negative consequences that arise from excessive inflation, which vary based on the social, economic and demographic characteristics of a given country. The adverse impacts of Excessive inflation on output have been connected to relative price distortion, which impedes productivity growth and the effective use of resources (Woodford 2003; Fischer 1993). Uncontrolled inflation deters investment, which is a key driver of productivity growth, by making households and businesses unpredictable about future asset values and absolute price fluctuations (Greenwood *et al.*,., 1997). When growing nominal incomes are compared to fixed nominal income tax categories, high inflation speeds up the taxation process. This reduces income from debt after taxes, which discourages saving, a necessary component of profitable investment (Greville & Reddell 1990; Feldstein 1997, 1999).

Conversely, low and consistent inflation has often been associated with higher rates of investment and production growth, as well as more stable output and employment. The purchasing power of household income and wealth is safeguarded, relative price fluctuations are more transparent, long-term savers and investors are given confidence, and financial stability is improved by low and steady inflation (IMF 2001; Mishkin 2008). Extremely low inflation presents problems for fiscal and monetary policy that are usually related to low nominal policy rates. In such a setting, negative shocks that lower inflation and economic activity may be harder for monetary policy to respond to using traditional tools (Blanchard *et al.*,., 2010; Arteta *et al.*,., 2018).

There is growing evidence that the demographic, social and economic outlook of a country influences GDP growth, development and inflation. Numerous empirical investigations verify the existence of correlations, which may be positive, negative or non-existent. Nonetheless, Some scholars especially those who endorse structural and Keynesian viewpoints, concur that

inflation has no adverse effects on the economy. On the contrary, proponents of monetarist viewpoints agree that adverse effects of inflation on welfare and a decent standard of living negatively impacts growth. Several scholars have appreciated the role of inflation in affecting output, investment, productivity, and employment and have stressed on the significance of price stability, which is leveraged on strong anti-inflationary policies meant to lower inflation.

1.1.1 Global Inflation and economic growth.

Various structural and cyclical factors, such as technical advancements, policy framework changes, global demand, supply, and oil price shocks, have contributed to the emergence of global inflation (Cline 1981; Bordo and Orphanides 2013). Over the course of the previous forty years, there has been a noticeable decrease in the median annual global inflation, falling from a peak of 16.6% in 1974 to 2.6 percent in 2017. According to Jongrim Ha *et al.,* (2019), this decrease started in industrialized advanced economies (AEs) in the mid of the 1980s and spread to other emerging and developing economies (EMDEs) in the mid-1990s. Over the same period, the industrialized economies experienced a faster and remarkable growth in their economies as compared to their low-income counterparts. This is attributed partly to the favorable settings for government policies that promote macroeconomic stability which is conducive for investments in most sectors of the economy.

Compared to industrialized economies, low-income countries (LICs) typically saw greater rates and more volatile level of consumer prices. In LICs and other emerging and developing economies (EMDEs), food and energy prices have influenced headline inflation swings more than they have in advanced economies (AEs). All parts of the world have seen a decline in inflation including areas that had previously seen consistently high prices, such as countries in

Sub-Saharan Africa (SSA) and Latin America. Figure 1.1 illustrates how inflation has decreased by two-thirds even in low-income countries (LICs) from the mid-1970s.

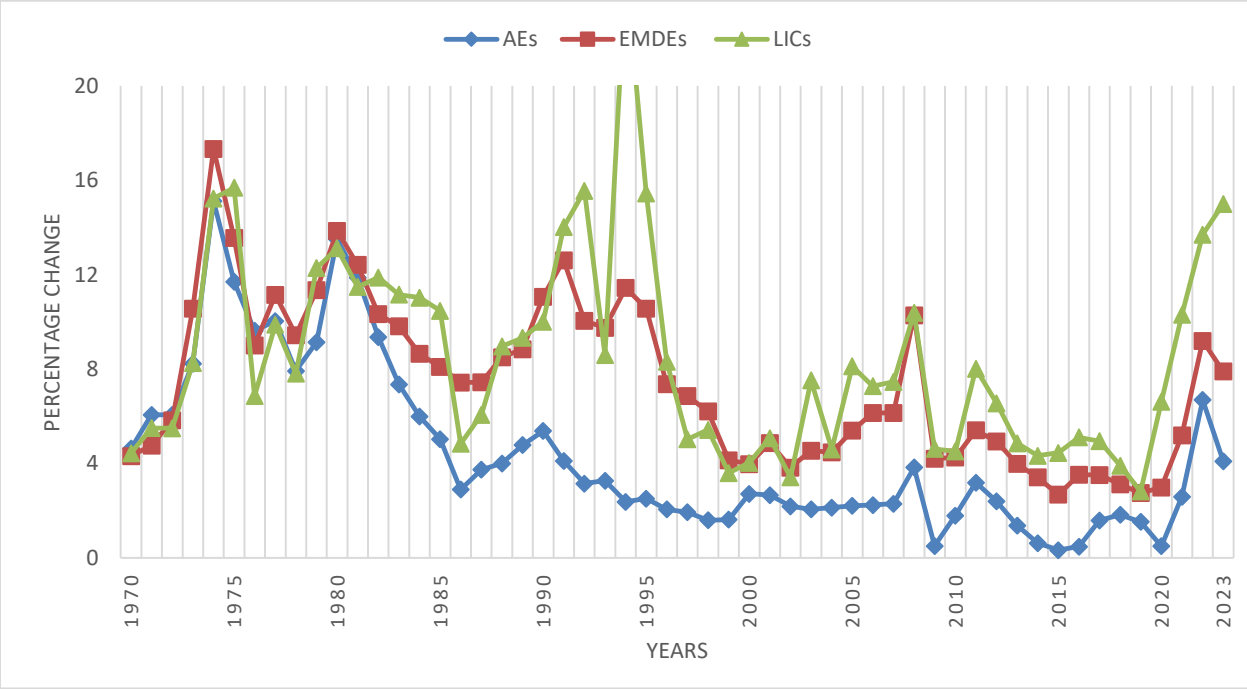

Figure 1.1: Inflation trend for AEs, EMDEs and LICs.

Sources: WDI (2024).

A significant portion of the improvement in inflation outcomes can be attributed to structural economic improvements, such as enhanced frameworks for fiscal and monetary policy, increased trade, and financial deregulation. Robust fiscal policies, deregulation, globalization, and, in the 1990s, faster productivity development in some regions of the world could have been additional causes (Rogoff 2003; IMF 2006). The active application of counter-cyclical policies, institutional strengthening, including increased central bank independence, and the creation of a fiscal environment robust enough to make a meaningful contribution to macroeconomic stabilization are some strategies to help safeguard economies from the effects of global intervention. This is because it lessens uncertainty, encourages more effective resource allocation, and supports

financial stability, lower and more stable inflation has frequently been linked to improved economic and development outcomes (Fang, Miller & Lee 2012).

1.1.2 Inflation and economic growth in Eastern Africa

The major sectors that have contributed to the expansion of the economies of Eastern African nations, includes the industrial, service, and agricultural sectors on the supply side and primarily consumption on the demand side of the economy. The primary forces behind economic growth differ depending on the demographic, social and economic features of a nation. The region holds a greater potential of growth with its diverse natural resources and young and vibrant population ready for provision of human capital.

The factors that undermine the region's growth and development include over reliance on export of primary commodities, persistent current account deficits, global oil prices, adverse weather conditions on agriculture and political instability. The region struggles with significant challenges which include sovereign debts which exerts fiscal and monetary pressure and therefore threatening sustained economic stability.

One of the critical pre-conditions for long-term economic growth and structural changes, which are essential to significantly lower poverty and improve standards of living, is a stable macroeconomic environment (Papageorgiou & Kolovich 2014; Shimeles 2014). As the table below illustrates, countries like Rwanda, Uganda, and Djibouti have recorded low inflation rates thus growing economies over the last ten years, while countries like Sudan, Ethiopia, and South Sudan have recorded high inflation along with a corresponding slump in economic growth. Inflation, an important indicator of macroeconomic stability and has remained volatile and unpredictable in the region.

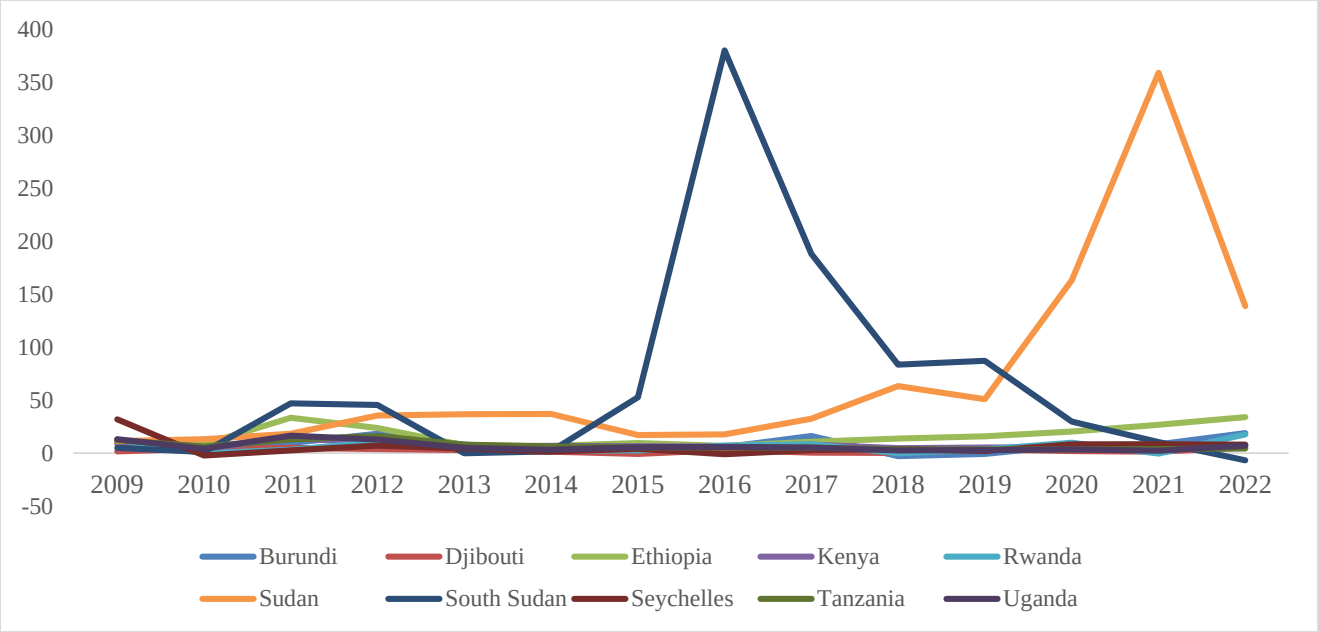

Figure 1. 2: Inflation rate trend in East Africa Countries 2009-2022

Source: World Bank, 2022.

The figure shows that inflation rate trend has been stable in East Africa Countries over the last decade except for Sudan and South Sudan Countries where the rate has been over 100 percent to 300 percent. This is because of constant political wars in the two countries leading to galloping inflation. However, the stable inflation rate witnessed in the remaining East Africa Countries such Kenya, Uganda; Tanzania among others is due to strong macroeconomic policies being implemented in these countries to contain the general rise in prices of basic commodities in the countries. The policies being implemented are aided by monetary authority policy tools such as open market operations, implementation of bank rate, minimum liquidity reserves, interest rates and bank reserves amongst other policy tools.

A combination of the following factors contribute to inflation outcomes, which are dependent on the economic and social characteristics unique to each country as well as the efficacy of government policy interventions: rapid currency depreciation, foreign exchange shortages, a high

reliance on imported capital and consumer goods, increased monetization of the large fiscal deficit, GDP contraction due to disruptions in oil production, limited food supply, and an overall lack of peace and security.

The primary strategies employed to combat supply shock-induced inflation in the East have primarily involved administrative price controls, significant interest rate increases to restrict private sector credit, and adjustments to the cash reserve ratio. The region has focused on general exchange rate stability and low inflation through diverse policies that aim at price stability and excellent growth.

1.1.3 Inflation and GDP Rate in Kenya

Kenya's economic growth has been impacted by several internal and foreign factors, including supply shocks, political stability, policy changes, and global economic conditions. Between 1981 and 1990, despite political unrest, droughts, and adverse global economic conditions, notably the oil shocks of the late 1970s, Kenya's GDP expanded by an average of 3.7% yearly. During the period 1980-1990, the government adopted expansionary fiscal policies resulting in high inflation. External shocks, such as rising global oil prices coupled with domestic supply-side constraints contributed to persistent inflation in the same period.

Kenya implemented the Structural Adjustment Plans (SAPs) imposed by the Bretton wood institutions in the 1990s. Trade liberalization, privatization, and financial sector reforms were some of these changes. As a result of the fiscal crisis, currency devaluation, and inadequate macroeconomic management, inflation increased from roughly 17.8% in 1990 to roughly 27.5% in 1992 before peaking at 46% in 1993. In contrast, economic growth remained weak, declining from 4.2% in 1990 to -0.8% in 1992, the lowest level since Kenya's independence (World Bank 1993). The remarkable achievement of the economy in 1994 and 1995 was due to control of

inflation to 28.8% in 1994 and 1.6% in 1995, Economic survey (1995). The rate of inflation rose to 11.4% by 1997 on the eve of political unrest, tribal differences, poor governance, environmental shock, among other challenges.

Kenya's economy in early 2000s grew at mean annual rate of 5-6% over the years 2003 and 2007 due to better governance, the growth of the service sector, and increased infrastructure investments. However, in 2008, the country's economy collapsed to 1.7%, mostly due to post-election violence that disrupted most economic activities. Although the period's inflation was comparatively low, it was nevertheless volatile because of shocks to the world's food and fuel prices. According to the Economic Survey (2009), the high cost of transportation, energy, and food caused inflation to rise from 10.5% in 2005 to 14.5% in 2006, then drop to 9.8% in 2007 and reach 26.2% by the end of 2008. Due to economic shocks linked to the money supply for campaigns and a decrease in economic activity, the economic growth increased to a greater level of 8.4% in 2010 before falling to 4.6% in 2012. As a result, the inflation decreased to 4.0 in 2010 and increased to 14.0 in 2012. Between 2013 and 2021, the average rate of inflation was 6%, whereas the average rate of economic growth over that time was 5.5%. The disruption of the economy caused by the general elections is blamed for the sharp increase in inflation to 8.0% in 2017 and the consequent decline in economic growth to a low of 4.8%.

Figure 1.3 illustrate the growth of the economy and inflation rate in Kenya from 1980 - 2023

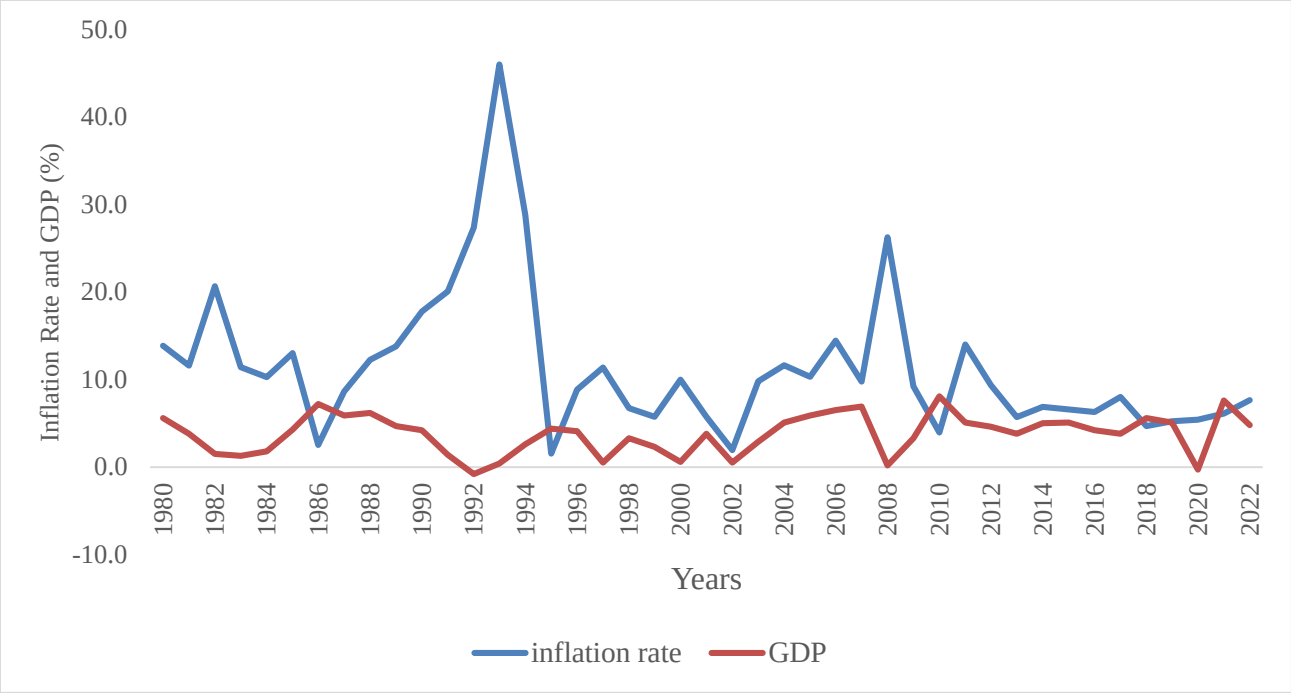

Figure 1. 3: Inflation and growth trend over 1980 to 2023
Source: World Bank, 2023

The trend between economic growth and inflation between 1980 and 2023 shows divergent movements cutting across various political, social and macro-economic policy regimes. For instance, in 2008, the rate of inflation was 26.2 percent while economic growth was 0.2 percent pointing to divergent movement between the two variables. Because the monetary authority implemented macroeconomic policies to restrain rising price levels in the economy and thereby promote economic growth, the early 1990s had a higher rate of inflation than the 2000s. Between 1990 and 1993, there was a decline in economic growth, which was attributed to several factors such as the agriculture sector's shrinkage, increases in the money supply, currency devaluation, and a subsequent rise in economic prices.

The economy performed better between 1994 and 1996 because of structural reforms which were adopted by the government (McPherson, 1997). The return to stability in 1994 saw a restoration

of growth and much more stable macroeconomic prices. Thereafter, there were significant inflows of private capital that raised foreign reserves consequently raising the exchange rate. As a result, price stability increased, and inflation gradually decreased from its high levels in 1993 to 1996. Knowing which product and service categories appear to be the primary source of inflation is essential to figuring out how inflation and economic growth are related in Kenya. Each inflation driver requires a separate set of optimal policies to maintain macroeconomic stability over the short, medium and long term for sustain economic growth.

1.1.4 Policies to Control Inflation in Kenya.

Kenya has implemented a wide range of policies, evolving from direct interventions and structural reforms in 1980s and 1990s to advanced fiscal and monetary policies in the 2000s and 2010s to achieve macroeconomic stability. These policies have evolved in response to the country's dynamic economic environment coupled with challenges including the supply shocks, fiscal imbalances, and global economic influences. To promote economic progress, the Central Bank of Kenya is playing an essential role in keeping inflation under control. Low and steady inflation promotes economic expansion, raises living standards, and improves people's financial well-being, particularly for the impoverished. Food and non-food products are the main categories of commodities and services that appear to be the main causes of inflation. A deeper comprehension of the efficient economic policies that support sustainable economic growth and development is necessary to maintain stable prices for products and services while also guaranteeing sustainable economic growth. Although it is impossible to pinpoint an exact inflation rate that is suitable for Kenya's growth, moderate inflation (typically single digits) is beneficial to the country's economy.

Kenya experienced severe inflation in the 1980s and early 1990s due to expansionary fiscal policies adopted during that period, outside shocks like increased oil prices, and internal economic inefficiencies also played a greater role. Political unrest and inappropriate structural and institutional reforms, particularly the Structural Adjustment Programs (SAPs) that were implemented in the late 80s under the direction of world development institutions contributed to the worsening of inflation level. Significant measures aimed at stimulating economic growth and stabilizing the economy were implemented in the early 1990s included price restrictions, subsidies, and exchange rate floating were all used to liberalize the economy. Tight monetary policies were also implemented to limit the rise of supply of money and rates of interest. SAPs continued in the 1990s with strong focus on fiscal discipline which included cuts in government spending, privatization of state-owned enterprises and efforts to improve tax collection. This reduced the inflationary pressures driven by excessive government borrowing and spending.

Kenya made a significant progress in controlling inflation through a more robust monetary and fiscal policy framework in 2000s and 2010s. The CBK began focusing on inflation targeting measures, exchange rate stabilization and fiscal consolidation to manage liquidity and inflation. The monetary policies implemented by the Central Bank of Kenya (CBK) include the use of central bank rate which influences lending by the commercial banks hence reducing the amount of money in the hands of the public thereby reducing inflation in the economy (Central Bank report, 2022). According to the CBK report, 2023, strong macroeconomic monetary policies implemented in financial year 2022/2023 aimed at controlling money in circulation saw non-food inflation reduced from 4.1 percent in 2022 to 3.8 percent in 2023. Food inflation decreases from 10.2 percent in 2022 to 8.0 percent in 2023 throughout this time due to price relaxation brought about by the CBK's strict monetary policies.

The fiscal policy implemented includes frequent adjustment of tax rates, government expenditure on essential services and prudent budgetary allocation to manage aggregate demand in the economy (National Treasury report, 2022). Changes in taxes has greatly influenced spending by the households and investments by businesses and firm, this has lowered demand for and supply of certain commodities in the economy leading to decline in price levels in the economy.

Further, the government has also implemented policies to control and regulate prices in certain sectors to manage inflation. However, economic theories put it that such interventions need to be carefully implemented to avoid distorting the market leading to inefficiencies resulting to exploitation of the consumers (Competition Authority of Kenya report, 2022).

1.2 Problem Statement

The objective of Kenya's Vision 2030 is to attain and maintain an annual average economic growth rate of 10%. A steady and predictable macroeconomic climate is necessary for growth, investment, and development to accomplish this goal. The continuous rise in the average cost of commodities and services threatens macro-economic stability, which is necessary for long-term, sustainable economic growth. Excessive and unstable costs of basic goods and services remain a threat to the economy because they reduce people's purchasing power, erode the real incomes of those on fixed incomes, discourage investments, devalue savings, and discourage household lending (Khan and Hanif, 2020). Increasing costs of products and services drive up living expenses, which in turn reduces savings and investment in an economy (Pendril, 2000). Furthermore, impoverished households endure the disproportionate burden of rising prices of necessities because they don't have access to interest-bearing accounts and are more dependent on wage income (Talukdar, 2012).

To attain macroeconomic stability, the Kenyan government has been using a variety of inflation strategies, ranging from direct interventions and structural reforms in the 1980s and 1990s to sophisticated fiscal and monetary policies in the 2000s and 2010s. The goal of sustainable economic expansion is being jeopardized by incomplete understanding of how the pricing of different commodities and services affect inflation. Food and non-food products are the main categories of commodities and services that drive inflation in Kenya. To effectively formulate economic policies that promote sustainable economic growth and development as well as preserving stable prices of commodities and services, a more comprehension of the complex connection between inflation and the economy is required.

There is disagreement on the ideal inflation rate for Kenya's economic growth, despite the broad understanding that high inflation is harmful to a country's ability to grow economically and develop. This is because economic theory suggests that a certain amount of inflation fosters economic growth. However, it is unclear how exactly the two components relate to one another. Similarly, it is unknown what kind of relationship there is, if any, between food and non-food inflation and Kenya's economic growth. Governments find it increasingly challenging to control inflation because of conflicting macroeconomic goals, and research on the connection between inflation and economic growth remains paramount. Despite the inflation policies implemented to regulate the fiscal and monetary environments and foster economic growth, continuous research on the optimal strategies is required. consequently, Abdurhman and Dagmawe (2023), Kiptum (2022), Khan and Hanif (2020), and Abdulhi and Salihu (2020) did studies on the effect of inflation on economic growth. These investigations found an inverse and nonlinear relationship between the variables using cross-sectional data. The current study scrutinizes the link between inflation and the rate of growth in Kenya by exploring how inflation connected to food and non-

food items influence the GDP growth, an area that has not gotten much attention in earlier research conducted in Kenya.

1.3 Research Questions

i. What is the relationship between non-food inflation and economic growth in Kenya?

ii. What is the effect of food inflation on economic growth in Kenya?

1.4 General Research Objective

The overall objective of this study was to determine the nexus between inflation and economic growth in Kenya.

The study was supported by the following specific research objectives.

i. To determine the relationship between non-food inflation and economic growth in Kenya.

ii. To evaluate the effect of food inflation on economic growth in Kenya.

1.5 Study Significance

Governments find it increasingly challenging to control inflation because of conflicting macroeconomic goals. Various researches on the connection between inflation and economic growth studied across various policy regimes have produced mixed findings. Additionally, Inflation is an aggregate component obtained by taking the average of consumer price index of various commodities and services. Various prices of commodities affect different sectors of the economy and individuals differently. Depending on the direction and extent of the price changes, significant price changes in one or more of the commodities in these categories invariably result in changes in inflation rates. The study therefore provides insights on how various categories of goods influence the economy. The study's conclusions produce data that helps the relevant

ministries, departments, agencies and policy makers in Kenya make well-informed decisions about how to stabilize prices and promote economic growth.

1.6 Study Scope

The study made use of data obtained from Kenya from 1980 to 2023 to review and analyze the inflation and economic growth relationship together with other variables observed in the same time period. Economic growth and inflation are macro issues that cannot be studied in isolation but examined collectively to understand the intricate linkages with other critical macro-economic variables. The study period covers a period that has transcends through various economic, institutional and political regimes characterized by various government policy changes, external shocks, changes in producer and consumer preferences. These factors play a significant role in understanding the connection between impact inflation and growth in Kenya.

1.7 Study Organization

There are five sections, or chapters, in the study. Background data, a problem statement, study objectives, scope, and significance are all included in the first few chapters. The last chapter delves into research methods, including design, modeling, and analysis, while the second section examines the theoretical and empirical literature. While Chapter 5 provides the study's summary, conclusions, policy implications, and areas for future research, Chapter 4 discusses the study's findings.

CHAPTER TWO

LITERATUREREVIEW

2.1 Introduction

The chapter provides an overview of the literature as well as pertinent theoretical and empirical works for the research.

2.2 Theoretical Review of Literature

The theories the study considered relevant and reviewed are the Solow-Swan growth, endogenous growth, classical, Keynesian and Monetarism growth theories

2.2.1 The Endogenous Growth

The basic tenet of an endogenous growth theory is that capital returns will constantly increase. It says that the main driver of economic growth is endogenous variables rather than external ones. Endogenous growth theory states that rather than exogenous factors like population growth, human capital, creativity, and knowledge have a major impact on growth, the rate of return on capital is the sole element that influences growth rate. Inflation usually reduces this rate of return by slowing expansion and reducing capital accumulation. The production of this theory is endless in its most basic version since the return on capital never drops below a positive bottom bound. The idea also emphasizes how the positive externalities and good spillover effects of the knowledge-based economy on promotion of economic growth. Policy factors such as funding for education or research and development can accelerate economic growth (Romer, 1986).

2.2.2 The Solow-Swan Growth Model

To explain long-term economic growth, the Solow-Swan growth theory looks at factors such as capital accumulation, rates of savings, labor or population expansion, productivity increases, and technical advancements (Solow, 1956; & Swan, 1956). The premise that technological change is

external and that opportunities in technology are available to all nations is a fundamental component of this approach. According to the paradigm, developing nations ought to be able to converge on wealthier nations. They get to the conclusion that various countries' steady-state rates of economic growth will be impacted by varying rates of saving and population increase. Higher saving rates are generally associated with higher rates of economic growth, and vice versa, all other factors being equal. Equation 2.1 illustrates the actual growth rate of output of an economy (Y) based on the analysis conducted by Harrod (1939) and Domar (1966).

$$\text{Output } (y) = \frac{Savings\ (s)}{Capital\ (k)} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \ 2.1$$

According to the above equation, a country or countries with high levels of saving have more money available for businesses to borrow and invest. Through a rise in the creation of products and services, investment can boost economy's capital stock and lead to economic growth (Y). A nation's savings rate is typically lowered by inflation, which also lowers the growth rate and capital accumulation. The productivity of the stock of capital is gauged by the capital output ratio (k). The economy will be more productive and produce greater amounts of output from fewer capital inputs if the capital output ratio declines. Higher economic growth results from this once more (Ghatak & Sanchez-Fung, 2007).

The Solow growth model's main tenet is that the economy is approaching a stable state. A steady state is one in which capital stock increases steadily but capital per capita does not. A steady state is defined by continuous proportionate labor force growth, constant full employment, a fixed saving-income ratio, unchanging coefficients of production, and no changes in technology. In general, the Solow growth model uses the form's production function model;

$$Y = f(AK^{\alpha}L^{1-\alpha}) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \ 2.2$$

2.2.3 Classical Theory of Growth

Adam Smith proposed the theory of classical growth. The production function, which he developed into a supply-side driven growth model, looks like this:

$$Y = f(L, K, A) \quad \text{……………………………………………………………….…………………2.3}$$

Where:

Y - Total output, L - Labour units, K - Capital units, A- Technology level,

Adam Smith argues that increases in land, investment, population, and overall productivity are the main drivers of output growth. Fundamental to the classical theory is the idea that the economy self-regulates, which implies that it can always achieve real GDP at its natural level, which is reached when all of the economy's resources are put to use. Smith thought that savings leads to investment and, consequently, growth, and that the distribution of income is one of the major variables determining how rapidly or slowly a society would grow.

2.2.4 Inflation by Keynesian.

Keynes proposed this hypothesis for the first time in 1936. Keynesians think that in order to achieve full production, government intervention is required. They contend that the government's expansionary policies will stimulate investment and demand, bringing the economy to full production. Aggregate supply (AS) and aggregate demand (AD) curves serve as the foundation for the Keynesian model. Dornbusch (1996) reports that the model's AS curve has an upward sloping short run, suggesting that changes in the economy have demand-side effects on output and price and lead to an adjustment path. According to the demand-pull theory, inflation is caused by an increase in overall demand (Hellwig, 2002).

In light of this, the theory ascribes inflation to excess demand in the commodity and factor markets and sees price variations as a mechanism for market clearing. Therefore, changes in the money supply, government spending and global pricing levels all have an impact on demand-pull inflation. On the other hand, factor prices are thought to be driving inflation under the cost-push theory since they are increasing faster than factor productivities. In essence, cost-push inflation happens when aggregate supply declines as a result of rising labor costs or raw material prices. Reduced output and a lower employment rate could result from higher manufacturing costs (Hendry, 2001; Hellwig, 2002). As to the 1936 Keynesians, economic shocks such as spikes in oil prices and disruptions in income are the primary causes of inflation. One way to depict the Keynesian Model is as

$\pi = f(l, w, u, o, p^e)$ 2.4

Where; inflation, labor demand, wage rate, un-employment rate, output level, and price expectations are represented by the variables π, l, w, u, o, and p^e, respectively.

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2.2.5 Monetarist theory of inflation.

Milton Friedman put out the idea of monetarism. He was more interested in the economy's supply side than its short-term dynamics. Milton Friedman emphasized the neutrality and quantity theory of money, among other significant long-term economic concepts. According to this view, the only thing that influences an economy's price levels is the money supply. They postulate that government interventions regulate money supply growth to match the rate of growth in production. According to monetarists, if money supply grows faster than the rate of growth in the national income inflation occurs. The primary determinant of the real variables (real GDP, employment, etc.) and price level in the near term is the money supply. But over

time, rather than real variables like employment and real output, money supply change results in greater impact on price levels and other nominal elements (Richard Froyen, 1998). The model is therefore expressed as in equation 2.5

$\pi = f\,(y, m_s, i)$ 2.5

where; π – rate of inflation, y -real income changes, m_s –amount of money stock and i refers to the cash balances cost.

2.3 Empirical Literature Review.

Abdurhman and Dagmawe (2023) studied about inflation, income inequality, and economic growth in Ethiopia and found strong correlation of the variables over the long term. Concerns regarding investments arise because inflation warps market signals, lowers consumer purchasing power, and raises uncertainty about the state of the economy going forward. Additionally, because lower-income households are disproportionately affected, it makes income disparity worse. By lowering debt, inflation can also have an impact on wealth distribution, which is advantageous for borrowers but frequently results in job losses and unstable economies. The study emphasized that economic development does not automatically equate to a decrease in income disparity because, depending on how inclusive it is, it may enlarge or close the gap. The study examines the connection between Ethiopia's economic growth, income inequality, and inflation using sophisticated econometric approaches. The results have important policy ramifications, suggesting that the Ethiopian government implement measures to encourage inclusive economic growth, re-distribute income more fairly, and coordinate fiscal and monetary policies to stabilize the macro-economy. In order to adopt plans for long-term economic stability

and equitable development, policymakers must have a thorough understanding of these interrelationships.

According to Kiptum's (2022) study on inflation and economic growth in Kenya, the threshold for statistically significant inflation is 5.83%, which has a negative impact on economic growth. On the other hand, a 5.7% barrier has no appreciable impact on GDP. The study also discovered that while severe inflation might reduce purchasing power, upset markets, and sow uncertainty, moderate inflation may encourage economic activity, such as consumer spending and company investment. The threshold regression approach was used to determine certain thresholds since the study employed econometric models to examine the relationship between inflation and economic growth. By allowing for non-linear connections between variables, this approach offers a more thorough understanding of the ways in which inflation affects the economy at various levels. The results have significant policy ramifications, indicating that in order to promote steady and sustainable economic growth, the Kenyan government should concentrate on inflation control measures that maintain inflation below the 5.83 percent mark.

Using time series data from 1970 to 2019, Talknice, Saungweme, and Odhiambo (2021) conducted comprehensive research to impartially evaluate the connection between inflation and economic growth in Kenya. This study employs the autoregressive distributed lag (ARDL) limits testing approach and the multivariate Granger-causality test to provide a comprehensive understanding of the short- and long-term dynamics between these two significant macroeconomic variables. The ARDL limits testing approach is particularly helpful for analyzing time series data that can have structural discontinuities or inconsistencies since it can model both short- and long-term relationships between variables. Because it allows for the inclusion of variables integrated at several orders, this method can handle datasets containing

variables that are both stationary at levels and first differences. Because of Kenya's extremely unstable economy, especially during periods of political upheaval and external shocks, the ARDL model's flexibility proved crucial to obtaining reliable results. Over time, inflation lowered Kenya's economic performance by having a statistically significant detrimental effect on long-term economic growth. The short-term finding of a one-way causal relationship aligns with earlier studies on the dynamics of growth and inflation in emerging and developing nations. Particularly in nations like Kenya where inflation can be fueled by supply-side shocks like shifts in agricultural production, fluctuations in currency rates, or changes in the price of commodities globally, inflation frequently precedes changes in economic development. These inflationary shocks have the potential to destabilize the economy by raising consumer and company costs, which will short-term, lower economic production.

Onwubuariri *et al.* (2021) claim that inflation eventually reduces economic growth and has a negative impact on it in the short and long terms. The exchange rate's excessive volatility not only discourages foreign direct investment but also erodes public confidence in domestic investment, both of which have a significant negative impact on economic growth. However, government spending and interest rates had a strong positive correlation and a modest positive relationship with economic growth, respectively. This suggests that government spending encourages capital accumulation at a favorable pace, while interest rates had little effect on growth. The study advises monetary authorities to keep inflation at a single digit rate in order to reduce unfavorable effects and promote economic growth. The Autoregressive Distribution Lag (ARDL) and Error Correction Model (ECM) were used to examine time series data from the World Bank and the Nigerian Central Bureau of Statistics from 1980 to 2019.

Idris (2021) investigated the connection between Nigeria's economic growth, unemployment, and inflation. It demonstrates how inflation causes investment to rise, which in turn causes the unemployment rate to rise and inhibits economic growth. This runs counter to accepted economic theory, which holds that inflation has a detrimental impact on economic stability. Additionally, the study discovered a substantial positive correlation between economic growth and unemployment, indicating that higher unemployment might be an inevitable consequence of some types of economic expansion. The study suggests improved security measures, solid legal frameworks, and sufficient infrastructural finance to address this issue. The study examined the relationship between inflation, unemployment, and economic growth over a significant time period using time series data from 1986 to 2020. The results help policymakers better understand Nigeria's economic dynamics and indicate that long-term, inclusive economic development requires effective inflation management, enhanced security, fortified legal frameworks, and infrastructure investment.

According to Abdulhi and Salihu (2020), inflation significantly hinders Nigeria's economic growth, reduces purchasing power, and lowers living standards. The problem is made worse by rising prices for necessities like rent, interest rates, and company expenses. The study also discovered that interest rates and exchange rates, which convey economic confidence and stimulate investment, positively affect economic growth. Raising living standards, lowering unemployment, and increasing productivity are all possible in a macroeconomic environment that is stable and has well-managed interest rates and currency rates. To lessen the negative consequences of inflation on economic growth, the study suggests that Nigeria's monetary authority implement a strategy aimed at a single-digit inflation rate. This would lessen uncertainty that deters investment, stabilize costs for firms, and preserve consumer purchasing

power. In order to boost economic growth, the Nigerian government should also concentrate on raising output levels. This can be done by boosting agricultural productivity, developing technical innovation, supporting industrial businesses, and improving infrastructure. Time series tests were used to guarantee the dependability and integrity of the data.

According to a study by Khan and Hanif (2020), there is a nonlinear link between inflation and economic growth in Pakistan in terms of output growth. Moreover, the study found that developing nations have a wider limit beyond which inflation affects output than do industrialized ones because weak political institutions lead to economic polarization after every election cycle. The study includes panel data from 113 countries between 1981 and 2015 and employed the GMM approach. The dependent variable, growth rate, and the dummy variable, institutional quality, were all measured along with per capita income, inflation rate, governance, human capital, size of public sector, and economic investment level. It has been found that the amount of output is significantly impacted negatively by a high rate of inflation. As a result, two-digit rates usually hinder growth and influence output levels; so, the inflation rate should be kept to one digit. Political instability has been shown to have a major impact on an economy's inflation rate. Low rates of inflation are conducive to growth, as the study suggested. However, price stability may only be helpful in the short run; over time, price stability may be useless because price increases are usually linked to economic expansion.

Mukoka (2018) investigated the relationship between inflation and Zimbabwean economic growth and discovered no association. This suggests that inflation has little influence on economic development, implying that addressing inflation-related concerns in the economy is only a prerequisite for promoting economic expansion, rather than an objective in itself. The research recommended keeping inflation as low as feasible in order to foster consistent economic

growth. The study's findings were analyzed using OLS and time series data covering 1990–2017. Economic growth was one of the dependent variables, with terms of trade, government spending, inflation, unemployment, and capital investment serving as explanatory factors.

Double-digit yearly inflation rates, in Wollie (2018) opinion, are detrimental to economic growth. Double-digit rates, on the other hand, constrain both spending and production, which hinders economic growth by raising consumer and producer uncertainty. However, single-digit rates and low inflation are good for the economy. Ethiopian time series data from 1988 to 2018 and a mixed-methods approach were employed in the study. According to the analysis, the main cause of inflation was the economy's overall mismatch between supply and demand.

The effect of inflation and external public debt on Kenya's output growth was investigated in a study by Osewe (2017). The findings showed that although the two factors did not significantly correlate, they did co-integrate with time. The Granger causality test indicated that there was no causal link between the variables, indicating that they were unrelated to each other. The report recommended that the government focus on borrowing and pricing policies that encourage economic growth. Annual time series data on inflation, economic growth, and external public debt from 1970 to 2010 were analyzed using a non-experimental study approach. More time series tests were carried out before analysis, and VECM was used to ascertain the association between the variables. Inspite quantity of debt accumulated is not a significant factor in explaining the slow investment rate in developing nations like Kenya is the reason for the lack of correlation between the variables. But foreign net income is important, and loan repayment just helps to push the private sector out of the picture. The lack of a long-term alliance results from

the markets' restricted ability to provide funds in the near run, and their gradual unavailability hinders the alliance.

Nyenyi, Amlega, and Scholastica (2017) found a significant negative correlation between inflation and economic growth in each of the five East Africa Community (EAC) nations. However, the effect gradually lessens and finally disappears as a dummy variable—such as a country joining the EAC—enters the model since the good effects of each individual country eventually offset the negative effects. Economic activity is negatively impacted by macroeconomic uncertainty and the attitudes it fosters, which jeopardizes the financial security of all citizens, but particularly the impoverished. It also widens the wealth divide and makes poverty worse by raising unemployment. The research recommended that EAC countries implement money supply and exchange rate controls to maintain a moderate and constant inflation rate within the (+/-) 5 percent bound in order to lessen the adverse effects. The research employed a panel data set that included both quantitative and qualitative components and covered the duration 1990 to 2014. The random association OF the two variables was validated using Granger causality and further analyzed using a robust least square estimate model.

Madurapperuma (2016) evaluated Sri Lanka's inflation and economic growth, it discovered a significant long-term association. This is because it implies that short-term fluctuations in inflation have a detrimental impact on actual output level and, consequently, economic growth, which is detrimental to the expansion of any economy. Certain products were in limited supply, primarily in the manufacturing, energy, and agricultural sectors, as a result of low production activity and high oil costs. This led to a high rate of inflation. The report recommended that a larger focus be made on the agricultural sectors with sufficient infrastructure in order to stimulate economic growth through increased financing for research and development. A non-

experimental study design was employed, utilizing time series data spanning the years 1988–2015. The percentage of economic growth was used as the regressand and the CPI, which acts as a proxy for inflation, as the regressor.

2.4 Overview of Literature Review.

The Cobb-Douglas Solow growth model's theoretical underpinnings have shown how inflation enters the model and undermines economic expansion. The paper claims that one of the primary barriers to economic expansion is the rate of inflation, while other variables that have no direct impact on user fees, such as interest rates and currency rates, enter the production function as free inputs. Keynesians believe that the government should intervene through expansionary economic policies in order to attain full production. Prices are a component of the market adjustment mechanism, though, as a result of excess demand that drives inflation in both the commodity and factor markets. On the other side, monetarists contend that government intervention controls the rate of money supply expansion with the ultimate objective of bringing it into balance with the rate of output growth.

A bidirectional causal relationship between inflation and economic growth was discovered by Abdurhman et al. (2023), suggesting that both variables can affect economic growth. To lessen the detrimental effects of inflation on growth, governments must enact policies. According to Kiptum (2022), threshold rates for inflation fluctuate depending on the level, and its effects on economic growth are non-linear. A significant inverse relationship between inflation and economic growth was noted by Onwubuariri et al. (2021), underscoring the challenge of preserving economic stability in the face of ongoing inflation. Inflation may not necessarily have a direct impact on economic performance, as Mukoka (2018) showed no significant correlation between inflation and economic growth. Further research on the relationship between inflation

and economic expansion is necessary, as evidenced by the considerable negative relationship between inflation and economic growth found by Khan et al. (2020), Abdulhi et al. (2020), and Nyenyi et al. (2017). With an emphasis on Kenya's economic setting, the current study attempts to investigate how food and non-food inflation affect economic growth in the country and provide more specific policymakers with recommendations.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

The methodology the study adopted is considered. This included research design, theoretical foundations, model construction, data collecting, processing, and analysis.

3.2 Research Design

The primary goal of the study is to find out how inflation has affected Kenya's economic growth from 1980 to 2023. Using a non-experimental research approach, the study examined the relationship between inflation and Kenya's production growth. The design was used since the study does not alter the studied variables in any way and has no influence over them (Stone, 2010). To accomplish its goals, the study used both quantitative and qualitative data.

3.3 Theoretical Framework

The study was based on the Solow growth model, sometimes known as neoclassical growth theory. The Harrod-Domar model, which incorporates labor units as a factor of production, is expanded upon by this model. Unlike the Harrod-Domar model, which has a fixed capital-output ratio, the model's capital-output ratio is flexible. When labor and capital are taken into account together, the Solow model demonstrates a constant return to scale but a diminishing return on labor. The Solow model explains how long-term economic growth is influenced by external variables including population expansion, capital accumulation, and technological advancement. Variables including output (Y), capital (K), labour (L), and technology (A) are often included in the model. Typically, the Cobb-Douglas form of production function is used in the Solow model as shown in equation 3.2.

$$Y = AK^{\alpha}L^{1-\alpha} \quad \ldots\ldots 3.1$$

The population grows exogenously and at a constant pace, which is factor AL, then

$L(t) = K$ …… 3.2

Equation 3.2 illustrates the rate of labor force growth from period (0) to (t), which adds up to the economy's capital stock and is therefore a key component in determining the pace of economic production. In the consumption function, (cY_t) is the proportion of income consumed and (sY_t) is saved forming capital stock and depreciates overtime at a constant rate, then the change of capital stock over time depends on investment and depreciation.

$K_t = sY_t - \delta K_t$ …… 3.3

Inflation enters the investment equation through price index and affects the real return on capital by reducing the effective savings rate by inflation rate (π) as shown in equation 3.4

$K_t = sY_t - \delta K_t - \pi K$……..3.4

Where: $k_t = \frac{dK_t}{d_t}$ represents the change in capital stock over time

sY_t is investment over time, δK_t is depreciation over time and Π is the inflation rate

The production that is neither consumed nor used to offset the depreciation of capital goods, which represents the net investment level in the economy over time, is shown in Equation 3.4, where πk stands for the decrease in real capital accumulation as a result of inflation. Factoring production function in Solow model to show effective unit of labour, then, dividing the production function throughout by $A_t L_t^{1-\alpha}$ then;

$\frac{Y_t}{A_t L_t^{1-\alpha}} = \frac{K_t^{\alpha} A_t L_t^{1-\alpha}}{A_t L_t^{1-\alpha}}$ …… 3.5

Equation 3.5 translates to output per effective unit of labour as follows

Thus $y_t = k_t^{\alpha}$ …… 3.6

The Solow model, represented by equation 3.6, relates the rate of inflation to the equation indirectly through the capital per unit of effective labor to determine net investment, or capital accumulation. At higher rates of inflation, investment returns decrease, and at lower rates of inflation, investment returns increase, resulting in economic growth.

Further capital is a function of return, since capital prices are impacted by the economy's rate of inflation and output per effective labour unit, is a function of capital per effective labour unit. The model is displayed in Equation 3.7 when the inflation rate is integrated.

$y_t = f((k_t(\pi))^{\alpha})$ ……..……. 3.7

Equation 3.7 shows that inflation joins the production function indirectly through the returns on investment.

3.4 Model Specification

To evaluate the effect of each variable in the model, the theoretical model is then adjusted to represent the actual impact of inflation on output growth. The concepts that have been presented suggest that a variety of other factors, including the interest rate, government expenditure, currency rate, output level, energy, infrastructure, and political stability, also have an impact on the economy's supply side. Therefore, the output growth is not only affected by amount of labour and capital accumulation but also inflation and other supply side variables.

From equation 3.7 and taking the logs of both sides to linearize the function for easy estimation and substituting equation 3.7 transforms to equation 3.8

$lny = \alpha_0 + \alpha_1 lnk_t + \alpha_2 ln\pi + \mu_t$ ……..……. 3.8

Where α-elasticity of output with respect to inflation (π) and μ is the stochastic term. Throughout the research period, the link between inflation and economic growth in Kenya will be determined using the model in equation 3.8.

3.4.1 Non-food inflation and economic growth Relationship

The study assessed the connection between non-food inflation and economic growth using the Granger causality test using equations 3.9 and 3.10.

$$(\pi)_t = \gamma_0 + \sum_{i=0}^{m+d} \gamma_{1i} (GDP)_{t-1} + \sum_{i=1}^{m+d} \gamma_{2i} (\pi)_{t-1} + \varepsilon_t \quad \text{..... 3.9}$$

$$(GDP)_t = \ddot{\gamma}_0 + \sum_{i=0}^{m+d} \ddot{\gamma}_{1i} (\pi)_{t-1} + \sum_{i=1}^{m+d} \ddot{\gamma}_{2i} (GDP)_{t-1} + \mu_t \quad \text{..... 3.10}$$

Where; m- maximum number of lags while d- maximum order of integration, $\ddot{\gamma}$ and γ are the parameters. The study uses all the criteria for lag selection to determine the maximum number of lags in order to estimate the optimal lags to be used.

3.4.2 Food inflation and economic growth in Kenya.

Evaluating the impact of food inflation on Kenya's economic growth is the study's second goal. To accomplish the goal, the study estimated equation 3.11, which includes additional variables derived from the studied theories and literature created from equation 3.8, in order to assess the impact of food inflation on economic growth over time.

Economic growth = f (food inflation, interest rate, exchange rate, government expenditure, capital investment, political stability, investment energy and infrastructure) ……..…3.11

Taking natural log of the variables, equation 3.8 becomes.

$$GDP = \beta_0 + \beta_1 ln\pi + \beta_2 lni + \beta_3 ln\varepsilon + \beta_4 lngovt + \beta_5 lncapinvest + \beta_6 lndebt + \tau + \mu \text{..} \quad 3.12$$

Where; β_0- constant term,β_1, β_2,β_3,β_4, β_5 are coefficients while π- food inflation, i- interest rate, ε- exchange rate, $govt$- government expenditure, $capinvest$- capital investment, τ- political stability in the country, $debt$- external debts and μ –stochastic term.

3.5 Definitions and Measurements of Variables

Table 3. 1: Definition and measurement of variables

Variable	Variable Definition	Variable Measurement
Economic growth	This is the gradual rise in a nation's potential for production over time.	Annual percentage GDP
Food Inflation	Increase in prices of food items.	Percentage annual change in consumer price index
Non-food inflation	Price increases for products and services other than food.	Percentage annual change in consumer price index
Exchange rate	Value of one currency expressed in terms of another.	Annual exchange rate
Interest rate	The cost of capital investment in a country	Percentage annual interest rate
Government expenditure	Spending by the government on public basic goods or utilities	Annual actual government expenditure on basic goods
Capital investment	Amount of cash put in fixed asset by private individuals as well as the government	Annual amount of money put in fixed assets
External debt	Monetary obligations incurred by the government from other governments	Annual external debts incurred
Production level	Aggregate output level in the economic for key sectors	Monetary value of annual output
Political stability	A situation in which there is no political unrest in the country	Political stability/ political instability

Source: Author (2024)

3.6 Type of Data and Source.

By utilizing secondary time series data covering the years 1980–2023, the study ascertained how inflation affects Kenya's economic expansion. The study used reliable and easily obtainable data from the databases of the World Bank, CBK, and KNBS. The secondary data sources such as economic development plans, economic surveys, quarterly journals, annual publications as well as World Bank economic journals were also used in the study.

3.7 Diagnostic Tests

The study assumed that every research variable was stationary based on the time-series literature and in accordance with Ordinary Least Square (Greene, 2012). Stationarity, correlation analysis, co-integration, and residual testing were conducted as part of the study.

3.7.1 Correlation Analysis

In order for explanatory variables to be independent of one another, Ordinary Least Square often assumes that the regressor is not collinear. In order to prevent multi-collinearity issues during analysis, a test was conducted to determine the degree of correlation among the explanatory variables. Those that are found to be highly correlated were excluded from the analysis. The study used Spearman Moment of Correlation to determine the coefficients of the correlation matrix.

3.7.2 Stationarity Test

Strong relationships between the study variables are frequently shown by regression of non-stationary data; therefore, in order to ensure that the results obtained are accurate, a test to ascertain the variables' integration order was carried out. The test was performed using the Augmented Phillips-Perron (PP) tests, which presuppose that the time-series data is non-stationary outside of the first and second differences and stationary at the first and second differences (Ender, 2015).

3.7.3 Residual Diagnostic Test

The study's test objective was to determine the model's robustness, particularly with regard to its specification, stability, and dependability. The Jarque-Bera test for normalcy, the Breusch-Pagan-Godfrey test for heteroscedasticity, and the Breusch-Godfrey test for serial correlation

were all used in this investigation. The Ramsey RESET test was also used to verify the stability of the model (Gujarati, Bernier & Bernier, 2004).

3.7.4 Co-integration Test

To ascertain whether there is a long-term link between the variables, the study employed the Johansen co-integration test. In econometric modeling, this test is essential for verifying the validity of long-term connections. The study would have examined the connection between food inflation and economic growth in Kenya using the Vector Error Correction Model (VECM) if a long-term association had been found. The lack of a long-term correlation found by the Johansen test, however, indicates that the variables' link is not stable over time. The study next examined the immediate and delayed effects of food inflation on Kenya's economic growth using the Autoregressive Distributed Lag (ARDL) model, taking into account both potential long-term effects and short-term changes. By taking into consideration the possible difficulties of short-term dynamics and guaranteeing solid and trustworthy results, this approach enabled the researchers to carry on examining the connection between food inflation and economic growth.

3.8 Granger Causality Test

The goal of the study was to ascertain whether there is a lasting relationship between variables, especially in time series data. To evaluate non-stationary time series data, the Johansen test—a popular technique for determining co-integration among several variables—was utilized. Because erroneous assumptions may result in misleading outcomes, the test sought to prevent false positives that suggested a bogus long-term link. The study would have moved further using the Vector Error Correction Model (VECM), which enables the modeling of both short-term dynamics and long-term equilibrium relationships, if the test had revealed a stable long-term relationship. Nevertheless, the lack of a reliable long-term correlation prompted the application

of alternative modeling approaches, such as the Autoregressive Distributed Lag (ARDL) model. For identifying the long-term relationship between variables and directing the choice of suitable econometric models, the Johansen test is essential.

3.9 Multicollinearity

A diagnostic tool for evaluating the relationship between the error term and independent variables in a study is the Variance Inflation Factor (VIF). Biased estimations, erroneous inference, and untrustworthy conclusions are some of the problems that may result from this. One or more independent variables may have a troublesome connection with the error term, as indicated by a high VIF, which also suggests a high degree of multicollinearity. The researcher may think about eliminating an independent variable or using methods like principle component analysis (PCA) or ridge regression to lessen multicollinearity if it shows high VIF values. By assisting in the identification of problematic variables and guaranteeing the validity of the regression model, the VIF improves the findings' credibility and guarantees that policy recommendations are supported by solid statistical data.

3.10 Data Analysis.

The study assumed a linear relationship between the input and output variables by using Equation 3.8, which was turned into a logarithmic function. If the variables are co-integrating and stationary at the level and after the first difference, the Autoregressive Distribution Lags (ARDL) method was used to estimate the model. If not, the Vector Error Correction Model (VECM) may be used to forecast the short- and long-term effects of inflation on economic growth.

However, Granger causality was used to achieve the second purpose, which was to determine the causative relationship between inflation and economic growth in Kenya. The study revealed how

the sign and magnitude of the major variables' coefficients influence Kenya's economic growth. Similarly, by looking at the P-values of F-statistics, a granger causality study determined whether inflation causes economic growth or economic growth causes inflation. The data was analyzed using E-Views and STATA tools. Graphs, charts, and frequency distribution tables were utilized to present the results.

CHAPTER FOUR

EMPIRICAL FINDINGS

4.1 Introduction

The following are contained in the chapter; descriptive statistics, stationarity test, correlation table, various diagnostic tests and estimation results

4.2 Descriptive Statistics

The study presented the results for the descriptive statistics as illustrated in table 4.1 below.

Table 4. 1: Descriptive Statistics

Variables	Obs	Mean	Standard Deviation	Minimum	Maximum
Gross Domestic Product (%)	44	3.8295	2.244	-0.7995	8.0585
Food Inflation (%)	44	12.301	7.9289	1.410	45.98
Non-food Inflation (%)	44	197.89	89.54	87.62	421.86
Interest rate (%)	44	13.839	7.764	0.9426	30.55
Exchange rate (Kshs/$)	44	63.503	34.942	7.420	139.85
External Debt (% GDP)	44	50.512	24.994	21.447	131.90
Capital Investment (million)	44	495625.3	633663.6	12450.6	1897011
Government Expenditure (million)	44	327095	446446.3	777.6	1404662
Production Level (million)	44	180952.5	187666.8	7062.2	628504.5
Political Stability (Dummy)	44	0.25	0.4380	0	1

Source: Study Data

The findings indicate that 44 years were spent gathering the data. Furthermore, the gross domestic product, which is a measure of economic growth, had a mean of 3.83 percent, a standard deviation of 2.24 percent, a minimum of -0.799 percent, and a maximum of 8.06

percent. This maximum growth was achieved during period when political temperature in the country favored economic activities hence facilitated tremendous growth of the economy.

Food inflation had a minimum value of 1.41 percent and a maximum value of 45.98 percent with a mean value of 12.30 percent and a standard deviation of 7.93 during the period of study. The standard deviation value indicates wide deviation from the mean value meaning that food inflation varies by 7.93 hence causing a change in food prices in the country. The maximum inflation realized during the period was 45.98 percent indicating a rise in food prices by 45.98 percent. This means that food inflation in the economy is mild given by a one-digit rate hence necessary for economy growth realized in the economy. Non-food inflation, on the other hand, ranged from 87.62 per cent to 421.86 per cent, it has a mean of 89.54 per cent and a standard deviation of 89.54, indicating a larger variation from the mean. This suggests that during the research period, non-food item prices rose faster than food item prices in the economy. It also suggests a two- or three-fold increase in costs, implying that the country's non-food inflation rate is skyrocketing; this form of inflation is detrimental to economic progress.

Interest rates in the economy during the period had minimum value of 0.94 Kenya Shillings per US dollar and a maximum rate of 30.55 Kenya Shillings per US dollar with a mean value of 13.84 Kenya Shillings per US dollar and standard deviation 7.76 indicating a significant deviation from the mean value over the period of study. Exchange rate had a minimum value of 7.42 percent and a maximum value of 139.83 with a mean rate of 63.50 Kenya Shillings per US dollar implying a growing weak shilling against the dollar. This would in turn make exports cheaper while imports more expensive slowing down economic growth over time. The deviation from the mean is a half times implying exchange rate does not disperse so much but just around the mean exchange rate.

Capital investment had a minimum value of Kshs. 12,450.6 million and a maximum of Kshs. 1,897,011 million with a mean of Kshs. 495,625.3 million. This implies that capital investment was growing over time stimulating economic activities hence the country realizing minimal economic growth. Further, government expenditure on key sectors in the economy had a minimum value of Kshs. 777.6 million and the highest expenditure was Kshs. 1,404,662 million. This means that the government should prioritize key sectors to facilitate economic growth hence the overall growth obtained over time in the economy of about 8.06 percent during the period of study. Lastly, production level in the economy reached highest level of about Kshs. 628,504.5 million with a minimum amount of Kshs.7, 062.2 implying a consistent increase of output level leading to growth of the economy. However, the deviations from the mean production was wide given by Kshs. 187,666.8 million causing swings or cycles in the growth rate as depicted by economic theory or literatures. The variations witnessed in the data were minimal making the data to be suitable for estimating the model. To accurately determine the existing relationship between the study variables accuracy, reliability, relevance and validity of the data must be considered. The sample size is sufficient covering a several political regimes where significant political and policy changes took place.

4.3.0 Time Series Tests

The study carried out several tests on the data to ensure the robustness and suitability of the data variables over time. Well tested data allows for efficient analysis, prediction capabilities, and informed decision making based on trend analysis, and robustness of the model to predict changes in economic growth due to changes in inflation overtime.

4.3.1 Stationarity Test

The study used the Phillip-Perron unit root test to assess stationarity. The test was chosen over Augmented Dickey Fuller because of its superiority and capacity to capture both stationarity at the level of the intercept and trend. It was necessary to conduct the test to ensure that all the statistical properties such as mean, variance remain constant over time to ensure spurious results are not obtained during analysis. The stability is necessary for accurate modeling and forecasting capabilities. Variables are said to be stationary if they have a constant mean over time. The variables which unit root test was carried out on include gross domestic product, food inflation, non-food inflation, interest rates, exchange rates, external debt, log of capital investment, log of government expenditure and log of production level in the economy for a period 1980-2023. Table 4.2 shows the results.

Table 4. 2: Unit Root Test

Variable	Level	z-Statistics	P-Value	Remarks
Gross Domestic product (GDP)	Intercept	-2.95	0.0001	Stationary
	Trend & Intercept	-3.528	0.0003	Stationary
Interest rate (I1)	Intercept	-2.952	0.0000	Stationary
	Trend & Intercept	-3.532	0.0000	Stationary
Exchange Rate (I1)	Intercept	-2.952	0.0001	Stationary
	Trend & Intercept	-3.532	0.0005	Stationary
Debt (I1)	Intercept	-2.952	0.0000	Stationary
	Trend & Intercept	-3.532	0.0000	Stationary
Log Gross Capital Formation (I1)	Intercept	-2.952	0.0000	Stationary
	Trend & Intercept	-3.532	0.0000	Stationary
Food Inflation	Intercept	-2.95	0.0018	Stationary
	Trend & Intercept	-3.528	0.0075	Stationary
Non-food Inflation (I1)	Intercept	-2.952	0.0000	Stationary
	Trend & Intercept	-3.532	0.0002	Stationary

Log Government Expenditure (I1)	Intercept	-2.952	0.0000	Stationary
	Trend & Intercept	-3.532	0.0000	Stationary
Log Production Level (I1)	Intercept	-2.952	0.0000	Stationary
	Trend & Intercept	-3.532	0.0000	Stationary

Source: Study Data

The analysis was performed at both the intercept and trend and intercept levels for all research variables, with a significance threshold of 5%. The findings show that all the study variables were stationary; the gross domestic product (GDP) and the food inflation rate were steady at the level, while all other variables were stationary after the first differential. This was determined by P-values of z-statistics that were less than 0.05 at the 5% threshold of significance. According to the rule of thumb, a P-value of less than 0.05 at the 5% statistical level indicates stationarity; otherwise, it is non-stationary. According to the analysis, there was no unit root among the variables, hence there was little chance of receiving erroneous results. Finally, all of the study variables were utilized to examine the relationship between inflation and economic growth in Kenya because they were all stationary at both levels and after the first divergence.

4.3.2 Correlation Analysis

Spearman's Moment of Correlation was used to determine the degree of correlation between the research variables. The test was required to check that the study variables were not highly linked before any estimation was performed. This was important to minimize the possibility of collinearity between the study variables, improving decision making and optimizing the model to optimize the estimation and predictive ability of the model. The results are presented in the table 4.3

Table 4. 3: Correlation Matrix Analysis

	Gross Domestic Product	Food Inflation	Interest Rate	Exchange Rate	Debt	Capital Investment	Non-Food Inflation	Government Expenditure	Production Level	Political
GDP	1									
FI	-0.443	1								
Int	-0.019	0.329	1							
Exch	-0.227	0.483	0.06	1						
Debt	-0.173	0.399	0.009	0.518	1					
GCF	0.234	0.079	0.017	0.037	-0.09	1				
NFI	-0.182	0.09	-0.078	0.228	0.061	-0.183	1			
GE	0.062	-0.14	0.084	-0.01	-0.428	0.265	0.072	1		
PL	-0.011	0.439	0.084	0.271	0.145	0.126	-0.07	-0.137	1	
Political	-0.204	0.061	0.091	-0.181	-0.007	-0.245	0.079	-0.045	-0.258	1

Source: Study Data

The test was performed at a 5% level of significance. The results demonstrate that all of the Spearman moment of correlation coefficients was less than 0.8 at the 5% significance level. According to the rule of thumb, a correlation coefficient less than or equal to 0.8 at the 5% level of significance indicates a low chance of correlation, whereas a correlation coefficient greater than 0.8 implies a high correlation, so variables that are highly correlated cannot be used in an estimation model. Furthermore, the results show that some variables were favorably and others adversely associated. The study's findings found that the variables are not significantly associated, allowing it to achieve its goal of determining the relationship between inflation and economic growth in Kenya.

4.3.3 Lag Selection

In order to identify the ideal lag length for a time series analysis model, the study employed five criteria. The model's predictive accuracy was evaluated using the FPE, HQIC, AIC, LR Test, and SBIC, which balance accuracy and complexity. While the HQIC penalizes models for adding too many parameters to prevent over fitting, the FPE suggests a better-fitting model with fewer prediction errors. The LR Test assesses how additional lags affect the model's explanatory power, whereas the AIC strikes a compromise between the model's complexity and goodness-of-fit. The Bayesian Information Criterion, or SBIC, is a helpful tool for choosing parsimonious models and determining the ideal lag time. Key research variables such as GDP, food inflation, debt, capital investment, non-food inflation, government spending, and production levels were all subjected to the lag length test. Additionally taken into account were control variables such as political stability, interest rates, and exchange rates. The study made sure the selected model produced solid and dependable results, highlighting how crucial it is to carefully choose the lag

duration in order to comprehend how variables change over time. The results are shown in table 4.4 and 4.5 respectively.

Table 4. 4: Lag Length Selection-model 3.9 and 3.10

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-366.665				0.495221	19.1623	19.2694	19.4609*
1	-315.478	102.37*	49	0	0.461326*	19.0502*	19.9072*	21.4389
2	-277.583	75.791	49	0.008	1.04748	19.6196	21.2266	24.0985
3	-204.614	145.94	49	0	0.651479	18.3904	20.7473	24.9594
4	-109.979	189.274	49	0	.4463211	16.0502	19.1572	24.7093

Source: Study Data

Table 4. 5: Lag Length Selection-model 3.12

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-776.296				153923	40.3229*	40.4759*	40.7494*
1	-696.556	159.48	100	0	509004	41.3618	43.0453	46.0539
2	-580.849	231.41*	100	0	692521	40.5564	43.7703	49.514
3	.	.	100	.	7.6e-27*	.	.	.
4	12042.8	.	100	.	.	-597.58	-591.611	-580.944

Source: Study Data

According to the data in table 4.4, the LR, FPE, AIC, and HQIC criteria have 1 lag, but SBIC has 0 delays; hence, the LR, FPE, AIC, and HQIC criteria have 1 lag for the association between non-food inflation and economic growth. Furthermore, for the influence of food inflation on economic growth model, AIC, HQIC, and SBIC show one lag, whereas LR shows two delays and the FPE criteria shows three lags, therefore AIC, HQIC, and SBIC are used with one lag. As a result, the study used one lag to meet the study's first and second objectives.

4.3.4 Co-integration test

In order to find stable correlations or co-integrations, the study made use of the Johansen Co-integration test to validate the long-term association between the research variables. When two or more non-stationary time series variables exhibit a shared long-term trend despite their individual short-term volatility, this is known as co-integration. Systems of variables with varied

orders of integration, such as those that are stationary at the level or integrated of order one, can be tested. The trace test and the maximum eigenvalue test are used to determine the number of co-integration vectors between variables. If co-integration is discovered, it indicates that the variables are not only associated because of sporadic variations or erroneous correlations but also share a shared trend or equilibrium throughout time. This enables economists and policy makers to comprehend the underlying cause influencing economic variables and make better decisions. In addition to controlling for factors like currency rates, interest rates, and political stability, the study looked at GDP, food inflation, debt, capital investment, non-food inflation, government spending, and output levels. Finding co-integration indicates that the variables are constrained by underlying economic dynamics and maintain a steady, long-term relationship. The test results are shown in table 4.6.

Table 4. 6: Co-integration test

Maximum rank	Params	LL	Eigenvalue	Trace statistic	Critical value 5%
0	72	-594.574	.	268.4636	156
1	87	-554.43	0.85889	188.1768	124.24
2	100	-528.766	0.71404	136.8483	94.15
3	111	-508.066	0.63569	95.448	68.52
4	120	-492.986	0.52079	65.2879	47.21
5	127	-479.287	0.48739	37.8902	29.68
6	132	-469.968	0.36528	19.2529	15.41
7	135	-464.584	0.23097	8.4851	3.76
8	136	-460.342	0.18694		

Source: Study Data

A co-integration test was necessary to determine whether two or more non-stationary variables have long-term relationships. Some variables tend to move together in stable, long term manner which may lead to misleading and spurious results. The unit root test results showed that the variables are stationary at both levels and after the first difference. Since the trace statistics

values were below the crucial levels at the 5% level of significance, the con-integration results show no co-integration among the variables and no long-term relationship between them. This suggests that there is no co-integration among the variables, as the study fails to reject the null hypothesis and rejects the alternative hypothesis of a long-run link. Hence ARDL model was the appropriate models to achieve objective two of the study and vector autoregressive (VAR) with granger-causality is used to achieve objective one of the study.

4.3.5 Heteroskedasticity Test

Heteroskedasticity occurs when there is no constant variance of the error terms across the observations violating the key assumption of the homoskedasticity (constant variance) in OLS regression. This test ensures reliable standard errors of coefficients and efficiency of the model to produce correct inferences.

The test was conducted using autoregressive heteroskedasticity (ARCH) model and presented results in 4.7

Table 4. 7: Heteroskedasticity test

F-Statistics	1.4526	Probability F-Statistics (1,40)	0.2384
Observed R-Squared	1.4522	Probability Chi-Square	0.2282

Source: Study Data

The test was performed to determine that the error term was not homogeneous. The test was performed at a 5% significance level. The results demonstrate that the likelihood of F-statistics and Chi-Square are all more than 0.05 at the 5% level of significance, implying that the variance of the error term remains constant across time, leading the research to infer that the error term is not heteroscedastic.

4.3.6 Serial Correlation Test

The test was conducted using Breusch-Godfrey method in order to determine the relationship between the independent variables and the error term. The results are presented in table 4.8 below.

Table 4. 8: Serial Correlation LM test

F-Statistics	0.87758	Probability F-Statistics (2, 27)	0.4273
Observed R-Squared	2.6246	Probability Chi-Square	0.2692

Source: Study Data

According to the study, there is no serial correlation between the independent variables and the model's error term because the F-statistics and Chi-square values are more than 0.05 at the 5 per cent significance level. This is significant since it goes against the traditional regression analysis assumptions, which state that the error term must not exhibit a time-varying correlation with either the independent variables or itself. There is no substantial evidence to support the null hypothesis of serial correlation, which is rejected. The model's residuals are independent and the model is well-specified, according to the alternative hypothesis, which states that there is no serial correlation between the independent variables and the error component. These findings lend credence to the idea that the model is well-defined and free of these problems, which makes it a suitable instrument for examining how food inflation affects Kenya's economic expansion. The results convince economists and policymakers that the research may be utilized to make decisions with more confidence and validate the model's technical resilience

4.3.7 Multicollinearity test

When Multicollinearity is present in a regression model, the coefficients become unstable leading to inconsistent and highly sensitive estimates which could be misleading. Variance

Inflation Factor (VIF) was used to establish the relationship among the study variables. Table 4.9 shows the results

Table 4. 9: Multicollinearity Test

Variable	**VIF**	**1/VIF**
Lag one Food inflation	2.87	0.3489
Debt	2.37	0.4226
Food inflation	2.25	0.4443
Log government expenditure	2.06	0.4860
Log capital formation	1.71	0.5860
Lag one political stability	1.67	0.6000
Lag two political stability	1.61	0.6208
Log production level	1.53	0.6532
Lag one GDP	1.47	0.6797

Source: Study Data

The results show that all the coefficients are less than or equal 10 and according to the rule of the thumb, a coefficient less than or equal to 10 implies an absence of multicollinearity while a coefficient more than 10 signifies presence of multicollinearity. From the findings, the study concludes that there is no multicollinearity among the study independent variables hence chances of obtaining spurious estimation results are minimal.

4.3.8 Normality test

The test was carried out using Histogram-Normality test to determine whether the residuals are evenly distributed throughout the data set. Figure 4.1 shows the results

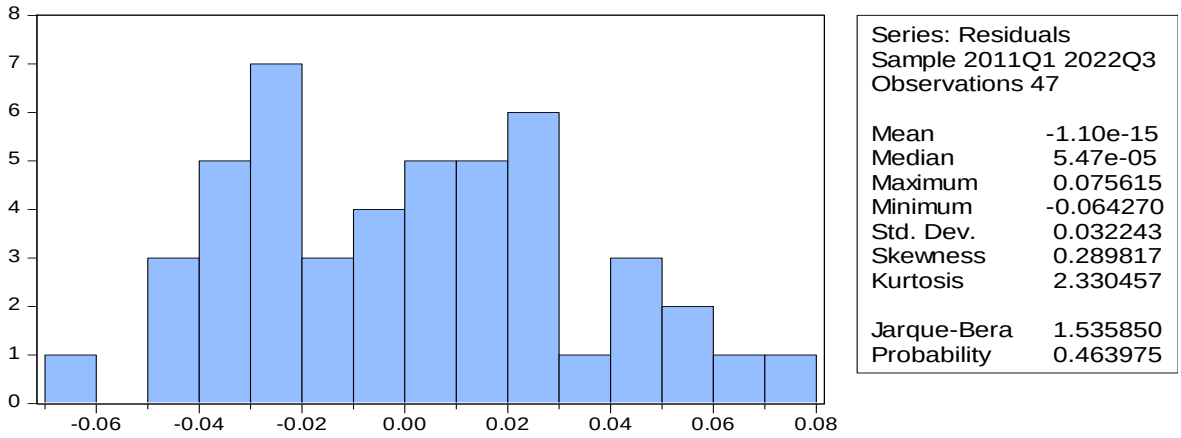

Figure 4. 1: Histogram-Normality test
Source: Study Data

The findings in Figure 4.1 demonstrate that the Jarque-Bera statistic value is 0.4640, which is larger than 0.05 at the 5% level of significance, suggesting that the residuals are uniformly distributed over the data set and that the odds of generating false results during coefficient estimation are low. The mean value is -1.10e-15, which is extremely close to zero. According to the rule of thumb, a mean value around zero indicates that the mean residuals in the model are well fitted, indicating an equal distribution of the residuals in the estimation.

4.3.9 Stability test

The test was conducted using Ramsey RESET test in order to determine the specificity of the model. The results are presented in table 4.10

Table 4. 10: Ramsey RESET Test

Test	Value	df	Probability
t-statistics	0.17335	28	0.8636
F-statistics	0.03005	(1,28)	0.8636

Source: Study Data

The results reveal that P-values for both t-statistics and F-statistics are all more than 0.05 at the 5% significance level, implying that the independent coefficients may explain variations in Kenya's economic growth rates.

4.4 Regression Analysis

Regression analysis was carried out using an ARDL model and a VAR model with the Granger-causality test in order to accomplish goals one and two. The study's objectives were to first assess the relationship between economic development and non-food inflation, and then to look at how food inflation affected Kenya's economic growth.

4.4.1 Non-food inflation and economic growth in Kenya

Finding a connection between non-food inflation and economic growth was the study's primary objective. A Granger causality test was used to determine which of the two variables influences the other after vector autoregressive (VAR) estimate was completed on all study variables to accomplish the purpose. The VAR results are presented in table 4.11

Table 4. 11: Vector Autoregressive Result

Dependent Variable: GDP		**Coefficients**	**Standard Error**	**z**	**P>|z|**
GDP	Lag one GDP	0.27533	0.15926	1.73	0.084
	Lag two GDP	-0.00559	0.15793	-0.04	0.972
Non-food Inflation (NFI)	Lag one NFI	-0.01249	0.01205	-1.04	0.300
	Lag two NFI	-0.001243	0.01182	-0.11	0.916
Constant Term		2.7534	0.76533	3.60	0.000
Dependent Variable: NFI					
GDP	Lag one GDP	1.9128	2.0337	0.94	0.347
	Lag two GDP	-0.79725	2.0167	-0.40	0.693
NFI	Lag one NFI	0.22401	0.15384	1.46	0.145
	Lag two NFI	-0.12446	0.15098	-0.82	0.410
Constant Term		-10.3229	9.773	-1.06	0.291

Source: Study Data

The findings are shown in two parts: the first part uses GDP as the dependent variable, and the second part uses non-food inflation (NFI). The research findings indicate no substantial correlation between GDP's lags one and two and its historical levels. Similarly, there is no discernible correlation between GDP and lags one and two of non-food inflation. This indicates that while changes in non-food inflation have an impact on economic growth, the impact is negligible when considering all relevant economic factors. Furthermore, when non-food inflation is considered the dependent variable under both lags one and two, an insignificant association is established, suggesting that there is no substantial relationship between inflation and economic

growth. The study conducted granger causality test on the VAR and presented results in table 4.12

Table 4. 12: Granger-causality Wald Test Results

Equation	Excluded	Chi-Square	df	Prob>Chi-Square
GDP	Non-food Inflation	1.1784	2	0.555
GDP	All	1.1784	2	0.555
Non-food inflation	GDP	0.89944	2	0.638
Non-Food Inflation	GDP	0.8944	2	0.638

Source: Study Data

The results reveal that the likelihood of Chi-Square in the GDP equation is larger than 0.05 at the 5 per cent level of significance, implying that non-food inflation does not drive economic growth. The findings contradict Talknice *et al*., (2021) and Onwubuariri *et al*., (2021), who discovered a negative substantial link between non-food inflation and economic growth, particularly during periods of political instability caused by supply-side shocks. This is because an increase in price of non-food items lowers the demand for such goods and therefore reduction in production of such goods hence insignificant effect in the economy. However, economic theories have indicated that higher inflation rates have effect on economic growth implying non-food inflation which is a measure of inflation is expected to granger-cause economic growth.

Similarly, the study found that GDP does not generate non-food inflation in the economy. This is due to the likelihood of Chi-Square (0.638), which is more than 0.05 at the 5% significance level. The study contradicts Bogmans et al., (2024), who discovered that an increase in income due to economic expansion creates non-food inflation in the economy by increasing demand for non-food commodities in order to earn more money in the future.

4.4.2. Food Inflation and Economic Growth in Kenya

The second goal of the study was to investigate how food inflation affected Kenya's economic expansion. The study evaluated the impact of food inflation on Kenya's economic development using a lagged ARDL regression model. The results are presented in table 4.13

Table 4. 13: Effect of food inflation on economic growth in Kenya

Dependent Variable: Economic Growth (GDP)				
Variable	Coefficient	Standard Error	t-Statistics	P-value
Lag one GDP	0.3766	0.1727	2.18	0.038
Debt	0.0668	0.0312	2.14	0.041
Lag one debt	0.0622	0.0314	1.98	0.048
Log Capital Investment	3.5299	3.3051	1.07	0.295
Log Government expenditure	0.05856	0.5733	0.10	0.919
Log Production level	8.4892	2.8608	2.97	0.006
Lag one of log production level	5.8406	2.4137	2.42	0.022
Food Inflation	-0.15446	0.05969	-2.59	0.015
Lag one food Inflation	-0.24754	0.05345	-4.63	0.000
Constant Term	3.0373	1.2703	2.39	0.024
R-Squared	**0.8736**	**Probability > F-Statistics**		**0.0015**
Adjusted R-Squared	**0.8611**	**Log Likelihood**		**77.403**
Durbin-Watson	**2.08**	**F (9, 29)**		**54.21**

Source: Study Data

The results show that the value of adjusted R-squared was 0.8611, indicating that about 86.11 percent of the changes in economic growth (GDP) are due to changes in past GDP value, food

inflation, debt levels, capital investment, government expenditure, production levels in key sectors of the economy, and political stability that provides a conducive environment for economic activities to thrive. The remaining 13.89 percent of the changes are the result of additional changes that were not caught throughout the research period. Furthermore, the F-statistics value of 54.21 is significant at 5 per cent, implying that the model is a strong fit for analyzing the influence of food inflation on economic development in Kenya.

Furthermore, the Durbin-Watson value is 2.18, which is greater than 1.8. According to the rule of thumb, a Durbin-Watson value greater than or equal to 1.8 indicates that there is no autocorrelation among the independent study variables. The study also revealed that the value of the constant term is 3.037 and significant at the 5% level of significance, this implies that in the absence of the factors considered, the GDP growth rate would be low, demonstrating the importance of vigorous production levels in key sectors of the economy, ensuring sustainable debt levels, and maintaining one-digit food inflation levels in the economy over time.

The coefficient of GDP in lag one was positive (0.3766) and statistically significant at 5 percent implying that past value of GDP growth rate affects the current level of economic growth. One percentage change in GDP past value causes 0.3766 percentage points increase in GDP currently. The finding corroborates with Khan and Hanif (2020) sustained past GDP growth rate significantly contribute to current level of economic growth realized in the economy. This shows that certain mechanisms have been put in place for growth in key sectors such as good governance, favorable economic environment ensured by political stability. Additionally, economic theories opine that one's growth has been kick-started and through the multiplier effect, future growth rates automatically realized propelling growth further.

At the 5 per cent level, the debt and lag one coefficients were both significant and positive (0.0668 and 0.0622, respectively). This means that for every 1 per cent increase in debt relative to GDP, GDP grows by 0.0622 percentage points. This is because sustained economic growth can be achieved by mobilizing resources through borrowing or incurring debt to invest in the important areas of the economy to ensure growth over time, especially in developing nations like Kenya that lack the means to stimulate economic growth. The results support Mukoka's (2018) assertion that while a certain amount of sustainable debt promotes economic growth, debt that exceeds the economy's commitments inhibits it.

The study has opined that sustainable debt boost economy growth by 6.22 percentage points.

The study has also revealed that production level in key sectors such as agriculture boost growth of the economy. This is indicated by a positive coefficient (8.489) and significant at 5 per cent significance level, implying that one percent increase in production level leads to an increase in economic growth by 8.489 percentage points. However, in lag one the growth declines to 5.841 percentage points, this is because of the marginal effect of any additional production to the overall economic growth. The finding agrees with Rungang and Mhaka (2021) that agricultural production significantly contributes to economic growth in the short-run which declines in the long-run since the economy has already developed. It also confirms findings by Gnangnon (2021) that production capacity boost economic growth at the same time reduce growth volatilities in the presence of structural economic vulnerability.

Further, the study found that the coefficient of food inflation is negative (-0.15446) and significant at the 5% level of significance, meaning that for every 1% increase in food inflation, economic growth is reduced by 0.1545 percentage points. The results are consistent with those of Talknice et al. (2021), Kiptum (2022), and Abdurhman and Dagmawe (2023), who discovered

that high rates of inflation, especially food inflation, had a negative effect on economic growth in the short and long term. This is because external shocks slow down overall economic development and have a multiplier effect. The literature indicates that the level of food inflation contributes to economic growth up to a certain point but then hinders it after that. The analysis had also shown that some variables have an insignificant effect on economic growth, the variables include capital investment, government expenditure, and political stability.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

The section entails study summary, conclusions from the findings and policy implications based on key findings of the study.

5.2 Study Summary

Kenya aims to achieve and maintain economic growth of about 10 percent annually by 2030 which requires steady and predictable macroeconomic growth to ensure investment in key sectors of the economy. Kenya Vision 2030 aims to make Kenya a middle-income industrializing nation that accords all its citizens a high standard of living by the year 2030. To achieve this, a stable macroeconomic environment is necessary, promoting investor confidence, job creation, poverty reduction, and economic growth. This requires managing debt, providing a stable currency, limiting inflation, and promoting prudent monetary and fiscal policies. High and fluctuating costs for necessities weaken the economy, discourage lending, and reduce the currency's buying power.

Low and consistent inflation is linked to higher investment, production growth, stable output, and employment. It protects household income, increases transparency of price fluctuations, and improves financial stability. However, extreme low inflation can pose challenges for fiscal and monetary policy due to low nominal policy rates. A nation's features affect the correlation between growth and inflation, with some academics arguing that inflation has no negative effect on economic expansion, while others emphasize the importance of price stability and strong anti-inflationary policies. Global inflation has decreased significantly over the past forty years, with the median annual global consumer price inflation falling from 16.6% in 1974 to 2.6% in 2017.

This decrease began in industrialized economies and spread to emerging markets and developing nations. Low-income countries (LICs) have experienced more volatile inflation, with food and energy prices influencing headline inflation swings more than in advanced economies.

East African nations' economic expansion is driven by industrial, service, and agricultural sectors. The factors that undermine the region’s growth and development include over reliance on export of primary commodities, persistent current account deficits, global oil prices, adverse weather conditions on agriculture and political instability. A stable macroeconomic environment is critical for realization of long-term economic growth and structural change. Countries like Rwanda, Uganda, and Djibouti have low inflation rates but growing economies, while Sudan, Ethiopia, and South Sudan have high inflation and slumped economic growth. Inflation rates in East Africa have remained stable over the past decade, except for Sudan and South Sudan, where they have experienced high rates due to political wars. However, other countries like Kenya, Uganda, and Tanzania have experienced stable inflation rates due to strong macroeconomic policies. Factors contributing to inflation include rapid currency depreciation, foreign exchange shortages, high reliance on imported goods, fiscal deficit monetization, GDP contraction, limited food supply, and lack of peace and security. Strategies to combat supply shock-induced inflation include administrative price controls, interest rate increases, and cash reserve ratio adjustments.

Kenya's growth and inflation have been influenced by internal and external factors such as supply shocks, political stability, policy changes, and global economic conditions. Between 1981 and 1990, Kenya's GDP expanded by an average of 3.7% yearly, but inflation increased due to fiscal policies and external shocks. In the 1990s, Kenya implemented Structural Adjustment Plans (SAPs), which led to inflation increasing from 17.8% in 1990 to 46% in 1993. Economic growth declined from 4.2% in 1990 to -0.8% in 1992. In the early 2000s, Kenya's economy grew

at a mean annual rate of 5-6% but collapsed in 2008 due to post-election violence. Inflation was volatile due to food and fuel price shocks. Between 2013 and 2021, the average rate of inflation was 6%, while economic growth was 5.5%. The disruption caused by general elections is blamed for the sharp increase in inflation to 8.0% in 2017 and the decline in economic growth.

Kenya has implemented various policies since the 1980s and 1990s to achieve macroeconomic stability. In the 1980s, severe inflation was caused by expansionary fiscal policies, external shocks, and internal economic inefficiencies. The Structural Adjustment Programs (SAPs) were unsuccessful due to political unrest and inadequate reforms. In the 1990s, the Central Bank of Kenya focused on inflation targeting measures, exchange rate stabilization, and fiscal consolidation to manage liquidity and inflation. The CBK's monetary policies, including central bank rate adjustments, have led to a reduction in non-food inflation and food inflation. Fiscal policies, such as frequent tax rate adjustments and prudent budgetary allocation, have also helped manage aggregate demand in the economy. However, economic theories suggest that these interventions need to be carefully implemented to avoid market distortion and consumer exploitation.

Kenya aims to achieve and maintain a 10% annual economic growth rate by the year 2030, but the continuous rise in goods and services costs threatens this goal. Excessive costs reduce purchasing power, erode real incomes, discourage investments, devalue savings, and discourage household lending. The Kenyan government has used various inflation strategies to achieve stability, but the goal of sustainable economic expansion is at risk due to incomplete understanding of how inflation promotes prices. There is disagreement on the ideal inflation rate for Kenya's economic growth, as high inflation can harm a nation's ability to grow economically. This study examines the association between inflation and growth of the economy in Kenya

using annual data from 1980-2023, focusing on the effect of inflation connected to food and non-food on economic growth.

The analysis was based on Keynesian inflation theory and the Solow-Swan growth model. After reviewing the literature, the study concluded that although inflation affects economic growth, more than a digit level of inflation stops or worsens economic growth. Furthermore, some research found a substantial negative linkage between inflation and economic growth, while others suggested that inflation drives economic growth, and yet others thought the opposite was true. The current study used annual time series data to assess and determine whether these mixed findings were worth investigating.

The study examined the connections between Kenyan economic factors between 1980 and 2023 using a non-experimental research design. A thorough analysis of the changes and interactions throughout time of food inflation, economic growth, and other control factors was made possible using data collected over a time. The Granger Causality Test and the ARDL and VAR models were employed in the study to investigate the relationship between the variables. In order to ascertain whether one variable can predict another, the Granger causation Test was used to investigate the direction of causation between variables. To make sure the results were reliable and legitimate, pre-estimation tests were performed. The stationarity of the time series data was assessed using the Johansen Co-integration test and unit root tests. Serial correlation, heteroscedasticity, normality, and the Variance Inflation Factor (VIF) were among the post-estimation tests used to check for multicollinearity among the independent variables. The study's conclusions about the effect of food inflation on economic growth in Kenya are trustworthy, genuine, and statistically reliable thanks to these stringent testing, which also reduced the possibility of false results and gave policy recommendations a solid basis.

The study found non-food inflation does not granger-causes economic growth, similarly, economic growth does not granger-cause non-food inflation in the economy. Additionally, the study has also revealed that lag one of GDP, lag one of debt, and production level had a positive significant effect on economic growth while food inflation had a negative significant effect on economic growth in Kenya. However, capital investment and government expenditure had insignificant positive effect on economic growth in Kenya.

5.3 Study Conclusion

The purpose of the study was to investigate the connection between food inflation and Kenya's economic growth, two factors that are vital to the stability and advancement of the nation. The study evaluated the short- and long-term links between inflation and economic growth using time series data and econometric models. The results demonstrated that there is no granger-cause link between economic growth and non-food inflation, indicating that their relationship may be more intricate or impacted by other variables.

Kenya's economic growth is severely hampered by food inflation, which raises living expenses, lowers consumer purchasing power, and increases poverty. In addition to decreasing consumption and slowing down overall economic activity, higher food prices can also have a domino impact on other economic sectors. However, there were notable positive effects on economic growth from past economic growth figures, debt levels as a percentage of GDP, and agricultural production levels. Current growth is positively impacted by past economic growth values, and economic growth is positively impacted by debt levels. The positive correlation between economic growth and agricultural production emphasizes how crucial agricultural development is to Kenya's economic future.

5.4 Policy Implications

The study found that several factors have a substantial impact on economic growth, including production levels, debt levels, food inflation, and economic growth. Therefore, as debt has a positive and considerable impact on economic growth, the study recommends that the government should take appropriate use of debt in order to stimulate investments in the key sectors of the economy and boost economic growth. However, these loans must be used for development rather than consumption. Additionally, the study discovered that output levels, particularly in the agricultural sector, have a beneficial effect on economic growth. To ensure long-term economic prosperity, the government and non-governmental organizations should so increase their investments in the production of agricultural products.

The World Bank, International Monetary Fund (IMF), and Africa Development Bank (ADB) are examples of other development partners that should encourage agricultural production by allocating more resources to produce an ideal level of output. This will maintain economic growth and improve the quality of life for people from all socioeconomic backgrounds. Furthermore, the findings show that food inflation substantially impeded economic growth; therefore, in order to lessen the negative effects on economic growth, the government should keep food inflation as low as possible, ideally within one digit. To encourage economic growth in Kenya, the monetary authority should also keep the amount of money in circulation that ensures economic growth rather than that which raises food prices rather than food production, which results in food inflation.

The reason for this is that if there is more money in circulation, households will have more available money to spend on basic goods and services, which will raise prices even more and only exacerbate inflation. Therefore, to keep inflation as low as feasible and promote economic

growth, the monetary authority should maintain a money supply that corresponds with output levels.

The policy proposals to be harnessed to control food inflation and encourage sustainable economic growth include, minimizing price volatility, enhancing supply systems, and increasing production. Economic stability can be preserved by prioritizing agricultural growth and appropriate debt management that guarantees long-term profits and prosperity.

5.5 Suggestion for Further Studies

using time series data, the study has demonstrated that neither non-food inflation nor economic growth granger-causes each other. The paper recommends future research utilizing cross-sectoral panel data to determine granger causality between non-food inflation and economic growth. Further study needs to be carried out to understand how inflation affects various sectors of the economy. The study has also shown that past level of economic growth also affects the current and future economic growth projections. Therefore, the study suggests that more research need to be conducted to determine what level of past growth guarantees future sustainable growth of the economy of a country. Lastly, the study has shown that government expenditure and capital investment have insignificant effect on economic growth, the study suggests that more research should be carried out using panel data and employing VECM or ECM to estimate if there is any short-run or long-run effect of the two variables on economic growth or sectoral analysis to determine the effect of the two variables on the sectoral growth of the different sectors of the economy.

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