MACROECONOMIC VARIABLES, GOVERNMENT EXPENDITURE ON INFRASTRUCTURE AND GROWTH OF DOMESTIC PRIVATE INVESTMENT IN KENYA

MONICAH WANJIRU KINYANJUI

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Monicah Wanjiru Kinyanjui

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DECLARATION

This thesis is my original work and has not been presented for a degree or diploma in any university

Signature ……Date ……

Monica Wanjiru Kinyanjui

This thesis has been submitted for examination with our approval as the University Supervisors.

Signature ……Date ……

Prof. Willy Muturi, PhD

JUAT, Kenya

Signature ……Date ……

Dr. Agnes Njeru, PhD

JKUAT, Kenya

DEDICATION

This thesis is warmly dedicated to my loving family who accorded me all the support required throughout my academic journey. You are my support system and the reason I keep going. May the Almighty God keep blessing you abundantly.

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ACRONYMS AND ABBREVIATIONS

ADB	African Development Bank
AERC	African Economic Research Consortium
ADF	Augmented Dickey Fuller
AIC	Akaikee Information Criterion
ARDL	Auto-Regressive Distributed Lag
CPI	Consumer Price Index
CBK	Central Bank of Kenya
CLRM	Classical Linear Regression Model
COVID	Coronavirus Disease
DPI	Domestic private investment
ECM	Error Correction Model
ECOWAS	Economic Community of West Africa States
EMDEs	Emerging Market and Developing Economies
ERS	Economic Recovery Strategy
EN	Engle –Granger
FDI	Foreign Direct Investment
FMOLs	Fully Modified Ordinary Least Squares

FPE	Final Prediction Error
GDP	Gross Domestic product
GFCF	Gross Fixed Capital Formation
GNI	Gross National Income
GNP	Gross National Product
GMM	Generalized Method of Moment
GOK	Government of Kenya
G7	Group of Seven
HQIC	Hannan Quinn Information Criterion
ICT	Information and Communication Technology
INF	Inflation
KBRR	Kenya Banks' Reference Rate
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
KSH	Kenyan Shilling
IMF	International Monetary Fund
LM	Lagrange Multiplier
MEC	Marginal Efficiency of Capital

MTP	Medium Term Plan
NARDL	Non Linear Autoregressive Distributed Lag
OECD	Organization for Economic Co-operation and Development
OPEC	Organization of the Petroleum Exporting Economies
PP	Philips-Perron
PPP	Public Private Partnership
RESET	Ramsey Regression Equation Specification Test
SBIC	Schwarz Bayesian Information Criterion
SDGs	Sustainable Development Goals
SMEs	Small and Medium-sized Enterprises
SSA	Sub-Saharan African
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Program
US	United States
USD	United States Dollar
VAR	Vector Autoregressive
VIF	Variance Inflation Factor

WAEMU West Africa Economic and Monetary Union

DEFINITION OF OPERATIONAL TERMS

Domestic Private Investment refers to investing of capital in profitable ventures to gain interest, income or appreciation of value carried out by businesses or financial institutions other than the government (Mohan & Kapur, 2015).

Exchange rate is the value of one currency as compared to another currency (Fofanah, 2022).

Gross Domestic Product (GDP) this refers is the economy's market value of goods and services manufactured in a given time period, usually one year. GDP assesses the economic state of a given country. The higher the GDP of a country, the resilient the economy (United Nations, 2016).

Inflation rate McMahon et al., (2018) defined inflation rate as the continued long run increase in price of general goods and service.

Interest Rate is the borrowing cost charged by the lender as percentage of the principal (Kidwell *et al.* 2016).

Money Supply According to Baumeister & Hamilton (2017), money supply refers to the total amount of money in circulation in an economy. This includes hard currency and notes, deposits held by banks and other current assets.

Public Investment Real investment by the government or public institutions on structures, infrastructure, machinery and equipment, and other real capital or any other public services (Narula, and Pineli, 2017).

ABSTRACT

Private sector investment in Kenya has been on the decline since independence, this is pronounced in major job creating sectors such as agricultural sector, business service sector and the manufacturing sector. Private sector has been widely accepted as an important driver of economic growth in any country across the world. The general objective of the study was to evaluate the effect of macroeconomic variables on growth of domestic private investment in Kenya. Specifically the study evaluated the effect of inflation, interest rate, money supply and exchange rates on growth of domestic private investment in Kenya. The study sought to determine if government expenditure on infrastructure moderate the relationship between macroeconomic variables and growth of domestic private investment in Kenya. This study adopted causal research design and relied on secondary data for the period 1972 to 2022. Data was collected from Kenya National Bureau of Statistics (KNBS), Central Bank of Kenya (CBK), The National Treasury and The World Bank. Autoregressive Distribute Lag (ARDL) model was adopted to examine if changes in macroeconomic variables were statistically significant to affect growth of domestic private investment in Kenya. A correlation analysis was conducted and confirmed that there was no high correlation among the variables. Granger causality test was conducted to determine whether one variable in the study was useful in forecasting another. The study results revealed that there was a negative significant relationship between inflation and domestic private investment, money supply had a positive and significant relationship with domestic private investment, Interest rates had a negative and significant relationship with domestic private investment and positive insignificant for exchange rates and domestic private investments. Further the study established that the government expenditure on infrastructure had a moderating effect on the relationship between Inflation rate, lending rate, Money supply, exchange rate and growth of domestic private investment in Kenya during the period of study. The study recommended that central bank of Kenya should seek to increase credit availability by regulating but allowing the thriving of mobile lending, group lending, micro finance lending among other credit platforms. Besides, money supply aggregates is an essential component of the monetary policy implementation framework. The variation of this money supply component through monetary policy instruments like critical reserve ratio, open market operation or central bank rate should aim at boosting private investment. The study advocates for policies that ensure the commercial banks remain liquid and maintain low lending rates. These policies include the liberation of the financial markets for more competition and support for more innovative but secure money lending avenues like mobile money markets. The study also recommended active financial market intervention through monetary policy to ensure commercial bank lending rates are within the conventional range for private domestic investment to thrive. The research also recommended that the quality of infrastructure investment should be enhanced through improvement of public investment process that will especially be effective in boosting aggregate demand and enhancing productive capacity over the long term.

The results of the study will benefit the National Treasury and Central Bank of Kenya in making appropriate policies that encourage domestic private investment, improve domestic private investment management strategy to boost the country's economic growth. This study will also benefit scholars in development finance in widening their knowledge on the effect of macroeconomic variables and growth of domestic private investment.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Kenya is one of Africa's Sub-Saharan economies with a fast growing economy registering an average annual growth of 5.4%, making it the East Africa largest economy but still lags behind the sufficient economic growth of at least 7% that is required to achieve the sustainable development goals, this is made possible by a thriving private sector which is key to poverty reduction (World Bank, 2017). The rate is also far below the targeted 10% annual economic growth envisioned in Vision 2030 economic pillar (Trading Economics, 2016). Private sector investment has been on the decline since independence, this is pronounced in major jobs creating sectors like agricultural sector (9.3% decline), Business services sector, (15.6% decline) and manufacturing sector (7.8% decline)(Mutuku and Kinyanjui, 2018).

The major challenge facing the government today is how to stimulate domestic private investment so as to achieve the desired level of economic growth that is useful in achievement of sustainable development goals (SDGs), poverty reduction, vision 2030 and the Big Four Agendas. This study will therefore provide a useful guide to policymakers concerned with growth of domestic private investment. According to Rauch *et al.* (2016), an economy's capacity is influenced by both the labor force and the capacity to generate products and services. This supports the claim made by Bosco and Emerence (2016) that an economy's growth rate is positively correlated with its rate of investment. In comparison to state investment, which is known to frequently be politically motivated and lack economic acumen, private investment has been found to contribute more to economic progress. ADB, Furceri, and IMF (2016) also point out that a higher investment ratio would need to come nearly entirely from private investment as the pressure on state resources increased. Any country's total macroeconomic development is greatly influenced by the private sector, and in the present development plan, private investment

is recognized as a key source for boosting income and employment through increased production and productivity (Osei-Kyei, & Chan, 2017).

According to Narula and Pineli, (2017) enhancing domestic investment indicates more domestic capital formation in the economy, which is quite healthy to the economic performance since it moderates productive resources/ capital leakages. Governments of developing countries, Kenya inclusive are now considering the potential of private sector involvement in their economies and more in terms of private investment, despite these efforts private investment has remained low in most developing countries (Bosco & Emerence, 2016).Through private investment, the economies experience an increase in job opportunities, increased foreign investment and enhanced technology growth (Bonga & Nyoni, 2017).

Private sector investment is the number one catalyst for economic growth whereas the public sector is tasked with providing a conducive environment (Feldman et al., 2016). This is because private investment forms an important portion of the Gross Domestic Product (GDP). If investment grows, GDP also grows (Kariuki & Nasieku, 2023). To be able to stimulate and sustain economic growth, it is paramount that developing countries have a private investment as a significant portion of GDP (Kariuki & Nasieku, 2023). According to Feldman et al. (2016), public investment as portion of GDP should not be less than 15% at any given time, whereas the target percentage of private investment should be at least 25% of GDP. With a stated government policy objective of achieving an average economic growth rate of 10 percent per annum, investment levels should be above 32 percent of the GDP with public investment being above 9 percent of the GDP and private investment being above 24 percent of the GDP (ROK, 2016).

In the progression towards economic growth, countries consider investment as a crucial feature in raising productivity levels by boosting technological progress and reducing the unemployment rate. It boosts long-run capital accumulation as investment creates new capital goods and increases the productive capacity of countries. The Investment Promotion Act2 (IP A, 2004) defines investment as the contribution of local or foreign

capital by an investor, including the creation of, or the acquisition of business assets by or for business enterprises, and includes expansion, restructuring, improving or rehabilitating of a business enterprise.

The growth in domestic private investment has been identified as a promoter of economic growth of any economy. The level of domestic private investment is influenced by resource mobilization, which also depend on the macroeconomic environment of any economy (Kinyanjui et al., 2021). Investment boosts productivity, according to the Endogenous Growth Theory, which was confirmed by Mwega (1997), however investment is highly dependent on a variety of macroeconomic conditions. According to Kolapo, Oke and Olaniyan (2018), important macroeconomic variables like the GDP and money supply might have an impact on investors' investment choices. Furthermore Kinyanjui et al., (2021) demonstrate that domestic private investment is susceptible to a number of macroeconomic variables, including the GDP, the availability of money, and the exchange rate.

High inflation rate points that the economy is experiencing macroeconomic instability which in turn discourages private saving and investment while low inflation helps the private sector by maintaining international competitiveness (Ekpo, 2016). Inflation rate is an indicator of macroeconomic instability it can have adverse effect if high and unpredictable, this introduces riskiness in long term investment (Funso, 2018). According to Ekpo, (2016), exchange rate volatility has to do with the uncommon movements of the exchange rate. Exchange rates stability also plays a major role in the stability of the overall macroeconomic environment of any country. Bulut (2018) made the assumption that devaluation alters the price of imported inputs and the supply price of capital goods because an increase in the exchange rate will deter imports and ensure that money is raised for economic investment and production. According to Boulatoff and Boyer (2017), more public expenditure fosters a climate that encourages private investment by making energy, transportation, and communications more accessible.

Pradhan et al., (2021) argue that adequate provision of infrastructure has been considered an essential feature of long-term economic growth and development. A well-functioning system of infrastructure reduces transaction costs and facilitates the mobility of goods and labor and the realization of economies of scale. Investment in public sector infrastructure affects the overall economic development through a number of channels which includes direct investment, it improves competitiveness by reducing transaction and trade costs, and it generates employment opportunities to the poor. An increase in public investment is expected to increase private investment as it allows firms to have a broader access to markets due to construction of roads, ports, railways, and so on. An increase in public investment is also expected to increase private investment by increasing the marginal productivity of capital (Cavallo & Daude, 2011). At the same time, public investment can also crowd out private investment because of a decrease in the availability of savings to the private sector and/or increase in the cost of finance (Mutuku & Kinyanjui, 2018).

China has experienced rapid economic growth and managed in thirty years to move their economy from underdevelopment and excessive poverty to an established global economy while attracting the attention of a number of developing countries among them South Africa (Naughton, 2018). China's economic growth has been phenomenal with an annual average of 9.9% from the year 1979. The highlight of China's economic growth was in 2010 with a GDP growth of 10.5%, which was equivalent to a third of the world growth. Enhanced domestic investment has been at the heart of China's growth for the last 30 years. The focus of China's approach has been more commodity than consumption driven with financing coming from significant amounts of domestic savings as well as foreign investment (Gruber & Kamin, 2017). Other stimulating factors include economic reforms, reduction in external demand, trade openness as well as enhanced public investment (Keynes, 2016). Domestic investment between 1984 and 2010 averaged 39.8% in comparison to 20.5% for African countries over the same duration (Naughton, 2018).

Proponents of the saving theory argue that investments are the equivalent of saving. The conventional belief is that interests rates help achieve equality within these economies (Keynes, 2016). Where savings exceed the investment level, interest rates decrease to

discourage savings while encouraging investment with the reverse being true. Change in interest rate will cause change in saving which will then lead to change in investment. Keynes however disagrees that the balance between saving and investment is brought about by rate of interest, instead Keynes argues that it is because of changes in income levels that bring about saving and investment balance (Keynes, 2016). Bbuba (2019) on his study evaluating the impact of saving on economic growth held that that savings create capital formation. Additionally, savings also bring about technological innovation as well as enhancing progress that lead to economies of scale while enhancing specialization leading to increased production thus GDP growth. Consequently savings lead to better utilization of scarce resources in an efficient way, enhance the level of domestic product output, income levels and employment and a result offering a solution to economic challenges such as inflation, unemployment and balance of payment deficit.

1.1.1 Global Perspective of Private Investment

In September 2017, the Gross Fixed Capital Formation for the United Kingdom was 109.72 billion US dollars. According to Gruber and KIamin (2017), this was an increase from the previous 106.82 billion USD reported in June 2017. Between March and September 2017, the average GFCF for the UK was an average of 41.06 billion USD (Gruber & Kamin, 2017). With growth for the UK expected to slow down, the trend is expected to decline. Growth in 2016 was reported at 1.8%, 1.5% in 2017 and a forecasted growth of 1.4% in 2018. The percentage growth rates indicate a decline in consumer spending levels, offset by significant growth in UK's export levels and exacerbated by decline in public investment coupled with Brexit effect (McGrattan, & Waddle, 2017). As a result, more investment will be required in the sectors of housing, transport, infrastructure and innovation. The UK government will also be required to put in place measures that will stimulate growth across all sectors of the economy through economic policies that are accommodative. In contrast, growth patterns are expected in the US. Available data shows that GFCF in the US increased from 947.71 Bn USD in June to 955.13 Bn USD IN July 2017. The average GFCF for the period between March 1947 and Sept. 2017 was 188.59 bn USD (Gruber & Kamin, 2017).

On the other hand, the Asian economies (Indonesia, Malaysia, Philippines, Thailand, Vietnam, China and India) have experienced substantial growth in Private investments (gross fixed capital formation in private sector) from 7.7% average basis from 2007-2015. The trend is expected to grow to a tune of 6.8% on average by 2019. Notably, among the Asian economies, China and Vietnam have registered the highest levels of private investments of 12.5% and 12.2% respectively between 2000-2007 on average with expected average growth of 12.5 8.3% and 12.5% respectively for the period 2015-2019(Bonga & Nyoni, 2017). In China decline in private investments is explained by a down swing in output growth figures for the first three quarters of 2016 (Hoffmann, & Schnabl, 2016). Of note, government owned enterprises has largely driven fixed investment in China. As a result, a decline in private investment has been heavily slowed down because of the overcapacity witnessed in key industrial sectors coupled with slowed market demand. Generally, East Asia is still suffering the aftershocks of the financial crisis that erupted in 1997 and 2008. Similar patterns are observable in Latin America and the Caribbean, South Asia, and Europe and Central Asia (Bonga & Nyoni, 2017).

On the other hand, European Union economies are registering positive trends in private investments. For instance, GFCF in European Union increased to 756200.90 EUR Million in the third quarter of 2017 from 744073.30 EUR Million in the second quarter of 2017 (Trading Economics, 2018). GFCF in European Union averaged 643423.65 EUR Million from 1995 until 2017, reaching an all-time high of 772121.40 EUR Million in the first quarter of 2008 and a record low of 505215.10 EUR Million in the first quarter of 1995 (Trading Economics, 2018). The substantial growth is expected to continue given that European economies are expected to experience the highest growth rate in a decade with an expected GDP growth rate of 2.2%. The growth is significantly higher than the previously estimated 1.1% in spring. According to European Commission, the growth is expected to carry on in both the Euro zone and also the EU with an estimated 2.1% in 2018 and 1.9% in 2019 (Trading Economics, 2018).

According to Gruber and Kamin (2017) private investment levels in Arabian countries are not exactly small. In the period between 1974 and 2000, the average investment rate was

24.6% which is marginally higher than that of OECD countries at 22.9% but just slightly lower than that of established economies of East Asia that averaged 29.9% investment rate. There was a substantial increase in investment from 17% in the period before oil-shock to 27% in the post-oil ((Bonga & Nyoni, 2017). According to UNCTAD (2014), the slow growth experienced in the Arab region is because of reduced investment rates.

1.1.2 Regional Perspective of Domestic Private Investment

Economic Report on Africa (2020) notes that a big number of African private businesses are small, pointing out that the private sector has few firms in the medium and large categories. This situation can be attributed to financial constraints, small and medium enterprises (SMEs) in Africa struggle to survive and grow into large firms, with most collapsing within the first three years. Small and medium enterprises (SMEs) in Africa struggle to survive and grow into large firms, largely due to financial constraints (Africa Development Bank, 2019).

According to Sakyi, Kofi and Immurana, (2016) poor private investment and saving climate has being experienced in Ghana due to macroeconomic imbalances. Political instability between the early 1970s and late 1980 contributed to reduced confidence. Inflation levels also accelerated rapidly with private savings being taxed where real interest rated went into the negative. In 1977, the rate of inflation was a high as 116%, which later increased to 122.8% in 1983. For most productive sectors, foreign exchange allocations were significantly reduced which led to reduced private sector investment. Over-inflation led to export incentives becoming ineffective. Balance of payment deficit was at an average of $162.4 million whereby the current deficit account averages $232.9 million. Poor implementation of import controls had a huge negative effect on investment as machinery; spare parts and raw material were inadequate in the critical productive sectors. Foreign exchange was also inhibited by substantial arrear on short-term debt and the heightened uncertainty on the government's economic policies (Sakyi, Kofi, & Immurana, 2016).

In Senegal, four major phases characterize private investment. These are the phases in the period between 1970 and 2000. The first phase was between 1970 and 1974. During this period, private investment grew by 4% from 8% to 12% of GDP. In the same period, public investment also increased from 5% to 7% of the GDP. The second period spanned 1975 to 1985. Within this period, private investment declined by 6% from the previous 12% to 6% of the GDP whereas public investment remained largely constant. The period 1971 to 1993 marked the third major phase in which private investment constantly fluctuated between 6 and 10 percent. Over the same period, public investment went down by 4 percentage points of the GDP. The fourth and final phase corresponded with the post-devaluation period. This period was marked by major private investment from 11% to 15% in the period between 1994 and 1998 while later declining to 11% in 1999 while growing later in 2000 to 12%. In the same period, public investment increased consistently (World Bank, 2018).

Tanzania, ranked among the least developed countries had a GDP per capita of $483.48 in the year 2012 measured at constant US$ 2005, or $1379.63 measured in purchasing power parity (PPP). Twenty five percent of Tanzania's GDP came from agricultural production. Agriculture was also responsible for employing over 70% of the total labor force in the period between 2008 and 2012 (Epaphra & Mwakalasya, 2017). The low economic growth rates in Tanzania and other developing countries is a factor of poor investment and saving (Epaphra & Mwakalasya, 2017). According to previous studies, if Africa is to make any meaningful progress in the reduction of poverty, African countries will be required to maintain a growth rate of not below 7% in the medium to long-term and which will require investment rates of not below 25% of the GDP (UNCTAD, 2017). Tanzania experienced one of strongest growth rates in the Sub-Saharan for non-oil producing countries with an average annual GDP growth rate of 6.6% and 7.2% in 2014 ((Epaphra & Mwakalasya, 2017). Despite the impressive growth rates, GDP per capita has remained substantially low.

In Sub-Saharan Africa (SSA), interest rate caps exist in 24 countries including Nigeria, South Africa, Ghana, Zambia, and Namibia. Interest rate caps in Nigeria doesn't exist as

a blanket ceiling on loans and deposits as is the case in Kenya. However, the Central Bank of Nigeria (CBN) periodically publishes guidelines for banks relating to commissions, fees, and rates for various products and services such as loans, deposits, electronic banking, overdrafts, commissions on turnover, current account maintenance fees, mortgage loans, foreign exchange charges, among others (Ojay, 2020).

Countries under the West African Economic and Monetary Union (WAEMU) have a maximum interest rate of 15 percent for commercial banks and 24 percent for microfinance institutions. All this goes to show that interest rate cap is extensively used in SSA countries. When we look at the case of Zambia, in January 2013 Zambia had introduced caps on the effective maximum lending rates by commercial banks, microfinance service providers and other nonbank finance institutions. Bank of Zambia (BOZ) introduced a ceiling on its interest rates that the non-bank institutions charged in the year 2013. The law required the interest rates charged by the institutions not to go beyond 42% and that the annual effective interest rates not exceed 30%. The effects were seen in the near collapse of the credit market credit to households, SMEs; the local currency was hard hit as lenders gave hard currency loans to non-tradable sectors (not earning foreign exchange). The law was later repealed in November 2015. The implication of removing the caps is that there is no limit as to the maximum rate of interest that financial institutions can provide (Ojay, 2020).

1.1.3 Local Perspective of Domestic Private Investment

Over the years, the Kenyan economy has seen low and abrupt changes. After gaining independence in 1963, Kenya's economic performance has been falling fairly rapidly. The government's dedication to promoting private investment helped private investment reach its peak between 1963 and 1970. Private investment fell in the years 1971 and 1977, this was ascribed to Kenya’s first oil crisis of 1973 and the severe drought that followed in 1974. Later, the dominance of the public sector drove away investment from the private sector (Wawire, 2017).

The coffee boom of 1976/1977 is credited for the fast expansion in coffee boom of 1978. Because of the boom, the average household pay and investment went up thus adding to development in investable funds. Private investment would later downfall because of failure by the public authority to make changes after the collapse of the coffee boom. The East African Community later disintegrated which prompted an absence of market for the produced items. The downward pattern in economic development of the mid 1980 is accused on the oil crisis and the government's shift from low interest policy (Wawire, 2017).

During the 1980s, the government adopted fiscal disciplinary that were aimed at borrowing that is more prudent. Through these measures, confidence may have been restored in the economy regarding future prospects thus slightly contributing to increased investment in 1986 and 1987. Through a raft of fiscal measures, Kenya sought to shift from a government controlled economy to a market driven one (Wawire, 2017).Sharp decline in private investment were witnessed in the period between 1988 and 1994. From a high of 14.5% in 1987, it fell to 11.6% in 1994. A number of factors are attributed to this decline among them introduction of structural adjustment programs by the World Bank and the IMF in 1986. It is argued that these adjustments failed to achieve the desired results. Additionally, the government embarked on increased domestic borrowing because of previous withdrawal by donors. Kenya was also undergoing radical political changes with the first multi-party elections of 1992, which led to uncertainties in the Kenyan economy thus discouraging private investment (Wawire, 2017).

Resources towards core functions of the government with the goal of enhancing productivity of the Kenyan public sector. Optimism towards the re-allocation may have led to the crowding out of private investment (Wekesa et al., 2016). However, the optimism was short-lived because declining trends marked the period between 1996 and 2002 where in 2002, private investment stood at 9.4%. The decline can be attributed to numerous factors such as 1997 general elections that resulted into tribal clashes, second physical infrastructure destruction by the heavy rains of 1998, and lastly development

expenditure cut so as to minimize budget deficit at most 2.5 percent of GDP (Wekesa et al., 2016).

An upward spiral emerged again in 2003 but did not have the robustness hoped for after the 2002 general election that brought about political and economic transformation. This is attributed to the failure to properly implement the Economic Recovery Strategy (ERS) coupled with the slow pace in implementing other reforms leading to bad relations with foreign donors (Wekesa et al., 2016). The period 2000-2010 was characterized by a major recovery of gross investment with the growth rising from 3% in the year 2000 to 13.6% in 2007 but only to fall back to 9.5% in 2008 and further to -0.2% in 2009 as part of the effects of the Kenyan post-election violence of 2007/2008. In 2010, however, the growth jumped back to 7.3% (Wekesa et al., 2016).

Kenya has the high cost of credit triggered debate on interest rate capping. Following concerns with the high cost of credit and interest rate spreads, the interest rate capping debate began in 2001, when a bill was introduced in Parliament proposing to peg commercial banks interest rates to the 91-day Treasury bill rate as CBK did not have a base rate at the time. The second attempt in 2013, called for rates to be capped consistent with the Central Bank Rate - both attempts failed largely on the strength of the arguments for free market interest rate structure. In addition, the banks were given a chance to self-regulate in terms of designing measures towards lower cost of credit. The Government initiated measures in a bid to lower the cost of credit and prevent capping of interest rates. These initiatives include the following: The Credit Information Sharing, CRBs were established to enhance credit information sharing mechanism and aid lenders in undertaking credit decisions based on credit history of borrowers (Ojay, 2020).

The KBRR and the National Treasury constituted a Committee in January 2014 to explore ways of enhancing private sector credit and mortgage finance supply in Kenya. To enhance transparency in pricing of credit, the Committee recommended introduction of a transparent credit pricing framework known as the KBRR. However, in practice, KBRR was less effective, owing to various challenges including the modalities of its computation

and the limited flexibility of its review. Moreover, whereas the KBRR framework was duly implemented, it did not satisfactorily address the public concern regarding the high cost of credit. Establishment of currency centers to help lower transaction costs associated with transporting cash over long distances across the country.

Investment levels in Kenya remain low as evidenced by data on private investment as a percentage of GDP. The highest percentage ever recorded was in 2005 when investment stood at 16.21% of GDP. But to realize the Vision 2030, private investments are expected to grow by at least 24% of GDP each year leading to the year 2030. It is therefore, imperative that we understand its determinants since low levels of investment would be a cause for concern because they affect growth and development. Similarly, low levels of investment increase the vulnerability of the economy (Mlambo and Oshikoya, 2001).

Kenya launched the Vision 2030 initiative, which aims at transforming Kenya from a low income economy to a middle income country by 2030. This project emphasizes the importance of public private partnerships (PPPs) to steer the economy to a higher level and to create employment opportunities for the youth. Challenges exist, key among them being policy formulation that can help spur private investment to promote and sustain long term economic growth. In Kenya domestic private investment on average increased from 10.67 % of GDP to 14.06% of GDP in which per capita GNI raises from 1602.5 US dollars to 2042 US dollar (Agidew, 2014).

Kenya in the period of 2000-2012: Kenya experienced GDP growth rates of 4.02% from the period of 2000- 2007 and 3.81% later on, for this result there are different assertions that lead to perform such economic growth. Among the stated factors are an increment of fuel prices, unfavorable weather conditions in the agriculture sector, which contribute a higher share to the country's GDP (i.e. more than 20%) and high costs of inputs that resulted from higher fuel prices added up together leaves undesirable effect on the economy of Kenya (CBK 2012). Furthermore, after Kenya's election in the 2007, the growth rates of the economy experienced different obstacles where the post-election violence in the 2008 and 2009 and unfavorable climate conditions especially drought

incident caused the economy to grow only 1.53 and 2.74 % respectively (Mutimba & Wanyoike, 2013). In addition, in 2011 and 2012, severe climate condition and an unstable macroeconomic environment put another undesirable effect on the growth of the economy. However, the growth rate of the economy shows relatively robust where 4.42 and 4.55 % respectively.

Before the COVID-19 pandemic, the economy was robust, expanding by an average of over 5.0 percent. The country registered an economic growth rate averaging 5.6 percent for the period from 2014 to 2019 (KIPPRA, 2020). The growth was also slightly higher than the 5.1 percent average recorded between 2008 and 2013. This is a strong recovery from the 1.5 percent growth recorded in 2008. Kenya's economy grew at an average of 3.9 percent between 1997 and 2016 despite recording a downward trend from 2.3 percent in 1997 to -0.2 percent in 2000. This growth has been attributed to a sound macroeconomic environment, political stability, heavy infrastructural public investments, and growth in domestic demand. The growth rate is however significantly lower than the targeted 10 percent annual economic growth rate envisioned in the Vision 2030 blueprint. In reaction the Government is making strides towards sectorial reforms that require Greater investments from both the public and private sectors to fill the existing gaps and ensure that more people have access to health, affordable decent housing, and education.

Kenya is midway through implementing Vision 2030 which envisages attaining a 10 percent GDP growth with an investment rate of 30 percent of GDP (GOK, 2020). In implementing MTP I and II, investment value has increased steadily but a contribution to GDP remained constant at around 20 percent. The realized investments fall short of the set targets. For instance, total investments were 20.4 percent of GDP against the target of 25.0 percent during the First MTPI, whereas it was 20.1 percent in the second MTP against the target of 28.0 percent. Total investments as a ratio of GDP remained relatively unchanged between 2013 and 2015 before declining in 2016 (Kippra 2020). Investments were largely dominated by public investments whereby public spending on infrastructure accounted for 10.1 percent of the growth in the period between 2005 and 2018. However, there was a significant decline in investments in 2016 due to a substantial decline in

investments in transport equipment, civil works, and residential buildings. This performance was below the 30 percent targets set in the MTP II for all the years considered partly because of delays in the completion of public investment projects.

While the investment rate remained constant at 20.0 percent, total investment value increased during the MTP II period compared to MTP I. Further, the savings-investment gap persisted and has remained a challenge in boosting investments. Gross savings remained low, ranging between 10 percent and 13 percent of GDP), resulting to a wide savings-investment gap. While poverty levels have declined in the last decade, a lot more growth in economic activity is required to address persistent development challenges.

According to Spratt (2013), the growth of the private sector has positive effects on growth for developing countries. It is widely accepted that the private sector, through its demand for investment and consumption, is the engine of growth (OECD, 2007). The private sector plays a crucial role in generating wealth, delivering jobs, and reducing poverty. The Kenya Investment Policy (draft of June 2017) provides an opportunity to strengthen the institutional structures to support growth. In support of this Policy, the Kenya government has put in place incentives to investors intending to set up firms within the Special Economic Zones (SEZs) and a legal framework for public-private partnership (PPP) to facilitate private investments in key areas such as public infrastructure, housing, and innovative technologies. Building on successful experiences in its energy sector, the government is committed to mobilizing private investment in infrastructure with PPPs (World Bank, 2018). Equally, Kenya has signed 19 Bilateral Investment Agreements (BITs) with various countries to promote and facilitate foreign investments, out of which 11 BITs are in force.

The importance of infrastructure for economic development cannot be gainsaid, as the superstructure of Kenya's overall wealth hinges on it ((Wekesa , kosimbei and wawire, 2016). As presented in the second Medium Term Plan, 2013–2017 (Republic of Kenya 2013), infrastructure plays a key role in the economy and constitutes the wheels, if not the engine of development. Reliable, adequate, and quality infrastructure will increase

economic productivity, lower production costs (enhancing efficiency in production), improve quality of life, raise the country's regional and global competitiveness, attract foreign direct investment (FDI) and help in modernizing the economy and facilitating the distribution of goods and services. As a result, the Kenya has significantly expanded investment in economic infrastructure in recent years which now averages 21 percent of GDP, accounting for about half of the development budget. The budget for economic infrastructure sectors (energy and petroleum, roads, railway, ports and other transport and ICT) has quadrupled in nominal terms over the past 10 years.

The government has identified 69 projects in transport, energy, education, water, sanitation and health that will be achieved through public-private partnerships (PPPs). Kenya's expansion of public infrastructure investments is aligned with global trends and priorities. Low-income countries spent approximately 35 percent of their public expenditure on infrastructure while the share for middle-income countries is around 25 percent. For both lower middle-income and middle-income countries, the trend has been towards increased public investments as a share of GDP. Equally, Kenya is also among the countries experiencing a significant growth in retail, entertainment and lifestyle facilities and as a result a rise in real estate activity. Retail, Entertainment and Lifestyle facilities (REL), modern office parks, and hotel space are all attributed to expansion into cities, a growing middle class, as well as high yields in retail property (Deloittes, 2018).

Globally, the G20 emphasizes infrastructure investment as a growth driver and the Financing for Development agenda acknowledges the key contributions of robust physical infrastructure for achieving the Sustainable Development Goals (SDGs).

According to the World Bank's Logistics Performance Index, Kenya has improved its ranking on the index from being number 76 out of 150 countries in 2007 to being number 42 out of 160 countries in 2016. On the quality of trade and transport- related infrastructure. Kenya scores of about 3 out of 5, way above other Sub-Saharan Africa nations. However, the Efficiency and effectiveness of public investments in Kenya seems to have declined in recent years. For the period 2008-12, investment contributed 1.9

percentage points to GDP growth compared to 0.9 percentage points in 2013-15, which was even lower than 1.1 percent for the period 2003-07 (World Bank 2018).

Kenya's focus on infrastructure spending has increased its gross fixed capital formation (GFCF) ratio, however only marginally from 18% of GDP in 2001 to peak at 23% of GDP in 2014 – on par with the SSA average. This includes spending on land improvements, equipment purchases, the construction of roads and railways, as well as social, commercial, and industrial buildings. Future room for infrastructure construction activity exists, with regional peers including Ethiopia and Tanzania spending between 30% and 40% of GDP on the same, in recent years.

Kenya already launched the Vision 2030 initiative, which aimed at transforming Kenya from a low-income economy to a middle-income country by 2030. This project emphasized the importance of public-private partnerships (PPPs) to steer the economy to a higher level and to create employment opportunities for the youth. Challenges exist, key among them being policy formulation that can help spur private investment to promote and sustain long term economic growth. In Kenya domestic private investment on average increased from 10.67 % of GDP to 14.06% of GDP in which per capita GNI raises from 1602.5 US dollars to 2042 US dollar. Unpredictable macroeconomic environment had a negative impact on economic growth. However, the economy's growth rate is rather solid, at 4.42 and 4.55 percent, respectively.

1.2 Statement of the Problem

The envisioned economic growth in Kenya is anchored on increase in private and public investment specifically, private investments were expected to rise from 15.6% of GDP in 2006/07 to 22.9% in 2012/13, and to over 24% of GDP during the period 2020/21 to 2030 (KIPPRA, 2017). At 20.4 % of GDP in 2021 and 19.2 % of GDP in 2022, this remains below 25% required to sustain a robust private investment for economic growth (World Bank, 2017). Which is key to achieving the sustainable development goals and vision 2030.

Notably, Kenya's Private sector investment has continued to perform below expectations (Gitonga, 2017). Wekesa et al., (2016) notes that private sector contribution is more meaningfully to economic growth than the public sector. If the government is to attain the anticipated 10%, economic growth by attracting the required level of private investment it means that it must put in place an enabling environment through enacting appropriate macroeconomic policies. To do this however it is important to know which of the macroeconomic variables play the bigger role in attracting private investment and maintaining them at the desire level for best results, hence the need for this study.

In Africa studies have been conducted on how macroeconomic variables affect private domestic investment. Bosco and Emerence (2016) using data for the period 1995 to 2009 examined the effect of GDP, interest rate and inflation on private investment in Rwanda, Atoyeobi, Adekunjo and Falana (2012) studied the patterns of private domestic investment in Nigeria for the period between 1970 and 2012. Ayeni (2014) studied the key factors that drive private domestic investment in Nigeria for the period between 1979 and 2012. Kalu and Onyinye (2015) using the period between 1970 and 2012 examined the link between private investment and economic growth in Nigeria. George-Anakwuru (2017) looked at the impact of interest rate on private domestic investment in Nigeria. Bakare (2011) examined the determinants of private domestic investment in Nigeria using data for the period 1978 and 2008.

It is worth mentioning that findings on the effect of macroeconomic variables on private domestic investments have come to varied conclusions based on the literature analyzed. Macroeconomic variables have a beneficial effect on private domestic investment, according to Bosco and Emerence (2016), Kalu and Onyinye (2015), and Esbalew (2014), however Ayeni (2014) found no statistically significant association between macroeconomic variables and private domestic investment.

Several studies have been conducted on growth of domestic private investment in Kenya. Gachoki and Nyang'oro (2016) studied the impacts of capital flight on private investment in Kenya, Mwenda (2017) researched on how to strengthen a vibrant domestic investment

market for economic growth in Kenya, Kamundia (2015) studied the effects of public debt on private investments and economic growth in Kenya, Mbaye (2014) researched on determinants of domestic private investments in Kenya, Njuru (2020) studied the effects of fiscal policy on private investments in Kenya. From the literature reviewed, it is worth noting that no study has looked at the moderating role of government expenditure on infrastructure on the relationship between macroeconomic variables and growth of domestic private investment in Kenya. This study will fill in on this existing knowledge gap.

1.3 Objectives of the Study

The study was guided by the following general and the specific objectives;

1.3.1 General Objectives

The general objective of this study was to establish the effect of macroeconomic variables on growth of domestic private investment in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were-

i. To determine the effect of the inflation on the growth of domestic private investment in Kenya.
ii. To establish the effect of money supply on growth of domestic private investment in Kenya.
iii. To examine the effect of interest rates on the growth of domestic private investment in Kenya.
iv. To explore the effect of exchange rates on growth of domestic private investments in Kenya.

v. To determine the moderating role of government expenditure on infrastructure on the relationship between macroeconomic variables and growth of domestic private investment in Kenya.

1.4 Research Hypotheses

The researcher tested the following hypotheses:

H_{01}: There was no significant relationship between inflation rate and growth of domestic private investment in Kenya.

H_{02}: There was no significant relationship between money supply and growth of domestic private investment in Kenya.

H_{03}: There was no significant relationship between interest rates and growth of domestic private investment in Kenya.

H_{04}; There was no significant relationship between exchange rates and growth of domestic private investment in Kenya.

H_{05}: Government expenditure on infrastructure did not moderate the relationship between macroeconomic variables and growth of private domestic investment in Kenya.

1.5 Significance of the Study

1.5.1 Kenyan Government

The Kenyan Government and policy makers may use the findings of the research for future policy formulation and in determining the effectiveness of and the sustainability of macroeconomic policies adopted and implemented. Key areas of development would be identified by this study whose major significance would enable governments, regulatory bodies, and agencies to understand the relationship between macroeconomic environment and growth of domestic private investment as well as the role of public investment in the relationship between macroeconomic variables and domestic private investment.

1.5.2 Investors

Based on the study outcomes, a precise model would be constructed to forecast and understand the future trends in domestic private investment that would allow the investors to maximize their investment profits in the private sector. The study outcome may enable domestic and foreign investors seeking to invest in the private sector or expand their investments, make robust investment decisions, beware of their risk exposure and detect early signals of investment opportunities.

1.5.3 Central Bank of Kenya

The study outcomes may help the central government and other policymakers to take advantage of positive externalities linked to the private sector developments and devise strategies to minimize unforeseen shocks. Implementing such policies would benefit private and public companies and individuals seeking private sector investment at lower transaction costs. The findings of this study will help the Central Bank of Kenya evaluate its present monetary policy and determine whether it encourages domestic private investment in Kenya.

1.5.4 The National Treasury

The current study's findings may also be useful to the National Treasury in analyzing its domestic investment policy in order to make it more appealing and favorable to private domestic investors in Kenya. This is because the current investigation's findings revealed a major effect of inflation rate and domestic private investment. This research also provided data-driven evidence to help Kenyan policymakers create strategies to support private domestic investment growth.

1.5.5 Financial Institutions

Financial institutions may find information on domestic private investment trends useful in devising financing products. At the same time, investors and developers stand to gain

from the study by ascertaining periods of over or undervaluation in the private sector and appreciate the role of public investment trends in the formulation of the investment strategies. The study's outcome would guide them on when to buy, sell, or develop to maximize their investment returns.

1.5.6 Academicians and Researchers

The study adds to the existing knowledge in investment theory by establishing the effect of macroeconomic variables on private investment growth in Kenya and also offers policy strategies to address domestic private investment development. Private investment is seen as a potent tool for sustaining and expanding an economy's capital formation and production capability. The study's findings will aid scholars in finance, investment, economics and public policy by increasing their understanding on the effect of macroeconomic variables on the growth of private domestic investment in Kenya based on the study's multiple significance linkages.

1.6 Scope of the Study

The study utilized annual data of the macroeconomic variables and domestic private investment as a ratio of GDP for the period 1972 to 2022. This period was chosen since it was recent to the study. The private sector in Kenya equally formed a unique area of study as it contributes about 25 percent to Kenya's national Gross domestic product (KNBS, 2018) and produces about 60 percent employment in Kenya . Equally, required data was available for Kenya permitting the analysis of macroeconomic variables effect on domestic private investment.

The sample period equally gave an adequate sample size for examining the effects of macroeconomic factors on domestic private investment. Further justification of the sample period emanated from the fact that significant events occurred in the Kenya economy that may have influenced the private sector investment. These events include a number of

general elections, revision of land laws (in 2012), rebasing of national accounts (in 2014), and introduction of interest rate capping laws (in 2016).

The proxies used for macroeconomic variables were inflation rate, interest rate, money supply, and exchange rate. Government expenditure on infrastructure was incorporated in the study as a moderator variable in the relationship between macroeconomic variables and growth of domestic private investment. The selection of study variables was inspired by the previous theoretical and empirical works, especially the Accelerator theory of investment associated with Thomas Nixon.

1.7 Limitation of Study

Finding key secondary data on domestic private investment and other proxies for macroeconomic factors from Treasury proved difficult for the researcher. The research was able to overcome this problem by limiting the time period for which data were accessible that is for the period 1972 to 2022.

This study did not consider tax expenditure as a moderator variable as earlier intended, as very little data was available, instead the researcher used government expenditure on infrastructure as the moderator since it was highly correlated with tax expenditure as noted in the study by (Mutuku, 2020).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The main objective of this chapter is to structure the study by pointing out the general conclusions found in the already existing literature on theoretical review and empirical review which are of value to the current study. Discussed in this chapter are the theoretical and empirical literature on macroeconomic variables and the growth of domestic private investments. To conclude the chapter, a conceptual framework is developed, research gaps are identified and a summary of the chapter which serves as the foundation for the current study.

2.2 Theoretical Review

Theoretical reviews provide insights into the researcher's reasoning by offering a conceptual model to aid in understanding the theory and the relationship between various components uncovered in the research (Sekaran & Bougie, 2016). The objective of selecting an appropriate theory was to establish a framework that can be employed to explain and forecast investment behavior that would help establish effect of macroeconomic variables on growth of domestic private investment in Kenya. To identify an appropriate theory in studying the effect of macroeconomic variables on domestic private investment in Kenya, the study applied the following theories: Deflation theory, Loanable funds theory, theory of price, theory of purchasing power parity (PPP) and the theory of public expenditure as explained below.

2.2.1 Deflation Theory

Deflation theory was propounded by Fisher (1933). The theory asserts that a decrease in inflation rates bring about a decline in the general price level, which subsequently brings down the business net worth, reduced profitability and thus, precipitating bankruptcies in

institutions. The cycles cause complicated disturbances in interest rates and a decline in the value of money. These complicated disturbances are described as both macro and micro forces (external and internal factors) impacting on the level of over indebtedness which exists among debtors and/or creditors which can result in loan default (Nzuve, 2016). The perspective was of the view that diminishing levels of prices indicate low inflation which results in the depreciation profitability of businesses thereby triggering bankruptcies and collapses of such organizations. The phases cause results in random rates of interest movements leading to a fall in money value. The movements are regarded as forces within macro and micro environment which are intrinsic in the operating atmosphere of business as it exerts a level of indebtedness with borrowers and lenders ultimately bringing about loan default (Nzuve, 2016). Therefore the impact of inflation rate on performance is dependent on how well it is anticipated. When well anticipated, the impact is positive as interest rates are adjusted accordingly by management of banks to absorb such changes and vice versa.

According to this theory, if the only channel through which the persistent increase in price levels is transmitted from the monetary policy is exclusively through financing, then inflationary pressures could be managed without policy adjustments if there exists alternative and sustainable sources such as external financing. This is however not always the case in practice. Practically it is necessary that there is some fiscal adjustments because either the fiscal policy has exerted too much pressure for price increases through aggregate demand channels or the available alternatives for financing are insufficient. Both challenging incidences could occur concurrently which arrives at the same results. Indeed, good amount of sustainable fiscal adjustments has proven to be effective in successful disinflation.

The theory is relevant to this study as it asserts that high rates of inflation will negatively affect growth of domestic private investment in Kenya. Conversely, decrease in rates of inflation, increase the chances of private investors to purchase investment stock and therefore positively affect growth of domestic private investment in Kenya (Nzuve, 2016). The anticipation of inflation rate determines its effect on the banks' profitability. It is

positive when it well anticipated, as management of banks will quickly adjust interest rates to cater for such changes and vice versa (see Nzuve, 2016). Deflation Theory Therefore was relevant to the study and was the basis for determining the effect of inflation rate on growth of domestic private investment in Kenya.

2.2.2 Loanable Funds Theory

This theory can be attributed to the works of British economist Dennis Robertson and Swedish Economist Bertil Ohlin (Robertson, 1936). The theory proponents argue that service quantity is affected by risk only to the extent that assortment of diverse risk require dissimilar levels of information handling. The theory argues that loanable funds can be categorized as inputs that pass through commercial banks as intermediaries. The theory also establishes the ability to separate the use of loanable funds and other production function of value added in the optimization problem (Fixler & Zieschang, 1999).

Loanable funds can be defined as the amount of money offered for lending and which is demanded by borrowers for a given period of time (Jakab & Kumhof, 2015). The model for lending depends on the interaction between potential borrowers and savers. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment in the economy.

This theory is regarded as a dynamic and optimizing theory of operations which incorporates production model, financial intermediaries and other portfolio theories. Lindner (2013) clarifies that the unified model provided the relationship between asset portfolio risk and the output of services. Portfolio risk on the other hand is used to determine the return rates on loans and any other borrowed funds. The bank in return generates discount rate which is used to derive the present value of future profits parts.

For borrowing to take place the return from investments must be greater than cost of borrowing. However, the borrowers would not be able and willing to repay their loans if

the rate of interest charged on loans is higher than the returns from the investments. Savers on the other will only be willing to save and lend on the prospects of earning interest out of the money lend out. Borrowers and lenders may be postponed their activities because of unfavorable time preferences (Kamasa et al., 2023).

When the question of measuring the bank output is resolved, theory of loanable funds contributes immensely to a large literature on bank production as explained by bank and industry characteristics and macroeconomic variables (Lindner, 2013). Commercial banks have internal characteristics that define how decisions are made that affect funds available as loans. The commercial banking industry also has common characteristics that are prescribed by the regulator and the nature of business. These characteristics determine the funds available as loans. The economic conditions and performance (economic factors) affect the funds at the banks' disposal to provide as loans. For example is inflation were high, savers would require more money to spend around and as such reducing the loanable funds (Were & Wambua, 2014).

The GDP of a country also determines the funds available in the sense that if the economy had a high growth, then the loanable funds would be more. The model of loanable fund is argued to be able to resolves conflicts in the bank production literature especially on the role of deposits. The theory argues that deposited funds form significant inputs in generation of new loans but transaction services are associated with bank output. The theory further provides the foundation for bank output measurement by identification of the value added components (Borio & Disyatat, 2015). Loanable Fund Theory was the basis for the analysis of effect of money supply on growth of domestic private investment in Kenya.

2.2.3 Keynesian Theory of Investment

Keynes (1936) laid emphasis on the central role of investment as a driver influencing aggregate output, employment and short term fluctuations in economic activities. The theory is based on marginal efficiency of capital and liquidity preference pillars. The

theory stresses that investment is as a result of firms matching the expected return on new capital, referred to as the marginal efficiency of capital (MEC), and with the cost of capital, which depends principally on the real interest rate. Keynes articulated an investment function of the form I = I0 + i(r), where I is investment, I0 is autonomous investment and i(r) is interest rates. The theory put forward that investment is inversely proportional to interest rates. The higher the interest rate, the less likely the firm will be willing to undertake any given investment project. Keynes stated that firms rank various investment projects depending on the internal rate of return (IRR), or marginal efficiency of investment.

The theory upholds that at lower rates of interest, more capital projects appear financially viable while higher interest rates lead to some projects being adjourned or cancelled since the cost of borrowing to finance investment become higher. According to the theory since investment is volatile and dependent on firms' expectations of the profitability of investment, so long as the expected yield on their investment exceeds the real interest rate, new investment will take place. Keynes rejected the notion that investment was based wholly on technological conditions of capital productivity, but stressed on monetary factors and finance and uncertainty as the basic causes of investment (Fazzari, 1989).

The proponents of this theory opine that increasing real interest rates in a financially repressed economies may encourage an increase in the flow of deposits that would allow increase in investment. On the other hand, a higher real interest rate may raise the hire cost of capital and therefore reduce investment. Ndikumana (2014) posited that accessibility of credit by the private sector which is determined by the cost of capital is an important determinant of domestic private investment. High interest rates will discourage investors since it erodes the profits expected from the investment.

This theory was critical to this study as it assessed the effect of interest rates on growth of domestic private investments in Kenya. Research shows that interest rates can either encourage or discourage accessibility to credit by the private sector, which will in turn affect investment in the sector hence economic growth. George-Anakwuru (2017)

suggested that growth in domestic private investment is inversely related to interest rates. Kaputo (2011) put forward that, lending interest rate has an important negative effect in the long-run on growth of domestic private investment, high cost of investment capital depresses investment by local firms.

2.2.4 Theory of Purchasing Power Parity (PPP)

The theory of purchasing power parity (PPP) was originated by Cassel (1918) and forms the framework for assessing the long-term movement of exchange rates. The theory simply asserts that there is an impulse-response relationship between exchange rates and prices (Chortareas & Kapetanios, 2013). According to this theory, identical goods and services in different countries should cost the same in those countries in the long run. The theory is based on the law of one price which contends that the price levels adjusted for exchange rate alterations should be matched worldwide (Kidwell et al, 2008; Shapiro, 1992). Additionally, the theory is linked to the arbitrage theory which assumes that the exchange rate will adjust to eliminate the arbitrage opportunity of buying a product or service in one country and selling it in another country (Mishkin & Eakins, 2019). Specifically, PPP theory implies that a basket of goods should cost the same in different countries regardless of the country in which the goods are purchased after an adjustment has been made to the exchange rate between the countries.

The absolute variant of the PPP states that the exchange rate between the currencies of two countries is equal to the ratio of the price levels in the two countries (Majok, 2015). The absolute form of PPP is based on the notion that in the absence of international trade barriers, consumers shift their demand to areas with low prices indicating that similar baskets of goods in two different countries should be of a similar cost when priced using the same currency (Njuguna, 2016). The relative form of this theory posits that exchange rate changes over time are assumed to be dependent on inflation rate differentials between countries (Sarno& Taylor, 2003). This version is based on the logic that importers and exporters would respond to variations in the relative costs of market baskets to maintain the law of one price, at least on average (Al-Zyoud, 2015). In the long run, the PPP

exchange rate is thought to represent a target toward which the spot exchange rate is slowly drawn over time. However, this theory has been criticized due to its inapplicability in the short run where the validity of the short run co-movement between exchange rate and relative price level between two countries has been rejected (Kwok, 2021).

This theory is relevant for this study as the purchasing power parity (PPP) exchange rates can be used to convert income data to a common currency which is a better way to make international comparisons because it compensates for the differential costs of living. The PPP was used as a conversion factor to transfer data from the denomination in Us Dollars to Kenyan shillings for inter country comparisons making it acceptable as a predictor of long-run purchasing power parity. Based on this theory an equilibrium exchange rate will ensure that the value exchanged can purchase the same basket of goods and services from either of the countries involved. Based on this model, the study derived an exchange rate that describes the impact of the effect of exchange rate on domestic private investment in Kenya in the short and the long run. Therefore, the theory was relevant to the dependent and the independent variables of the study. By extension, the main objective of the study was fulfilled.

This theory is relevant for this study as it explains the value of one currency in terms of another country's currency based on the basket of goods and services it can purchase regarding the demand and supply. According to this theory, the ideal exchange rate is one that guarantees that the money exchanged can be used to buy the same assortment of products and services from either of the two concerned countries. This theory is important to this study because it links fluctuations in the exchange rate with changes in investments, especially when it comes to the nominal effective exchange rate, which compares any currency to the Kenyan shilling.

2.2.5 Musgrave Theory of Public Expenditure Growth

This theory was put forward by Musgrave in 1969, he found that changes in the income elasticity of demand for public services was in three ranges of per capita income. He

advances that at low levels of per capita income, demand for public services tends to be very low, this is so because such income is devoted to satisfying primary needs and that when per capita income starts to rise above these levels of low income, the demand for services supplied by the public sector such as health, education and transport starts to rise, thereby forcing the government to increase expenditure on them. The theory also observes the changing role of the public sector during the development process and therefore relies on structural factors in order to explain government growth (Gemmell, 2001). According to Musgrave, economies situated in an early development stage are faced with a high demand of public capital formation in order to install a basic infrastructure. At later development phases, institutions for private capital formation become more developed and therefore the share of public expenditure may decrease (Musgrave 1969)

Musgrave and Musgrave (1989) opined that as progressive nations industrialize, the share of the public sector in national economy grows continually. The theory states that there is a functional relationship between the growth of an economy and the growth of the government activities; so that the government sector grows faster than the economy (Musgrave, 1969). Thus, all kinds of government, irrespective of their level of intentions (Peaceful or war), and size, indicate the same tendency of increasing public expenditure. In other words, Wagner's law states that, as per capita income of an economy grows, the relative size of public expenditure grows; the relative size of public expenditure grows along with it. As the economy grows, there will be increase in the number of urban centers, with the associated social vices such as; crime, which require the intervention of the government, to reduce such activities to the barest minimum. Large urban centers also require internal security, to maintain law and order. These interventions by the government have cost, leading to increase in public expenditure in the economy.

This theory implies that growth in government capital outlay can translate into more investment which in turn brings about positive economic growth as well bring about growth. However, growth in government recurrent expenditure does not bring about significant growth in the economy. This also implies that the causal effect of economic

growth on government capital spending is more significant when compared with government recurrent expenditure.

2.3 Conceptual Framework

Lopes (2015) define a conceptual framework as the research base of the entire research. It's a developed, represented, and elaborated system of links between variables identified from literature surveys, questionnaires, observations, and interviews (Kothari, 2017). Kothari (2017) defines an explanatory variable as one that affects the response variable. This research examines how inflation, money supply, interest rate, and currency rate affect Kenyan growth of domestic private investment and whether public investment moderates the relationship. The conceptual framework variables are the result of theoretical and empirical literature reviews (Bonga & Nyoni, 2017). The diagrammatical representation of both dependent and independent variables is presented in Figure 2.1.

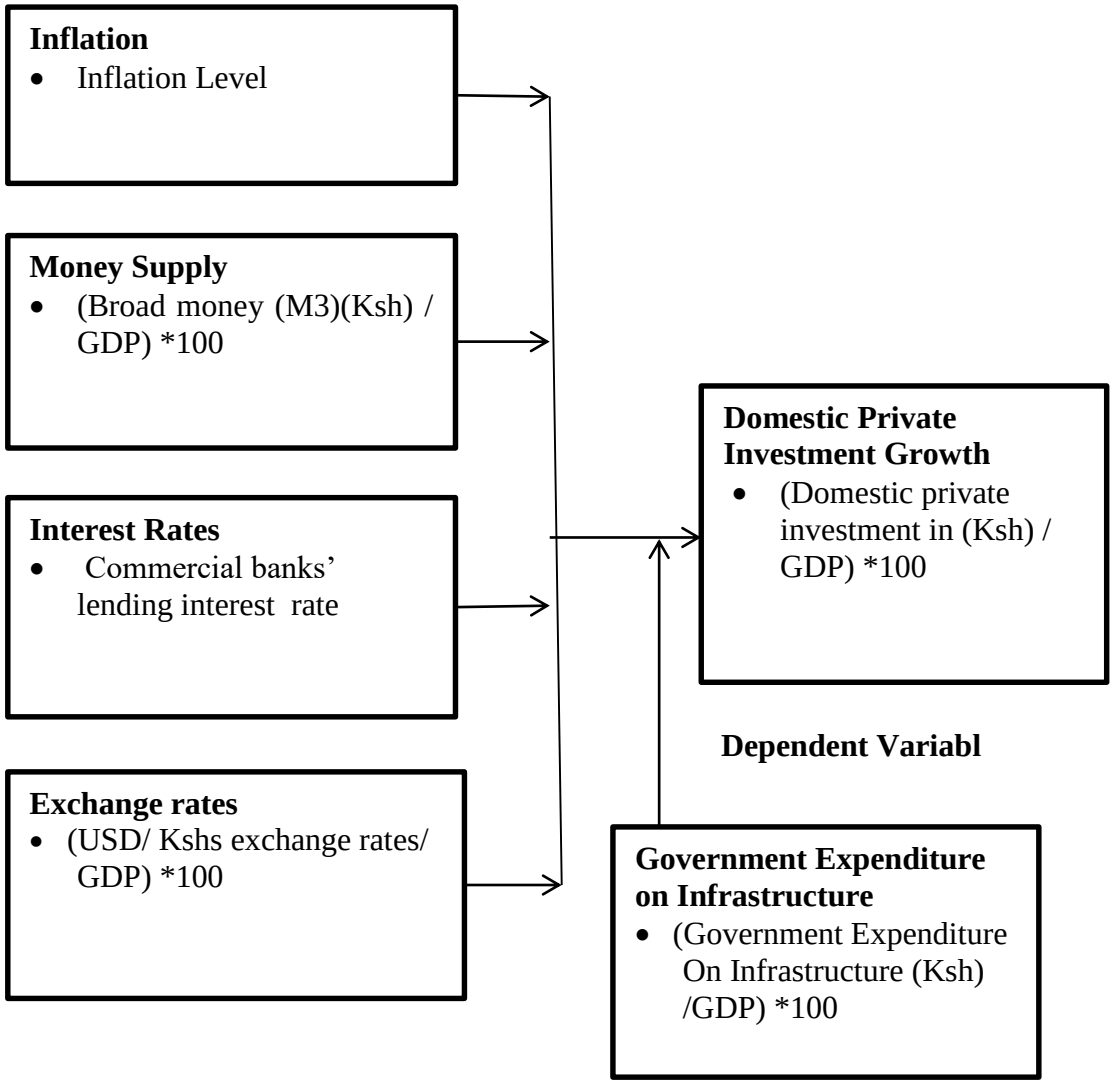

Figure 2.1: Conceptual Framework

2.3.1 Inflation Rate

Batu (2016) characterized inflation as the consistent increment in the price level, maintained over some stretch of time. Inflation might be caused by a persistent increment

in the supply of cash, a consistent lessening in the interest for cash, or a blend of the two. Government might just and frequently increment the cash supply ceaselessly. In the event that the interest for cash were fixed, at that point the price level would develop at indistinguishable rate from cash supply. Rising genuine wages for the most part cause the interest for cash to ascend after some time. This tempers the inflationary impact of cash supply development, thus the price level commonly develops more gradually than the cash supply. All things being equal, a higher rate of cash supply development is relied upon to cause a higher rate of inflation (Batu, 2016).

Inflation rate is the yearly expansion in the cost of a crate of labor and products that are bought by purchasers in an economy. Inflation rate hence gauges the progressions after some time of the customer costs or the Gross domestic product deflator which considers costs of labor and products created in the country. This rate cost for most everyday items is determined utilizing the shopper cost list in Kenya (Batu, 2016). Nwakoby and Bernard (2016) characterizes expansion as a supported ascent in costs in all cases rather than relative changes in cost of labor and products. It alludes to a phenomenon where the typical cost of merchandise is on rising trajectory for a while.

Nwakoby and Bernard (2016) takes note of that the central proportion of price inflation is the inflation rate, the annualized rate change in a general price index (typically the Consumer Price Index) after some time. Inflation's consequences for an economy are different and can be simultaneously positive and negative. Unwanted impacts of inflation incorporate a reduction in the genuine estimation of cash and other monetary things after some time; vulnerability about future inflation may cripple investment and sparing, or may prompt decrease in investment of beneficial capital and increment reserve funds in non-creating resources. This can diminish in general economic efficiency rates, as the capital required to retool organizations turns out to be more slippery or costly.

According to Nwakoby and Bernard (2016) inflation a tax on genuine parity, diminishes genuine comes back to investment funds which thus causes an educational grinding burdening the financial framework. These financial market contacts results in credit

apportioning and along these lines confine the accessibility of investment lastly this decrease in investment unfavorably influences economic development. The significant impact of inflation on firms is to debilitate investment. High inflation carries with it less unsurprising profits for capital obtained and the additionally the desire that interest will fall later on. This debilitation of investment is one of the fundamental reasons why the administration wishes to restrain inflation. Low inflation will support investment and an assistance organization build up a long haul see.

As indicated by Brima and Brima (2017) monetary policy ought to be fixed to accomplish single digit inflation since investors both private and foreign may not invest in a domain with high inflation rate. The structure conceives a backwards connection among inflation and private sector investment as increment in the rate of inflation may dishearten private sector investment.

2.3.2 Money Supply

Money supply can be characterized as the aggregate load of money circling in the economy. The flowing money includes the cash, printed notes, money in the store accounts and as well as other fluid resources. Valuation of the money supply assists experts and policy creators with framing the policy or to modify the current policy of expanding or decreasing the supply of money. The valuation is critical as it eventually influences the business cycles and along these lines influences the economy (Okoroafor, 2020).

Different measures of money supply are in existent, they include M0, M1, M2 and M3. These categories depend on a country; this could be because of institutional framework or arbitrary specifications. The Central Bank of Kenya (CBK) defines M1 to include coins and notes circulating in the economy and other money that can be easily converted into cash. M2 includes M1 and short time deposits in banks and 24-hour money market funds. M3 consists of M2 and includes longer-term time deposits and money market funds with

more than 24 hour maturity period. M1 is also referred as narrow money while broad money describes M2 and M3 (Okoroafor, 2020).

Baumeister and Hamilton, (2019) take note of that there are a few standard proportions of the money supply including, M1, M2 and M3. The monetary base characterizes the aggregate of money available for use and save adjusts (deposits held by banks and other safe organizations, for example, miniaturized scale financing establishments in a given nation). M1 is characterized as the entirety of cash held by people in general and exchange deposits at the safe foundations, financial organizations which acquire their assets predominantly through deposits from the general population, for example, commercial banks, savings and advances affiliations, savings unions and credit unions M2 alludes to M1 in addition to deposits issued in sums not as much as $ 100,000 standard cash and retail showcase money. M3 is considerably more wide and incorporates M2 plus expansive time deposits, huge money showcase assets and repurchase assertions, which are financial instruments for the most part utilized by vast organizations and establishments. In Kenya, this is finished by the Central Bank of Kenya through its half-yearly monetary policy reports issued under the Central Bank of Kenya Act, CAP 491 (CBK, 2017).

Money functions as a medium of exchange, a store of value and a unit of account. Money reinforces all sectors of the economy and guarantees operation of economies. In an economy, the total demand for money is a result of money demanded by households, firms and government, each with different money demand function. Money provides liquidity by enabling transactions and can earn interest. Demand for money results from the trade-off between the liquidity advantage of holding money and the interest advantage of holding other assets (Baumeister & Hamilton, 2019). Brima and Brima (2017) utilized IS-LM model to clarify the effect of money supply on Private Investment. Government borrowing lessens the measure of accessible domestic savings expediting upward weight the level of interest rates as the offer of treasury bills and securities decreases money supply available for use while government spending places the money back available for use (Baumeister & Hamilton, 2017).

2.3.3 Interest Rates

The cost that borrowers incur to use the money they borrow from lenders or financial institutions, as well as any fees associated with lent assets, is known as the interest rate (George-Anokwuru, 2017). Bwire et al., (2017) claims that interest might be compared to paying rent on money. Interest rates serve as a price for money that takes into account market information about anticipated changes in the purchasing power of the currency or upcoming inflation (Bwire et al, 2017). According to Kidwell et al. (2016), interest rates are the percentage of money that the lending specialist charges for using its funds. The annual rate, which is how interest rates are typically expressed, is based on an annual basis (APR). The interest rate is the cost borrowers pay to use the money they borrow from lenders or financial organizations as well as any costs related to lent assets (George-Anokwuru, 2017). According to Bwire et al., (2017), paying interest is like paying rent on money. Interest rates act as a price for money that incorporates information from the market regarding predicted changes in the value of the currency or impending inflation (Bwire, 2017). Interest rates are the percentage of money that the lending specialist charges for using its funds, according to Kidwell et al. (2016). Interest rates are frequently expressed using the annual rate, which is calculated on an annual basis (APR).

The Keynesian and Monetarists sees loan fees order the conversation on whether changes in financing costs influence private speculation. One school suggest that it meaningfully affects private venture while the other school suggests that changes in loan costs essentially influence speculation (Becker, 2017). Haberler (2017) offers another enormous point of view when she communicates that the veritable loan fee is the cost at which the inventory of and premium for capital are thought about where capital is given through saving, and is mentioned for investment. The Keynesian school believes that loan fee is principally a financial wonder that is directed by the supply of and premium for cash. Among this school, changes in loan fees affect investment. One of the objects of this investigation is to survey the effects of loan fee on development of domestic private investment. In this way, the accompanying speculation was proposed:

2.3.4 Exchange Rate

Exchange rate is a value that a currency has contrasted with another currency (Alagidede & Ibrahim, 2017). Udoka, Chris and Roland (2012) expressed that the exchange rate can be isolated into two classes, the fixed exchange rate, and adaptable exchange rate. In a fixed exchange rate, it is set by the administration, though the adaptable exchange rate is set by the market with or without the impact of the legislature in the push to balance out the monetary. As indicated by Alagidede, and Ibrahim, (2017), the exchange rate of the currency in which a portfolio holds the greater part of its investments verifies that portfolio's genuine return. A declining exchange rate obviously diminishes the buying intensity of wage and capital additions coming about because of any profits. In addition, the exchange rate impacts on other pay factors, for example, interest rates, inflation, and even capital increase from domestic securities. While exchange rates are controlled by various complex factors that frequently leave even the most experienced financial specialists flummoxed, investors should, in any case, make them comprehend of how currency values and exchange rates assume an essential job in the rate of profit for their investments.

According to George-Anokwuru (2017), the ratio between a unit of one currency and the amount of another currency for which that unit may be exchanged at a particular moment is known as the exchange rate. The relationship between domestic and international prices for goods and investments is the exchange rate of currencies. Also, the currency rate may improve or decline. When less domestic currency is exchanged for a unit of foreign currency, favorable conditions exist; nevertheless, when more domestic currency is exchanged for a unit of foreign currency, the exchange rate depreciates. Economic history has demonstrated that there are two regular ideas of exchange rate specifically ostensible exchange rate and genuine exchange rate. The ostensible exchange rate is the quantity of a unit of domestic currency that must be offered up to get a unit of foreign currency. In other words, the ostensible exchange rate is the price of domestic currency in term of foreign currency. Therefore, the following hypothesis was proposed:

2.3.5 Government Expenditure on Infrastructure

The Organization for Economic Cooperation and Development (OECD 2002), defines infrastructure as a structure of public facilities in a nation or state, together with roads, national buildings and power lines. The investment industry emphasizes on the economic and financial characteristics of infrastructure assets. In his study of the infrastructure as an asset, Inderst (2010) categorizes economic infrastructure to include transportation and energy. The public infrastructure includes educational institutions, and health care amenities. Chan et al. (2009) defines infrastructure as a varied word, including physical buildings of various types used by many factories as inputs to the formation of chattels and services.

Infrastructure investment is one of the main preconditions for enabling developing countries to accelerate or sustain the pace of their development and achieve the Sustainable Development Goals (SDGs) set by the United Nations in 2000. Furthermore, the future investment needs of developing countries in infrastructure far exceed the amount being spent by the governments, the private sector and other stakeholders, resulting in a significant financing gap. According to the World Bank estimate, on average, developing countries currently invest annually 3-4% of their GDP in infrastructure; yet they would need to invest an estimated 7-9% to achieve broader economic growth and poverty reduction goals (UNCTAD, 2008).

M‘Amanja and Morrissey (2012) sought to identify aspects of the determinants of growth in Kenya, in particular if aid played a role. The empirical specifications used in cross-country work do not translate easily into country studies, many of the variables are not available annually or tend to change very slowly over time, and it is not feasible to include all potential determinants. In Kenya, Paur (2008) did a study on water investments a case of Water Fund in Kenya. In cooperation with Swiss contact East Africa this pilot study is exploring the feasibility of developing a water fund as an innovative saving product for the microfinance sector in Kenya. The objective is to get an overview of the water sector in Kenya, to tackle possible bottlenecks and challenges in the water management and to

find solutions and potential investment opportunities along the value chain of water management.

2.4 Empirical Review

An empirical review is an examination of numerous areas of an empirical study that have some amount of importance to the study being done. An empirical literature review, also known as a systematic literature review, evaluates previous empirical studies to answer a specific research issue. It plays the fundamental role of unveiling the theory, or theories, that underpin the paper argument, or, if there are no such theoretical background, which is the related extant knowledge. It sets the limits of discussion and defines and clarifies the main concepts that will be used in the empirical sections. A substantive and thorough literature review is the basis for any good research project (Boote & Beile, 2005). The empirical review was done on the effect of the inflation rate, money supply, interest rate and exchange rate on growth of domestic private investment in Kenya and also the moderating role of government expenditure on infrastructure on the relationship between macroeconomic variables and growth of a domestic private investment.

2.4.1 Inflation Rate and Growth of Domestic Private Investment

Musarat et al. (2021) investigated the role of inflation in the economy and the construction industry in Malaysia from 2013 to 2019. The study carried a qualitative study methodology by review of the existing literature. The study findings revealed that the inflation rate is ignored in most construction project economics and budgeting, resulting in project cost overruns as building materials prices, labor wages, and machinery hire rates change annually. The study discovered a need for a framework that is useful for the future budget estimation model to eliminate project cost overruns caused by the inflation rate. The findings also revealed that there was a significant and acceptable relationship between the inflation rate and several categories of labor wages. The majority of labor wages had a negative relationship with the inflation rate, indicating that wage deviations resulted in cost overruns.

McCloud (2022) evaluated inflation targeting regimes' effects on domestic investment in inflation targeting and non-inflation-targeting among the OECD countries between 1984 and 2017 using the synthetic control method. The study found that adopting an inflation targeting regime had no statistically significant short- or long-run effect on domestic investment in 21 out of 29 treated countries at the 5, 10, and 20-year horizons. Equally, the study found rational inattention behavior in firms. The study further found that inflation targeting had long-run heterogeneous effects on domestic investment prices in 9 countries, suggesting that external supply constraints can weaken the link between inflation targeting and domestic investment. The study found that the magnitude of the effects varied by country, suggesting that in some countries, inflation targeting affects welfare, capital costs, and productive capacity. The heterogeneous effect of domestic investment on inflation targeting is consistent with Lin and Ye (2009) and Lee (2011), which show substantial heterogeneity in inflation outcomes across countries. This finding helps contextualize the current study on inflation's effect on private investment in Kenya.

Kamasa et al. (2022) used an autoregressive distributed lag (ARDL) method to study inflation uncertainty's effect on domestic investment in Ghana from 1970 to 2020. The study found that inflation uncertainty reduces Ghana's domestic investment. Furthermore, the study found that permanent inflation uncertainty affects domestic investment more than transitory inflation uncertainty. Furthermore, the study found that interest rates, government spending, and trade openness affect domestic investment in Ghana.

Bosco and Emerence (2016) used a cointegration and error correction model to investigate the effect of selected macroeconomic factors on private investment in Rwanda from 1995–2009. The study found short-run dynamic adjustment and long-run equilibrium between macroeconomic variables and private investment. Additionally, the study found that Inflation increased private investment. The study outcome indicated that when private sector credit is tight, private investment may rise. However, the study was done in Rwanda which has a different economic context from Kenya. The current study contextualized the study to Kenya using the latest data to 2021 and examined the moderating effect of public

investment. Using multiple estimation methods to address specification biases for a robust result.

Sargolzaei and Bahrololoum (2019) investigated how inflation affected economic growth from 1970 to 2015 in OPEC countries. Inflation's nonlinear effects on economic growth and financial development were estimated using Panel Smooth Threshold Regression (PSTR). Two different proxies of financial development yielded inflation rate thresholds of 20.33 and 20.36. The study concluded that in over-threshold inflations, financial development would reduce, if not reverse, the effect of financial development on OPEC's economic growth depends on the economy and inflation rate.

Odidi and Jagongo (2020) looked at how inflation affected the relationship between foreign direct investment, financial market development, and economic growth in Kenya between 1980 and 2016.The study used the linear multiple regression methodology. Additionally, the study examined the role of inflation in moderating the relationship between FDI, financial market development, and economic growth in Kenya. The study used the inflation rate to mediate between dependent and independent variables. The study found that financial market development and FDI had a positive effect on Kenya's economic growth.

Ezeibekwe (2020) used a vector error correction model to examine the effect of inflation on Nigeria's monetary policy and domestic investment from 1981 to 2018. The study found that inflation affects how interest rates affect investment. The study found that inflation reduces the impact of interest rates on investment. This study does not show how other macro factors or public investment affect the relationship.

2.4.2 Money Supply and Domestic Private Investment

Dang, Pham, and Tran (2020) examined the relationship between monetary policy and private investment in Vietnam as estimated by a system generalized method of moment (GMM) framework. The study found that monetary policies through broad money,

domestic credit, and interest rate channels have a significant direct and positive effect on private investment in Vietnam. The exchange rate, on the other hand, had a negligible impact. The study also revealed a correlation between interest rates and private investment and that high competition between domestic and foreign investors is a significant impediment to the investment decisions of private firms in Vietnam.

Sakyi Boarchie and Immurana (2016) examined the impact of financial development (measured by Money supply to GDP) on private investment in Ghana between 1970 and 2014 using ARDL methodology The ARDL bounds test approach to cointegration was used for the estimation. The results indicate that financial development is a key driver of private investment in the short run as compared to the long run. The study also revealed that the growth and development policies are geared more towards encouraging private sector investment through the development of the financial sector.

Fu and Liu (2015) examined the impact of monetary policy on the investment adjustments of China's listed firms during 2005–2012 using an asymmetric framework. The Using integrated investment efficiency and partial adjustment models, the study found that corporate investment cash flow adjustment is faster during expansionary monetary policy regimes than during contractionary regimes. The study also noted that a higher growth rate in money supply exacerbates the corporate investment adjustment and concluded that the monetary policy dynamics are transmitted through the credit and monetary channels in China. A significant asymmetric adjustment in the monetary channel was also discovered in the study.

Xie and Huang (2014) examined the impact of monetary policy on financing constraints and investment efficiency of private enterprises. The studies used the Nonlinear Vector autoregressive Autoregressive assisted bymeta-analysis of past literature and found that loose monetary policy suppresses the financing constraints of private enterprises and improves the financial ecological environment of enterprises by reducing the sensitivity of the internal cash flow of enterprises' investments.

Brima and Brima (2017) studied the effects of monetary variables on domestic investments and growth in the Nigerian economy between 1970 and 2018 using an ARDL methodology. The study found that the national currency supply had a statistically significant and negative effect on domestic private investment in Nigeria. The study noted that the narrow money supply was majorly used by the government, leaving less investment money for private sector investment. The study further indicated that credit supply and economic growth rates had no statistically significant influence on domestic investment over the sample period.

Ajayi and Kolapo (2018) conducted a research on sensitivity of domestic private investment to macroeconomic indicators in Nigeria from 1986 to 2015. The Ordinary Least Square technique, ARDL Modeling technique, and the Engle-Granger causality technique were employed for analysis. The study revealed that in the short run domestic private investment was most sensitive to money supply; in the long run money exerts negative and significant effect on domestic private investment. The study recommended that monetary policies that regulate the cost, supply, or availability, and direction of money must be revised periodically to ensure such are implemented with little or no lag.

2.4.3 Interest Rate and Growth of Domestic Private Investment

Conrad (2022) analyzed German investment cycles by simulating demand increases and interest rate cuts.The study used the true experimental research methodology through the use of two games in summer and winter. The study found that rising demand and falling interest rates lead to uncoordinated, high investment cycles. The results support the Wicksell and Shachat and Zhang (2012) hypotheses but contradict the Efficient Market Hypothesis on aspects of allocative efficiency and information efficiency.

Dotsis (2020) uses a one-period intertemporal model using the blacks (1995) shadow rate model in autoregressive framework to examine the impact of the zero lower bound on uncertain investment. The study examined irreversible investment decisions with stochastic interest rates and a zero lower bound. The study found that a lower interest rate

bound asymmetrically affects investment decisions. When interest rates are low, increased volatility decreases the value of waiting and increases investment, but when rates are high, volatility increases the value of waiting and decreases investment.

Ngouo and Ndeffo (2020) studied the effect of private investment on real interest rates in the CFA Franc Zone between 1980 and 2015. The study adopted the system generalized methods of moment methodology. The study found that Private investment negatively affects real interest rates. The result was attributed to weak private investment in the franc zone or weak and stagnant investment demand. This bivariate study considered private investment's impact on interest rates while ignoring other macro factors.

Bhat, Kamaiah and Acharya (2020) examined the impact of monetary policy instruments on the price level, aggregate demand, and supply in India. The study used the Gauss-Seidel algorithm to simulate an aggregate structural macro-econometric model estimated by generalised method of movements. The study noted that money supply and interest rates affect price level, aggregate demand, and supply in India. An increase in interest rates has a negative impact on output and aggregate demand, but the most on investment demand, imports, and private consumption.

Bosco and Emerence (2016) used a cointegration and error correction model to study private investment in Rwanda from 1995–2009. The study found short-run dynamic adjustment and long-run equilibrium between macroeconomic variables and private investment. Real interest rates affected private investment in the short run. The study's empirical results confirm that inflation has a positive relationship with private investment. Real-world evidence suggests that private investment rises when the private sector has trouble getting credit. Second, it's not possible to draw broad conclusions since the samples were too big and because different economic contexts produce different results. Results cannot be generalized because of disparities in economic environments and because the samples studied were too large.

Ajayi and Kolapo (2018) investigated Nigeria's private investment macroeconomic indicators in Nigeria from 1986 to 2015. Error-correction modeling was employed that reduces the possibility of approximating fictitious relationships while retaining long-run data. The analysis used OLS, ARDL, and Engle-Granger causality. The study found that the investment rate was linked to both discretionary cash flow growth and bank deposit interest rates. The study found that investment in Nigeria slowed due to increased bank lending rates, reduced open use, decreased funds, political instability, and a weak foundation. The assessment required that Nigeria's development policy expand the economy's gainful base to reduce unemployment and boost real income growth. In the short run, domestic private investment was less sensitive to interest rates, but in the long run, it had a significant effect. A causality test found that domestic private investment drives Nigeria's money supply. Money availability and investment incentives were not taken into account, despite their potential impact on domestic private investment

2.4.4 Exchange Rate and Growth of Domestic Private Investment

Canbaloglu and Gurgun (2018) examined the influence of exchange rate uncertainty on domestic investment for 25 EMDEs between 2004 and 2014. Employing a feasible generalized least squares panel data model, GARCH models were estimated for each country's exchange rate uncertainty. A positive and statistically significant effect of exchange rate uncertainty on domestic investment for EMDEs was found in the study. The result suggests risk-neutral or insensitive local investors in these countries when it comes to the volatility of their respective currency exchange rates. Contrarily, the study revealed that the real exchange rate had a negative but negligible effect on domestic investment. The results show that domestic investors in these nations are risk neutral and indifferent to exchange rate volatility and investment irreversibility.

Bahmani-Oskooee and Hajilee (2013) use ARDL to study 36 countries (developed and developing) from 1975 to 2008. Their findings show that exchange rate volatility negatively affects domestic investment in Chile, France, Malawi, South Africa, and the UK but positively affects domestic investment in Colombia, Italy, Singapore, Sweden,

and the US. Chowdhury & Wheeler (2015) examined the exchange rate and output uncertainty on fixed private investments for Canada, Germany, the United Kingdom, and the United States by implementing VAR models. Dang et al., (2020) examined the relationship between monetary policy and private investment in Vietnam as estimated by a system-generalized method of moment (GMM) framework. The study indicated that monetary policies affect private investment in Vietnam through broad money, domestic credit, and interest rate channels. The effects of the currency exchange rate were, however, marginal.

Gidey and Nuru (2021) examined the effect of real effective exchange rate uncertainty on domestic investment for the South African economy over the sample period of 1985Q1–2019Q2. Using a local projection methodology due to (Jord, 2005). The generalized impulse response functions indicate that domestic investment decreases between the second and seventh quarters in response to one standard deviation shock in exchange rate uncertainty. The study further found a negative effect of high exchange rate uncertainty on domestic investment and a positive effect of low exchange rate uncertainty on domestic investment. Similarly, the study found bidirectional causality between exchange rate uncertainty and domestic investment using granger causality tests.

Bahman-Oskooe and Baek (2021) analyzed the effect of exchange rate volatility on domestic private investment in G7 countries using ARDL methodology to study 36 countries (developed and developing). The study found that the effects of exchange rate volatility on domestic investment could be asymmetric, suggesting that higher uncertainty may have a different effect on domestic private investment in magnitude and direction than lower uncertainty in the exchange rates . The study found an asymmetric effect in the short run in almost all seven countries, but the short-run asymmetric effects translated into the long run only in Germany and the U.S.

Emmanuel, Ike, and Yunusa (2019) examined the effect of exchange and interest rates on foreign direct investment in Nigeria from 2006–2018. The study used the multiple linear regression methodology in an error correction framework. The result of the study indicates

that a positive relationship exists between the exchange rate and foreign direct investment (FDI). The long-run co-integrating equation shows an insignificant negative relationship between interest rates and foreign direct investment. Inflation (INF) was negatively related to foreign direct investment (FDI) in the long-run.

Akinlo and Onatunji (2020) examined the dynamic relationship between exchange rate volatility and domestic investment for twelve ECOWAS countries over the period 1986–2017. The ARDL bound testing approach was used for co-integration and error correction modeling techniques in the study, which included real GDP, real interest rate, real exchange rate, and exchange rate volatility as important drivers of domestic investment. The outcome of the study confirms the existence of a long-term relationship among the variables in the selected countries. Furthermore, the findings show that exchange rate volatility is negative and statistically significant only in the cases of Nigeria, Sierra Leone, Guinea, Gambia, Cote d'Ivoire, Togo, and Liberia but insignificant in Cabo Verde and Senegal. However, contrary to many theoretical predictions and hypotheses, exchange rate volatility is found to be positive but insignificant in Ghana, Benin, and Burkina Faso.

Gurgun (2017) used a feasible generalized least square panel data model to provide a broad perspective on the influence of exchange rate uncertainty on domestic investment, taking into account economic growth, real interest rates, and the 2008/2009 global financial crisis (GFC). The empirical findings revealed that the impact of exchange rate uncertainty on domestic investment in EMDEs was positive and considerable, implying that these nations have risk-neutral or insensitive domestic investors to exchange rate uncertainty. On the other hand, the study also found that economic growth has a positive and significant impact on domestic investment, but the GFC has a negative and significant impact. On the other hand, it was found that the real exchange rate had a small but negative effect on domestic investment.

Musyoka and Ocharo (2018) investigated the impact of real interest rates, exchange rates, inflation, and competitiveness on Foreign Direct Investment (FDI) in Kenya using annual time series data from 1970 to 2016. The study employed ordinary least square regression

in the estimation. The study found that real interest rates and currency rates negatively impacted FDI in Kenya. Furthermore, the study indicated that Kenya's competitiveness boosts FDI inflows while inflation has little effect on FDI.

2.4.5 Government Expenditure on Infrastructure, Macroeconomic Variables and Growth of Domestic Private Investment

Javid (2019) investigated the relationship between infrastructure investment and economic growth at the aggregate and sectorial levels in Pakistan over the period 1972 to 2015. The study used fully modified ordinary least squares (FMOLS) to address the problem of reverse causality. The main finding is that both public and private infrastructure investments have positive but different effects on economic growth; their marginal productivities differ across the different sectors of the economy. Additionally, the study found the marginal contribution of aggregate investment in infrastructure to the real GDP per worker is positive and statistically significant for the aggregate as well as for the sub-sectors of the economy.

Nguyen and Trih (2018) assessed the influence of public investment on economic growth and the rate of private investment in Vietnam using an autoregressive distributed lag model and Vietnam's macro data between 1990 and 2016. Based on neoclassical theories, the study found that public investment in Vietnam does affect economic growth in the pattern of an inverted-U shape as described by Barro (1990), with positive effects mostly occurring in the second year and negative effects constraining long-term growth. The estimated influence of public investment on private investment also shows an inverted-U shape in which public investment has a crowded-in private investment in the short term but a crowded-out private investment in the long run.

Atabaev et al., (2018) examined the crowding-out (or -in) effect of public spending on private investment in the transition economy of Kyrgyzstan Using an autoregressive distributed lag (ARDL) and the vector auto regression approach (VAR) for the period 2005 to 2013. The study found that an increase in government purchases leads to a rise in

private investment. On the contrary, it was revealed that broad money has a statistically significant, affirmative effect on private investment.

Adeosun et al., (2020) explored the asymmetric linkage between public investment and private sector performance in Nigeria For the period 1986 to 2017 using the nonlinear autoregressive distributed lag model (NARDL), asymmetric generalized impulse response and variance decomposition, and asymmetric granger causality techniques. The study found that positive investment shocks exhibit a stimulating effect on private investment in the long run while the (negative) shocks have a substantial dampening influence. The study also found evidence that negative investment shocks portend a positive influence on the performance of the private sector in the short run. This suggests that negative shocks to investment may not dampen the effectiveness of private sector in the short run, and this thus brings to bear the debate on the tenability of public investment as a potent counter-cyclical tool in enhancing short-run private sector growth. The nonlinear granger causality also shows a unidirectional nonlinear causality from public investment to private sector performance.

Mathhu (2017) examined the relationship between public and private investment in India. Using the autoregressive distributed lag (ARDL) bounds testing approach and annual data from 1971-1972 to 2009-2010. The study found that aggregate public investment has a positive effect on private investment both in the long run and the short run. In contrast to the findings of previous studies, no significant impact of public infrastructure investment on private investments is found in the long run, while non-infrastructure investment has a positive impact on private investment in the short run. The study contradicts Nguyen and Trih's (2018) study that assessed the influences of public investment on economic growth and the rate of private investment in Vietnam using the same methodology between 1990-2016. The study found that public investment in Vietnam does affect economic growth with positive effects mostly occurring from the second year and negative effects of constraining long-term growth.

Ouédraogo et al., (2020) examined the impact of public investment on private investment in SubSaharan Africa using the finite mixture model using a sample of 42 countries. Using the autoregressive distributed lag (ARDL) bounds testing approach and annual data. The study outcome showed that the impact of public investment on private investment differs across groups of countries with similar but unobserved characteristics. When the study incorporated the component of hidden heterogeneity it was found that a country with high risk of conflict, terrorism and repatriation of profits crowding in of private investment is unlikely.

Mahmoudzadeh et al. (2013) used panel data from 2000-2009 years to examine the effect of fiscal spending on private investment of developed and developing countries. The study adopted the Bayesian structural vector auto regressive approach. The result indicated that public investment has a positive effect on private investment in both developed and developing countries, which is a crowding-in effect. On the other hand, the effect of government consumption on private investment is negative for both country groups. The study contradicts the early study of Afonso and Sousa (2009) that showed that government spending shocks lead to important "crowding-out" effects in the USA, the UK, Germany, and Italy. Hence, government consumption has a negative effect on private investment, whereas government investment.

Njuru et al. (2020) sought to ascertain the effects of government spending on private investment in Kenya. The VAR approach was used in the study on a time data from 1963 to 2012. The study used the Vector autoregressive analysis approach in addition to variance decomposition and error correction modelling. The studied literature emphasized the significance of government spending in affecting levels of private investment. According to the study's findings, both recurrent and development spending increased private investment. Private investors were shown to be discouraged by adjustments to government spending. The study findings revealed that the government should reallocate funds to projects that are beneficial to the private sector and avoid those that compete with or crowd it out. For the current study a more flexible autoregressive distributed lag model was used to extract the short run and long run mediating effect of public investment. This

was justified because the Public Investment spending sluggishly responds to demand signals in the Kenyan Economy.

2.5 Critique of Existing Literature

Musarat et al. (2021) looked into the impact of inflation in the economy and the building industry in Malaysia; however, the current study's goal is to determine the effect of macroeconomic variables on domestic private investment is conducted in Kenya. Despite conducting a thorough assessment of the majority of macroeconomic variables of domestic private investment, Musarat *et al* (2021) failed to take into account significant aspects such as money supply and currency rates. The study was also confined to response factors for which data was readily available, excluding those variables that may be important but for which data was unavailable. Even though the study would be generalized in Malaysia, its conclusions cannot be applied to other locations without more research.

In their study Kamasa *et al.* (2022) used an aggregate measure of investment and did not separate private and public investment. The current study investigated the extent to which inflation influences capital formation in Kenya alongside other macro-variables. The current study deviates from other studies that focused on the general determinants of investment by focusing on inflation and private investment in Kenya. The study also examined the moderating effect of public investment, a key determinant of domestic private investment, and multiple estimation methods to address specification biases for a robust result.

Dang, *et al.* (2020) this study was carried out in Vietnam, a developing country like Kenya but with a different economic situation. The study equally failed to partition the difference between the short-run and long-run effects. The current study adds to the previous one by putting it in the context of Kenya and focusing on the effects of macroeconomic factors on domestic private investment and how public investment affects this relationship. Sakyi Boarchie and Immurana (2016)in their study focused on the financial development policies in Ghana, unlike the current study which is more focused on the monetary policies

and their effect on domestic private investment in Kenya. The finding supports Eshun *et al*. (2014) who found a significant effect of the money supply as a measure of monetization in the country but contradicts Frimpong and Marbuah (2010) found that money supply as a measure of financial development has no significant effect on private investment. The current study fills the inconsistent research gaps and goes further to examine the moderating effect of public investment on the relationship between macroeconomic variables and domestic private investment in Kenya for an extended period.

Fu and Liu (2015) and Xie and Huang (2014) the two studies investigated the effect of monetary policy on corporate investment in China and focused on under/over investment due to credit constraints. Using an ARDL model, the current study looks at how the amount of money affects the direction and speed of changes in domestic private investment in the short run and in the long run. Brima and Brima (2017)the study contradicts the earlier study of Brima and Brima (2017) that examined the effect of monetary policy changes on private investment behavior in Sierra Leone for the period 1980–2014 using the Error Correction Model (ECM) approach. The study found that money supply and gross domestic saving significantly and positively affect investment activity in Sierra Leone. Both studies used an error correction model but did not report on the short-term and long-term effects of changes in money supply on domestic private investment and have produced inconsistent results. The current study fills the gap by examining the short-run and long-run effects of macro variables on domestic private investment using Kenya's economic data. The study will also look at the effect of structural breaks in the data that might change the outcome.

Conrad (2022) study was conducted in Germany, which has a different economic setting from Kenya. The current study will examined how interest rates affect Kenyan private investment. Dotsis (2020) study focused on the effect of interest rate uncertainty on investment decisions but did not separate long- and short-term effects. The current study will complement the previous one by diffusing the long- and short-run effects of interest rates on domestic private investment using a multifactor factor model that incorporates other macro factors.

Sargolzaei and Bahrololoum (2019) investigation to determine how inflation affects financial development and economic growth was inconclusive because it did not analyze the effects of macroeconomic factors with government expenditure on infrastructure as a moderator. Furthermore, nonlinear estimation results suggested that under over-threshold inflations, the influence of financial development on the economic growth of OPEC economies would be decreased, if not negative. The current study attempted to fill these gaps through a novel approach. The study was undertaken in Kenya, which provided a unique dynamic and chance for comparison. In addition, the data used in the study was more extensive, extending from 1972 to 2022, as opposed to Sargolzaei and Bahrololoum's (2019) study, which covered the years 1970-2015, and finally various macroeconomic variables, which was also used in this research.

Mose *et al.* (2020) investigated the determinants that influence domestic private investment behavior in Kenya, Rwanda, and Burundi. The study sought to ascertain the influence of domestic credit on private investment in Kenya, Rwanda and Burundi from 2009 to 2018. This study was constrained for several reasons. First, the study was done throughout East Africa, involving various countries, because the countries differ in economic foundation and environment, generalizing conclusions from the three countries may result in inaccuracies. Furthermore, the researcher admits to being hampered by data availability and ended up employing proxy variables in some cases, which has an impact on the accuracy of conclusions. The study also only used data from different countries; thus may not be a genuine picture of the actual and practical situation due to the large study area. Because the current study was only undertaken in one country, more reliable results were achieved. The current analysis additionally made use of other macroeconomic variables as well as the period span for which data is available.

Bhat, *et al* (2020) the study was conducted in developed India, compared to a developing Kenya, and did not separate short- and long-term effects. The current study extends the study to Kenya by examining macroeconomic factors' effects on domestic private investment and government expenditure on infrastructure as a moderating variable on this relationship using the autoregressive distributed lag approach. The study by Javid (2019)

cannot be generalized in the Kenyan economy since Kenya is an emerging nation that has different economic characteristics from the US markets. The study also failed to address how the differential elasticity's across the sectors would impact the targeted policies and how the outcome would be used to attract private investment. The study also did not separate the short-term and long-term effects of infrastructure investment. The present study localized the investigation in Kenya to overcome these gaps. Also, public investment was used as a mediating variable in a more flexible ARDL model to find out how it affects the relationship between macroeconomic variables and domestic private investment in both the short and long term.

The study by Nguyen and Trih (2018) cannot be generalized in the Kenyan economy since Kenya is an emerging nation that has different economic characteristics from the Vietnam economy. The study did not report on the long-term and short-term effects that the current study strives to examine. The current study found the result using a framework that controls for reverse causation, endogeneity, and structural breaks in the data. The framework passes a number of statistical tests that show no evidence of model misspecification.

Atabaev *et al*., (2018) in their study did not incorporate other demand-side fundamentals in the investigation, which may change the results' significance and direction. The study also assumed a linear relationship between public investment and domestic private investment. The present study filled the gap by incorporating demand-side factors such as inflation and interest rate in the analysis model to unravel the interaction of demand and supply factors in determining the growth of domestic private investment in Kenya. In the process, the study equally considered public investment as a moderating variable owing to the ever-increasing demand for public fixed goods in Kenya.

In Nigeria, Ajayi and Kolapo (2018) researched on the sensitivity of domestic private investment to macroeconomic indicators in Nigeria from 1986 to 2015. The research despite being comprehensive from the objectives, it is clear he did not set to review any specific macro-economic variables. The effect of this is failure to have a focused study

and obtain data for specific variables. The present study filled this gap by examining specific macroeconomic variables including inflation rate, money supply, and interest rate. Further, the period differs from that used by (Ajayi & Kolapo, 2018). The research focused on the different periods from 1986 to 2015 while the present study covers the period between the period 1972 to 2022 which is more recent and therefore likely to yield additional findings. This was confirmed by the current study in Kenya where the findings revealed that an increase in the amount of money supply in the economy promotes domestic private investment. The availability of currency (i.e. cash) in circulation, traveler's checks, demand for deposits at commercial banks (or other depository institutions) held by the public, and other checkable deposits were used to represent Kenya's money supply. These were predicted to have a substantial impact on the level of private domestic investment since they reflect the number of transactions or demand in the economy.

Awad *et al.* (2021) investigated the impact of interest rates and political instability on domestic private investment in Palestine using a set of time series econometric approaches to achieve the study's objectives. This study had a number of limitations first, it was general and did not specify the Macroeconomic variables to cover. It was also limited to the impact of interest rates and political instability on domestic private investment in Palestine from the first quarter of 2008 to the fourth quarter of 2017. The current study bridged the research gap by establishing the effects of macroeconomic variables on domestic private investment in Kenya for the period 1972– 2022 which is wider, the study also included key macroeconomic variables, money supply, interest rate, inflation rates, and exchange rate. Further, the study was conducted in Palestine which had a different economic background as compared to Kenya hence; the findings of this study could not be generalized.

Musyoka and Ocharo (2018) investigated the impact of real interest rates, exchange rates, inflation and competitiveness on Foreign Direct Investment (FDI) in Kenya. The study used annual time series data from 1970 to 2016. World Bank Indicators and Kenya National Bureau of Statistics yearly reports were used as data sources. Data for the

variables were real interest rates, exchange rates, inflation rate, competitiveness/ease of doing business, and FDI were obtained. Other macroeconomic variables that could have an impact on DPI were also neglected in the study. According to the examined literature, the context of the studies focused on FDI, currency rates, interest rates, and state investments separately. This research was different from the current study, which aimed at investigating the role of government expenditure on infrastructure in moderating the relationship between various macroeconomic variables and DPI growth. The examined literature demonstrates that the bulk of research overlooked the aspects of money supply, interest rates, and inflation, which are the fundamental determinants of DPI. These studies were conducted outside of the scope of this research.

2.6 Research Gaps

The review of empirical literature identified several research gaps noteworthy. Firstly, several studies reviewed either analyzed the supply side, excluding the demand-side or concentrated on the demand side variables, excluding supply factors or simply focusing on a subset of macroeconomic factors. The study filled this gap by considering a combination of variables that affect both sides of the economy. Consequently, interest rate, inflation, money supply, exchange rate and government spending on infrastructure were considered. Much of the preceding research established the relationship between DPI and public expenditure, as well as the nature of the causation between them. However, no research had been conducted to examine the impact of Public investment on the relationship between key macroeconomic variables and growth of domestic private investment in Kenya.

The the studies reviewed have employed different methodologies in either linear or nonlinear frameworks, using different panel data sets and time series that yield conflicting results. This attests that there is no global consensus on the long-run relationships between macroeconomic factors and domestic private investment. Although some studies found enough evidence to reject the null hypothesis of no integration among macroeconomic factors and domestic private investment, other studies fail to reject the null hypothesis.

The present study employed a linear autoregressive distributed lag model to examine the cointegration between macroeconomic variables and domestic private investment. The methodology equally unravels the short-run and long-run relationships simultaneously and the effect of macroeconomic factors on domestic private investment both in the short run and the long run.

Lastly, it is important to note that most of the reviewed empirical studies were carried out in foreign economies where data on investment growth are readily available, unlike the Kenyan economy with thin information. Therefore, the result could not be assumed true in the Kenyan context. The study filled the gap by contextualizing the domestic private investment dynamics analysis to the Kenyan economy. This would uncover the inherent characteristics because economies are heterogeneous, localized, and geographically specific.

2.7 Summary of the Literature Review

This chapter covered the theories, presentation of the variables, empirical review and a critique of relevant literature. The study was anchored on Deflation theory that was propounded by by Fisher (1933), Loanable funds theory attributed to the works of British economist Dennis Robertson and Swedish Economist Bertil Ohlin, Keynesian theory of investment of 1936 that laid emphasis on the central role of investment as a driver influencing aggregate output, employment and short term fluctuations in economic activities. The theory of purchasing power parity (PPP) was originated by Cassel (1918) and Musgrave theory of public expenditure growth put forward by Musgrave in 1969

The study variables were inflation which is the consistent increment in the price level, maintained over some stretch of time, money supply which is the aggregate load of money circling in the economy. This flow includes the cash, printed notes, money in the store accounts and as well as other fluid resources, interest rate defined as the cost that borrowers incur to use the money they borrow from lenders or financial institutions, as well as any fees associated with lent assets, is known as the interest rate, exchange rates

which is value that a currency has contrasted with another currency. The moderating variable was government expenditure on infrastructure which was the amount spent by government annually on assets such as roads, railway lines, communication networks etc.

The study aimed to establish the effect of macroeconomic variables on growth of domestic private investment in Kenya since there was inadequate literature on the subject. From the empirical literature it was discovered that previous studies had arrived at contradicting findings on the effect of macroeconomic variables on growth of domestic private investment. It was also noted that no study investigated the moderating role of government expenditure on infrastructure on the relationship between macroeconomic variables and growth of domestic private investment.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter describes a researcher's approach to data analysis, which encompasses all aspects of the research design and data collection instruments. In the first section, the study's research philosophy and design are examined, reviewed, and justified. The empirical model of the investigation is then addressed in detail in the following section. In addition to other variables and measurements, a target population, sampling method, data collecting tool, data collection procedures, and diagnostic tests are provided. The chapter also covered methods for data gathering and analysis.

3.2 Research Philosophy

A research philosophy is a school of thought that explains how data from a study's investigation is obtained, processed, evaluated, and applied (Cuthbertson et al., 2021). According to Davidavičienė (2018) it is the widely held belief about the best way to collect and analyze data. Positivism and phenomenology are the two major research paradigms. This study used the positivist approach. According to According to Davidavičienė (2018) Positivist researchers are distinguished by the use of a systematic and purposive research strategy which means picking a clear topic for research, coming up with hypotheses, and using the right and acceptable method for research grounded on theory. This strategy is more objective and employs quantitative procedures and tools that deal with measuring and counting Mbanaso et al., (2023). Equally, the method assumes that reality is consistent and can be properly measured by conforming to predefined procedures and guidelines (Mbanaso et al., 2023)

Positivism was adopted in this study since the objective of this research was to determine the effect of macroeconomic variables on growth of domestic private investment in Kenya. Positivism employs a structured scientific method that involves selecting a topic

amenable to inquiry and developing and testing the hypotheses. This approach leaves little room for subjectivity, as the study findings are independent of the subjective assessment of the researchers (Bell, Bryman & Harley, 2022). The strategy is applicable to both cases because the researcher employs statistical and mathematical methodologies and follows established research procedures.

3.3 Research Design

Research design is the overall strategy for gathering, measuring, and analyzing data to provide insight into the phenomenon being investigated (Mugenda & Mugenda, 2013). The study adopted a Causal research design, which entails analyzing the effect of various modifications on existent procedures and guidelines (Mbanaso et al., 2023). The causal research design asserts that there is a statistically significant cause-effect interaction between independent and dependent variables (Pandey & Pandey, 2021). The most controversial part of causal study design is whether the predictor variable actually causes a change in the dependent variable and the size of that effect.

This method was deemed appropriate and suitable for this investigation since it was hypothesized that there was a significant causal relationship between macroeconomic conditions and growth of domestic private investment in Kenya. Similarly, it was chosen because it is verifiable, strategic, and systematic, and requires the researchers to explore and evaluate causal relationships between numerous factors.

3.4 Target Population

A target population is the group of subjects that the researcher is interested in investigating (Pandey & Pandey, 2021). The target population of the study was domestic private investment for the period 1972 to 2022.

3.5 Sample and Sampling Technique

Following consideration of the aforementioned criteria, the study used a census design that included all Kenyan enterprises in the calculation of a domestic private investment. A census approach takes into account every subject of the target population (Pandey & Pandey, 2021). A census approach increases data quality and lowers sampling error as it takes each unit into account prior to making conclusions (Nkuru, 2017). The varying concentration of Kenyan enterprises also influenced the choice of technique as they differ in size, market value, liquidity, and trading industry. Therefore, if the population under research consists of varied entities, the sample may not precisely represent the population or may exaggerate certain study outcomes (Sharma, 2017).

3.6 Data Type and Data Sources

Secondary time series data for the period of 1972 to 2022 was used to meet the objectives of this study. The term "time series data" refers to a set of observations made at regular intervals (Blázquez-García et al., 2021). As a general rule, financial models require that all variables have the same number of data points. The factors listed below played a role in the decision to use time series data: first, time series data allows for the examination of historical trends and the prediction of future trends based on prior trends and patterns (Blázquez-García et al., 2021). Also, time series data makes it easier to deal with interdependencies and temporal effects between different data sets (Blázquez-García et al., 2021). The consequences of one time period might be felt in the next. The selection of time series was influenced by the availability of long-term market data from the Central Bank of Kenya, the Kenya National Bureau of Statistics, and the World Bank.

The data came from the Central Bank of Kenya (CBK), the Kenya National Bureau of Statistics (KNBS), and the World Bank (WB). Kenya's central bank (CBK) quarterly statistical reports were mined for information on interest rates, money supply, exchange rates, and inflation; the World Bank's metadata and the Kenya national Bureau of statistics were tapped for information on domestic private and public investment, respectively.

3.7 Research Collection Procedure

To ensure that the study will produce the desired results, the data extraction technique must be examined (Godfred, 2016). A data collecting schedule, shown in appendix III, was used to gather the secondary data utilized in the study.

3.8 Data Analysis and Presentation

Data collected was analyzed using both descriptive and inferential statistics. The inquiry used auto regressive analysis, time series regression analysis, and correlation analysis. Using E-views version 10 software, the study conducted an ARDL cointergration. Descriptive statistics were used to simplify, summarize, and distribute the data and included the standard deviation, mean, and percentages along with the inferential statistics. Included in the inferential analysis were Pearson correlation, trend analysis, and autoregressive analysis. The development of the study's variables was depicted by employing a trend analysis. The Autoregressive analysis was used to show the relationship between macroeconomic variables and private investment in Kenya.

The empirical investigation consisted of four steps. First, the stationarity and appropriate lag length of the time series were evaluated. Because it does not require a unit root pre-test, the ARDL Bound test is preferable when variables are integrated in different orders or a combination of both (Nkoro & Uko, 2016). However, the methodology is inapplicable to I (2) variables, which necessitates testing for stationary. Secondly, a linear ARDL model was applied to determine whether the F-statistic revealed linear long-run cointegration between macroeconomic variables and growth of domestic private investment (Wald test). At this level, it was possible to identify both short-run and long-run linear relationships. Thirdly, an additional analysis includes assessing the moderating effect of government expenditure on infrastructure using the two-step technique of (Whisman & McClelland, 2005). This required solving equations 3.2 and 3.3. The empirical results were provided in tables, graphs, and estimations of statistical parameters.

3.8.1 Diagnostic Tests

Diagnostic tests demonstrate the robustness of the coefficient estimates by establishing that parameter estimates are not biased, examining for incorrect functional form, parameter instability, and measurement error, and confirming that there is no erroneous functional form. Prior to estimating the regression models that underpins inferences and conclusions, researchers run diagnostic tests on their data to make sure the assumptions of the classical linear regression model (CLRM) hold. Preceding the estimation of regression models that lead to various inferences and conclusions, these tests are executed. If these assumptions are violated, then there is a greater probability that the parameter estimations will be biased, inefficient, and inconsistent. Equally, because the study utilized time-series data, strong patterns and non-random distribution of the series may weaken some econometric tests, resulting in type I error (Chorozoglou & Kugiumtzis, 2019).

Therefore, the ARDL model pre-analysis test of stationarity and multiple structural breaks advocated by Kong et al., (2021) were conducted. In addition, the cointegration test was undertaken to evaluate the long-run convergence of the variables under examination. The tests of normality, stationarity, heteroskedasticity, multicollinearity and autocorrelation were performed to ensure that the assumptions of the Classical Linear Regression Model were not infringed.

Normality Test

When conducting regression analysis, it is better to have data that follows a normal distribution. In a study, the normality test is used to determine if the data obtained is distributed normally. This is because inferences and conclusions drawn from the data that do not conform to a normal distribution will be inaccurate (Mishra et al., 2019). The study used Jarque Bera statistics as to consider skewness and kurtosis. The null hypothesis that the population is normal was tested. The null hypothesis would be rejected if the P-value was less than 0.05. If the P-value is greater than 0.05, the null hypothesis is not

rejected, and the population data distribution is considered normal (Mishra et al., 2019). In the event that a population is not normally distributed, a technique that successfully eliminates observations or outliers that are the root cause of the non-normality will be applied (Mishra et al., 2019). In the event that the data set does not follow a normal distribution, either no testing is done, or a non-parametric (distribution-free) test would be used.

Unit root Tests

Stationery time series data has a constant mean, variance, and covariance regardless of measurement time. This means that time factors do not affect the data. Using non-stationary data may produce erroneous results that look good under standard measurements with large estimates and a high R^2 but have little practical application (Vishwas & Patel, 2020). Using non-stationary series produces incorrect regression results if the presence of unit root is overlooked. Consequently, inefficient estimations and incorrect inferences are obtained.

The study applied the Augmented Dickey-Fuller (ADF) and Philip and Peron (PP) tests to evaluate the time series properties of each variable at t levels and in differences. In both ADF and PP tests, the null hypothesis of non-stationary (H_0), i.e., the variable has a unit root or is not stationary, is tested against the alternative hypothesis of stationary data (H_1), i.e., the variable has no unit root or is stationary, at a significance level of 0.05 (Vishwas & Patel, 2020). If the P-value is greater than 0.05, the null hypothesis should not be rejected (Vishwas & Patel, 2020). If the P-value is less than 0.05, however, the null hypothesis is rejected and the study shows that the data is stationary. If computed ADF or PP-values exceeded the critical levels, the null hypothesis would be rejected, signifying that the series is stationary (Vishwas & Patel, 2020). If the parameter does indeed become stationary at the first difference, it is classified as integrated order one. If a unit root exists in the variables, they are differenced, and the differenced variables are used for analysis. Moreover, if the ADF and PP tests yielded dissimilar results, the variables would be subjected to Kwiatkowski, Phillips, Schmidt, and Shin's (1992) (KPSS) test for

confirmation. The null hypothesis is rejected for KPSS if the KPSS statistic is greater than the 0.05.

Cointergration Test

Cointegration is a state in which the variables under consideration indicate long-term connection or movement in the same direction. This implies that, although variables may display upward or downward tendencies in the short term, they will eventually attain equilibrium. To be deemed cointegrated, the F-statistic for a series of variables must be greater than the upper critical limit (Sam et al., 2019). Due to cointegration, the influence of a change in the independent variables on the dependent variable may be delayed and spread out over multiple time periods.

The study employed the ARDL bound testing model devised by Pesaran and Shin (1995) and Pesaran *et al*. (2001) to determine the long- and short-term effects of macroeconomic factors on domestic private investment. This method does not suffer from the same order of integration problem as the Johansen likelihood approach and other conventional cointegration models, which can only be applied to high sample sizes (Sam et al., 2019). Even when some of the regressors are endogenous, unbiased estimates of the long-run model and reliable statistics are still provided (Sam et al., 2019).

Heteroskedasticity Test

The error variance in regression is expected to be constant in a regression analysis, a situation termed as homoscedastic (Astivia & Zumbo, 2019). Heteroskedasticity occurs when disturbances have unequal variance (Astivia & Zumbo, 2019). The presence of heteroskedasticity makes standard errors, statistics, and confidence intervals biased and inefficient. If the data is heteroskedastic, standard errors will be wrong, which leads to misleading inferences.

The Breusch-Pagan heteroskedasticity test was applied to the study's data, which presented a null hypothesis that the residuals were homoscedastic. A p-value higher than

0.05 indicates the presence of constant variance and the data is assumed homoscedastic. In case the p-value was less than 0.05 the study rejected the null hypothesis and it was plausible to deduce that the data contained heteroskedasticity. To address this issue, variables would be transformed into logarithms and each model was adjusted using credible standard errors.

Multicollinearity Test

Multicollinearity occurs when two or more predictor variables are significantly and linearly interconnected (Wooldridge, 2018). Because of multicollinearity among the explanatory variables, the coefficient estimates will be inaccurate because the variances and covariances of the regression are quite large, thus widening the confidence intervals. That means that the test statistic will not be statistically significant even when the R^2 is quite high (William et al., 2018). The Variance Inflation Factor (VIF) test was used to examine multicollinearity, whereby it is tolerable if the Variance Inflation Factor (VIF) is less than 5. Astivia and Zumbo (2019)) says that multicollinearity is considered severe if the VIF is higher than 8. To reduce the effects of multicollinearity, it is necessary to control a few highly associated variables or transform the predictor variables into ratios.

Autocorrelation Test

Autocorrelation is the degree of similarity between successive observed values of the same variable (Astivia & Zumbo, 2019). That is the connection between the variable and its lag (Astivia & Zumbo, 2019). In a regression, autocorrelation makes the coefficients unbiased and not blue. Positive serial correlation, on the other hand, would normally result in type 1 error because standard errors are biased downward relative to their actual values and R^2 can increase or decrease. Thus, inaccurate assumptions regarding the relationship between the research variables are feasible. Breusch-Godfrey LM was used to test for autocorrelation in this study. The test was suitable because its application required fewer assumptions. The test is also applicable applicable even when the dependent variable lags. The null hypothesis that there is no serial correlation in the data was examined. The null

hypothesis is not rejected if P > 0.05; however, if P = 0.05, the null hypothesis is rejected, indicating that the residuals are serially correlated. In the event of autocorrelation.

Specification Error Test

The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Domínguez & Lobato, 2020). The test can identify bias that occurs when there are missing data points or when there is inappropriate transformation of the data. Errors in the specification lead to inconsistent and biased estimators, which invalidates the inference process. If the estimated F-value is significant at the stated significance level, the null hypothesis is not rejected, suggesting a model with an incorrect specification. However, if the calculated statistic is not statistically significant (P>0.05), the null hypothesis is rejected, indicating that the model has an adequate functional form (Domínguez & Lobato, 2020).

3.8.2 Regression model

Model One

The guiding model for this study was (ARDL)

$$Y_{It} = \alpha_{it} + \sum_{i=1}^{K} \delta'_{it} Y_{i,t-j} + \sum_{i-0}^{q} \beta'_{it} X_{i,t-j} + \sum_{i-0}^{q} \beta'_{it} X_{i,t} + \lambda \mathrm{ECT}_{t-1} + \varepsilon_{it} \ldots\ldots \quad 3.1$$

Y_{It_t}= Dependent Variable Matrix

$Y_{i,t-j}$ = Lags of the Dependent Variable Matrix

$X_{i,t}$ = Independent Variables Matrix

$X_{i,t-j}$ = Lags of Independent Variables Matrix

$\lambda \mathrm{ECT}_{t-1}$ = error correction term

Model Two

i. $DPI_t = \beta_0 + DPI_{t-j} + \beta_1 INT_{t-j} + \beta_5 GE_{t-j} + \beta_6 INT_{t-j} * GE_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$ ……...3.2

ii. $DPI_t = \beta_0 + DPI_{t-j} + \beta 2_2 EXR_{t-j} + \beta_5 GE_{t-j} + \beta_7 EXR_{t-j} * GE_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$ 3.3

iii. $DPI_t = \beta_0 + DPI_{t-j} + \beta_3 MS_{t-j} + \beta_5 GE_{t-j} + \beta_8 MS_{t-j} * GE_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$ ……...3.4

iv. $DPI_t = \beta_0 + DPI_{t-j} + \beta_4 INF_{t-j} + \beta_5 GE_{t-j} + \beta_9 INF_{t-j} * GE_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$ …..3.5

Model Three

$DPI_t = \beta_0 + \beta_1 INT_{t-j} + \beta 2_2 EXR_{t-j} + \beta_3 MS_{t-j} + \beta_4 INF_{t-j} + \beta_5 GE_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$ …… 3.6

$DPI_t = \beta_0 + DPI_{t-j} + \beta_1 INT_{t-j} + \beta 2_2 EXR_{t-j} + \beta_3 MS_{t-j} + \beta_4 INF_{t-j} + \beta_5 GE_{t-j} + \beta_6 INT_{t-j} * GE_{t-j} + \beta_7 EXR_{t-j} * GE_{t-j} + \beta_8 MS_{t-j} * GE_{t-j} + \beta_9 INF_{t-j} * GE_{t-j} + \lambda ECT_{t-1} + \varepsilon_t$ ……..3.7

Where:

DPI_t= Domestic Private Investment in Kenya

GE_{t-j}= Government expenditure on Infrastructure (Moderating Variable)

INT_{t-j}= Interaction between Interest rate and Government Expenditure on Infrastructure

EXR_{t-j} = Interaction between Exchange Rate and Government Expenditure on Infrastructure

MS_{t-j} = Interaction between Money Supply and Government Expenditure on Infrastructure

INF_{t-j} = Interaction between Inflation and Government Expenditure on Infrastructure

GE = Government expenditure on Infrastructure (Moderating Variable)

$INT_{t-j} * GE_{t-j}$= Interaction between Interest rate and Government Expenditure on Infrastructure

$EXR_{t-j} * GE_{t-j}$ = Interaction between Exchange Rate and Government Expenditure on Infrastructure

$MS_{t-j} * GE_{t-j}$ = Interaction between Money Supply and Government Expenditure on Infrastructure

$INF_{t-j} * GE_{t-j}$ = Interaction between Inflation and Government Expenditure on Infrastructure

t = time t

λECT_{t-1} = error correction term

Moderation occurs when the magnitude, direction, and strength of the effect of the independent variable on the dependent variable varies as a function of another variable (Hayes, 2010). In testing for the moderating effect, the study utilized Whisman and McChelland's (2005) procedure. According to Kraemer et al. (2001), this test can be used to determine the moderating influence of a variable on the relationship between independent and dependent variables. The method requires determining if government spending on infrastructure is a moderating variable or merely an explanatory variable.

The methodology is built on two processes, with the first step introducing government infrastructure spending as an explanatory variable, as shown in Equation (3.2). The second step analyzes the interaction of government spending on infrastructure with each of the independent variables, i.e. macroeconomic factors, as depicted by equation (3.3)

Table 3.2 summarizes the criteria applied in deciding whether Government Expenditure on Infrastructure moderates the relationship between macroeconomic factors and Domestic private investment in Kenya.

3.9 Operationalization and Measurement of Variables

Table 3.3 lists the independent variables, moderating variables, and dependent variables of the study. The table also includes the operational definitions of the variables as well as the measures used to estimate the variables. Using related studies from the literature, the measurements used to estimate the various variables were validated

Table 3.1: Operationalization of variables

Variable	Operationalization	Measurement
• Growth Of Domestic Private Investment	Private investment: It is the productive accumulation of physical and liquid stock by the private sector in a country.	• (private investment sector / GDP)*100
• Interest Rate	Costs that banks and other lenders impose on loans made to customers	• Bank Lending rate.
• Exchange Rate	The cost of exchanging one currency for another	• Effective KES/ USD Exchange rate
• Money Supply	The total of a country's currency in circulation, demand money market holdings, and debt securities with maturities of up to two years.	• (Broad Money (M3) / GDP)*100
• Inflation Rate	Changes in the average price of commodities in a country over a specific time period.	• Inflation rate in %
• Government Expenditure On Infrastructure	The systems that facilitate the distribution of products, services, and energy from their point of production to their final destination.	• (Government Expenditure on Infrastructure/ GDP)*100

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This section presents the study's outcomes as well as the subsequent discussions. This chapter is divided into two sections: the first is a descriptive analysis highlighting the most important components of the study's data through summary statistics and trend analysis. In the second section of the chapter, the inference analysis results are discussed. Equally, the preliminary diagnostic tests are discussed in this section. These tests examine the model's stability. The presentation of the findings and subsequent discussions are congruent with the study's specific objectives and null hypotheses, as well as their relevance to both theoretical and empirical literature.

4.2 Descriptive Statistics of the Study Variables

This section comprises a descriptive analysis of the study's time series variables displayed in annual format. A plot of the resulting time series versus time is performed in order to determine the historical evolution of each of the study variables. The outcomes of a study are highly dependent on the types of data collected and the methods used to analyze some of these data. Consequently, the descriptive analysis also provided the generated statistics, including the minimum and maximum possible values as well as the mean and standard deviation of the study variables, which were as follows: change in interest rate, Exchange rate, Inflation, and Money supply and Government Expenditure on infrastructure for the period 1972-2022. These measures of central tendency are used to describe the study data which was informed by the fact that in comparison to other statistical measures the mean is the most robust statistic while the standard deviation is the most stable statistical measure of dispersion (Mungami, 2013).

Table 4.1: Descriptive Statistics Results

	Private invests (%GDP)	Inflation rate (%)	Money supply %,GDP)	Interest rate(%)	Exchange rate (%)	Infrastructures (%)
Mean	23.61759	9.930152	34.38416	16.37932	4.820701	19.19345
Median	22.15245	8.711724	35.51043	14.41667	2.718181	19.17132
Maximum	36.69933	41.98877	42.81939	36.24000	44.45501	25.07647
Minimum	16.48605	-9.219158	25.71029	9.000000	-8.984555	15.38790
Std. Dev.	5.356066	7.929678	4.631653	6.564068	9.108642	2.089359
Skewness	0.768572	1.467834	-0.094482	1.393223	1.700595	0.288322
Kurtosis	2.702268	7.416919	1.881743	4.373279	8.266629	3.253774
Jarque-Bera	5.209350	59.77056	2.733190	20.50662	81.88642	0.843456
Probability	0.073927	0.000000	0.254974	0.000035	0.000000	0.655913

As shown in Table 4.1, the dependent variable (domestic private investment had a minimum value of 16.48605 percent of GDP and a highest value of 36.69933 percent of GDP. A mean of 23.61759 percent and a standard deviation of 5.356066 percent of GDP further corroborate that domestic private investment fluctuated during the study period. During the study period, change in Inflation rate percent ranged between 41.98877 percent and -9.219158 percent of GDP, with a mean of 9.930152 percent and a standard deviation of 7.929678 percent. During the study period, the interest rate fluctuated between 36.24000 percent and 9.000000 percent, with a mean of 16.37932 percent and standard deviation of 6.564068 percent, respectively. Additionally, Table 4.1 demonstrates that the exchange rate ranged from 44.45501 percent to -8.984555 percent, with an average of 4.82070 percent and a standard deviation of 9.108642 percent, indicating substantial volatility in the foreign exchange market during the study period. As seen in Table 4.1 the money supply oscillated tremendously from 1972 to 2022, with the smallest and maximum values being 42.81939 percent and 25.71029 percent of GDP, respectively, with a mean of 34.38416 percent and a standard deviation of 4.631653. The minimum and greatest values of the expenditure on Infrastructures percent variable were 15.38790 percent and 25.07647 percent respectively, with a mean of 19.19345 percent and a standard deviation of 2.089359 percent. From 1972 to 2022, inflation fluctuated considerably as well.

4.3 Trend Analysis

4.3.1 Variables Trend Graph at Level

This section presents trend analysis on the various research variables. The discussions for each of the variables are presented thereafter.

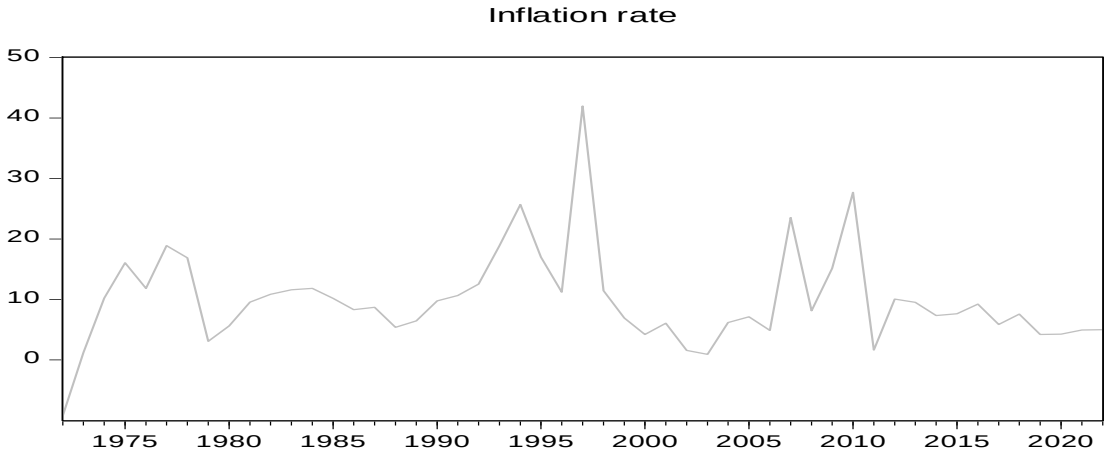

Figure 4.1: Inflation Rate at Level

Figure 4.1 points out that the evolution of Inflation rate has been cyclical over the study period. However, during the study period, the cyclical movement in Inflation can be associated with expansionary and contraction monetary and fiscal policies to mitigate external shocks' adverse effects such as international oil prices, droughts, and cases like the global financial crises witnessed in 1999. The period 2006- 2021 however the overall Inflation remained within the central bank target range despite the global corona virus pandemic that affected many sectors in the economy which is a clear indication of general stability of price level (Kippra, 2021).

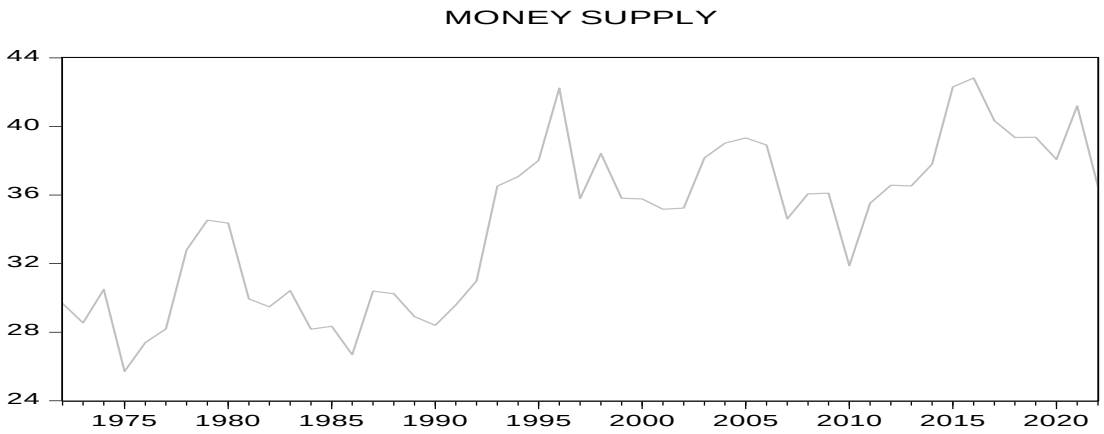

Figure 4.2: Money Supply at Level

Figure 4.2 points out that the evolution of Money supply as a percentage of GDP has been slightly cyclical. Money supply has consistently increased year on year thorough the study period standing. Money supply is a metric, which measure the economic activity in a country, has grown consistently at stable rate of over the study period with the spikes related to election-related spending and surge of domestic credit to the government and the private sector. The contained inflation may be because of the central bank strong monetary policy to curb inflation and maintain monetary stability and a competitive exchange rate. The Government always quickly reacts to monetary and fiscal policies.

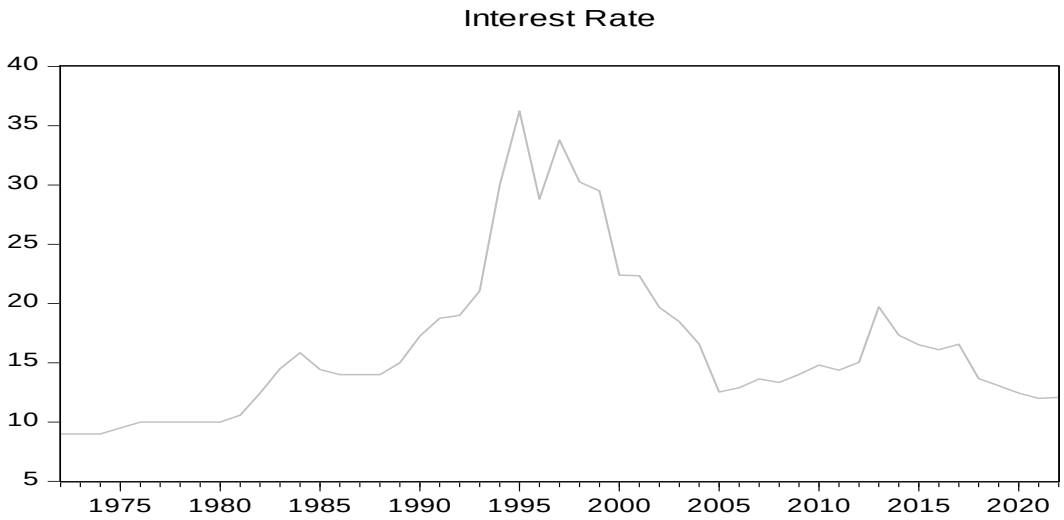

Figure 4.3: Interest Rate at Level

Figure 4.3 indicates that there has been great variability in the interest rate movement ranging between 12.00 percent and 35.47 percent over the study period. The interest rate remained below 15 percent for the period 1972 - 2022 when interest rates rose sharply to peak at 35 percent in 1996 then dropped gradually. On average, interest rates tend to co-move with the expansion and contraction of credit supply.The prevailing interest rates in Kenya are principally influenced by the actions of the monetary authority or central bank. The Central banks apply Monetary Policy Rate (MPR) to influence the movement of other rates in the country and ultimately the level of Inflation, output and employment. These interest rates facilitate the flow of funds from lenders to borrowers. Interest rates further aid the flow of credit in the economy and help financial entities to efficiently carry out financial intermediation roles.

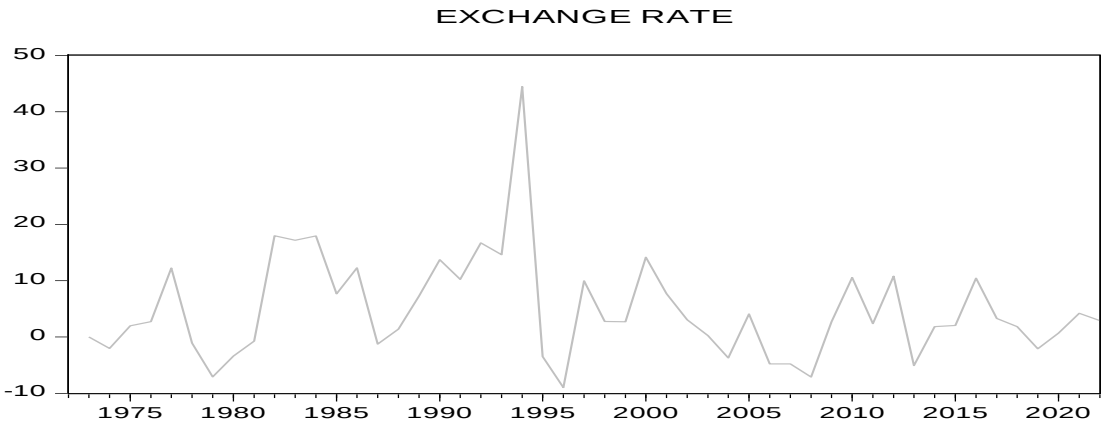

Figure 4.4: Exchange Rate at Level

Figure 4.4 shows that, there was unstable trend in exchange rates over the study period. However, the year 1994 portrays a period of consistent increase in the trend of exchange rates. The result shown in in Figure 4.4 portray that the KES/USD exchange rate is characterized high volatility with random and rapid changes.

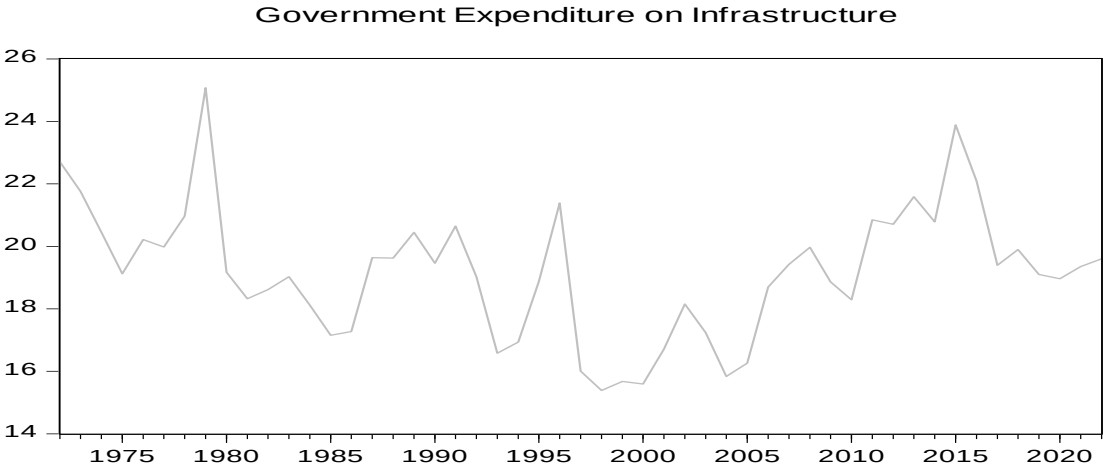

Figure 4.5: Government Expenditure on Infrastructure

Figure 4.5 shows that, there was a consistent increasing trend of Government Expenditure on infrastructure during the study period. The trend however decreased in 2013 and 2015 but reversed and continued with an upward trend until 2021.

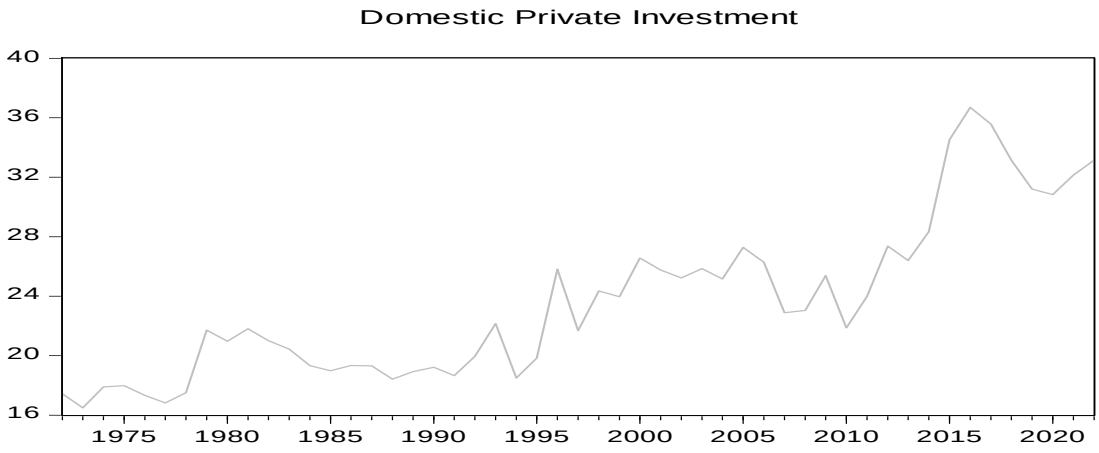

Figure 4.6: Domestic Private Investment

Figure 4.6 indicates that, Domestic Private Investment had an increasing trend over the study period. This is an indication that the study period was characterized by fairly fluctuating Domestic private investment as a percentage of economic growth. The period 1972 – 2022 exhibited an increasing trend constantly.

4.3.2 Trend graph at First Difference

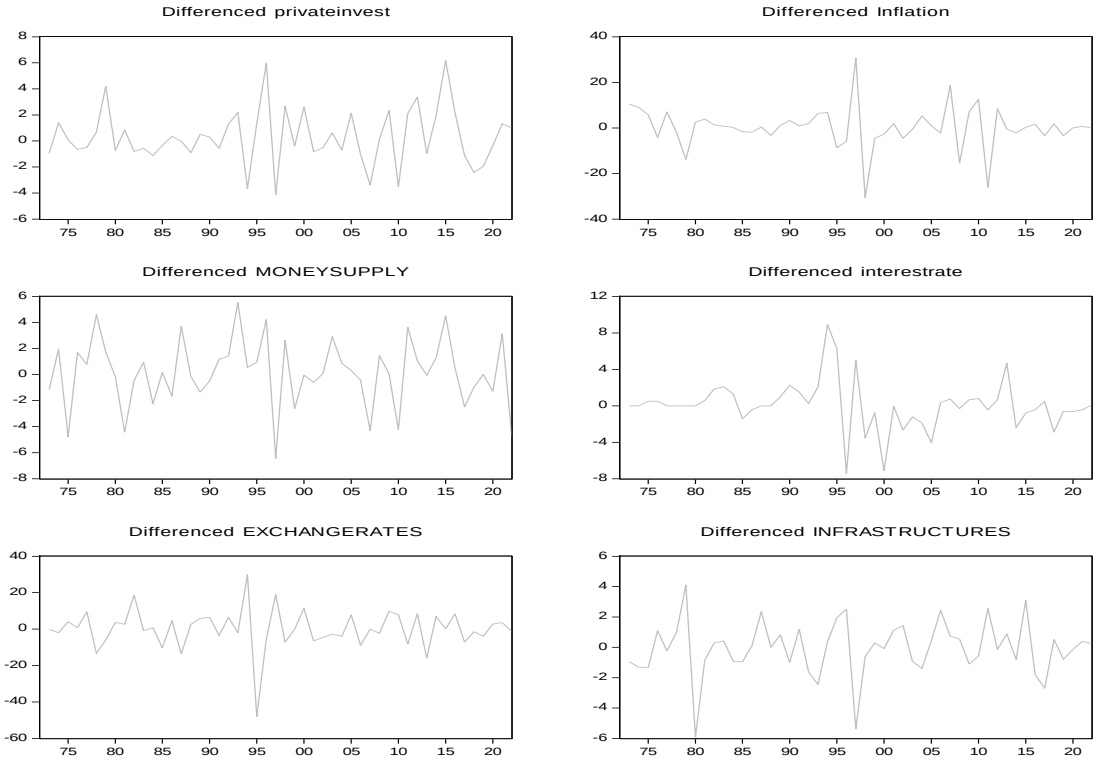

Figure 4.7: Trend Variables at First Difference

Figure 4.7, presents the results on the differenced variables trend graphs. The results show that the variables are stationary after the first difference. This indicates that further investigations using unit root analysis was necessary and was conducted.

4.4 Diagnostic Tests

4.4.1 Normality Test

The normality test assesses if the data is adequately modeled and normally dispersed. It is used to determine how much farther data shifts away from the Gaussian distribution by inspecting the graph and assessing whether the distribution deviates significantly from a bell-shaped normal distribution (Avioli, 2012).

Table 4.2: Shapiro-Wilk W Test for Normal

Variable	W	V	z	Probability
Private investment	0.92136	3.756	2.826	0.00236
Inflation rate	0.87480	5.981	3.819	0.00007
Money supply	0.95083	2.349	1.823	0.03415
Interest rate	0.84529	7.390	4.271	0.00001
Exchange rate	0.86898	6.259	3.916	0.00005
Government Expenditure on infrastructure	0.97386	1.249	0.475	0.31754

The results presented in table 4.2 indicates the normality test for the study variables. From the Shapiro-Wilk W Tests, the study failed to reject the null hypothesis and this implied that, the data set was not normally distributed save for one variable that is the Government Expenditure on infrastructure. In line with Brooks (2008), the evidence of a normal distribution implied that, the OLS regression methodology can be utilized for purposes of estimating the regression models but integrated with ARDL to take account the autocorrelation problem.

4.4.2 Stationarity Test of the Study Variables

The study conducted a stationarity test on the variables used for purposes of avoiding spurious regressions. Stationarity of the study data was tested using the Augmented Dickey-Fuller (ADF). Data is said to be stationary if the mean, variance, and covariance remain the same no matter the time of measurement. The use of non- stationery data may yield spurious results that look good under standard measures with significant estimates and with a high R^2 but are valueless (Gujarati, 2003). Stationarity would be inferred if the null hypothesis was rejected. In case the tests of Augmented Dickey-Fuller (ADF). ADF the result of ADF, are presented on Table 4.3.

Table 4.3: Augmented Dickey-Fuller (ADF) Stationarity Test

Variable	Unit root at level		Unit root at First difference	
	t-Statistic	Probability	t-statistic	probability
Private investment	-1.092213	0.7119	-7.937074	0.0000
Inflation rate	-5.669370	0.0000	-8.465679	0.0000
Money supply	-2.134435	0.2325	-8.392681	0.0000
Interest rate	-1.602548	0.4739	-6.843148	0.0000
Exchange rate	-5.233955	0.0001	-10.02887	0.0000
Government Expenditure on infrastructure	-3.622766	0.0086	-6.819710	0.0000

From the results, domestic private investment, money supply and interest rate were stationary at the first difference for ADF, Tests. From the same results, the null hypothesis of Non-stationarity was rejected for inflation rate, exchange rate, and infrastructure series at levels, indicating that these three were integrated order zero (0). These results imply that the use ARDL method which deals with mixed unit root process variables was warranted.

4.4.3 Pairwise Granger Causality Tests

Table 4.4: Granger Causality Tests

Null Hypothesis:	F-Statistic	Probability
Inflation does not granger cause private investments	1.08308	0.3474
Private investments does not granger cause inflation	6.47905	0.0034
Money supply does not granger cause private investments	0.97465	0.3853
Private investments does not granger cause money supply	0.52330	0.5962
Interest rate does not granger cause private investments	1.66221	0.2014
Private investments does not granger cause interest rate	2.93361	0.0637
Exchange rate does not granger cause private investments	1.19711	0.3117
Private investments does not granger cause exchange rates	2.22080	0.1205
Infrastructures does not granger cause private investments	0.49704	0.6117
Private investments does not granger cause infrastructures	1.39725	0.2580
Money supply does not granger cause inflation	3.27990	0.0470
Inflation does not granger cause money supply	1.01541	0.3706
Interest rate does not granger cause inflation	0.30848	0.7361
Inflation does not granger cause interest rate	0.95986	0.3908

Table 4.4 presents the results on the Granger Causality Tests. The results show that; Private investments granger cause inflation rate and exchange rate granger cause private investments since the associated p-values were significant 6.47905, p - value 0.0034. The results also show that the null hypothesis that Money supply does not granger because inflation was rejected since F-Statistic 3.27990 p = > value 0.0470. This necessitated the use of ARDL to solve this problem in the subsequent sections. All the other variables pairs do not granger cause one another.

4.5 Correlation Analysis of the Study Variables

This section examines the correlation pattern between macroeconomic variables and growth of domestic private investment for the dataset covering 1972 to 2022. The nature and direction of the relationship between macroeconomic factors and domestic private investment were established through the Pearson correlation analysis, tested at the 0.05 significance level (denoted α). The p-value, therefore, indicates whether the correlation coefficient is significantly different from 0 or not. In the case where the p-value is less than or equal to 0.05, the correlation is therefore significant. However, in the scenario where the p-value is greater than 0.05, then correlation is not significant (Verbeek, 2012).

Table 4.5: Correlation Matrix

Probability	**Domestic Private Investment**	**Inflation rate**	**Money supply**	**Interest rate**	**Exchange rate**	**Government Expenditure on infrastructure**
Domestic Private Investment	1.000000					
Inflation Rate	-0.354118	1.000000				
p-value	0.0108*					
Money Supply	0.833213	0.224072	1.000000			
p-value	0.0000*	0.1139	-----			
Interest Rate	0.281626	0.212805	0.357602	1.000000		
p-value	0.0443*	0.1338	0.0100*	-----		
Exchange Rate	-0.097647	0.319819	-0.265611	0.297202	1.000000	
p-value	0.4954	0.0221*	0.0596	0.0342*	-----	
Government Expenditure On infrastructure	-0.086425	-0.150860	-0.044072	-0.407679	-0.365611	1.000000
	0.5465	0.2906	0.7588	0.0030*	0.0083*	-----

From the results interest rate has a positive significant correlation 0.281626, p-value = 0.0443 < 0.05 with growth of domestic private investment. The correlation between inflation rate and domestic private investment was found to be p-value = 0.0108 < 0.05 negative and significant. Further, Exchange rate has a negative and insignificant p-value = 0.4954 > 0.05 relationship with Domestic Private Investment. The negative relationship between Exchange rate p-value = 0.4954 > 0.05 and Domestic Private Investment can be attributed to the high volatility associate with Exchange rate flows. The findings further reveal that government expenditure on infrastructure has an insignificant p-value = 0.5465

> 0.05 negative relationship with Domestic Private. The correlation between the independent variables range between 0.357602 and -0.407679.

4.6 Cointegration Test

The study employed the Johansen cointegration test as suggested by Pesaran *et al*. (2001) to test for the existence of long-run relationships between macroeconomic variables and Domestic Private investment. The linear Johansen cointegration tests are presented in Table 4.6.

Table 4.6: Johansen Cointergration Test

Variables	Hypothesized, No. of CE(s)	Trace Statistic	0.05, Critical Value	Probability
Growth of Private investments	None *	109.8256	95.75366	0.0038
Inflation rate	At most 1	66.72764	69.81889	0.0860
Money supply	At most 2	41.25596	47.85613	0.1807
Interest rate	At most 3	16.89219	29.79707	0.6480
Exchange rate	At most 4	6.755207	15.49471	0.6063
Government Expenditure on infrastructure	At most 5	0.447364	3.841466	0.5036

The result of the linear cointegration test presented in table 4.6 indicates that there is at least one long run relationship among the study variables. Hence the null hypothesis of no cointegration was rejected, indicating that long-run relationships existed relationship between macroeconomic factors and growth of Domestic Private Investment. The linear ARDL model was then estimated to reveal the underlying dynamics, having confirmed the existence of linear cointegration,

4.7 Autocorrelation Test

The study used The Breusch-Godfrey autocorrelation test to determine whether the residuals are serially correlation across time. The Breusch-Godfrey test can be used to examine autocorrelation of any order and models with or without lagged dependent

variables (Brooks, 2008). The null hypothesis states that no first-order serial correlation the results are presented in Table 4.7.

Table 4.7: Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.189291	Prob. F(2,32)	0.8285
Chi-Square	0.572927	Prob. Chi-Square(2)	0.7509

The results presented in Table 4.7, indicates that the P-value of the F-statistic, F-statistic 0.189291 and Chi-Square 0.572927 is greater than the significance level of 0.05 (P=>0.05). The study therefore failed to reject the null hypothesis and concluded that the residuals were statistically insignificant and hence exhibited no serial correlation.

4.8 Heteroskedasticity Test

The study tested for heteroskedasticity by conducting the Breusch–Pagan (B-P) test. The results are shown in Table 4.8.

Table 4.8: Heteroskedasticity ARCH Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.760652	Prob. F(14,34)	0.7011
Chi-Square	11.68684	Prob. Chi-Square(14)	0.6314
Scaled explained SS	5.774553	Prob. Chi-Square(14)	0.9719

The result presented in Table 4.8 indicates that the calculated statistic is less than the critical values; F-statistic 0.760652, Chi-Square 11.68684 and Scaled explained SS 5.774553 (P = > 0.05). Hence the study rejected the null hypothesis suggesting that there was evidence for the presence of heteroscedasticity.

4.9 Multicollinearity Test Results

Multicollinearity is a statistical phenomenon that occurs when two or more regressors are significantly correlated. The occurrence of multicollinearity may result in statistically

insignificant tests and incorrect conclusions that there is no link between the predictor and criterion variables (Whitley & Kite, 2012). The review investigated for multicollinearity by calculating the Tolerance and Variance Inflation Factor (VIF), which was used to determine the presence and degree of multicollinearity. The following explanatory factors were used in the study: Interest Rate (INT), Exchange rate (EXR), Money Supply (MS), Inflation (INF) and Government Expenditure on Infrastructure (GE).Table 4.9 presents the tolerance and variance inflation factors from the explanatory variables.

Table 4.9: Multicollinearity Test Results

Collinearity Statistics	Tolerance	Variance Inflated Factor
Inflation rate	0.769	1.300
Money supply	0.646	4.059
Interest rate	0.537	1.861
Exchange rate	0.784	3.522
Government Expenditure on infrastructure	0.713	1.402

Table 4.9, presents the Inflation rate Tolerance 0.769 variance inflated factor 1.300, money supply tolerance 0.646 variance inflated factor 4.059, interest rate tolerance 0.537 Variance Inflated Factor 1.861, Exchange rate Tolerance 0.784 Variance Inflated Factor 3.522 and public investment in Infrastructure Tolerance Tolerance 0.713 Variance Inflated Factor 1.402. The variables all had a VIF value of less than 5, thereby indicating the absence of severe multicollinearity and the level can be tolerated. Table 4.9 indicates that all the explanatory variables have a VIF statistic less than 10 and tolerance statistic greater than 0.1. This is further demonstrated by the Correlation Matrix on Table 4.9 (Cooper & Schindler, 2008).

4.10 The Optimum Number of Lags Selection.

Table 4.10: Optimal Lag Selection Criteria

lag	FPE	AIC	HQIC	SBIC
0	5.3e+07	34.8107	34.8996	35.0469
1	334363*	29.7339*	30.356*	31.3872*
2	554260	30.1639	31.3193	33.2344
3	758370	30.2726	31.9613	34.7601
4	852067	29.9519	32.1739	35.8566

Based on the result presented on Table 4.10, one lag was selected based on LR, FPE, SBIC and AIC, LR test statistic, HQIC: Hannan Quinn information criterion, FPE: Final prediction error, AIC: Akaikee information criterion, SC: Schwarz Bayesian information criterion.Before estimating the ARDL Model, the optimum lag length specification is necessary. Appropriate lag length for endogenous variables is essential to avoid under or over parameterization due to inappropriate lag selection (Shahbaz, 2015). Pre estimation test was conducted to determine the optimal lag length for the model.

4.10 Inference Analysis Results

4.10.1 Inflation Rates and Growth of Domestic Private Investment in Kenya

H_{01}: There is no significant relationship between inflation rate and growth of domestic private investment in Kenya.

Table 4.11: Ramsey RESET Stability Test for Inflation Rate

Tests statistics	Value	df	Probability
t-statistic	0.045081	43	0.9643
F-statistic	0.002032	(1, 43)	0.9643

Presents the Ramsey RESET Test. The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Asteriou & Hall, 2007). The estimated t-statistic and F-value were insignificant at the stated significance level and the null hypothesis was rejected, suggesting that the

model had a correct specification. The null hypothesis is rejected, indicating that the model has an adequate functional form (Brooks, 2008).

Goodness - of - fit statistics

The model's R-squared was 0.885311 which showed that inflation rate variable used explained the changes in private investment by approximately 88.5311%. The adjusted R-Squared was 0.874884 or 87.4884 % which is an indication for the model stability. The probability F-Statistic = 84.91121 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.751790 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.12: Inflation Rate and Growth of Domestic Private Investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investment (-1)	0.914544	0.055125	16.59026	0.0000
Inflation Rate	-0.148218	0.037627	-3.939126	0.0003
Inflation Rate (-1)	0.038297	0.039152	0.978144	0.3334
Inflation Rate (-2)	0.058644	0.035091	1.671224	0.1018
C	2.915278	1.592042	1.831156	0.0739
R-squared	0.885311	Mean dependent var		23.88936
Adjusted R-squared	0.874884	S.D. dependent var		5.286854
S.E. of regression	1.870050	Akaike info criterion		4.186258
Sum squared resid	153.8718	Schwarz criterion		4.379301
Log likelihood	-97.56333	Hannan-Quinn criter.		4.259499
F-statistic	84.91121	Durbin-Watson stat		1.751790
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = 2.915278 + 0.914544\mathrm{DPI}_t - 0.148218\mathrm{INF}_t + 0.038297\mathrm{INF}_{-1} + 0.058644\mathrm{INF}_{-1} + \lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Table 4.12 data support the presence of a statistically significant negative link between inflation rate and domestic private investment (beta= - 0.148218, P-value = 0.0003). The null hypothesis was therefore rejected at the 0.05 significance level. The findings of this study regarding the effect of inflation rate on domestic private investment are consistent

with the Deflation theory which was propounded by Fisher (1933). The theory asserts that a decrease in inflation rates bring about a decline in the general price level, which subsequently brings down the business net worth, reduced profitability and thus, precipitating bankruptcies in institutions.

Nguyen (2018), discovered a strong negative effect of inflation on domestic private investment in Kenya, supports these findings. In emerging economies like Kenya, inflation is strongly related to consumers' purchasing power, hence this result has policy implications. This is because investors' purchasing power decreases when inflation rises, which has a negative impact on construction prices and economic activity.

Goodness-of-Fit Statistics

The model's R-squared was 0.892662 which showed that inflation rate variable used explained the changes in private investment by approximately 89.2662 %. The adjusted R-Squared was 0.883121 or 88.3121 % which is an indication for the model stability. The probability F-Statistic = 93.55904 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.940913 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.13: Interact Inflation and growth of domestic private investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Private investments (-1)	0.936466	0.049837	18.79045	0.0000
Inflation rate	-0.119132	0.029301	-4.065823	0.0002
Inflation rate (-1)	0.070194	0.030038	2.336814	0.0240
Infrastructures	0.300568	0.170676	1.761041	0.0850
Error correction	-0.061715	0.018044	-3.420148	0.0014
C	-3.420462	3.923889	-0.871702	0.3880
R-squared	0.892662	Mean dependent var		23.74129
Adjusted R-squared	0.883121	S.D. dependent var		5.336345
S.E. of regression	1.824368	Akaike info criterion		4.134984
Sum squared resid	149.7744	Schwarz criterion		4.326187
Log likelihood	-98.37461	Hannan-Quinn criter.		4.207795
F-statistic	93.55904	Durbin-Watson stat		1.940913
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -3.420462 + 0.936466\mathrm{DPI}_t - 0.119132\mathrm{INF}_t + 0.070194\mathrm{INF}_{-1} + 0.300568\mathrm{GE}_t - 0.061715\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Table 4.13 data support the presence of a statistically significant negative and positive link between inflation rate and domestic private investment (beta= -0.119132 and 0.070194, P-value = 0.0002 and 0.0240). The null hypothesis was therefore rejected at the 0.05 significance level. The findings of this study regarding the effect of inflation rate on domestic private investment are consistent with the Deflation theory which was propounded by Fisher (1933). The theory asserts that a decrease in inflation rates bring about a decline in the general price level, which subsequently brings down the business net worth, reduced profitability and thus, precipitating bankruptcies in institutions.

Nguyen (2018), discovered a strong negative effect of inflation on domestic private investment in Kenya, supports these findings. In emerging economies like Kenya, inflation is strongly related to consumers' purchasing power, hence this result has policy implications. This is because investors' purchasing power decreases when inflation rises, which has a negative impact on construction prices and economic activity.

Goodness-of-Fit Statistics

The model's R-squared was 0.892909 which showed that inflation rate variable used explained the changes in private investment by approximately 89.2909 %. The adjusted R-Squared was 0.880739 or 88.0739 % which is an indication for the model stability. The probability F-Statistic = 73.37295 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.913475 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.14: Moderated inflation rate and growth of domestic private investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private investments (-1)	0.938285	0.051087	18.36654	0.0000
Inflation rate	-0.225291	0.257152	-0.876101	0.3857
Inflation rate (-1)	0.070477	0.029875	2.359086	0.0228
Infrastructures	0.252241	0.192793	1.308348	0.1975
Infrastructure* inflation rate	0.006023	0.014801	0.406952	0.6860
Error correction	-0.063534	0.020644	-3.077568	0.0035
C	-2.613972	4.053501	-0.644868	0.5224
R-squared	0.892909	Mean dependent var		23.74129
Adjusted R-squared	0.880739	S.D. dependent var		5.336345
S.E. of regression	1.842861	Akaike info criterion		4.172682
Sum squared resid	149.4299	Schwarz criterion		4.402125
Log likelihood	-98.31704	Hannan-Quinn criter.		4.260055
F-statistic	73.37295	Durbin-Watson stat		1.913475
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -2.613972 + 0.938285\mathrm{DPI}_t - 0.225291\mathrm{INF}_t + 0.070477\mathrm{INF}_{-1} + 0.252241\mathrm{GE}_t + 0.006023\mathrm{INF}_t * \mathrm{GE}_t - 0.063534\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Table 4.14 data support the presence of a statistically significant negative and positive link between inflation rate and domestic private investment (beta= - 0.225291 and 0.070477, P-value = 0.3857 and 0.0228).

As summarized in Table 4.14, the estimation result also indicates that the moderating variable (government expenditure on infrastructure) interaction effects with Inflation rate. The fitting statistics have also improved tremendously from R-squared 0.892662 and Adjusted R-squared 0.883121 without interaction to R-squared 0.892909 and adjusted R-squared 0.880739 after interaction.

4.10.2 Money supply and Growth of Domestic Private Investment in Kenya

H_{02}: There is no significant relationship between money supply and growth of domestic private investment in Kenya.

Table 4.15: Ramsey RESET Test

Tests statistics	Value	df	Probability
t-statistic	1.650065	45	0.1059
F-statistic	2.722715	(1, 45)	0.1059

Table 4.15, presents the Ramsey RESET Test. The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Asteriou & Hall, 2007). The estimated t-statistic and F-value were insignificant at the stated significance level and the null hypothesis was rejected, suggesting that the model had correct specification. The null hypothesis is rejected, indicating that the model has an adequate functional form (Brooks, 2008).

Goodness-of-Fit Statistics

The model's R-squared was 0.908257 which showed that money supply variable used explained the changes in private investment by approximately 90.8257 %. The adjusted R-Squared was 0.902273 or 90. 2273% which is an indication for a stable model is. The probability F-Statistic = 151.7997 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.962373 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.16: Money Supply and Growth of Domestic private Investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments (-1)	0.810789	0.082900	9.780321	0.0000
Money Supply	0.524779	0.095670	5.485309	0.0000
Money Supply (-1)	-0.275318	0.121122	-2.273068	0.0277
Error correction	-0.189211	0.070801	2.672447	0.0104
C	-3.891609	1.995271	-1.950416	0.0572
R-squared	0.908257	Mean dependent var		23.74129
Adjusted R-squared	0.902273	S.D. dependent var		5.336345
S.E. of regression	1.668208	Akaike info criterion		3.937995
Sum squared resid	128.0142	Schwarz criterion		4.090957
Log likelihood	-94.44988	Hannan-Quinn criter.		3.996244
F-statistic	151.7997	Durbin-Watson stat		1.962373
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -3.891609 + 0.810789\mathrm{DPI}_{-1} + 0.524779\mathrm{MS}_t - 0.275318\mathrm{MS}_{-1} - 0.189211\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Money Supply has a positive and statistically significant effect on domestic private investment in the long run (Coefficients = 0.524779 and - 0.275318 and the P-values = 0.0000 and 0.0277) as shown in Table 4.16 for different time horizon. Therefore, the study rejected the null hypothesis and concluded that Money Supply has a long term effect on domestic private investment in Kenya. This study also contradicts the findings of Okoroafor (2020), who identified a strong negative effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively when a lag of one year is introduced.

The study was also in agreement with Brima and Brima (2017), the results of this analysis indicate that the money supply exerts a both positive and negative and statistically significant effect from the previous one year on private sector investments. This finding is backed by theory the Loanable funds theory. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment in the economy (Sia, 2015).

Goodness-of-Fit Statistics

The model's R-squared was 0.919195 which showed that money supply variable used explained the changes in private investment by approximately 91.9195 %. The adjusted R-Squared was 0.912012 or 91.2012 % which is an indication for a stable model is. The probability F-Statistic = 151.7997 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 2.011409 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.17: Interact Money Supply and growth of domestic private investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments(-1)	0.787016	0.074578	10.55285	0.0000
Money Supply	0.469009	0.107374	4.368012	0.0001
Money Supply(-1)	-0.189598	0.128743	-1.472684	0.1478
Infrastructures	0.285509	0.122979	2.321610	0.0248
Error correction	-0.212984	0.055989	-3.804056	0.0004
C	-9.815463	2.916831	-3.365112	0.0016
R-squared	0.919195	Mean dependent var		23.74129
Adjusted R-squared	0.912012	S.D. dependent var		5.336345
S.E. of regression	1.582906	Akaike info criterion		3.851042
Sum squared resid	112.7517	Schwarz criterion		4.042244
Log likelihood	-91.27604	Hannan-Quinn criter.		3.923853
F-statistic	127.9738	Durbin-Watson stat		2.011409
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -9.815463 + 0.787016\mathrm{DPI}_{-1} - 0.469009\mathrm{MS}_t - 0.189598\mathrm{MS}_{-1} - 0.285509\mathrm{GE}_t + -0.212984\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Money Supply has a positive and statistically significant effect on domestic private investment in in the long run (Coefficients = 0.469009 and -0.189598 and the P-values = 0.0001 and 0.1478) as shown in Table 4.17 for different time horizon. Therefore, the study rejected the null hypothesis and concluded that Money Supply has a long term effect on

domestic private investment in Kenya. This study also contradicts the findings of Okoroafor (2020), who identified a strong negative effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively when a lag of one year is introduced.

The study was also in agreement with Brima and Brima (2017), the results of this analysis indicate that the money supply exerts a both positive and negative and statistically significant effect from the previous one year on private sector investments. This finding is backed by theory the Loanable funds theory. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment in the economy (Sia, 2015).

Goodness-of-Fit Statistics

The model's R-squared was 0.931122 which showed that money supply variable used explained the changes in private investment by approximately 93.1122 %. The adjusted R-Squared was 0.923294 or 92.3294% which is an indication for a stable model is. The probability F-Statistic = 118.9612 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 2.099179 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.18: Moderate Money Supply and growth of domestic private investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private investments(-1)	0.748475	0.070481	10.61959	0.0000
Money supply	-0.974921	0.350719	-2.779780	0.0080
Money supply(-1)	-0.180003	0.125055	-1.439396	0.1571
Infrastructures	-2.447559	0.608319	-4.023477	0.0002
Infrastructures * Money Supply	0.074944	0.016535	4.532537	0.0000
Error correction	0.251525	0.050190	-5.011472	0.0000
C	43.38241	12.31504	3.522716	0.0010
R-squared	0.931122	Mean dependent var		23.74129
Adjusted R-squared	0.923294	S.D. dependent var		5.336345
S.E. of regression	1.477942	Akaike info criterion		3.731345
Sum squared resid	96.10974	Schwarz criterion		3.960787
Log likelihood	-87.28362	Hannan-Quinn criter.		3.818718
F-statistic	118.9612	Durbin-Watson stat		2.099179
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = 43.38241 + 0.748475\mathrm{DPI}_{-1} - 0.974921\mathrm{MS}_t - 0.180003\mathrm{MS}_{-1} - 2.447559\mathrm{GE}_t + 0.074944\mathrm{MS}_t * \mathrm{GE}_t + -0.251525\,\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Money Supply has a negative and statistically significant effect on domestic private investment in in the long run (Coefficients = -0.974921 and -0.180003 and the P-values = 0.0080 and 0.1571) as shown in Table 4.17 for different time horizon. Therefore, the study rejected the null hypothesis and concluded that Money Supply has a long term effect on domestic private investment in Kenya.

As summarized in Table 4.18, the estimation result also indicates that the moderating variable (government expenditure on infrastructure) interaction effect on Money supply. The fitting statistics have also improved tremendously from R-squared 0.919195 and Adjusted R-squared 0.912012 without interaction to R-squared 0.931122 and adjusted R-squared 0.923294 after interaction.

4.10.3 Interest rate and Growth of Domestic Private Investment in Kenya

H_{03}: There is no significant relationship between interest rates and growth of domestic private investment in Kenya

Table 4.19: Ramsey RESET Test

Tests statistics	Value	df	Probability
t-statistic	0.247862	43	0.8054
F-statistic	0.061435	(1, 43)	0.8054

Table 4.19, presents the Ramsey RESET Test. The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Asteriou & Hall, 2007). The estimated t-statistic and F-value were insignificant at the stated significance level and the null hypothesis was rejected, suggesting that the model had a correct specification. The null hypothesis is rejected, indicating that the model has an adequate functional form (Brooks, 2008).

Goodness-of-Fit Statistics

The model's R-squared was 0.888297 which showed that Exchange Rate variable used explained the changes in private investment by approximately 88.8297 %. The adjusted R-Squared was 0.878142 or 87.8142 % which is an indication for a stable model is. The probability F-Statistic = 87.47515 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.791845 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.20: Interest Rate and Growth of Domestic Private Investment

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments(-1)	0.904712	0.051574	17.54189	0.0000
Interest rate	-0.379066	0.102264	-3.706736	0.0006
Interest rate (-1)	0.417263	0.101734	4.101491	0.0002
Error correction	-0.095288	0.046729	-2.039174	0.0472
C	1.941029	-1.379253	1.407304	0.1661
R-squared	0.885051	Mean dependent var		23.74129
Adjusted R-squared	0.877554	S.D. dependent var		5.336345
S.E. of regression	1.867310	Akaike info criterion		4.163493
Sum squared resid	160.3950	Schwarz criterion		4.316455
Log likelihood	-100.0873	Hannan-Quinn criter.		4.221742
F-statistic	118.0586	Durbin-Watson stat		1.653833
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = 1.941029 + 0.904825\mathrm{DPI}_t - 0.379066\ \mathrm{INT}_t + 0.417263\ \mathrm{INT}_{t-1} - 0.095288\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

The results on Table 4.20, indicates that interest rates has a statistically significant impact on domestic private investment for at least two years consecutively in the near run (a P-value of 0.0004 and 0.0002). The null hypothesis of no effect was therefore rejected at the 0.05 level of significance. This study revealed that interest rates had a considerable impact on domestic private investment which was negative in first year and positive in the next year.

This finding is supported by the Keynesian Theory of Investment Keynes (1936). The theory upholds that at lower rates of interest, more capital projects appear financially viable while higher interest rates lead to some projects being adjourned or cancelled since the cost of borrowing to finance investment become higher. According to the theory since investment is volatile and dependent on firms' expectations of the profitability of investment, so long as the expected yield on their investment exceeds the real interest rate, new investment will take place. Keynes rejected the notion that investment was based wholly on technological conditions of capital productivity, but stressed on monetary factors and finance and uncertainty as the basic causes of investment (Fazzari, 1989).

The cumulative amount of interest paid is subject to other factors such as credit risk of the borrower, amount borrowed and the period it will take to repay the loan (Schindler, 2011). A higher real interest rate, may raise the cost of capital and thus discourage investment. The cost of capital, which defines the private sector's access to credit, is a crucial determinant of domestic private investment. High-interest rates discourage investors in short run because they diminish the anticipated profits of the enterprise (Ndikumana, 2014).

Goodness-of-Fit Statistics

The model's R-squared was 0.921568 which showed that money supply variable used explained the changes in private investment by approximately 92.1568 %. The adjusted R-Squared was 0.914596 or 91. 4596 % which is an indication for a stable model is. The probability F-Statistic = 132.1859 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.946557 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.21: Interaction Interest Rate and Growth of Domestic Private Investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments (-1)	0.907648	0.044359	20.46126	0.0000
Interest rate	-0.351374	0.071608	-4.906893	0.0000
Interest rate(-1)	0.467008	0.062956	7.417980	0.0000
Infrastructures	0.554532	0.138544	4.002560	0.0002
Error correction	-0.092352	0.016569	5.573736	0.0000
C	-10.00893	3.315251	-3.019057	0.0042
R-squared	0.921568	Mean dependent var		23.74129
Adjusted R-squared	0.914596	S.D. dependent var		5.336345
S.E. of regression	1.559491	Akaike info criterion		3.821236
Sum squared resid	109.4406	Schwarz criterion		4.012438
Log likelihood	-90.53090	Hannan-Quinn criter.		3.894047
F-statistic	132.1859	Durbin-Watson stat		1.946557
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -10.00893 + 0.904825\ \mathrm{DPI}_t - 0.351374\ \mathrm{INT}_t + 0.467008\ \mathrm{INT}_{t-1} + 0.554532\ \mathrm{GE}_t + -0.092352\ \lambda \mathrm{ECT}_{t-1} + \varepsilon_t$$

The results on Table 4.21, indicates that interest rates has a statistically significant impact on domestic private investment for at least two years consecutively in the near run (coefficients= -0.351374 and 0.467008, P-value of 0.0004 and 0.0002). The null hypothesis of no effect was therefore rejected at the 0.05 level of significance. This study revealed that interest rates had a considerable impact on domestic private investment which was negative in first year and positive in the next year.

This finding is supported by the Keynesian Theory of Investment Keynes (1936). The theory upholds that at lower rates of interest, more capital projects appear financially viable while higher interest rates lead to some projects being adjourned or cancelled since the cost of borrowing to finance investment become higher. According to the theory since investment is volatile and dependent on firms' expectations of the profitability of investment, so long as the expected yield on their investment exceeds the real interest rate, new investment will take place. Keynes rejected the notion that investment was based wholly on technological conditions of capital productivity, but stressed on monetary factors and finance and uncertainty as the basic causes of investment (Fazzari, 1989).

The cumulative amount of interest paid is subject to other factors such as credit risk of the borrower, amount borrowed and the period it will take to repay the loan (Schindler, 2011). A higher real interest rate, may raise the cost of capital and thus discourage investment. The cost of capital, which defines the private sector's access to credit, is a crucial determinant of domestic private investment. High-interest rates discourage investors in short run because they diminish the anticipated profits of the enterprise (Ndikumana, 2014).

Goodness-of-Fit Statistics

The model's R-squared was 0.922196 which showed that money supply variable used explained the changes in private investment by approximately 92.2196 %. The adjusted R-Squared was 0.913355 or 91.3355 % which is an indication for a stable model is. The probability F-Statistic = 104.3046 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.967143 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.22: Moderated Interest Rate and Growth of Domestic Private Investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments(-1)	0.904825	0.045286	19.98019	0.0000
Interest rate	-0.529398	0.286736	-1.846290	0.0716
Interest rate(-1)	0.459665	0.067736	6.786108	0.0000
Infrastructures	0.377827	0.316294	1.194543	0.2387
Infrastructures *interest rate	0.010111	0.015202	0.665102	0.5095
Error correction	-0.095175	0.016903	-5.630707	0.0000
C	-6.639612	6.432519	-1.032195	0.3076
R-squared	0.922196	Mean dependent var		23.74129
Adjusted R-squared	0.913355	S.D. dependent var		5.336345
S.E. of regression	1.570785	Akaike info criterion		3.853195
Sum squared resid	108.5641	Schwarz criterion		4.082638
Log likelihood	-90.32988	Hannan-Quinn criter.		3.940568
F-statistic	104.3046	Durbin-Watson stat		1.967143
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -6.639612 + 0.904825\mathrm{DPI}_t - 0.529398\ \mathrm{INT}_t + 0.459665\ \mathrm{INT}_{t-1} + 0.377827\ \mathrm{GE}_t + 0.010111\ \mathrm{INT}_t * \mathrm{GE}_t - 0.095175\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

The results on Table 4.22, indicates that interest rates has a statistically significant impact on domestic private investment for at least two years consecutively in the near run (coefficients= -0.529398 and 0.459665, P-value of 0.0716 and 0.0000). The null

hypothesis of no effect was therefore rejected at the 0.05 level of significance. This study revealed that interest rates had a considerable impact on domestic private investment which was negative in first year and positive in the next year.

As summarized in Table 4.22, the estimation result also indicates that the moderating variable (government expenditure on infrastructure) interaction effects with interest rate. The fitting statistics have also improved tremendously from R-squared 0.921568 and Adjusted R-squared 0.914596 without interaction to R-squared 0.922196 and adjusted R-squared 0.913355 after interaction.

4.10.4 Exchange Rates and Growth of Domestic Private Investments in Kenya.

H_{04}; There is no significant relationship between exchange rates and growth of domestic private investment in Kenya.

Table 4.23: Ramsey RESET Test

Test statistics	Value	df	Probability
t-statistic	0.415623	46	0.6796
F-statistic	0.172743	(1, 46)	0.6796

Table 4.23, presents the Ramsey RESET Test. The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Asteriou & Hall, 2007). The estimated t-statistic and F-value were insignificant at the stated significance level and the null hypothesis was rejected, suggesting that the model had a correct specification. The null hypothesis is rejected, indicating that the model has an adequate functional form (Brooks, 2008).

Goodness-of-Fit Statistics

The model's R-squared was 0.854601 which showed that Exchange Rate variable used explained the changes in private investment by approximately 85.4601 %. The adjusted R-Squared was 0.848414 or 84.8414% which is an indication for a stable model is. The

probability F-Statistic = 138.1245 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 2.081671 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.24: Exchange Rate and Growth of Domestic Private Investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investment (-1)	0.924545	0.057043	16.20793	0.0000
Exchange Rate	-0.063552	0.032771	-1.939294	0.0585
C	2.388332	1.393533	1.713868	0.0931
R-squared	0.854601	Mean dependent var		23.74129
Adjusted R-squared	0.848414	S.D. dependent var		5.336345
S.E. of regression	2.077654	Akaike info criterion		4.358481
Sum squared resid	202.8824	Schwarz criterion		4.473202
Log likelihood	-105.9620	Hannan-Quinn criter.		4.402167
F-statistic	138.1245	Durbin-Watson stat		2.081671
Prob(F-statistic)	0.000000			

Table 4.24, shows that the effect of the exchange rate on domestic private investment is statistically insignificant (coefficient = -0.063552, P-value =0.0585).As indicated in Table 4.24, the influence of exchange rate is statistically insignificant over the long term. Therefore, the study does not reject the null hypothesis and concludes that the exchange rate has insignificant long-term effects on domestic private investment in Kenya. This study supported the relevance of the purchasing power parity (PPP) theory. This theory is important to this study because it links fluctuations in the exchange rate with changes in growth of domestic private investments in Kenyan. The theory simply asserts that there is an impulse-response relationship between exchange rates and value of investments (Chortareas & Kapetanios, 2013). This is consistent with those of Nazar and Bashiri (2012), who asserted that real exchange rate uncertainty has a negative impact on private investment. The findings are inconsistent with the findings of Canbaloglu and Gurgun (2017), who discovered that the impact of exchange rate was positive on domestic private investments.

Goodness-of-Fit Statistics

The model's R-squared was 0.867915 which showed that money supply variable used explained the changes in private investment by approximately 86.7915 %. The adjusted R-Squared was 0.859300 or 85.9300 % which is an indication for a stable model is. The probability F-Statistic = 100.7532 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 2.088663 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.25: Interaction Exchange Rate and Growth of Domestic Private Investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private investments(-1)	0.934672	0.055157	16.94560	0.0000
Exchange rates	-0.038924	0.033580	-1.159145	0.2524
Infrastructures	0.319943	0.148586	2.153252	0.0366
Error correction	-0.065328	0.018846	3.466383	0.0012
C	-4.085973	3.292880	-1.240851	0.2210
R-squared	0.867915	Mean dependent var		23.74129
Adjusted R-squared	0.859300	S.D. dependent var		5.336345
S.E. of regression	2.001660	Akaike info criterion		4.302450
Sum squared resid	184.3056	Schwarz criterion		4.455411
Log likelihood	-103.5612	Hannan-Quinn criter.		4.360698
F-statistic	100.7532	Durbin-Watson stat		2.088663
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -4.085973 + 0.934672\mathrm{DPI}_{t-j} - 0.038924\mathrm{EXR}_t + 0.319943\ \mathrm{GE}_t$$

$$- 0.065328\ \lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Table 4.25, shows that the effect of the exchange rate on domestic private investment is statistically insignificant (coefficient = -0.038924, P-value = 0.2524).As indicated in Table 4.25, the influence of exchange rate is statistically insignificant over the long term. Therefore, the study does not reject the null hypothesis and concludes that the exchange rate has insignificant long-term effects on domestic private investment in Kenya. This

study supported the relevance of the purchasing power parity (PPP) theory. The theory simply asserts that there is an impulse-response relationship between exchange rates and value of investments (Chortareas & Kapetanios, 2013). This is consistent with those of Nazar and Bashiri (2012), who asserted that real exchange rate uncertainty has a negative impact on private investment. The findings are inconsistent with the findings of Canbaloglu and Gurgun (2017), who discovered that the impact of exchange rate was positive on domestic private investments.

Goodness-of-Fit Statistics

The model's R-squared was 0.873862 which showed that money supply variable used explained the changes in private investment by approximately 87.3862 %. The adjusted R-Squared was 0.859528 or 85.9528 % which is an indication for a stable model is. The probability F-Statistic = 60.96501 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 2.044285 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.26: Moderated exchange rate and growth of domestic private investment in Kenya

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private investments (-1)	0.942820	0.056065	16.81646	0.0000
Exchange rates	-0.077473	0.325944	-0.237688	0.8132
Infrastructures	0.484806	0.188771	2.568227	0.0137
Infrastructures (-1)	-0.254922	0.178583	-1.427469	0.1605
Infrastructures *exchange rate	0.002341	0.017759	0.131826	0.8957
Error correction	-0.063543	0.018294	-3.473454	0.0011
C	-2.554526	3.634106	-0.702931	0.4858
R-squared	0.873862	Mean dependent var		23.74129
Adjusted R-squared	0.859528	S.D. dependent var		5.336345
S.E. of regression	2.000037	Akaike info criterion		4.336375
Sum squared resid	176.0066	Schwarz criterion		4.565818
Log likelihood	-102.4094	Hannan-Quinn criter.		4.423748
F-statistic	60.96501	Durbin-Watson stat		2.044285
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -2.554526 + 0.942820\mathrm{DPI}_{t-j} - 0.077473\ \mathrm{EXR}_t + 0.484806\ \mathrm{GE}_t -$$

$$0.254922\mathrm{GE}_{t-1} + 0.002341\mathrm{EXR}_t * \mathrm{GE}_t + \ -0.063543\ \lambda\mathrm{ECT}_{\mathrm{t}-1} + \varepsilon_{\ t}$$

Table 4.26, shows that the effect of the exchange rate on domestic private investment is statistically insignificant (coefficient = - 0.077473, P-value = 0.8132).

As summarized in Table 4.26, the findings of the moderation test indicate that the coefficient of the moderating variable (Government Expenditure on Infrastructure) in step one are positive and significant. This finding implies that there is a moderating influence but also direct effect. The estimation result also indicates that the moderating variable's (government expenditure on infrastructure) interaction effects with all explanatory variables. The fitting statistics have also improved tremendously from R-squared 0.867915 and Adjusted R-squared 0.859300 without interaction to R-squared 0.873862 and adjusted R-squared 0.859528 after interaction.

4.11 Joint Regression Model

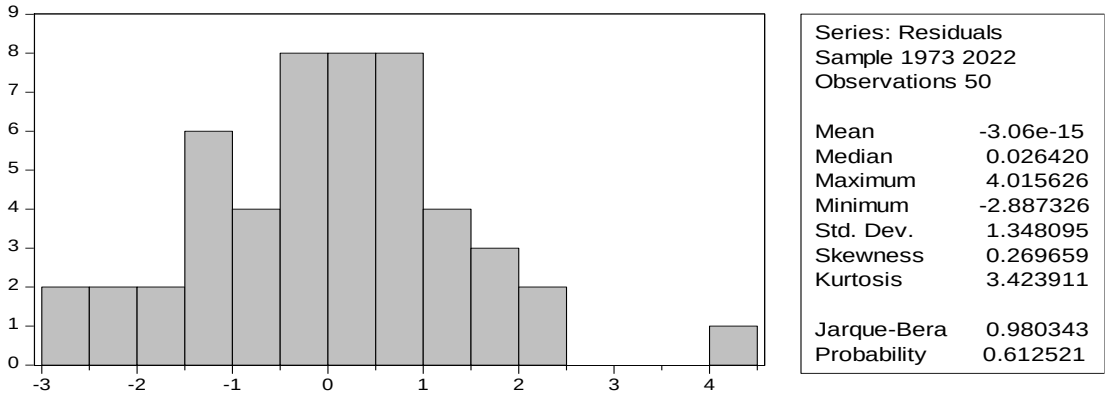

Figure 4.8: Residuals Plot

Figure 4.8 presents the residuals for the joint regression for the independent variables combined. The results show that that they are normally distributed. This show that all the estimates are correct efficient and unbiased.

Table 4.27: Ramsey RESET Test

Statistics	Value	df	Probability
t-statistic	1.501198	42	0.1408
F-statistic	2.253596	(1, 42)	0.1408

Table 4.27 presents the Ramsey RESET Test. The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Asteriou & Hall, 2007). The estimated F-value was insignificant at the stated significance level and the null hypothesis was rejected, suggesting that the model was correctly specified. The null hypothesis is rejected, indicating that the model has an adequate functional form (Brooks, 2008).

Goodness-of-Fit Statistics

The model's R-squared was 0.936181 which showed that macroeconomic variables used explained the changes in private investment by approximately 93.6181%. The adjusted R-Squared was 0.927275 or 92.7275 % which is which an indication for a stable model is. The probability F-Statistic = 105.1293 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.533442 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.28: Joint Autoregressive Distributed Lag Model

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments(-1)	0.644063	0.061767	10.42730	0.0000
Inflation Rate	-0.071984	0.034505	-2.086160	0.0429
Money Supply	0.422541	0.081250	5.200505	0.0000
Interest Rate	-0.276010	0.099723	-2.767759	0.0083
Interest Rate (-1)	0.220089	0.092964	2.367473	0.0225
Exchange Rate	0.029782	0.026947	1.105188	0.2752
Error correction	0.355937	0.050760	-7.012164	0.0000
C	-4.379141	1.758914	-2.489684	0.0167
R-squared	0.936181	Mean dependent var		23.74129
Adjusted R-squared	0.927275	S.D. dependent var		5.336345
S.E. of regression	1.439078	Akaike info criterion		3.695059
Sum squared resid	89.05063	Schwarz criterion		3.962742
Log likelihood	-85.37648	Hannan-Quinn criter.		3.796994
F-statistic	105.1293	Durbin-Watson stat		1.533442
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -4.379141 + 0.644063\mathrm{DPI}_{t-1} - 0.276010\ \mathrm{INT}_t + 0.220089\ \mathrm{INT}_{t-1} + 0.029782\ \mathrm{EXR}_t + 0.422541\mathrm{MS}_t - 0.071984\ \mathrm{INF}_t - 0.355937\lambda\mathrm{ECT}_{t-1} + \varepsilon_t$$

Inflation Rate

Table 4.28 data support the presence of a statistically significant negative link between inflation rate and domestic private investment (beta= -0.071984, P-value = 0.0429). The

null hypothesis was therefore rejected at the 0.05 significance level. The findings of this study regarding the effect of inflation rate on domestic private investment are consistent with the Deflation theory was propounded by Fisher (1933). The theory asserts that a decrease in inflation rates bring about a decline in the general price level, which subsequently brings down the business net worth, reduced profitability and thus, precipitating bankruptcies in institutions.

Nguyen (2018), discovered a strong negative effect of inflation on domestic private investment in Kenya, supports these findings. In emerging economies like Kenya, inflation is strongly related to consumers' purchasing power, hence this result has policy implications. This is because investors' purchasing power decreases when inflation rises, which has a negative impact on construction prices and economic activity.

Money Supply

Money Supply has a positive and statistically significant effect on domestic private investment in the long run (Coefficients= 0.422541 and the P-values = 0.0000) as shown. Therefore, the study reject the null hypothesis and concluded that Money Supply has a long term effect on domestic private investment in Kenya. This study also contradict the findings of Okoroafor (2020), who identified a strong negative effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively when a lag of one year is introduced. The study was also in agreement with Brima and Brima (2017), the results of this analysis indicate that the money supply exerts a both positive and negative and statistically significant effect from the previous one year on private sector investments.

This findings of this study are is backed by theory the Loanable funds theory. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment in the economy (Sia, 2015).

Interest Rate

The outcome in Table 4.28, shows that the effect of the Interest rate on domestic private investment is statistically significant (coefficient = - 0.276010, and 0.220089 while the P-values were = 0.0083 and 0.0225). These results indicate that interest rates have a statistically significant impact on domestic private investment for at least two years consecutively. The null hypothesis was therefore rejected at the 0.05 level of significance. This study revealed that increase in interest rates had a significant impact on domestic private investment over the long term negative in first year and positive in the next year. The interpretation is that the horizon is very important.

This finding is supported by the Keynesian Theory of Investment Keynes (1936). The theory upholds that at lower rates of interest, more capital projects appear financially viable while higher interest rates lead to some projects being adjourned or cancelled since the cost of borrowing to finance investment become higher. According to the theory since investment is volatile and dependent on firms' expectations of the profitability of investment, so long as the expected yield on their investment exceeds the real interest rate, new investment will take place. Keynes rejected the notion that investment was based wholly on technological conditions of capital productivity, but stressed on monetary factors and finance and uncertainty as the basic causes of investment (Fazzari, 1989).

The cumulative amount of interest paid is subject to other factors such as credit risk of the borrower, amount borrowed and the period it will take to repay the loan (Schindler, 2011). A higher real interest rate, may raise the cost of capital and thus discourage investment. The cost of capital, which defines the private sector's access to credit, is a crucial determinant of domestic private investment. High-interest rates discourage investors in short run because they diminish the anticipated profits of the enterprise (Ndikumana, 2014).

Exchange Rate

Table 4.28, shows that the effect of the exchange rate on domestic private investment is statistically insignificant (coefficient = 0.029782, P-value = 0.2752). As indicated, the influence of exchange rate is statistically insignificant over the long term. Therefore, the study does not reject the null hypothesis and concludes that the exchange rate has insignificant effects on domestic private investment in Kenya. This study supported the relevance of the purchasing power parity (PPP) theory. This theory is important to this study because it links fluctuations in the exchange rate with changes in growth of domestic private investments in Kenyan. The theory simply asserts that there is an impulse-response relationship between exchange rates and value of investments (Chortareas & Kapetanios, 2013). This is inconsistent with those of Nazar and Bashiri (2012), who asserted that real exchange rate uncertainty has a negative impact on private investment. It also support the findings of Canbaloglu and Gurgun (2017), who discovered that the impact of exchange rate was positive on domestic private investments.

4.12 The Autoregressive Distribution Lag Model Estimation with Interaction Terms

This section contains the results of testing the first four hypothesis with the inclusion of government infrastructural spending included as one of the independent variables. All study hypotheses were evaluated at a significance level of 0.05. This part displays the outcomes of testing the hypotheses in accordance with the study's specific objectives. ARDL was used to establish statistical significance at 95 percent confidence interval (0.05) for hypotheses H_{01}, H_{02}, H_{03}, and H_{04}. The research assumed that the macroeconomic variables have no significant impact on growth of private domestic investment in Kenya.

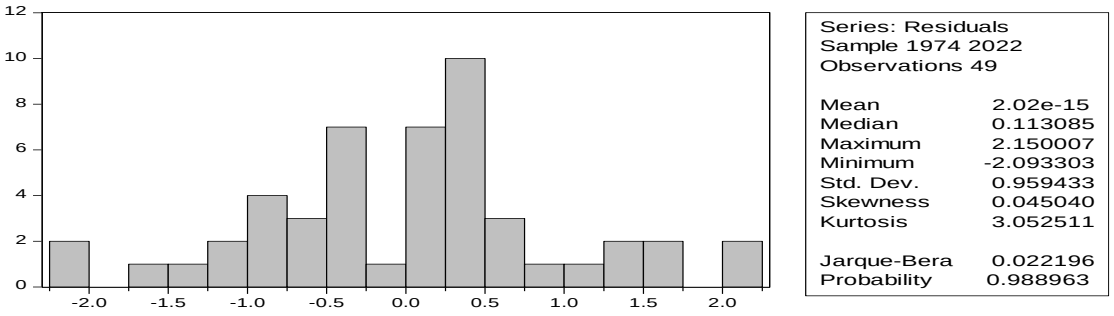

Figure 4.9: Residuals Plot

Figure 4.9 presents the residuals for the joint regression for the independent variables combined. The results show that that they are normally distributed. This shows that all the estimates are corrected efficient and unbiased.

Goodness-of-Fit statistics

The model's R-squared was 0.950619 which showed that macroeconomic variables used explained the changes in economic growth by approximately 95.0619 %. The adjusted R-Squared was 0.942389 or 94.2389 % which is which an indication for a stable model is. The probability F-Statistic = 115.5038 had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 1.832222 which was within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.29: Autoregressive Distributed Lag Model Long Run Effect

Variable	Coefficient	Std. Error	t-Statistic	Probability
Private Investments (-1)	0.701104	0.057335	12.22825	0.0000
Inflation rate	-0.060405	0.030889	-1.955591	0.0572
Money supply	0.337018	0.076324	4.415646	0.0001
Interest rate	-0.310128	0.089291	-3.473228	0.0012
Interest rate (-1)	0.323443	0.087842	3.682111	0.0007
Exchange rate	0.049429	0.024631	2.006805	0.0512
Expenditure on Infrastructure	0.395292	0.112802	3.504302	0.0011
Error correction	-0.298896	0.033934	-8.808039	0.0000
C	-11.67801	2.605578	-4.481927	0.0001
R-squared	0.950619	Mean dependent var		23.74129
Adjusted R-squared	0.942389	S.D. dependent var		5.336345
S.E. of regression	1.280849	Akaike info criterion		3.478571
Sum squared residuals	68.90415	Schwarz criterion		3.784494
Log likelihood	-78.96426	Hannan-Quinn criteria		3.595068
F-statistic	115.5038	Durbin-Watson stat		2.038147
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = -11.67801 + 0.701104\mathrm{DPI}_{t-1} - 0.060405\ \mathrm{INF}_t - 0.310128\mathrm{INT}_t + 0.3234438\mathrm{INT}_{t-1} + 0.049429\ \mathrm{EXR}_t + 0.337018\ \mathrm{MS}_t + 0.395292\mathrm{GE}_t - 0.298896\lambda\mathrm{ECT}_{t-1}$$

4.12.1 Effect of Inflation Rate on Growth of Domestic Private investment in Kenya

Table 4.29, data support the presence of a statistically significant negative link between inflation rate and domestic private investment (beta= - 0.060405, P-value = 0.0572). The null hypothesis was therefore rejected at the 0.05 insignificance level. The findings of this study regarding the effect of inflation rate on domestic private investment are consistent with the Deflation theory was propounded by Fisher (1933). The theory asserts that a decrease in inflation rates bring about a decline in the general price level, which subsequently brings down the business net worth, reduced profitability and thus, precipitating bankruptcies in institutions.

Nguyen (2018), discovered a strong negative effect of inflation on domestic private investment in Kenya, supports these findings. In emerging economies like Kenya, inflation is strongly related to consumers' purchasing power hence this result has policy implications. This is because investors' purchasing power decreases when inflation rises, which has a negative impact on construction prices and economic activity.

4.12.2 Effect of Money supply on Growth of Domestic Private investment in Kenya

Money Supply has a positive and statistically significant 0.337018 effect on domestic private investment in the long run (P-value = 0.0001) as shown in Table 4.29. Therefore, the study rejects the null hypothesis and concludes that Money Supply has a long-run effect on domestic private investment in Kenya. This study contrasts the findings of Okoroafor (2020), who identified a strong detrimental effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively. This study also contradict the findings of Okoroafor (2020), who identified a strong negative effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively when a lag of one year is introduced.

The study was also in agreement with Brima and Brima (2017), the results of this analysis indicate that the money supply exerts a both positive and negative and statistically significant effect from the previous one year on private sector investments. This finding is backed by theory the Loanable funds theory. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment in the economy (Sia, 2015).

4.12.3 Effect of Interest Rate on Growth of Domestic Private Investment in Kenya

The outcome in Table 4.29 indicates that interest rates has a statistically significant -0.310128 and 0.323443 impact on domestic private investment since the P-value were both 0.0012 and 0.0007 consecutively. The interest rate has a statistically significant

impact on domestic private investment in Kenya. The null hypothesis was therefore rejected at the 0.05 level of significance. After, the study revealed data suggesting that interest rates had a considerable impact on domestic private investment over the long term.

This finding is supported by the Keynesian Theory of Investment Keynes (1936). The theory upholds that at lower rates of interest, more capital projects appear financially viable while higher interest rates lead to some projects being adjourned or cancelled since the cost of borrowing to finance investment become higher. According to the theory since investment is volatile and dependent on firms' expectations of the profitability of investment, so long as the expected yield on their investment exceeds the real interest rate, new investment will take place. Keynes rejected the notion that investment was based wholly on technological conditions of capital productivity, but stressed on monetary factors and finance and uncertainty as the basic causes of investment (Fazzari, 1989).

The cumulative amount of interest paid is subject to other factors such as credit risk of the borrower, amount borrowed and the period it will take to repay the loan (Schindler, 2011). A higher real interest rate, may raise the cost of capital and thus discourage investment. The cost of capital, which defines the private sector's access to credit, is a crucial determinant of domestic private investment. High-interest rates discourage investors in short run because they diminish the anticipated profits of the enterprise (Ndikumana, 2014).

4.12.4 Effect of exchange rate on Growth of Domestic Private investment

On the other hand, as indicated in Table 4.29, the influence of exchange rate is statistically significant 0.049429 and the associated P-value = 0.0512. Therefore, the study rejects the null hypothesis and concludes that the exchange rate has significant and effects on domestic private investment in Kenya. As indicated the influence of exchange rate is statistically insignificant over the long term. Therefore, the study does not reject the null hypothesis and concludes that the exchange rate has insignificant long-term effects on domestic private investment in Kenya. This study supported the relevance of the

purchasing power parity (PPP) theory. This theory is important to this study because it links fluctuations in the exchange rate with changes in growth of domestic private investments in Kenyan. The theory simply asserts that there is an impulse-response relationship between exchange rates and value of investments (Chortareas & Kapetanios, 2013). This is inconsistent with those of Nazar and Bashiri (2012), who asserted that real exchange rate uncertainty has a negative impact on private investment. It also supports the findings of Canbaloglu and Gurgun (2017) who discovered that the impact of exchange rate was positive on domestic private investments.

4.13 Moderating Role of Government Expenditure on Infrastructure

H_{05}: Government expenditure on infrastructure does not moderate the relationship between macroeconomic variables and growth of private domestic investment in Kenya

The study also evaluated the moderating effect of government expenditure on infrastructure investment on the association between macroeconomic variables and growth of domestic private investment in Kenya. As a result, the moderation strategy of Whisman and McClelland (2005) was utilized, which entailed the estimation of two regressions.

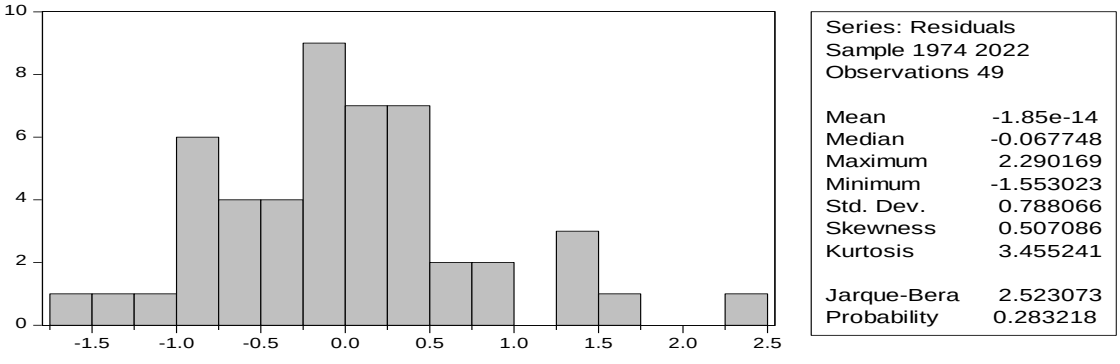

Figure 4.10: Residuals Plot

Figure 4.30 presents the residuals for the moderating role of government expenditure on the effect of macroeconomic variables on growth of domestic private investments in Kenya. The results show that they are normally distributed. This show that all the estimates are corrected efficient and unbiased.

Table 4.30: Ramsey Reset Test

Statistic	Value	df	Probability
t-statistic	0.044862	29	0.9645
F-statistic	0.002013	(1, 29)	0.9645

Table 4.30, presents the Ramsey RESET Test. The research employed a Ramsey Regression Equation Specification Test (RESET) to determine if the model's functional form was adequately specified (Asteriou & Hall, 2007). The estimated F-value and t-statistic was insignificant at the stated significance level and the null hypothesis of misspecification was rejected, suggesting that the model was correctly specified. The null hypothesis is rejected, indicating that the model has an adequate functional form (Brooks, 2008).

Goodness-of-Fit Statistics

The model's R-squared was 0.964842 which showed that macroeconomic variables used explained the changes in economic growth by approximately 9604842%. The adjusted R-Squared was 0.954665 or 95.4665which is which an indication for a stable model is. The probability F-Statistic had a probability value of 0.000000 which was less than 0.05 and significant at 5% level of significance. This added to the stability of the model. Durbin-Watson Statistic was 2.285255 which were within the acceptable range. This meant that there was no serial correlation in the model.

Table 4.31: Test for Interacted Effect Method

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	46.29444	17.04135	2.716595	0.0099
Private investments (-1)	0.605645	0.057254	10.57823	0.0000
Inflation rate	0.048107	0.274535	0.175232	0.8618
Money supply	-1.244040	0.471539	-2.638254	0.0120
Interest rate	-0.007111	0.311551	-0.022825	0.9819
Interest rate(-1)	0.243028	0.082936	2.930316	0.0057
Exchange rates	-0.388914	0.213568	-1.821034	0.0765
Expenditure on Infrastructure	-2.589561	0.870147	-2.976003	0.0051
Expenditure on Infrastructure * Inflation rate	-0.006836	0.015093	-0.452919	0.6532
Expenditure on Infrastructure *Money supply	0.086081	0.024864	3.462074	0.0013
Expenditure on Infrastructure *Interest	-0.013716	0.015800	-0.868110	0.3908
Expenditure on Infrastructure *Exchange rate	0.022994	0.011622	1.978556	0.0551
Error correction	-0.394355	0.034804	-11.33076	0.0000
R-squared	0.964842	Mean dependent var		23.74129
Adjusted R-squared	0.954665	S.D. dependent var		5.336345
S.E. of regression	1.136218	Akaike info criterion		3.298850
Sum squared resid	49.05763	Schwarz criterion		3.757735
Log likelihood	-70.47124	Hannan-Quinn criter.		3.473596
F-statistic	94.80352	Durbin-Watson stat		2.285255
Probability (F-statistic)	0.000000			

$$\mathrm{DPI}_t = 46.29444 + 0.605645_{t-1}DPI - 0.007111\mathrm{INT}_t - 0.243028\mathrm{INT}_{t-1} - 0.388914\mathrm{EXR}_t + -1.244040\mathrm{MS}_t + 0.048107\mathrm{INF}_t - 2.589561\mathrm{GE}_t - 0.013716\mathrm{INT}_t * \mathrm{GE}_t + 0.022994\mathrm{EXR}_t * \mathrm{GE}_t + 0.086081\mathrm{MS}_t * \mathrm{GE}_t - 0.006836\mathrm{INF}_t * \mathrm{GE}_t - 0.394355\,\lambda\mathrm{ECT}_{t-1}$$

4.13.1 Effect of Inflation Rate on Growth of Domestic Private investment in Kenya

Table 4.31, data support the presence of a statistically insignificant positive link between inflation rate and domestic private investment (beta= 0.048107, P-value = 0.8618). The null hypothesis was not therefore rejected at the 0.05 significance level. The outcome for

the interaction term indicates that interest rates have a statistically insignificant -0.006836 impact on domestic private investment only (p value = 0.6532). The findings of this study regarding the effect of inflation rate on domestic private investment are consistent with the Deflation theory was propounded by Fisher (1933). The theory asserts that a decrease in inflation rates bring about a decline in the general price level, which subsequently brings down the business net worth, reduced profitability and thus, precipitating bankruptcies in institutions.

Nguyen (2018), discovered a strong negative effect of inflation on domestic private investment in Kenya, supports these findings. In emerging economies like Kenya, inflation is strongly related to consumers' purchasing power hence this result has policy implications. This is because investors' purchasing power decreases when inflation rises, which has a negative impact on construction prices and economic activity.

4.13.2 The Effect of Money supply on Growth of Domestic Private investment in Kenya

Money Supply has a positive and statistically significant -1.244040 effect on domestic private investment in the long run (P-value = 0.0120) as shown in Table 4.31. Therefore, the study rejects the null hypothesis and concludes that Money Supply has a long-run effect on domestic private investment in Kenya. The outcome for the interaction term indicates that interest rates have a statistically insignificant 0.086081 impact on domestic private investment only (p value = 0.0013). This study contrasts the findings of Okoroafor (2020), who identified a strong detrimental effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively. This study also contradict the findings of Okoroafor (2020), who identified a strong negative effect of a limited Money Supply on domestic private investment in selected Asian nations and Nigeria, respectively when a lag of one year is introduced.

The study was also in agreement with Brima and Brima (2017), the results of this analysis indicate that the money supply exerts a both positive and negative and statistically significant effect from the previous one year on private sector investments. This finding is backed by theory the Loanable funds theory. This theory argues that economic agents seek to exploit the resources available to them in the market. Economic agents focus on increasing future income by borrowing funds to take advantage of opportunities available for investment in the economy (Sia, 2015).

4.13.3 Effect of Interest Rate on Growth of Domestic Private Investment in Kenya

The outcome in Table 4.31 indicates that interest rates have a statistically significant -0.007111 and 0.243028 impact on domestic private investment only (p value = 0.9819 and 0.0057). The outcome for the interaction term indicates that interest rates have a statistically insignificant -0.013716 impact on domestic private investment only (p value = 0.3908). The interest rate has a statistically significant impact on domestic private investment in Kenya. The null hypothesis was therefore rejected at the 0.05 level of significance. After, the study revealed data suggesting that interest rates had a considerable impact on domestic private investment over the long term.

This finding is supported by the Keynesian Theory of Investment Keynes (1936). The theory upholds that at lower rates of interest, more capital projects appear financially viable while higher interest rates lead to some projects being adjourned or cancelled since the cost of borrowing to finance investment become higher. According to the theory since investment is volatile and dependent on firms' expectations of the profitability of investment, so long as the expected yield on their investment exceeds the real interest rate, new investment will take place. Keynes rejected the notion that investment was based wholly on technological conditions of capital productivity, but stressed on monetary factors and finance and uncertainty as the basic causes of investment (Fazzari, 1989).

The cumulative amount of interest paid is subject to other factors such as credit risk of the borrower, amount borrowed and the period it will take to repay the loan (Schindler, 2011).

A higher real interest rate may raise the cost of capital and thus discourage investment. The cost of capital, which defines the private sector's access to credit, is a crucial determinant of domestic private investment. High-interest rates discourage investors in short run because they diminish the anticipated profits of the enterprise (Ndikumana, 2014).

4.13.4 Effect of exchange rate on Growth of Domestic Private investment

On the other hand, as indicated in Table 4.31, the influence of exchange rate is statistically insignificant -0.388914, over the long term (P-value = 0.0765). The outcome for the interaction term indicates that interest rates have a statistically significant 0.022994 impact on domestic private investment only (p value = 0.0551).Therefore, the study does not rejects the null hypothesis and concludes that the exchange rate has significant and effects on domestic private investment in Kenya.

As indicated the influence of exchange rate is statistically insignificant over the long term. Therefore, the study does not reject the null hypothesis and concludes that the exchange rate has insignificant long-term effects on domestic private investment in Kenya. This study supported the relevance of the purchasing power parity (PPP) theory. This theory is important to this study because it links fluctuations in the exchange rate with changes in growth of domestic private investments in Kenyan. The theory simply asserts that there is an impulse-response relationship between exchange rates and value of investments (Chortareas & Kapetanios, 2013). This is inconsistent with those of Nazar and Bashiri (2012), who asserted that real exchange rate uncertainty has a negative impact on private investment. It also supports the findings of Canbaloglu and Gurgun (2017) who discovered that the impact of exchange rate was positive on domestic private investments.

4.14 Moderation Effect

As summarized in Table 4.31, the findings of the moderation test indicate that the coefficient of the moderating variable (coefficient= -2.589561 and p value = 0.0051) in

step one are positive and significant. This finding implies that there is a moderating influence but also direct effect. The estimation result also indicates that the moderating variable's (government expenditure on infrastructure) interaction effects with all explanatory variables. The fitting statistics have also improved tremendously from R-squared 0.950619 and Adjusted R-squared 0.942389 without interaction to R-squared 0.964842 and Adjusted R-squared 0.954665 after interaction. This implies an increase in explanatory power. The study rejected the null hypothesis that government spending has no moderating influence on the association between macroeconomic factors and domestic private investment, based on the examination of the moderation finding. The result verifies the premise that government spending on infrastructure moderates the relationship between macroeconomic conditions and domestic private investment over the long term. In the long run, the outcome of the moderation test confirms Kollamparambil and Nicolaou (2011) claim that public investment through infrastructure expenditure exerts an indirect pressure on private investment via accelerator effects.

4.15 Summary of Hypothesis Testing Results

Table 4.32 below shows a summary of the results after testing for the five hypotheses.

Hypotheses	Coefficient	Probability Value	Results	Decision
H_{01}: There was no significant relationship between inflation and growth of domestic private investment in Kenya.	-0.071984	0.0429	Negative and statistically significant	Reject H_{01}
H_{02}: There was no significant relationship between money supply and growth of domestic private investment in Kenya.	0.422541	0.0000	Positive and statistically significant	Reject H_{02}
H_{03}: There was no significant relationship between interest rates and growth of domestic private investment in Kenya.	-0.276010	0.0083	Negative and statistically significant	Reject H_{03}
H_{04}: There was no significant relationship between exchange rates and growth of domestic private investment in Kenya.	0.029782	0.2752	Positive statistically insignificant	Fail to reject H_{04}
H_{05}: Government expenditure on infrastructure does not moderate the relationship between macroeconomic variables and growth of domestic private investment in Kenya				Reject H_{05}

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses on the summary, conclusion and recommendations of the study. The chapter also presents the areas for further studies consists of drawing conclusions from the results.

5.2 Summary of Findings

This thesis mainly sought to assess the effect of macroeconomic variables on domestic private investment in Kenya. The study utilized an explanatory research design supported by positivist philosophy to analyze annual data spanning 1972 to 2022. The study employed the ARDL model for analysis. The descriptive analysis revealed that changes in the money supply, exchange rate, interest rates, and inflation rate and government expenditures on infrastructure were dispersed.

5.2.1 Inflation Rate and Growth of Domestic Private Investment in Kenya

The study sought to investigate the effect of inflation rate on growth of private domestic investments in Kenya for the time period 1972 to 2022. This study found that inflation rate was stationary at level which suggested that the variable did not exhibit trend and erratic behavior. This indicated that inflation rate was not very drastically sensitive to the changes in the policies and actions sensitively over time and it was stable over long term. This study also found that the inflation rate variable had negative univariate effect and positive when it is moderated given the different time horizons considered. When enjoined with all the other variables the effect was found to be negative and significant. The results of the ARDL model therefore indicate that Inflation Rate in Kenya has statistically significant effect on domestic private investment.

5.2.2 Money Supply and Growth of Domestic Private Investment in Kenya

The study sought to investigate the effect of money supply on growth of private domestic investments in Kenya for the time period 1972 to 2022. This study found that money supply was stationary at level which suggested that the variable did not exhibit trend and erratic behavior. This indicated that money supply was not very sensitive to the movement in the policies and actions over time and it were stable over long term. This study also found that the money supply variable had both positive and negative for lag one univariate effect and negative when it is moderated given the different time horizons considered. When enjoined with all the other variables the effect was found to be positive and significant. The results of the ARDL model therefore indicate that money supply in Kenya has statistically significant effect on domestic private investment.

5.2.3 Interest Rates and Growth of Domestic Private Investment in Kenya

The study sought to investigate the effect of interest rates on growth of private domestic investments in Kenya for the time period 1972 to 2022. This study found that interest rates was non-stationary at level which suggested that the variable exhibited trend and erratic behavior. This indicated that interest rate was sensitive to the movement in the policies and actions. This study also found that the Interest Rates variable had both positive and negative for lag one univariate effect and positive when it is moderated given the different time horizons considered. When enjoined with all the other variables the effect was found to be both positive and negative and also statistically significant. The results of the ARDL model therefore indicate that Interest Rates in Kenya has statistically significant effect on domestic private investment.

5.2.4 Exchange Rates and Growth of Domestic Private Investments in Kenya

The study sought to investigate the effect of exchange rates on growth of private domestic investments in Kenya for the time period 1972 to 2022. This study found that exchange rate was stationary at level which suggested that the variable did not exhibit trend and

erratic behavior. This indicated that exchange rate was not very sensitive to the movement in the policies and actions over time and it were stable over long term. This study also found that the money supply variable had negative univariate effect and negative when it was moderated given the different time horizons considered. When enjoined with all the other variables the effect was found to be both positive and statistically insignificant. The results of the ARDL model therefore indicate that money supply in Kenya has statistically insignificant effect on domestic private investment.

5.2.5 Moderating Role of Government Expenditure on Infrastructure on the Relationship between Macroeconomic Variables and Growth of Domestic Private Investment in Kenya

The study sought to investigate the effect of government expenditure on infrastructure on growth of private domestic investments in Kenya for the time period 1972 to 2022. This study found that government expenditure on infrastructure was stationary at level which suggested that the variable did not exhibit trend and erratic behavior. This indicated that government expenditure on infrastructure was not very drastically sensitive to the changes in the policies and actions over time and it were stable over the long term. This study also found that the government expenditure on infrastructure variable had single positive effect. The results indicate that government expenditure on infrastructure in Kenya moderates the relationship between macroeconomic variables and growth of domestic private investment.

5.3 Conclusions

The study made several conclusions based on the findings concerning the specific objectives and research hypotheses.

5.3.1 Inflation Rate and Growth of Domestic Private Investment in Kenya

The study concluded that the domestic private investment responds in the long term to inflationary pressures, particularly when inflation is relatively high. If there is a change in

the rate of inflation rate this would results in changes in investor perceptions of investments prospects. This study also conclude that the inflation rate variable had negative univariate effect and positive when it is moderated given the different time horizons considered. When joined with all the other variables the effect was found to be negative and significant. The study conclude that inflation rate is a key driver of domestic private investment in the long run. The study also revealed that the inflation rate management policies which are geared towards encouraging private sector investment credit are very important.

5.3.2 Money Supply and Growth of Domestic Private Investment in Kenya

The study conclusion is that the amount of money supply available was extremely important to the dynamics of domestic private investment because it has a significant effect on aggregate demand. If there is a change in the rate of money supply this would results in changes in investor perceptions of investments prospects. This study also conclude that the money supply variable had both positive and negative for lag one univariate effect and negative when it is moderated given the different time horizons considered. When joined with other variables the effect was found to be positive and significant. The results indicate that money supply is a key driver of domestic private investment in the long run. The study also revealed that the money supply policies which are geared towards encouraging private sector investment credit is very important.

5.3.3 Interest Rates and Growth of Domestic Private Investment in Kenya

The study conclude that the interest rate as measured by the lending rate is a key predictor of growth of domestic private investment. The conclusion was supported by theory and empirical analysis. This study also conclude that the Interest Rates variable had both positive and negative for lag one univariate effect and positive when it is moderated given the different time horizons considered. When joined with all the other variables the effect was found to be both positive and negative and also statistically significant. The

conclusion is that if there is a change in the cost at which financial resources are supplied this would correspond to changes in demand and new investments.

5.3.4 Exchange Rates and Growth of Domestic Private Investment in Kenya

The conclusion from the test for hypothesis show that changes in the value of the exchange rate had a moderate impact on the direction of domestic private investment in Kenya. According to the study, the effect of exchange rate fluctuations is that decreases in exchange rate shocks influence domestic private investment in Kenya. Movement in the policies and actions sensitively over time and it were stable over long term. This study also conclude that the money supply variable had negative univariate effect and negative when it is moderated given the different time horizons considered. When joined with all the other variables the effect was found to be both positive statistically insignificant. Thus if there is a change in the rate at which supply responds to changes in demand, new investments would be more expensive, and investors would find it more challenging to react swiftly to market signals.

5.3.5 Government Expenditure on Infrastructure and Growth of Domestic Private Investment in Kenya

Lastly, the study conclude that the value of future private investment increase or decrease depending on the degree of government expenditure on infrastructure. Therefore, the study concluded that the domestic private investment expansions are dependent on the existing Government investments in Infrastructure. Infrastructures such as road ease the rate of communication and movement of goods and services and enables investments and confidence by the private sector.

5.4 Recommendations

Based on the findings, the study deduces the following policy and managerial recommendations.

5.4.1 Policy Recommendations

The finding that there is a negative significant relationship between inflation and growth of private domestic investment. This finding underscores the importance of monetary policy design in driving private investment. Monetary policy in Kenya seeks to contain inflation within a range of 5%. Moderate inflation is neutral to growth in private investment, however, significant inflation is an impairment to private investment. Since monetary policy seeks to contain inflation, it private investment growth should be one of the underlying objectives in contacting monetary policy. Essentially, should be aware of the empirical evidence that intervention in the market affects private investment. Further, the study found that a statistically significant and positive relationship exist between money supply (M3) and the growth of a private domestic investment. M3 is also a measure of credit availability in the markets. Therefore, the study recommends innovative ways that increase the segment of the monetized economy in the country.

Financial innovations that increase access to finances and ease of transactions methods especially cashless transactions platforms are crucial for private domestic investment growth. The CBK should seek to increase credit availability by regulating but allowing of mobile lending, group lending, micro finance lending among other credit platforms. Besides, money supply aggregates (M3) is an essential component of the monetary policy implementation framework. The variation of this money supply component through monetary policy instruments like critical reserve ratio, open market operation or central bank rate should aim at boosting private investment.

The study noted that commercial bank lending rates is negatively significant in driving investment. Lending rate is the price of capital borrowing. The higher the lending rate, the lower the level of investment. Therefore, the study advocates for policies that ensure the commercial banks remain liquid and maintain low lending rates. These policies include the liberation of the financial markets for more competition and support for more innovative but secure money lending avenues like mobile money markets. The study also recommends active financial market intervention through monetary policy to ensure

commercial bank lending rates are within the conventional range for private domestic investment to thrive.

The study found that the depreciation of exchange rate has negatively affected the growth of investment growth in Kenya during the period of study. Exchange rate depreciation increases the cost of imports especially for investment products hence reducing private domestic investment. At one level the currency depreciation induces financial outflows from the economy as investors seek more stable investment markets in the world markets. This leads to capital outflow and a reduction in private domestic investment. This study therefore recommends for use of monetary policy interventions to preserve exchange rate stability especially against the dollar in which Kenya trades predominantly. There is also the need for the central bank to maintain the forex reserves to cover against exchange rate shocks which may impair the long-term growth in private domestic investment. Secondly, the major source of dollars is export trade. The more the exports, the more the supply of dollars hence decline in pressure on exchange rate. Therefore, export promoting measures are critical in stabilizing private investment. In addition, it is critical to incentivize imports, especially on investments inputs by zero rating or making them exempt. This would cushion investors from high exchange rate effect.

The study found that government spending on infrastructure moderated the relationship between macroeconomic variables and growth of private domestic investment in Kenya. This indicates that the amount of money spent by the government on infrastructure will influence the amount of money invested privately in the domestic economy. The study recommends that the Kenyan government must move more swiftly to implement the amended strategic development zones so that infrastructure and private sector growth may occur there. In addition, research recommends that the quality of infrastructure investment should be enhanced through improvement of public investment process that will especially be effective in boosting aggregate demand and enhancing productive capacity over the long term. Importantly, fiscal budget should prioritize capital investment expenditure other than recurrent expenditure. Similarly, deficit financing should also

prioritize investment expenditures which are essentially productive through catalyzing private investment.

The study established that it was essential for government to re-allocate funds towards project that are of benefit to the private sector and avoid those that compete with or crowd it out investments. Central government expenditure and capital expenditure ought to be more engrossed on infrastructure development and maintenance. In addition government ought to increase its expenditures on those items that enter private production functions as productive public inputs that boost expansion of private investors' activities. Such productive government expenditure includes expenditure on physical transport and communication infrastructures, health and education facilities, buildings, plant, machinery and equipment, all of which generate positive externalities that raise private investment.

Simultaneously, the study recommends that county administrations should speed up the approval procedure for their varied development plans. These plans should set up a long-term plan for development and make sure there is enough space for building important infrastructure. The study recommends that the counties should identify the public investments that that may crowd in private investment before increasing the national government participation that should be complementary.

5.4.2 Managerial Policy Recommendations

At the firm level, several policy recommendations are deduced from the study. First, commercial banks should seek to increase credit uptake by adopting more conventional but innovative ways of lending. As the money supply increases in the economy, the investment levels increase, and therefore economic activity increase. This chain of causation, as revealed in the study informs commercial bank policy on credit expansion through innovation and public awareness on their financial products.

The study also advice that, investment risk emanating from exchange rate fluctuations should be properly managed to edge the private investment sector. Exchange rate movements impact returns when a change in the value of one currency against another currency leads to a rise or fall in the value of an asset. Therefore, investment firms and large-scale importers should consider hedging against exchange rate fluctuations possibly through forward exchange contracts. Lastly, the study note that the firms can easily monitor their interest rate and investment risks emanating from any changes in monetary policy anchors.

5.5 Contribution of the Study

The contribution of this study is twofold. First, this study has closed a gap that exists in the literature on the controversial relationship between growth of domestic private investment and key macroeconomic variables. Although the existing controversy on the relationship is attributed to methodological inadequacies, this study used the ARDL modeling technique to ensure that such biases are mitigated. Secondly, the study brings out the core policy perspectives about a private investment which seem to be omitted in past panel-based studies e.g. Misati and Nyamongo (2011). In this study, the macroeconomic variables considered are unique in the sense that they are the main anchors of macroeconomic policy worldwide. These are inflation rate, interest rates, and money supply on which the monetary policy framework is anchored. The variables also include exchange rate and public infrastructure expenditure on which trade policy and incentive policies are anchored. Therefore, the study brings the key policy effects of pursuing a stable accommodative monetary policy on private domestic investment.

5.6 Areas for Further Studies

This study focused on the relationship between growth of private domestic investment and key macroeconomic policy indicators like inflation rate, interest rate and money supply, exchange rate and public infrastructure investments. The study finds that these variables affect private domestic investment. The study found empirical evidence for infrastructure

investments to moderate the relationship between macroeconomic variables and private domestic investment. Further, the study has established the effect of macroeconomic variables on private domestic investment in Kenya. However, this study only revealed the relationship between four macro variables, future studies should consider other variables such as stock market development, tax policy and foreign direct investments.

REFERENCES

ADB, A. A., Furceri, D., & IMF, P. T. (2016). The macroeconomic effects of public investment: Evidence from advanced economies. *Journal of Macroeconomics*, 50, 224-240. Doi: 10.1016/j.jmacro.2016.07.005

Adeosun, O. A., Orisadare, M. A., Fagbemi, F., & Adedokun, S. A. (2020). Public investmentand private sector performance in Nigeria. *International Journal of Emerging Markets, 16*(8),1697–1720. https://doi.org/10.1108/IJOEM-02-2020-0144

Agidew, E. T. (2014). An Investigation of Macroeconomic Determinants of Domestic Private Investment.

Ajayi, L. B., & Kolapo, F. T. (2018). Is domestic private investment sensitive to macroeconomic indicators? Further evidence from Nigeria. *World Journal of Economics and Finance, 4*(2), 100-105.

Akinlo, A. E., & Onatunji, O. G. (2020). Exchange rate volatility and domestic investment: Evidence from twelve ECOWAS countries. *African Journal of Economic Review*, *8*(2), 176-189.

Alagidede, P., & Ibrahim, M. (2017). On the causes and effects of exchange rate volatility on economic growth: Evidence from Ghana. *Journal of African Business, 18*(2), 169-193.

Al-Zyoud, H. (2015). An Empirical Test of Purchasing Power Parity Theory for CanadianDollar-US Dollar Exchange Rates. *International Journal of Economics and Finance*, *7*(3), 233. https://doi.org/10.5539/IJEF.V7N3P233

Astivia, O. L. O., & Zumbo, B. D. (2019). Heteroskedasticity in Multiple Regression Analysis: What it is, How to Detect it and How to Solve it with Applications in R and SPSS. *Practical Assessment, Research & Evaluation*, *24*(1), n1.

Atabaev, N., Ganiev, J., & Alymkulova, N. (2018). Crowding-out (or -in) effect in transitioneconomies: Kyrgyzstan case. *International Journal of Development Issues*, *17*(1), 102–113.https://doi.org/10.1108/IJDI-09-2017-0144

Awad, I. M., Al-Jerashi, G. K., & Alabaddi, Z. A. (2021). Determinants of private domestic investment in Palestine: time series analysis. *Journal of Business and Socio-economic Development*, *1*(1), 71-86.

Batu, M. Muhdin. (2016). Determinants of Private Investment: A Systematic Review. *International Journal of Economics, Finance and Management Sciences*.

Baumeister, C., & Hamilton, J. D. (2019). Structural interpretation of vector autoregressions with incomplete identification: Revisiting the role of oil supply and demand shocks. *American Economic Review*, *109*(5), 1873-1910.

Bbuba, M. S. (2019). *Determinants of savings, private investment and economic growth in Nigeria (1981-2015)* (Doctoral dissertation, Kampala International University, College of Economics and Management).

Becker, G. S., Michael, G., & Michael, R. T. (2017). *Economic theory*. Routledge.

Bell, E., Bryman, A., & Harley, B. (2022). *Business research methods*. Oxford university press.

Bhat, S. A., Kamaiah, B., & Acharya, D. (2020). Examining the differential impact of monetary policy in India: A policy simulation approach. *Journal of Economics, Finance and Administrative Science*, *25*(50), 339-362.

Blázquez-García, A., Conde, A., Mori, U., & Lozano, J. A. (2021). A review on outlier/anomaly detection in time series data. *ACM Computing Surveys (CSUR), 54*(3), 1-33.

Blumberg, B., Cooper, D., & Schindler, P. (2014). *EBOOK: Business research methods*. McGraw Hill.

Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational researcher*, *34*(6), 3-15.

Borio, C. E., & Disyatat, P. (2015). Capital flows and the current account: Taking financing (more) seriously. *Bank for International settlements*. BIS Working Papers No 525

Bosco,N.J.,&Emerence,U.(2016).Effect of GDP interestrate and inflation on private investment in Rwanda. *International Academic Journal of Economics*, *3*(1).

Boulatoff, C., & Boyer, C. M. (2017). What is the impact of private and public R&D on clean technology firms' performance? An international perspective. *Journal of Sustainable Finance & Investment*, *7*(2), 147-168.

Brima, S., & Brima, A. S. (2017). Monetary policy effect on private sector investment: Evidence from Sierra Leone. *International Journal of Economics and Financial Issues*, *7*(1), 476-488.

Brooks, C. (2008). *Introductory econometrics for finance*. Cambridge University Press.

Brooks, C., & Manza, J. (2008). *Why welfare states persist: The importance of public opinion in democracies*. University of Chicago Press.

Bryman, A. (2012). *Social research methods*. Oxford University Press.

Bulut, L. (2018). Google Trends and the forecasting performance of exchange rate models. *Journal of Forecasting*, *37*(3), 303-315.

Bwire, T., Lloyd, T., & Morrissey, O. (2017). Fiscal reforms and the fiscal effects of aid in Uganda. *The Journal of Development Studies*, *53*(7), 1019-1036.

Canbaloglu, B., & Gurgun, G. (2018). The impact of exchange rate uncertainty on domestic investment: Panel evidence from emerging markets and developing economies. *Management From An Emerging Market Perspective*, 221.

Cassel, G. (1918). Abnormal deviations in international exchanges. *The Economic Journal*, *28*(112), 413-415.

Cavallo, E., & Daude, C. (2011). Public investment in developing countries: A blessing or a curse?. *Journal of Comparative Economics*, *39*(1), 65-81.

Chen, X., Nuñez, H. M., & Xu, B. (2015). Explaining the reductions in B razilian sugarcane ethanol production costs: importance of technological change. *Gcb Bioenergy*, *7*(3), 468-478.

Chorozoglou, D., & Kugiumtzis, D. (2019). Testing the randomness of correlation networks from multivariate time series. *Journal of Complex Networks*, *7*(2), 190-209.

Chortareas, G., & Kapetanios, G. (2013). How Puzzling Is The PPP Puzzle? An Alternative Half-Life Measure of Convergence to PPP. *Journal of Applied Econometrics*, *28*(3), 435-457.

Conrad, C. (2022). The Effects of Demand and Interest Rates on Investments, Evidence of Overinvestment from Two Behavioral Experiments. *Applied Economics and Finance*, *9*(1).

Cuthbertson, L. M., Robb, Y. A., & Blair, S. (2020). Theory and application of research principles and philosophical underpinning for a study utilising interpretative phenomenological analysis. *Radiography*, *26*(2), e94-e102.

Dang, T. T., Pham, A. D., & Tran, D. N. (2020). Impact of Monetary Policy on Private Investment: Evidence from Vietnam's Provincial Data. *Economies*, *8*(3), 70.

Davidavičienė, V. (2018). Research methodology: An introduction. *Modernizing the academic teaching and research environment: Methodologies and cases in business research*, 1-23.

De Beukelaer, C. (2014). Creative industries in "developing" countries: Questioning country classifications in the UNCTAD creative economy reports. *Cultural Trends*, *23*(4), 232-251.

Domínguez, M. A., & Lobato, I. N. (2020). Specification testing with estimated variables. *Econometric Reviews*, *39*(5), 476-494.

Downward, P., & Mearman, A. (2007). Retroduction as mixed-methods triangulation in economic research: Reorienting economics into social science. *Cambridge Journal of Economics*, 31(1), 77-99.

Emmanuel, B., Ike E,C., Alhasan, Y. (2019). Effect of Exchange and Interest Rates on Foreign Direct Investment in Nigeria 2006-2018. *International Journal Of Contemporary Research and Review*. 2(2): 12-34

Epaphra, M., & Mwakalasya, A. H. (2017). Analysis of foreign direct investment, agricultural sector and economic growth in Tanzania. *Modern Economy*, *8*(01), 111-140.

Eshun, M. E., Adu, G., & Buabeng, E. (2014). THE financial determinants of private investment in Ghana. *International Journal of Financial Economics* , 3. 25-40.

Ezeibekwe, O. F. (2020). Monetary Policy and Domestic Investment in Nigeria: The Role of the Inflation Rate. *Economics and Business, 34*(1), 139-155.

Fazzari, S. (1989). Keynesian theories of investment: neo-, post-, and new. *Brazilian Journal of Political Economy*, *9*(4), 551-561.

Feldman, M., Hadjimichael, T., Lanahan, L., & Kemeny, T. (2016). The logic of economic development: A definition and model for investment. *Environment and Planning C: Government and Policy*, *34*(1), 5-21.

Field, A. (2009). *Discovering statistics using SPSS*. SAGE Publications Ltd.

Fisher, I. (1933). The debt-deflation theory of great depressions. *Econometrica: Journal of the Econometric Society*, 337-357.

Fixler, D., & Zieschang, K. (1999). The productivity of the banking sector: Integrating financial and production approaches to measuring financial service output. *The Canadian Journal of Economics/Revue canadienne d'Economique*, *32*(2), 547-569.

Fofanah, P. (2022). Effects of Exchange Rate Volatility on Economic Growth: Evidence from West Africa. *International Journal of Business and Economics Research, 11*(1), 32-48.

Frimpong, J. M., & Marbuah, G. (2010). The determinants of private sector investment in Ghana: An ARDL approach. *European Journal of Social Sciences*, *15*(2), 250-261.

Fu, Q., & Liu, X. (2015). Monetary policy and dynamic adjustment of corporate investment: A policy transmission channel perspective. *China Journal of Accounting Research*, *8*(2), 91-109.

Gachoki, C. (2016). *Impact of capital flight on private investment in Kenya* (Doctoral dissertation, University Of Nairobi).

Gemmell, N. (2001). *Fiscal policy in a growth framework* (No. 2001/84). WIDER Discussion Paper.

George-Anokwuru, C. C. (2017). Interest Rate and Domestic Private Investment in Nigeria. *International Journal of Economics and Business Management*, 3(5), 43-49.

Gitonga, F. K. (2017). *The relationship between tax incentives and foreign direct investment inflows of listed multinational corporations in kenya* (Doctoral dissertation, University of Nairobi).

Godfred, E. S. (2016). *Research methods and techniques in sociology*. Sonlife Press.

Gruber, J., & Kamin, S. (2017). *Corporate buybacks and capital investment: An international perspective* (No. 2017-04-11). Board of Governors of the Federal Reserve System (US).

Guichard, S., Kennedy, M., Wurzel, E., & André, C. (2007). What promotes fiscal consolidation: OECD country experiences.

Gujarati, D. N. (2003). *Basic econometrics*. Tata McGraw-Hill Education.

Haberler, G. (2017). *Prosperity and depression: A theoretical analysis of cyclical movements*. Routledge.

Hayes, A. F. (2010). *Moderation, mediation, and conditional process analysis: A regression-based approach*. Guilford Press.

Hoffmann, A., & Schnabl, G. (2016). Adverse effects of ultra-loose monetary policies on investment, growth and income distribution.

Jakab, Z., & Kumhof, M. (2015). Banks are not intermediaries of loanable funds–and why this matters. Bank of England: Working Paper No. 529. https://acpr.banque-france.fr/sites/default/files/medias/documents/20160601-article.pdf

Javid, M. (2019). Public and private infrastructure investment and economic growth in Pakistan: An aggregate and disaggregate analysis. *Sustainability*, *11*(12), 3359.

Javid, M. (2019). Publicand private infrastructure investment andeconomicgrowthinPakistan:An aggregate and disaggregate analysis. *Sustainability (Switzerland)*, *11*(12).https://doi.org/10.3390/SU11123359

Jomo, K. S., & Chowdhury, A. (2019). World Bank financializing development. *Development*, *62*(1), 147-153.

Kamasa, K., Afful, S. L., & Bentum-Ennin, I. (2023). Impact of monetary policy rate on commercial banks' lending rate: empirical evidence from Ghana. *Journal of Economic and Administrative Sciences*.

Kamasa, K., Kpodo, E. E., Bonuedi, I., & Forson, P. (2022). Does inflation uncertainty hurt domestic investment? Empirical evidence from Ghana. *Cogent Economics & Finance*, *10*(1), 2115673.

Kamundia, S. W. (2015). *The effects of public debt on private investments and economic growth in Kenya (1980-2013)* (Doctoral dissertation).

Kaputo, C. C. (2012). *Macroeconomic policy and domestic private investment: The case of Zambia, 1980-2008* (Doctoral dissertation).

Kariuki, R., & Nasieku, T. (2023). Macroeconomic Factors Affecting Commercial Banks' Credit to Small And Medium-Sized Enterprises in Kenya. *International Journal of Social Science and Humanities Research (IJSSHR) ISSN 2959-7056 (o); 2959-7048 (p)*, *1*(1), 399-410.

Kenya Institute for Public Policy Research and Analysis (KIPPRA) (2020). Kenya Economic Report 2020 Popular Version Creating An Enabling Environment For Inclusive Growth In Kenya. Retrieved from https://kippra.or.ke/wp-content/uploads/2021/02/Kenya-Economic-Report-2020-Popular-Version.pdf

Kenya Institute for Public Research and Analysis (KIPPRA). (2018).Development in Kenyas Public debt 2007-2017. *PolicyMonitor*, *10*, 1–28.

Keynes, J. M. (1936). The supply of gold. *The Economic Journal*, *46*(183), 412-418.

Kidwell, D. S., Blackwell, D. W., Sias, R. W., & Whidbee, D. A. (2016). Financial institutions, markets, and money. John Wiley & Sons.

Kinyanjui, M. W., Muturi, W., & Njeru, A. (2021). Investment Incentives as a Mediator in the Relationship between Macroeconomic Variables and Growth of Private Domestic Investment in Kenya. *Journal of Finance and Investment Analysis*, *10*(1), 81-87.

Kinyanjui, M. W., Muturi, W., & Njeru, A. (2021). Investment Incentives as a Mediator in the Relationship between Macroeconomic Variables and Growth of Private Domestic Investment in Kenya. *Journal of Finance and Investment Analysis*, *10*(1), 81-87.

Kollamparambil, U., & Nicolaou, M. (2011). Nature and association of public and private investment: Public policy implications for South Africa. *Journal of Economics and International Finance*, *3*(2), 98.

Kong, Q., Peng, D., Ni, Y., Jiang, X., & Wang, Z. (2021). Trade openness and economic growth quality of China: Empirical analysis using ARDL model. *Finance Research Letters*, *38*, 101488.

Kothari, C. (2017). research methodology methods and techniques by CR Kothari. *Published by New Age International (P) Ltd, Publishers*, *91*.

Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.

Koyck, L. M. (1954). Distributed Lags and Investment Analysis, Amsterdam, 1954. *KoyckDistributed Lags and Investment Analysis1954*.

Kraay, A. (2018). Methodology for a World Bank human capital index. *World Bank Policy Research Working Paper*, (8593).

Kraemer, H. C., Wilson, G. T., Fairburn, C. G., & Agras, W. S. (2001). Mediators and moderators of treatment effects in randomized clinical trials. *Archives of General Psychiatry*, 58(10), 877-883.

Kwok, J. (2021). *Macroeconometric models for portfolio management*. Vernon Press.

Lee, C. C., & Chiu, Y. B. (2011). Oil prices, nuclear energy consumption, and economic growth: New evidence using a heterogeneous panel analysis. *Energy Policy*, *39*(4), 2111-2120.

Leuffen, D., Shikano, S., & Walter, S. (2013). Data collection in a digital age: How ICT affects public opinion surveys. In A. J. Trechsel (Ed.), E-voting and identity: 4th International Conference, Vote-ID 2013, Guildford, UK, July 17-19, 2013. Proceedings (pp. 61-77). Springer.

Lin, S., & Ye, H. (2009). Does inflation targeting make a difference in developing countries?. *Journal of Development economics*, *89*(1), 118-123.

Lindner, F. (2013). *Does saving increase the supply of credit? A critique of loanable funds theory* (No. 120). IMK Working Paper.

Lopes, I. T. (2015). Research methods and methodology towards knowledge creation in accounting. *Contaduría y administración*, *60*, 9-30.\

M'Amanja & Morrissey, O. (2012). *Aid and government fiscal behaviour: What does the evidence say?* (No. 2012/01). WIDER working paper.

Majok, E. (2015). *Effects of exchange rate fluctuations on financial performance of commercial banks in Kenya* (Doctoral dissertation, University of Nairobi).

Mbanaso, U. M., Abrahams, L., & Okafor, K. C. (2023). Research philosophy, design and methodology. In *Research Techniques for Computer Science, Information Systems and Cybersecurity* (pp. 81-113). Cham: Springer Nature Switzerland.

Mbaye, E. Z. (2014). *Determinants of domestic private investments in Kenya* (Doctoral dissertation, University of Nairobi).

Mbobo, M. E., & Ekpo, N. B. (2016). Operationalising the qualitative characteristics of financial reporting. *International Journal of Finance and Accounting*, *5*(4), 184-192.

McCloud, N. (2022). Does domestic investment respond to inflation targeting? A synthetic control investigation. *International Economics*, *169*, 98-134.

McGrattan, E. & Waddle, A., (2017). The Imact of Brexit on Foreign Investment and Production. In *2017 Meeting Papers* (No. 710). Society for Economic Dynamics.

McMahon, M., Peiris, M. U., & Polemarchakis, H. (2018). Perils of unconventional monetary policy. *Journal of Economic Dynamics and Control*, 93, 92-114.

Mills, T. C. (1999). The econometric modelling of financial time series. Cambridge University Press.

Mishkin, F. S., & Eakins, S. G. (2019). *Financial markets*. Pearson Italia.

Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of cardiac anaesthesia*, *22*(1), 67-72.

Miyamoto,H., Baum,A.,Gueorguiev,N., Honda,J. ;,&Walker,S.(2018).Growth ImpactofPublic Investment and the Role of Infrastructure Governance. In *Angewandte ChemieInternationalEdition, 6(11), 951–952.*(pp.10–27). Rachman, Tahar.

Mlambo, K., & Oshikoya, T. W. (2001). Macroeconomic factors and investment in Africa. *Journal of African economies*, *10*(suppl_2), 12-47.

Mohan, R., & Kapur, M. (2015). *Emerging powers and global governance: Whither the IMF?*. International Monetary Fund.

Mugenda, O. M., & Mugenda, A. G. (2013). *Research methods: Quantitative and qualitative approaches*. African Centre for Technology Studies.

Musarat, M. A., Alaloul, W. S., & Liew, M. S. (2021). Impact of inflation rate on construction projects budget: A review. *Ain Shams Engineering Journal*, *12*(1), 407-414.

Musgrave, R. A. (1969). Cost-benefit analysis and the theory of public finance. *Journal of Economic Literature*, *7*(3), 797-806.

Musyoka, N., & Ocharo, K. N. (2018). Real interest rate, inflation, exchange rate, competitiveness and foreign direct investment in Kenya. *American journal of economics*, *3*(1), 1-18.

Muthu, S. (2017). Does public investment crowd-out private investment in India. *Journal ofFinancialEconomicPolicy*,*9*(1),50–69.https://doi.org/10.1108/JFEP-02-2016-0016

Mutimba, S., & Wanyoike, R. (2013). Towards a coherent and cost-effective policy response to climate change in Kenya: Country report.

Mutuku, C., & Kinyanjui, M. (2018). Crowding in or crowding out? Economic growth, public and private investment in Kenya. *Research Journal of Economics*, *2*(4), 38-52.

Mwega, F. M. (1997). Saving in sub-Saharan Africa: A comparative analysis. *Journal of African Economies*, 199-228.

Mwenda, R. N. (2017). *Strengthening a Vibrant Domestic Investment Market for Economic Growth in Kenya* (Doctoral dissertation, United States International University-Africa).

Narula, R., & Pineli, A. (2017). Multinational enterprises and economic development in host countries: what we know and what we don't know. In *Development finance* (pp. 147-188). Palgrave Macmillan, London.

Naughton, B. J. (2018). *The Chinese economy: Adaptation and growth*. Mit Press.

Ndikumana, L. (2014). Capital flight and tax havens: impact on investment and growth in Africa. *Revue d'economie du developpement*, *22*(HS02), 99-124.

Nguyen, C. T., & Trinh, L. T. (2018). The impacts of public investment on private investment and economic growth: Evidence from Vietnam. *Journal of Asian Business and Economic Studies*.

Nguyen, C., Minh City, C., & Thi Trinh, L. (2018). The impacts of public investment onprivate investment and economic growth Evidence from Vietnam. *Journal of AsianBusiness and Economic Studies*, *25*(1), 2515–2964. https://doi.org/10.1108/JABES-04-2018-0003

Njuguna, W. K. (2016). *The Relationship Between Exchange Rates and Foreign Direct Investments in Kenya* (Doctoral dissertation, University of Nairobi).

Njuru, S. G. (2012). Effects of fiscal policy on private investment in Kenya 1964–2010. *School of Economics Kenyatta University*.

Nkoro, E., & Uko, A. K. (2016). Autoregressive distributed lag (ARDL) cointegration technique: Application and interpretation. *Journal of Statistical and Econometric Methods*, 5(4), 63-91.

Nwakoby, N.C. & Bernard, N. (2016), Effect Of Private Sector Investment On Economic Growth In Nigeria.

Nwankwo, S. N. P., & Allison, P. (2021). Effect of Macroeconomic Determinants on Private Sector Investments in Nigeria, 1986-2020. *Contemporary Journal of Management*, *3*(4), 14-27.

Nyoni, T. & Bonga, W. G.,(2017). An empirical analysis of the determinants of private investment in Zimbabwe. *Dynamic Research Journals' Journal of Economics & Finance (DRJ-JEF)*, *2*(4), 38-54.

Nzuve, R. M. (2016). *Impact of macroeconomic factors on financial performance of deposit-taking micro finance institutions in Kenya* (Doctoral dissertation).

Ojay, S. A. (2020). *The Influence of Interest Rate Capping and Measures Adopted by the Commercial Banks in Nairobi County In order To Curb Its Impact on Their Performance* (Doctoral dissertation, United States International University-Africa).

Okoroafor, O. K. (2020). Influences of monetary policy instruments on domestic investments and economic growth of Nigeria: 1970-2018. *International Journal of Applied Economics, Finance and Accounting*, *6*(1), 42-56.

Onyimadu, C.O. (2015). An Overview of Endogenous Growth Models: Theory and

Critique. *SSRN Electronic Journal*. https://doi.org/10.2139/SSRN.2685545

Osei-Kyei, R., & Chan, A. P. (2017). Implementing public–private partnership (PPP) policy for public construction projects in Ghana: critical success factors and policy implications. *International journal of construction management*, *17*(2), 113-123.

Ouédraogo, R., Sawadogo, R., & Sawadogo, H. (2020). Private and public investment in sub-Saharan Africa: The role of instability risks. *Economic Systems*, *44*(2), 100787.https://doi.org/10.1016/J.ECOSYS.2020.100787

Pandey, P., & Pandey, M. M. (2021). *Research methodology tools and techniques*. Bridge Center.

Paramati, S. R., & Gupta, R. (2013). The effects of tourism on economic growth in the United States. *Journal of Travel Research*, 52(6), 774-789.

Pesaran, M. H., & Shin, Y. (1995). An autoregressive distributed-lag modeling approach to cointegration analysis. In S. Strom (Ed.), Econometrics and Economic Theory in the 20th Century: *The Ragnar Frisch Centennial Symposium* (pp. 371-413). Cambridge University Press.

Pradhan, R. P., Arvin, M. B., & Nair, M. (2021). Urbanization, transportation infrastructure, ICT, and economic growth: A temporal causal analysis. *Cities*, *115*, 103213.

Rauch, E., Dallasega, P., & Matt, D. T. (2016). Sustainable production in emerging markets through Distributed Manufacturing Systems (DMS). *Journal of Cleaner Production*, *135*, 127-138.

Robertson, M. I. (1936). On the theory of univalent functions. *Annals of Mathematics*, 374-408.

Romer, P. (1990). Endogenous Growth Theory. *Journal of political economy*, *98*(5), 71-102.

Sakyi,D.,Boachie,M.K.,&Immurana,M.(2016).DoesFinancialDevelopmentDrivePrivateInvestmentin Ghana?*Economies2016, Vol. 4, Page27*, *4*(4), 27.https://doi.org/10.3390/ECONOMIES4040027

Sam, C. Y., McNown, R., & Goh, S. K. (2019). An augmented autoregressive distributed lag bounds test for cointegration. *Economic Modelling*, *80*, 130-141.

Sargolzaei, M., & Bahrololoum, M. M. (2019). Inflation effects on finance-growth link: A panel smooth transition approach. *American Journal of Industrial and Business Management*, *9*(09), 1873.

Sarno, L., & Taylor, M. P. (2003). *The economics of exchange rates*. Cambridge university press.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Pearson Education.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Pearson education.

Schatsky, D., Arora, A., & Dongre, A. (2018). Blockchain and the five vectors of progress. *Deloitte Insights*, 2-6.

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*. john wiley & sons.

Shapiro, D. H. (1992). A preliminary study of long term meditators: Goals, effects, religious orientation, cognitions. *Journal of Transpersonal Psychology*, *24*(1), 23-39.

Sharma, S. (2017). *Applied multivariate techniques*. John Wiley & Sons.

Spratt, S. (2013). Food price volatility and financial speculation. *Future agricultures working paper*, *47*(7).

Trading Economics. (2016). Kenya GDP growth rate. https://tradingeconomics.com/kenya/gdp-growth

Trochim, W. M. (2006). *Research methods: The concise knowledge base*. Atomic Dog Publishing.

Tsay, R. S. (2000). Analysis of financial time series. Wiley.

Udoka, C. O., & Anyingang, R. A. (2012). The effect of interest rate fluctuation on the economic growth of Nigeria, 1970-2010. *International Journal of Business and Social Science*, *3*(20).

United Nations (2016). World Economic Situation Prospects. Retrieved from https://unctad.org/system/files/official-document/wesp2016_en.pdf

Verbeek, M. (2012). *A guide to modern econometrics*. John Wiley & Sons.

Vishwas, B. V., & Patel, A. (2020). *Hands-on time series analysis with Python*. Apress.

Wawire, N. (2017). Determinants of value added tax revenue in Kenya. *Journal of Economics Library*, *4*(3), 322-344.

Wekesa, D. W., Wang, C., Wei, Y., & Zhu, W. (2016). Experimental and numerical study of turbulence effect on aerodynamic performance of a small-scale vertical axis wind turbine. *Journal of Wind Engineering and Industrial Aerodynamics*, *157*, 1-14.

Were, M., & Wambua, J. (2014). What factors drive interest rate spread of commercial banks? Empirical evidence from Kenya. *Review of development Finance*, *4*(2), 73-82.

William, H. G., J. A. M., James, W. C., & Jeffrey, M. W. (2013). *Multicollinearity*. Wiley StatsRef: Statistics Reference Online.

Wittmayer, J. M., van Steenbergen, F., Rok, A., & Roorda, C. (2016). Governing sustainability: a dialogue between Local Agenda 21 and transition management. *Local Environment*, *21*(8), 939-955.

Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach*. Nelson Education.

Xie, W., Ali, T., Cui, Q., & Huang, J. (2017). Economic impacts of commercializing insect-resistant GM maize in China. *China Agricultural Economic Review*.

APPENDICES

Appendix I: Institutions with the Required Data

1. Kenya National Bureau of Statistics (KNBS)
2. International Financial Statistics (IFS)
3. Central Bank of Kenya (CBK)
4. World Bank

Appendix II: Pairwise Granger Causality Tests

Null hypothesis:	Obs	F-statistic	Prob.
Inflation does not granger cause privateinvest	49	1.08308	0.3474
Private invest does not granger cause inflation		6.47905	0.0034
Money supply does not granger cause privateinvest	49	0.97465	0.3853
Private invest does not granger cause moneysupply		0.52330	0.5962
Interest rate does not granger cause privateinvest	49	1.66221	0.2014
Private invest does not granger cause interest rate		2.93361	0.0637
Exchange rates does not granger cause privateinvest	49	1.19711	0.3117
Private invest does not granger cause exchange rates		2.22080	0.1205
Infrastructures does not granger cause privateinvest	49	0.49704	0.6117
Private invest does not granger cause infrastructures		1.39725	0.2580
Money supply does not granger cause inflation	49	3.27990	0.0470
Inflation does not granger cause moneysupply		1.01541	0.3706
Interest rate does not granger cause inflation	49	0.30848	0.7361
Inflation does not granger cause interest rate		0.95986	0.3908
Exchange rates does not granger cause inflation	49	0.33568	0.7167
Inflation does not granger cause exchange rates		0.23209	0.7938
Infrastructure does not granger cause inflation	49	0.60727	0.5493
Inflation does not granger cause infrastructures		0.71202	0.4962
Interest rate does not granger cause moneysupply	49	1.92972	0.1573
Money supply does not granger cause interest rate		3.50191	0.0388
Exchange rates does not granger cause moneysupply	49	2.19594	0.1233
Money supply does not granger cause exchange rates		2.37643	0.1047
Infrastructure does not granger cause moneysupply	49	0.31467	0.7317
Money supply does not granger cause infrastructures		0.58760	0.5600
Exchange rates does not granger cause interest rate	49	7.36798	0.0017
Interest rate does not granger cause exchange rates		0.35766	0.7013
Infrastructure does not granger cause interest rate	49	0.12309	0.8845
Interest rate does not granger cause infrastructures		4.45954	0.0172
Infrastructure does not granger cause exchange rates	49	0.18437	0.8323
Exchange rates does not granger cause infrastructures		0.79625	0.4574

Appendix III: Transformed Data

Year	Private investment	inflation	Money supply	Interest rate	Exchange rate	infrastructures
1972	17.43253	-9.219158	29.6744	9	0.136125	22.70366
1973	16.48605	1.205246	28.53554	9	1.73E-08	21.75923
1974	17.89332	10.20384	30.49112	9	-2.023489	20.44973
1975	17.97643	16.04927	25.71029	9.5	1.983356	19.11945
1976	17.33317	11.83511	27.39467	10	2.72815	20.21309
1977	16.82708	18.90617	28.18176	10	12.23777	19.98005
1978	17.5086	16.89982	32.79569	10	-1.094466	20.96941
1979	21.71203	3.080996	34.52913	10	-7.079187	25.07647
1980	20.97326	5.638644	34.3548	10	-3.398845	19.17132
1981	21.81178	9.55072	29.9314	10.58333	-0.742861	18.32276
1982	21.00308	10.85308	29.4702	12.41667	17.98631	18.61133
1983	20.43702	11.59255	30.42047	14.5	17.16509	19.02778
1984	19.32301	11.83804	28.17589	15.83333	17.94831	18.11459
1985	18.9864	10.19072	28.34209	14.41667	7.647897	17.15324
1986	19.33408	8.305783	26.68185	14	12.2823	17.27143
1987	19.31199	8.711724	30.38808	14	-1.271899	19.63593
1988	18.41642	5.401952	30.24395	14	1.390198	19.62612
1989	18.92614	6.455624	28.90107	15	7.28349	20.44688
1990	19.22448	9.769009	28.39891	17.25	13.73373	19.4581
1991	18.65653	10.6372	29.57702	18.75	10.22179	20.6482
1992	19.95807	12.53196	30.98193	18.9975	16.69741	19.0301
1993	22.15245	18.89723	36.5178	21.0675	14.61648	16.58137
1994	18.4962	25.69848	37.06523	29.98917	44.45501	16.93762
1995	19.83416	17.01641	38.01601	36.24	-3.480354	18.87307
1996	25.81412	11.22107	42.23227	28.79583	-8.984555	21.38559
1997	21.68163	41.98877	35.79169	33.78667	9.953684	16.00906
1998	24.35518	11.43522	38.42265	30.245	2.753149	15.3879
1999	23.96342	6.931403	35.80718	29.49	2.708212	15.67521
2000	26.56944	4.193939	35.7708	22.38	14.16188	15.59143
2001	25.75838	6.079848	35.16473	22.33917	7.678744	16.70881
2002	25.22269	1.57312	35.24074	19.66583	3.03915	18.15156
2003	25.8546	0.933206	38.15891	18.45333	0.236125	17.23688
2004	25.15568	6.197313	39.02316	16.57333	-3.70521	15.83821
2005	27.28752	7.126842	39.32703	12.53167	4.09012	16.25922
2006	26.27688	4.89965	38.90671	12.8825	-4.790959	18.69911
2007	22.88831	23.53013	34.60157	13.63553	-4.789507	19.42444
2008	23.04496	8.129486	36.06482	13.34034	-7.105414	19.96473

2009	25.38061	15.15117	36.1055	14.01694	2.685469	18.86492
2010	21.87482	27.69682	31.87356	14.80454	10.57076	18.28649
2011	23.98664	1.6392	35.51043	14.3715	2.374182	20.84706
2012	27.36595	10.06501	36.56944	15.04676	10.7843	20.70864
2013	26.40223	9.522972	36.52652	19.72341	-5.064697	21.58504
2014	28.33217	7.337562	37.79339	17.31346	1.850005	20.78579
2015	34.52207	7.635032	42.30126	16.51393	2.046452	23.88473
2016	36.69933	9.238655	42.81939	16.08661	10.44658	22.09104
2017	35.57107	5.849629	40.32761	16.55963	3.276624	19.39174
2018	33.1506	7.581934	39.35199	13.66757	1.842796	19.89572
2019	31.19869	4.215028	39.35983	13.06076	-2.08134	19.098
2020	30.83203	4.275234	38.07048	12.44113	0.676258	18.96157
2021	32.14692	4.934504	41.19887	11.99578	4.189243	19.35315
2022	33.14692	5.004546	36.49208	12.08	2.906815	19.59907