

INTEREST RATE, REAL EXCHANGE RATE AND PRIVATE SECTOR

INVESTMENT IN UGANDA (1995-2015)

BY

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MAY, 2017

DECLARATION

I am here by to declare that this research dissertation is my original work and has never been presented for a degree or any other academic award in any university or institution of learning.

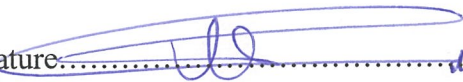
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APPROVAL

"I confirm that the work presented in this research dissertation was carried out by the candidate under my supervision".

Signature.....

Date.....27/05/2017.....

Dr.Abuga Mokano Isaac

DEDICATION

I dedicate this work to my parents and family members for their moral support and the encouragement that they gave me during my studies.

ACKNOWLEDGEMENTS

I wish to acknowledge and be grateful to Allah for enabling me to reach this point in my academic life and I am so thankful for His unconditional protection.

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LIST OF ABBREVIATIONS

ADB	African Development Bank
ADF	Augmented Dickey Fuller
AEF	African Enterprise Fund
NGO	Non-Government Organization
PSIS	Private Sector Investment Survey
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
LDC	Least Developed Countries
MNC	Multinational corporations
MNE	Multinational enterprises
OECD	Organization of Economic Cooperation and Development
PrivInv	Private Investment
IR	Interest Rate
RER	Real exchange rate
SPSS	Statistical Package for Social Science
UIA	Uganda Investment Authority
UPSF	Uganda Private Sector Foundation
UBOS	: Uganda Bureau of Statistics
UCDA	: Uganda Coffee Development Authority
UN	: United Nation
UN-DESA	: United Nation Development of Economic and Social Affairs
WB	: World Bank

ABSTRACT

The study was set to determine how both interest rates and real exchange rates influence the level of private sector investment in Uganda. The study objectives included to determine the relationship between interest rates and private sector investment in Uganda 1995-2015, to determine the relationship between real exchange rates and private sector investment in Uganda 1995-2015. A correlation research design is used in determining the relationship between variables in which the data sets for the independent and dependent variables are entered in software and through comparison a relationship is attained. Analysis was carried out using a combination of both correlation and an ordinary least squares multivariate regression model. The findings on the objective reveal that there is a negative relationship between interest rates and private sector investments in Uganda from 1995-2015. This implies that lower Interest rates encourage additional investment spending, which gives the economy a boost in times of slow economic growth. It adjusts interest rates to affect demand for goods and services, on the second objective there is a strong negative relationship between the real exchange rates and level of investment in the country. It implies that as the real exchange rates collectively called the price level is increased; the level of investment in the country will decrease. These results are consistent with previously conducted correlation analysis of the relationship between the interest rates and private investment in the country. The researcher concludes that there is a very weak negative relationship between the interest rates and the level of private investment in the country. And there is a strong negative relationship between the real exchange rates and level of private sector investments in the country, In other words the results implies that an increase in the interest rates is expected to lead to a decline in the level of private investment in the country. The researcher recommend that fiscal and monetary strategies for stimulating private investment like offering tax holidays to prospective investors would be a better option since relying on interest rates alone is not significant enough. Due to the very significant relationship between the real exchange rate (price level) and private investment in Uganda, the study recommends the policy makers ought to adopt strategic and systematic ways of controlling and adjusting the real exchange rate since their impact on the overall level of private investment can easily be felt and finally the researcher recommend for the establishment of a strong finance mechanism that will improve the state of functional of interest rates, real exchange rates through establishing a strong policy framework that can guide the execution of the duties of financial system controls in Uganda.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter consists of background of the study, problem statement, purpose of the study, objectives of the study, research questions, research hypothesis, scope of the study, significance of the study and definitions of key terms to be used in the study.

1.1 Background of the Study

This section was dividing or categorizing in to three subsections which historical perspective, theoretical perspective, conceptual perspective and contextual perspective. These are outline below.

1.1.1 Historical Perspective

History of interest rates presents a very readable account of interest rate trends and lending practices over four millennia of economic history (Asante, 2010). Despite the paucity of data prior to the industrial revolution, authors Homer and Sylla provide a highly detailed analysis of money markets and borrowing practices in major economies. Underlying the analysis is their assertion that "the free market long-term rates of interest for any industrial nation, properly charted, provide a sort of fever chart of the economic and political health of that nation." Given the enormous volatility of rates in the 20th century, this implies we're living in age of political and economic excesses that are reflected in massive interest rate swings (Banam, 2010).

In the past two centuries, interest rates have been variously set either by national governments or central banks. For example, the Federal Reserve federal funds rate in the United States has varied between about 0.25% to 19% from 1954 to 2008, while the Bank of England base rate varied between 0.5% and 15% from 1989 to 2009, and Germany experienced rates close to 90% in the 1920s down to about 2% in the 2000s. During an attempt to tackle spiraling hyperinflation in 2007, the Central Bank of Zimbabwe increased interest rates for borrowing to 800% (Kasekende, & Atingi-Ego, 2012)

The interest rates on prime credits in the late 1970s and early 1980s were far higher than had been recorded – higher than previous US peaks since 1800, than British peaks since 1700, or than Dutch peaks since 1600; "since modern capital markets came into existence, there have never been such high long-term rates" as in this period. Possibly before modern capital markets, there have been some accounts that savings deposits could achieve an annual return of at least 25% and up to as high as 50%,(Asante, 2010).

The value for interest rate spread (lending rate minus deposit rate, %) in Uganda was 10.72 as of 2014. Over the past 34 years, this indicator reached a maximum value of 14.67 in 1987 and a minimum value of 3.25 in 1991. In the three months to May 2013, the weighted average lending rates on shilling loans averaged 24%. Interest rates on foreign currency loans are lower at an average 10 %, (Banam, 2010).

Real exchange rate after the Bretton Woods system broke down, the world finally adopted the use of floating foreign real exchange rates during the Jamaica agreement of 1976. This meant that the use of the gold standard would be permanently abandoned. However, that doesn't mean that governments adopted a purely free-floating real exchange rate system. Most governments today use one of the following three real exchange rate systems: dollarization pegged rate and managed floating rate.

Although fixing the value of a smaller country's currency can have advantages particularly in arresting inflation the IMF and like-minded economists have warned that countries get into trouble when they wait too long to adjust the value of their currency to changing economic conditions and end up with economically damaging crises, as several Asian economies did in late the late 1990s and Argentina did subsequently (Banam, 2010). With the enthusiastic support of Nobel Prize winning economist Robert Mundell, who has advised the Chinese lately not to take the advice of the U.S. Treasury and others, several big continental Europe nations surrendered the advantages and disadvantages of flexible currencies in 1999 with the creation of a shared currency, the euro, and a multi-country central bank to set interest rates (Kasekende, & Atingi-Ego, 2012)

Meanwhile in Africa, the developing countries have moved towards more flexible real exchange rates in the past quarter century. "Back in 1975, for example, 87 percent of developing countries

had some type of pegged real exchange rate. By 1996, this proportion had fallen to well below 50 percent," the IMF noted. "Many countries that traditionally pegged to the U.S. dollar adopted a basket approach during the first half of the 1980s, in large part because the dollar was appreciating rapidly" (Asante, 2010).

Between 1981 and 1988, the Ugandan government repeatedly devalued the Ugandan shilling in order to stabilize the economy. Before 1981 the value of the shilling was linked to the IMF's special drawing right. In mid-1980 the official real exchange rate was USh9.7 per SDR or USh7.3 per United States dollar (Banam, 2010). When the Obote government floated the shilling in mid-1981, it dropped to only 4 percent of its previous value before settling at a rate of USh78 per US\$1. In August 1982, the government introduced a two tier real exchange rate. It lasted until June 1984, when the government merged the two rates at USh299 per US\$1.

A continuing foreign exchange shortage caused a decline in the value of the shilling to USh600 per US\$1 by June 1985 and USh1,450 in 1986. In May 1987, the government introduced a new shilling, worth 100 old shillings, along with an effective 76 percent devaluation. Ugandans complained that inflation quickly eroded the new currency's value. As a result, the revised rate of USh60 per US\$1 was soon out of line with the black market rate of USh350 per US\$1 (Banam, 2010). Following the May 1987 devaluation, the money supply continued to grow at an annual rate of 500 percent until the end of the year. In July 1988, the government again devalued the shilling by 60 percent, setting it at USh150 per US\$1; but at the same time, the parallel rate had already risen to USh450 per US\$1. President Museveni regretted this trend, saying "If we can produce more, the situation will improve, but for the time being we are just putting out fires." The government announced further devaluations in December 1988 to USh165 per US\$1; in March 1989, to USh200 per US\$1; and in October 1989, to USh340 per US\$1. By late 1990, the official real exchange rate was USh510 per US\$1; the black market rate was USh700 per US\$1 (Kasekende, & Atingi-Ego, 2012).

Private sector has been instrumental in boosting the economies of different states or nations. This is simply because it is part of a country's economy that is not controlled directly by the government. It is a term that combines households and businesses in the economy into a single group. The resources of production owned by the private sector are owned in the form of private

property (Asante, 2010). The private sector includes entities such as households and individuals, for-profit enterprises, sole traders, partnerships, corporations, nonprofit-making organizations, charities, and nongovernmental organizations (NGOs) (Matsheka, 2009)

In Africa, most developing countries such as Togo, Niger or Cameroon did not make many institutional changes during the 1990s and also did not demonstrate private sector development by the mid-2000s. By contrast, Mozambique, Uganda, Ghana, Zambia, and Cape Verde passed new investment laws, embraced privatization, and liberalized trade during the 1990s. Consistent with these policies, by the mid-2000s, they had sold state-owned enterprises; formalized relationships with business; and improved their banking sectors. African countries today exhibit the dramatic effects of political and economic reforms undertaken over the past few decades (Banam, 2010), many countries now hold regular, competitive elections and citizens enjoy freedoms denied to them just twenty years ago. Reforms to encourage the private sector and build market economies have been equally significant. Banking, telecommunications, mining, and construction sectors have expanded. Mobile phone sales have mushroomed. Shopping malls, fashionable boutiques, (Matsheka, 2009)

Starting in the late 1980s, the Uganda government has pursued a series of stabilization and pro-market structural reforms. The resultant macroeconomic stability, post-conflict rebound, and investment response generated a sustained period of high growth during 1987-2010 (Matsheka, 2009) Real gross domestic product (GDP) growth averaged 7% per year in the 1990s and the 2000s, placing Uganda among the 15 fastest growing economies in the World. However, over the past decade, the country witnessed more economic volatility and the growth in gross domestic product (GDP) slowed to an average of just about 5%. With the population increasing at a rate of at least 3% per annum through these decades, per capita income growth decelerated from a rate of 3.6% recorded in the decades of 1990s and 2002, to about 2% (Matsheka, 2009)

McKinnon, (2012) stipulates that going forward, takeoff of a huge public investment program and resumption of private sector economic activity in the post-election era is expected to drive growth. This notwithstanding, the effects of a volatile global economy on demand for Uganda's exports and timing of key infrastructure projects in the country's oil sector, could offset any benefits of improved terms of trade due to low oil prices. Under these circumstances, the

Ugandan economy is forecast to grow at a rate of approximately 5.9% in FY16/17. Growth will increase to 6.8% in FY17/18, and thereafter stay on an upward trajectory into the medium term, if major infrastructure projects are implemented as planned, and private investment intensifies with oil-related activities (Asante, 2010).

The interest rates and real exchange rates in Uganda have affected investment in the private sector. According to the Private Sector Investment Survey (PSIS) 2014 conducted by the Bank of Uganda in collaboration with Uganda Bureau of Statistics and Uganda Investment Authority. The grossed-up findings on Foreign Direct Investment (FDI) transactions during 2013 declined by US\$109.3 million to US\$1,096.1 million from the estimate of US\$1,205.4 million for 2012. (McKinnon, 2012) The decreased in EDI in 2013 inflows was mainly on account of lower disbursement of foreign borrowings from affiliated enterprises. Net inflows of other capital which is comprised of borrowings from foreign affiliates decreased by US\$89.2 million to US\$247.8 million during 2013 compared to US\$337.0 million recorded in 2012. Similarly, foreign borrowing by resident enterprises from nonaffiliated enterprises reduced to a net repayment of US\$41.1 million during 2013 compared to a net inflow of US\$116.9 million recorded in 2012. Transactions involving other equity investment (less than 10% equity stake) during 2013 were estimated at US\$ 8.7 million (Bategeka, & Okumu, 2010)

1.1.2 Theoretical Perspective

The study based on two theories; loanable funds theory of interest rate and Keynes liquidity preference theory of interest rate.

Loanable Funds Theory of Interest Rate

The theory was formulated in the 1930s by British economist Dennis Robertson and Swedish economist Bertil Ohlin. However, Ohlin attributed its origin to Swedish economist Knut Wicksell and the so-called Stockholm school, which included economists Erik Lindahl and Gunnar Myrdal.

Loanable funds theory of interest rate determination views the level of interest in the financial market as resulting from the factors that affect the supply and demand of loanable funds (Saunders, 2010) interest rate in this theory is determined just like the demand and supply of goods is determined, supply of loanable funds increases as interest increases, other factors held

constant He goes further to explain that the demand for loanable funds is higher as interest rate fall, other factors held constant, Saunders(2010), identifies two factors among others causing demand curve for loanable funds to shift; economic conditions and the monetary expansion (Asante, 2010).

Keynes Liquidity Preference Theory of Interest Rate

The liquidity preference theory was propounded by J. M. Keynes. According to this theory, the rate of interest is the payment for parting with liquidity.

According to the theory investors will always prefer short term securities to long term securities. In uncertain world, then saving and investment maybe much influenced by expectations and exogenous shocks than by the underlying real forces. One possible response of the risk averse savers is to vary the form in which they hold their financial wealth depending on what they think is likely to happen to asset prices. They are likely to vary the average liquidity of their portfolios (Bategeka, & Okumu, 2010)

Interest rates play a major role in the investment demand schedule .Keynes advocates government ‘monetary policy directed at influencing the rate of interest “He however believes that the other factors that influence the investment demand schedule are too powerful for such “monetary policy” alone to achieve levels of investment sufficient to maintain full employment. There is a well-recognized relationship between investment demand and interest rates. According to classical theory interest rate s sensitively adjust to allocate all available funds for investment purposes (Moshi, & Kilindo, 2012)

With growth of consumer credit-already recognized factor in the1920s-the investment demand is not the only major use of funds available for loans. Keynes omits the fact that interest rates allocate available funds not just for various investment purposes but also for consumption purposes as well (Asante, 2010). The availability of funds at low interest rate has to influence the propensity to consume. To Keynes, are natively small monetary effort may be all that is required to move interest rates up or down as desired, because speculations will quickly enter to move the market in the expected direction and they will arbitrage subsequent interest rate fluctuations on the basis of the expected rate (Bategeka, & Okumu, 2010)

However in the nature of markets to maintain a desired level of interest rates below the market rate will inevitably require an increasing rate of monetary expansion over time. More over interest rates are the time cost of money. They dictate the investment patterns. They also influence the saving and consumption patterns. By fiddling with the interest rate, Keynes, “monetary policy” inevitably sends the wrong signals and screws up the economy. A substantial period of artificially low interest rates must leave an economic system increasingly unbalanced (Asante, 2010).

1.1.3 Conceptual Perspective

An interest rate, or rate of interest, is the amount of interest due per period, as a proportion of the amount lent, deposited or borrowed (called the principal sum). The total interest on an amount lent or borrowed depends on the principal sum, the interest rate, the compounding frequency, and the length of time over which it is lent, deposited or borrowed. It is defined as the proportion of an amount loaned which a lender charges as interest to the borrower, normally expressed as an annual percentage. It is the rate a bank or other lender charges to borrow its money, or the rate a bank pays its savers for keeping money in an account

Interest rate defines the cost of credit in an economy. More specifically, it is the yearly price charged by a lender to a borrower in order to obtain a loan. This is usually expressed as a percentage of the total amount loaned (Asante, 2010). It is the price that relates to present claims on resources relative to future claims on resources. The price a borrower pays in order to be able to consume resources now (Kwak, 2000). The real interest rate-an interest rate adjusted for either realized or expected inflation-is the relative price of consuming now rather than later. As such it's a key variable in important theoretical models in finance and microeconomics- such as the consumption based asset pricing model (Lucas, 1978). According to Keynes (1936), interest rate represents the cost of borrowing capital for a given period of time. Due to the fact that borrowing is a significant source of finance for many firms, prevailing interest rate are of much concern to the firms due to the indexing of interest rate on borrowing arrangements of the firms ultimately affecting growth (Moshi, & Kilindo, 2012)

Real exchange rate is the price of one currency in terms of another currency. Real exchange rates can be either fixed or floating. Fixed real exchange rates are decided by central banks of a

country whereas floating real exchange rates are decided by the mechanism of market demand and supply. This refers to the price of a nation's currency in terms of another currency (Bategeka, & Okumu, 2010)

An real exchange rate thus has two components, the domestic currency and a foreign currency, and can be quoted either directly or indirectly. In a direct quotation, the price of a unit of foreign currency is expressed in terms of the domestic currency. In an indirect quotation, the price of a unit of domestic currency is expressed in terms of the foreign currency. An real exchange rate that does not have the domestic currency as one of the two currency components is known as a cross currency, or cross rate (Asante, 2010).

An real exchange rate has a base currency and a counter currency. In a direct quotation, the foreign currency is the base currency and the domestic currency is the counter currency. In an indirect quotation, the domestic currency is the base currency and the foreign currency is the counter currency (Moshi, & Kilindo, 2012) Most real exchange rates use the US dollar as the base currency and other currencies as the counter currency. However, there are a few exceptions to this rule, such as the euro and Commonwealth currencies like the British pound, Australian dollar and New Zealand dollar. Real exchange rates for most major currencies are generally expressed to four places after the decimal, except for currency quotations involving the Japanese yen, which are quoted to two places after the decimal (Bategeka, & Okumu, 2010)

Private sector investment is the process of investing in a commodity that is not traded publicly. In many cases, this refers to a private business that has a limited number of shareholders, but the term can also be used to describe many other scenarios. For example, if an investor purchased a collection of valuables from another person, this would qualify as well. Another popular area for this type of investment is within the healthcare, regulation, and education fields to improve the standard of living for a certain region (Asante, 2010).

The type of private sector investment that consumers are often most familiar with involves businesses that are looking to expand. If the company is not large enough to be traded publicly, but it needs an influx of money to remain profitable, it can hand pick investors who can help meet its needs. Financial institutions are the most reputable businesses that make such investments, but private lenders are often called on as well. One example of an industry that

thrives almost solely on these investors is the Internet; most of the existing websites would not be here without it. Another type of investment comes from a commodities dealer (Bategeka, & Okumu, 2010), the product could be anything from corn or wheat to diamonds and other valuables; the value of the investment does not really matter. This type deals with buying goods directly from the source and holding them until they can be sold for a profit. As long as the product is purchased for financial gain, then it fits the definition. There are many private sector businesses that cater to these types of clients (Bryan, 2011)

Another important type of private sector investments does not involve monetary profit at all. Instead, investors look for private businesses that strive to make the world a better place. This would include places like schools, research organizations, medical clinics, and many other entities that provide services that could possibly raise the quality of life for some regions. For example, this type of investment could include giving funds to a medical center that provides services for low income families. Even though the investor might not have personally profited from the transaction, the people who use the services of the clinic receive better care because of it. While many would consider this act more of a loan or a donation, it still qualifies since there are measurable results because of it (Bryan, 2011)

1.1.4 Contextual Perspective

The central bank of Uganda lowered its benchmark lending rate by 100bps to 15 percent on June 13th 2016. It is the second straight rate cut, bringing the borrowing cost to the lowest since July last year. Policymakers last cut the central bank rate by 100bps in April, mentioning lower growth and subdued consumer demand. Interest Rate in Uganda averaged 14.41 percent from 2011 until 2016, reaching an all-time high of 23 percent in November of 2011 and a record low of 11 percent in June of 2013. Interest Rate in Uganda is reported by the Bank of Uganda (Asante, 2010).

In Uganda, the changes of real exchange rates reflect movements of the currency exchange market that is the interaction between supply and demand for currency units. Increased demand for national currency unit is caused by an increase in demand for national exported goods and services and leads to appreciation of national currency unit. Thus, real exchange rate is an important indicator of international trade (Bryan, 2011)

On 21st May 2015, the Bank of Uganda, Uganda Investment Authority and Uganda Bureau of Statistics launched the Private Sector Investment Survey (PSIS) 2015. The Objectives of the survey are to monitor record and analyze private sector investment activities and perceptions in Uganda. Uganda's private sector investment inflows fell during 2013 compared with 2012, but remained high. The decline in EDT was on account of mainly lower inflows of affiliated received from direct investors during 2013. Similarly, private foreign borrowing (non-affiliated debt) decreased as a result of higher net repayments during 2013 (Private Sector Investment Survey report, 2014).

1.2 Statement of the Problem

The private sector performance in Uganda is poor given the existing environment of the people. The prevailing and existing mechanism for the trade and operations signal poor and a low performing economy (Bategeka, & Okumu, 2010). The private sector investments in Uganda despite growing at a high rate and being considered as an engine for the development is still faced by many factors among which are external challenges of financing for the businesses. Private sector foundation continues to propose critical interventions through this policy document that will position businesses better for competition both in the region and on the global market, make substantial contribution to the creation of wealth through sustainable investment, job creation and income generation. The economy according to bank of Uganda report of 2014/2015 grows at relate of 4.5% per annum. Though the investment climate for the private sector seem to be prevalent and okay, many aspects of investments existing are faced with the poor planning environment and an administrative framework which has kept investments of the private sector. Beside one may wonder whether the private sector investments in Uganda could be influenced by interest and real exchange rates. It was based on these that the researcher set to conduct a time series research on interest rates, real exchange rate and their influence on private sector investments. In light of the above, the study seeks to investigate whether interest rate and real exchange rate have had any influence and impact on the private sector investment.

1.3 Purpose of the Study

To determine how both interest rates and real exchange rates affect the private sector investment in Uganda

1.4 Objectives of the Study

- i. To determine the relationship between interest rates and private sector investment in Uganda.
- ii. To determine the relationship between real exchange rates and private sector investment in Uganda.

1.5 Research Questions

- i. What is the relationship between interest rates and private sector investment in Uganda?
- ii. What is the relationship between real exchange rates and private sector investment in Uganda?

1.6 Hypothesis

H₀₁: There is no significant relationship between interest rates and private sector investment in Uganda.

H₀₂: There is no significant relationship between real exchange rates and private sector investment in Uganda.

1.7 Scope of the Study

1.7.1 Geographical Scope

This study carried out in Uganda which is bordered by Kenya in the East, the East South, Rwanda in the South, Burundi in the South West, DR. Congo in the West and South Sudan in the North. Specifically data will be obtained from the Uganda Bureau of Statistics and Bank of Uganda.

1.7.2 Content Scope

The study focused on the relationship between interest rates and private sector investment in Uganda, also the study focuses on the relationship between real exchange and private sector investment in Uganda.

1.7.3 Time Scope

The study looked at a time period of twenty one (21) years, that is, from 1995-2015. This period is preferred because it is the time most financial reforms were made that favored investment in the private sector.

1.8 Significance of the Study

It is hope that the findings of this study will provide the Bank of Uganda with valuable information that will help it to put into consideration the stability of the economy before implementing financial liberalization measures.

Similarly, policy makers will benefit from the findings of this study since it will help them to come up with strong macroeconomic policies (fiscal and monetary) in order to maintain economic stability. For example, stabilization of real exchange rate, control of to ensure price stability, maintaining stable interest rates to encourage savings and investments, and maintaining a manageable public debt.

Last but not least, the findings of this study would be used by academicians as a reference material in case of related studies on

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter review literature from different authors and scholars in accordance to the objectives of the study. The chapter is sub-sectioned in three different parts, that is, the theoretical review, conceptual framework and review of related literature.

2.1 Theoretical Review

The researcher used both Loanable Funds Theory of Real Interest Rate and Keynes Liquidity Preference Theory of Interest Rate.

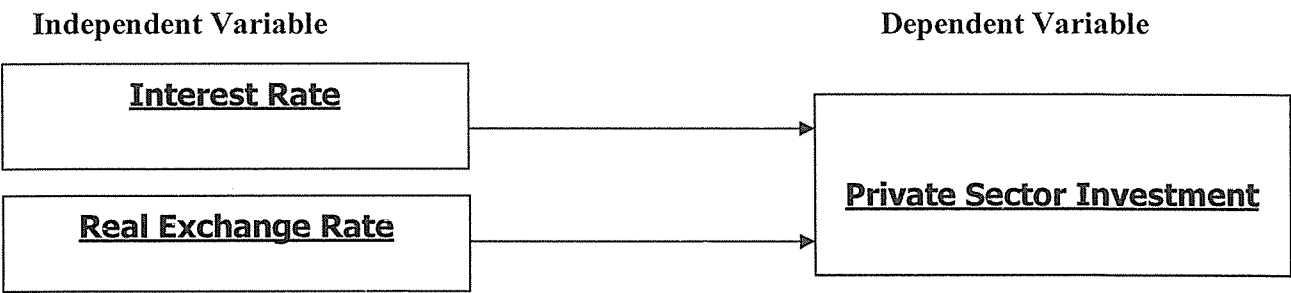
Loanable Funds Theory of Real Interest Rate was formulated in the 1930s by British economist Dennis Robertson and Swedish economist Bertil Ohlin (Asante, 2010). It refers to the sum of money offered for lending and demanded by consumers and investors during a given period. The interest rates models determined by the interaction between potential borrowers and potential savers (Dailami, & Walton, 2012).

According to the loanable funds theory, economic agents seek to make the best use of their sources available to them over their life time. One way of increasing future real income might be to borrow funds now in order to take advantage of investment opportunities in the economy. This will only work if the rate of return available from the investment were greater than the cost of borrowing. These borrowers would not be willing to pay higher real rate of interest than the rate of return available to capital. Savers are willing to save and lend only if there is a promise of real return on their savings that will allow them to consume more in future than they would otherwise be able to do. The extent to which people are willing to postpone consumption depends upon their time preferences (Saunders, & Cornet, 2011)

Keynes (1973), defined liquidity preference theory as the rate of interest set forth in the general theory of employment, interest and money. The rate of interest depends on the present supply of money and the demand schedule for the present claim on money in terms of a deferred claim. Says that," The rate of interest depends on the demand and supply of money

“(Keynes1937,1973).In Keynes view, the primary way that interest rates affect the level of aggregate output is through their effects on their planned investment spending. Profit seeking organizations make investments in physical capital (machines, factories and the raw materials) as long as they expect to earn more from the physical capital than the interest cost of a loan to finance investment.

2.2 Conceptual Framework



The diagrammatic conceptual framework above presents the relationship between the independent variables and the dependent variable included in the study.

Interest rates, real exchange rates are the independent variables; on the other hand private sector investment which is dependent variable is measured in terms of GDP.

2.2.1 Interest rates and private sector investment

Investment is one of the most important economic decisions that investors make (Dixit, & Pindyck (1994). Among all variables that might affect investment, interest rate changes have important implications for monetary and fiscal policies, and have drawn a lot of attention from economists. While the neoclassical theory of investment (Jorgenson (1963)) predicts that a decrease in the interest rate increases investment by reducing the cost of capital, recent theoretical analyses (Capozza, & Li (1994), Capozzam & Li (2002), & Chetty (2007)) suggest that, when firms make irreversible investments with uncertain pay-offs, the effect of an interest rate change on investment is non-monotonic. Chetty (2007) specifically suggests that investment is a backward-bending function of the interest rate. This means that a decrease in the interest rate reduces investment when the interest rate is “low”, in the sense that the difference between the interest rate and the expected future income growth rate is small, and increases investment when

the interest rate is “high”. While focusing on empirical analyses, Capozza, & Li (2002) also show that the difference between the discount rate and the expected future income growth rate influences the investment responses to interest rate changes.

Many scholars draw different conclusions about the relationship between interest rate and investment according to a large number of empirical analyses. If investment was added as an endogenous variable into a monetary utility function model, the result turned out that investment indeed has a certain impact on interest rates (Qing, & Chong, 2004). If discount rate was replaced by stochastic interest rate in a real option model, the result turned out that the uncertainty of interest rate had obvious effects on investment (Ingersoll, & Ross, 1992). The analysis of irreversible investment under the changing rates showed that the change in rate had positive or negative effect on the demand of investment (Alvareand, & Koskef, 2004).

The diffusion model of short-term rates showed that the uncertainty of rate may limit the best investment and enterprise scale (Luis Alvarez 2010).

Different from the traditional theory, some scholars concluded that there was a positive correlation between interest rate and investment. Based on the evidence of 21 developing countries, 1971 to 1980, the analysis about the real financial assets showed that there was a positive relationship between the growth of real interest rates and financial assets (Lanyim, & Saracoglu, 1983). If the discount factor was selected to represent the variable of investment and the GMM estimation method was used to analyze the relationship between investment and interest rate in an uncertain environment, the result turned out that there was a positive correlation between them. And the higher volatility the interest rate had, the more positive the correlation would be (Andrea, 2007).

There are also some scholars believe that the rates may have no impact on the investment. VAR model was used to test the causal relationship between interest rates and investment, and found that investment depended on the level of demand in the macroeconomic, rather than interest rates (Mohammed, 2013). According to the analysis of three rate hikes from 1960 to 1978 in West Germany, it turned out that the effect of interest rate on investment is different in two periods due to the different policy (Baillie, & McMahon, 1981).

In the field of microeconomics, impulse response was used to analyze the effect of rate policy on investors. Based on the data of interest rates and ISE national 100 indexes, 2002-2010, the result

showed that investors can't cope with the impact of interest rates in the short term (Mustafa, & Ayhan, 2012).

When it came to the optimal investment decision-making under the rate risk in the long term, it is proved that interest rate had a great influence on the investment income. (Hiroaki, & Jun, 2006). Empirical analysis was applied according to the long-term interest rates, short-term real exchange rate and investment. On the analysis of short-term investment on the long-term bonds, it turned out that there was a weak relationship between interest rate changes and investment in Switzerland. And in the United States the relationship curve corresponded better to the interest rate parity theory (Christoph, 2006).

Scholars find strong evidence for the non-monotonic effect of interest rate changes on the capital improvements in apartment, office, and retail properties, but not for industrial properties. For the first three types of properties, a decrease in the Treasury yield dramatically increases expenditures on capital improvements when property values are high (low cap rates), but has little or negative effect when properties have low valuation (high cap rates). For example, when the cap rate is 4%, a decrease of 50 basis points in the Treasury yield increases the capital improvement by 18% for apartments, 15% for offices, and 31% for retail properties, but the same interest rate decrease has no or negative effect when the cap rate is 10%. This result indicates that a decrease in the interest rate may strongly stimulate investment in a booming economy when asset values are high, but will have no or negative effect on investment in a recession when assets values are low. This result has important policy implications. If a decrease in the interest rate does not necessarily stimulate investment, then monetary authorities should take extreme care when they try to use interest rate changes to stimulate investment.

2.2.2 Real exchange rates and private sector investment

In finance, a real exchange rate (also known as a foreign-real exchange rate, forex rate, FX rate) between two currencies is the rate at which one currency will be exchanged for another. It is also regarded as the value of one country's currency in terms of another currency. Real exchange rates are determined in the foreign exchange market, which is open to a wide range of different types of buyers and sellers where currency trading is continuous: 24 hours a day except weekends, i.e. trading from 20:15 GMT on Sunday until 22:00 GMT Friday. The spot real exchange rate refers to the current real exchange rate. The forward real exchange rate refers to an

real exchange rate that is quoted and traded today but for delivery and payment on a specific future date (Asante, 2010).

In the retail currency exchange market, a different buying rate and selling rate will be quoted by money dealers. Most trades are to or from the local currency. The buying rate is the rate at which money dealers will buy foreign currency, and the selling rate is the rate at which they will sell the currency. The quoted rates will incorporate an allowance for a dealer's margin (or profit) in trading, or else the margin may be in the form of a commission or in some other way (Fowowe, 2011).

Real exchange rate movements have important implications for a wide range of economic variables. While a continuous effort has been made to improve our understanding of the real exchange rate pass-through on prices (Taylor, 2000) and profitability (Bodnar, Dumas, & Marston 2002), some recent studies have extended the analysis by examining the impact of real exchange rate movements on the real economy. In particular, one research stream focuses on the relationship between real exchange rate fluctuations and investment (Campa, & Goldberg 1999). In theory, changes in the real exchange rate have two opposite effects on investment. When the domestic currency depreciates, the marginal profit of investing an additional unit of capital is likely to increase, because there are higher revenues from both domestic and foreign sales. Yet, this positive effect is counterbalanced by the rising variable cost and the higher price for imported capital.

The optimal level of investment for a firm is an increasing function of the current and expected value of future profits. Real exchange rate changes influence profits not only through changes in the prices of domestically produced goods sold in export markets but also through changes in the prices of imported goods used as inputs to production and in the prices of imports that compete with domestically produced goods. A firm with a larger share of sales in export markets, for example, would be expected to reduce investment in response to an appreciation of the domestic currency. Conversely, a firm that is highly dependent on the use of imported inputs into production would face a larger drop in variable costs and would consequently be expected to increase investment following an appreciation (Goldberg, 1999).

The real exchange rate pass-through literature has also highlighted the importance of the competitive structure of industry in determining the size of the response to real exchange rate

changes, (Dornbusch 1987). Firms in more competitive industries with lower price-over-cost markups have less ability to absorb real exchange rate changes in their markups so that the change in prices for these firms following an real exchange rate change will be larger. Lower levels of industry markups would therefore be expected to interact with, and amplify, the effects of external exposure on investment.

Some authors have argued the market structure may influence the amount by which price or real exchange rate volatility or misalignments can change investment expenditures. Cabellero, 1991, & Craine, 1989, are important examples. Similarly Carruth, 1998 - using a panel of data on British firms - have found evidence that market concentration causes investment to fall in the face of price uncertainties. Our study is silent on this issue. However, it is true that imperfect competition is likely to increase prices on average, and to increase the opportunity cost of waiting since the higher price level will encourage competitors to try to enter the market. That means that imperfectly competitive firms will probably be in case B with smaller values of σ_2 , and that market concentration is therefore likely to cause investment to fall in that face of real exchange rate misalignments and price uncertainties (Cabellero, 1991)

2.2.3 Relationship between interest rate, real exchange rate and private sector investment

Interest rates influence real exchange rates because they directly affect the supply and demand of a nation's currency (Fowowe, 2011) Fluctuating interest rates affect currency values in a directly proportionate manner. Higher interest rates provide lenders a higher return relative to other nations; higher returns attract foreign capital, which increases demand and causes the real exchange rate to rise. The opposite is true for decreasing interest rates, which proportionately decreases real exchange rates (Okpara, 2010)

A country's central bank exerts influence over real exchange rates by setting interest rates and subsequently controlling monetary policy. The primary influence that drives real exchange rates is interest-rate changes made by any of the eight global central banks. These banks increase interest rates to curb inflation and cut rates to promote lending and inject money into their economies (Grishchenko, & Jing-zhi, 2012)

Unexpected increases in the interest rate in the United States relative to overseas would provide investors a higher return on U.S. assets relative to their foreign equivalents. This raises the value

of the dollar, reduces the price of imports and reduces demand of U.S. goods and services abroad (Grishchenko, & Jing-zhi, 2012)

Real exchange rates are relative because they are a comparison of the currencies of two countries. Several factors determine real exchange rates, but all are related to the economies and trading relationship between the two countries. Interest rates provide a scale for the cost of borrowing or the gain from lending (Asante, 2010).

All other factors being equal, higher interest rates in a country increase the value of that country's currency relative to nations offering lower interest rates. However, such simple straight-line calculations rarely, if ever, exist in foreign exchange. Although interest rates can be a major factor influencing currency value and the level of investment, the final determination of a currency's real exchange rate with other currencies is the result of a number of interrelated elements that reflect and impact the overall financial condition of a country in respect to that of other nations.

These discussions have clearly showed that there exist simplistic relationships between the interest rates and real exchange rates on the overall level of investment in the country without implying causality. The regression analysis investigated the pupated causal relationship between the interest rates and real exchange rates on the overall level of private investment in the Uganda. These were then used to investigate the percentage of the variation in private investment explained by these two variables.

Generally, higher interest rates increase the value of a given country's currency. The higher interest rates that can be earned tend to attract foreign investment, increasing the demand for and value of the home country's currency. Conversely, lower interest rates tend to be unattractive for foreign investment and decrease the currency's relative value (Okpara, 2010).

Interest rates alone do not determine the value of a currency. Two other factors that are often of greater importance are political and economic stability and the demand for a country's goods and services. Factors such as a country's balance of trade between imports and exports can be a much more crucial determining factor for currency value. Greater demand for a country's products means greater demand for the country's currency as well. Favorable gross domestic product

(GDP) and balance of trade numbers are key figures that analysts and investors consider in assessing the desirability of owning a given currency (Asante, 2010).

Developing economies suffer from a high degree of macroeconomic uncertainty. Growth, inflation, real exchange rates and other key macroeconomic variables are much more volatile than in industrial economies, and the consequences of this excess volatility for aggregate performance in several dimensions growth, investment and trade have attracted some attention in recent empirical literature. In the case of investment, this concern has been renewed by recent theoretical work identifying several channels through which uncertainty can impact on investment, under various assumptions about risk aversion, adjustment costs to investment and other factors (Caballero, 1991 & Abel, Eberly 1994). However, some of these effects of uncertainty operate in mutually opposing directions, and their magnitude depends on a variety of factors identified in the literature. As a result, the sign of the investment-uncertainty relationship is indeterminate on theoretical grounds.

The theories of investment date back to Keynes in 1936, who first called attention to the existence of an independent investment function in the economy, and the empirical literature on private investment behavior is vast. For instance, private investment in the developing countries has faced many economic problems such as low growth rate, inflation and foreign debt, deficit in trade balance and low standard of living. Private and public investment could complement each other rather than compete with each other and private investment had larger impact than public investment on economic growth (Admasu, 2002, Khan, & Rinluhart, 1990).

2.3 Empirical Literature Review

A World Bank Study empirically examined the link between real private investment and other variables such as real public investment, credit to the private sector, real rate of interest and a dummy for 1976 in Ghana. Public investment was found to crowd-in private investment, and real interest rate was found not have a substantial effect on private investment (Islam, & Wetzel, 1991).

Dixit & Pindyck, (1994) considered the effects of uncertainty on investment when decisions are irreversible. A firm can have an option to invest overseas, with real exchange rate uncertainty

potentially influencing the expected return on the option. Real exchange rate uncertainty may increase the value of holding onto the option by not investing, whereas changes in real exchange rate levels affect the price of the option. Examples can be found in Campa, (1993), Darby *et al* (1999).

Nucci, & Pozzolo (2001) investigated the relationship between real exchange rate fluctuations and the investment decisions of a sample of European manufacturing firms in Italy using a multiple regression model framework. Their results support the view that a depreciation of the real exchange rate has a positive effect on investment through the revenue channel, and a negative effect through the cost channel. The magnitude of these effects varies over time with changes in the firm's external orientation, as measured by the share of foreign sales over total sales and the reliance on imported inputs. Consistent with the predictions of our theoretical framework, the effect of real exchange rate fluctuations on investment is stronger for firms with low monopoly power, facing a high degree of import penetration in the domestic market, and of a small size. We also provide evidence that the degree of substitutability between domestically produced and imported inputs influences the effect through the expenditure side.

Servén (2003) empirically examine the link between real-exchange-rate uncertainty and private investment in developing countries, using a large cross-country time series data set. The paper builds a GARCH-based measure of real-exchange-rate volatility and finds that it has a strong negative effect on investment, after controlling for other standard investment determinants and taking into account their potential endogeneity. The effect of uncertainty is not uniform, however. There is some evidence of threshold effects, so that uncertainty only matters when it exceeds some critical level. In addition, the negative effect of real-exchange-rate uncertainty on investment is significantly larger in economies that are highly open and in those with less developed financial systems.

Badawi (2004) investigated the impact of macroeconomic policies on private investment in Sudan employing annual data over the period 1969-1998. One of the independent variables, that is real interest rate, impacts negatively on private investment. Interest rate was also found to be less important in determining the level of private investment in Kenya (Frimpong, & Marbuah, 2010).

2.4 Research gaps

Both interest rates and real exchange rates in Uganda have so far been relatively limited in both scope and impact, largely because government intervention in financial markets for a locative purpose was mediated mainly through its ownership of the largest bank rather than through administrative controls over private sector institutions (Jenkins, 2013) The latter mainly consisted of interest rate controls, reform of which commenced in 1992 when some rates were decontrolled and others linked to the Treasury bill rate. A Treasury bill auction was also introduced in 1992, although the market is very thin. Interest rates were further liberalized in 1994 when the formal link with Treasury bill rates was removed (Sharer, 1995: 34-35). The interest rates and real exchange rates have also involved removing some of the restrictions previously imposed on commercial banks' operations and asset holdings such as dealing in foreign exchange and treasury bills (Asante, 2010).

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter consists of the procedures and methods used to conduct research on the study area. The chapter discusses how the respondents are selected, how data is collected and analyzed. The chapter presents research design, data processing, data analysis and limitations of the study.

3.1 Research design

A correlational design is part of the non-experimental research design. The correlational design simply aims to determine the relationship between two variables, as well as how strongly these variables relate to one another (Saunders, 2007).

A time series analysis was adopted and the use of quantitative techniques to analyze secondary data to critically conclude the research objectives. Time series analysis is used to collect and analyze data on the relation between interest rate, real exchange rate and private sector investment. Secondary data was collected from World Bank reports. Also inferences were drawn from the regression model results and testing for its significance using the t-statistic, correlation of the variables and test for significance of the coefficient of determination and finally time series analysis was done using regression.

3.2 Data type and Sources

Secondary data collection methods are used to collect relevant data to the study. The data obtained from the “world development indicators” published by World Bank and recorded documents. Other information is obtained from the internet. Covering the period 1995-2015.

3.3 Data Analysis

A Pearson's correlation coefficient was used to study the relationship between variables. This is followed by estimation of the significance level by the T- statistic associated with the Pearson's value. The diagnostic tests of regression, autocorrelations and Homoscedasticity were used to determine the effect of the independent variable and dependent. From the P-value obtained, preliminary tests of the relationship between these variables are thus conducted to investigate how they influence each other as shown in the subsequent sections of the study. The results are presented in form of tables then discussed in relation to existing literature. Conclusion and recommendations are drawn in relation to the set objectives of the study.

3.4 Model specification

Based on the theoretical review and empirical considerations, the following model was used in this work:

$$PINV_t = f(INT, EX) \quad (3.1)$$

$PINV_t$ = Private investment for a given period of time represented by the subscript t in the model.

INT_t = Interest rates for a given period of time represented by the subscript t in the model.

EX_t = Exchange rates for a given period of time represented by the subscript t in the model.

The explicit estimable econometric model is formulated as follows:

$$PRINV_t = \beta_0 + \beta_1 INT + \beta_2 EX + \varepsilon \quad (3.2)$$

Where all variables were previously defined and ε is the error term. The parameters $\beta_0, \beta_1, \beta_2$ are the parameters to be estimated and „t “ stands for different period of time.

Log transformation can reduce the problem of heteroskedasticity because it compresses the scale in which the variables are measured (Gujarati, 1995).

3.5 Diagnostic tests

3.5.1 Stationarity test

This study will use the Argumented Dickey Fuller (ADF) to test the time series data are stationary. If the time series data is non-stationary, the regression analysis carried out in a conventional way will produce spurious results. A spurious regression occurs when after regressing a time series variables on others, the test statistics show a positive relationship between the variables even though no such relationship exists (Johannes, Njong& Cletus 2011).

The test is based on the following model.

$$\Delta Y_t = \beta_t + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^m \alpha_i \Delta Y_{t-1} + \varepsilon_i \quad (3.3)$$

Where ε_i is a pure white noise error term, m is the maximum of lags and

$$\Delta Y_{t-1} = Y_{t-1} - Y_{t-2}, \Delta Y_{t-2} = Y_{t-2} - Y_{t-3} \text{Etc.} \quad (3.4)$$

This involves testing the null hypothesis that; time series has a unit root (i.e. $p=1$, it is non-stationary) against the alternative that; time series has no unit root (it is stationary).

3.5.2 Normality Test

In the literature, there are several tests for normality such as histogram of residuals normal probability plot (NPP), Anderson–Darling and Jarque–Bera tests. The Jarque–Bera test for normality is employed in this research. The Jarque - Bera test is a test based on OLS residuals mainly used in a large sample test. First, it requires calculating the Skewness and Kurtosis and then measures the OLS residuals. In this case, we used the *JB* test to determine whether the residuals are normally distributed or not. The null hypothesis and the alternative hypothesis are given as

H_0 : Residuals are normally distributed

H_1 : Residuals are not normally distributed

Under the null hypotheses where the residuals are normally distributed, if the p -value of the statistics is sufficiently low or lower or equal to the level of significance, then it will be rejected.

But if the p -value is found to be reasonably higher, then the normality assumption will not be rejected. In other words, the normality assumption is not rejected mostly when the value of the statistic is close to zero. The Jarque–Bera test statistic follows the chi square distribution with two degrees of freedom (Jarque, & Bera, 1987).

3.6 Ethical Consideration

To ensure ethical considerations of the study and the safety, social and psychological well-being of the person and community involved in the study, the researcher get an introductory letter from Kampala International University, college of higher degree and research and Management to the field which showed that he is a student from the same university.

3.7 Limitations and problems encountered

The study has the following limitations:

1. The researcher encountered problems of financial difficulties, especially in areas of printing, transportation, internet costs and feeding among others, this constraint averted by seeking financial sponsorship from friends and well-wishers.
2. The researcher was limited by the availability of data on the websites of Uganda Bureau of Statistics and World Bank
3. The researcher used only data of 20 years' period hence might affect the correlations and time series tests of the variables under study.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0. Introduction

The analysis section of the study presents an empirical analytical look and interpretation of all the data that was collected in this study regarding the three variables as identified in the conceptual framework of the study. The analysis was being mainly based on the objectives and hypotheses that were stated in the introduction part of this study. However, preliminary description of the major variables and their trend for the years the study as stated in the time scope was be thoroughly done. This analysis was entail obtaining the descriptive statistics of each of the variables in the study.

The initial part of this chapter deals with descriptive summary of the data. This can be used to evaluate the scores of each variable for more advanced statistical analysis and the data can easily be understood in the form of tables and graphs.

4.1. Description of the data variables

The study has a total of three different variables that are considered in the analysis of the data as per the objectives stated in the previous sections. The two variables; interest rates and real exchange rates form the two independent variables whereas private sector investment forms the dependent variable that we seek to explain using the former two variables. The data for all the three variables in the study was for a twenty (20) years, that is, from 1995-2015. The data used in the study is secondary got from the internet search of World Bank data as being viewed in the subsequent sections of the analysis.

Table 4.1: Summary of the three variables under study

	Real exchange	Interest	Private investments
Year	Rate (%)	Rates (%)	(% of GDP)
1995	144.04	12.55	4.59
1996	144.58	9.68	5.29
1997	151.39	9.53	4.83
1998	134.15	9.51	5.62
1999	122.17	12.82	6.36
2000	115.53	13.08	6.23
2001	112.67	14.19	7.11
2002	107.84	13.53	7.95
2003	94.48	9.09	8.40
2004	97.88	12.86	8.06
2005	102.32	10.85	8.62
2006	102.36	9.61	10.11
2007	105.60	9.84	10.23
2008	109.20	9.78	13.90
2009	107.32	11.20	11.58
2010	100.00	12.49	13.34
2011	95.78	8.81	15.44
2012	109.05	10.08	13.68
2013	110.90	11.41	13.50
2014	114.28	10.72	14.37
2015	105.60	9.83	15.23

Source: <http://data.worldbank.org>

Table 4.2: Descriptive statistics of the variables in the study

Descriptive Statistics	Real exchange rate	Interest rates (%)	Private investments (%)
Mean	113.673	11.023	9.734
Standard Error	3.596	0.359	0.809
Median	109.050	10.718	8.616
Standard Deviation	16.480	1.645	3.708
Sample Variance	271.598	2.706	13.747
Kurtosis	0.472	-1.184	-1.485
Skewness	1.191	0.483	0.180
Range	56.909	5.372	10.851
Minimum	94.478	8.815	4.590
Maximum	151.387	14.187	15.441
Sum	2387.136	231.482	204.421

The plot in Table 4.2 shows that the real exchange rates have generally been decreasing between 1995 and 2015. However, this decrease has not been too far from the mean value of the real exchange rate as depicted in table 4.2. The data indicates that real exchange rate has registered a mean of 113.673 (SE=3.596) for the time period this study was considered. The year 1997 recorded the highest value of real exchange rate, (151.387). The year 2003 recorded the lowest real exchange rate figure, 94.478, compared to all the other years under study. The data shows that the largest decrease in the average real exchange rate was registered between 1997 and 2003.

Also the plot in Table 4.2 shows that the interest rates have generally been decreasing and increasing at a rather irregular rate between 1995 and 2015. The data indicates that this interest rate has registered a mean value of 11.023 (SE=0.359) for the time period this study was considered. The year 2001 recorded the largest value of interest rate, 14.186 whereas 2011 recorded the lowest interest rate figure, 8.81, compared to all the other years in the study. The forecast for five years ahead indicate that the interest rates are to remain constant 13.5 and 6.7.

The plot in Table 4.2 shows that the level of private investment (% of GDP) has generally been increasing between 1995 and 2015 at increasing rate. The data further indicates that private investment data has registered a mean of 9.734 (SE= 0.809) for the time period this study was considered. The year 2015 has the highest recorded figure for private investment (15.22) compared to all the other years that were considered in the study. Similarly, the year 1995 was

associated with the least figures for private investment. It was associated with a value of 4.589 if compared to all the other years that were considered in the study. Such a steady increase is commensurate with economic theory as it shows that the economy is performing great. The data further indicates that the private investments are to increase in magnitude for the years following 2015 between 20.4 and 16.43 by the year 2020.

Table 4.3: Transformed Data of the three variables under study

Year	LEXR	LIR	LPRIN
1995	4.970091	2.529721	1.52388
1996	4.973833	2.270062	1.665818
1997	5.019859	2.254445	1.574847
1998	4.898959	2.252344	1.726332
1999	4.805414	2.551006	1.850028
2000	4.74953	2.571084	1.829376
2001	4.724463	2.652537	1.961502
2002	4.680649	2.604909	2.073172
2003	4.548388	2.207175	2.128232
2004	4.583742	2.554122	2.086914
2005	4.628105	2.384165	2.154085
2006	4.628496	2.262804	2.313525
2007	4.659658	2.286456	2.325325
2008	4.693181	2.280339	2.631889
2009	4.675815	2.415914	2.44928
2010	4.60517	2.524928	2.590767
2011	4.562054	2.175888	2.736962
2012	4.691806	2.310553	2.615935

2013	4.708629	2.43449	2.60269
2014	4.738652	2.372111	2.665143
2015	4.659658	2.285439	2.723267

4.2 Test for stationarity for interest rate, real exchange rate and private sector investment in Uganda

This section involves testing for the stationarity of the individual variables using Augmented Dickey-Fuller test. Also ACF tests results used in this study.

4.2.1 Unit Root Test Results Using the ADF test

The result of Augmented Dickey Fuller (ADF) unit root test is summarized in below at levels and at their first differences, respectively. The rejection criteria is that we reject the null hypothesis if the p-values of both intercept, and trend and intercept are less than 0.05 otherwise we fail to reject the null hypothesis

Table 4.4: ADF Test Results

Dickey-Fuller test for unit root		Number of obs = 20		
		Interpolated Dickey-Fuller		
	Test	1% Critical	5% Critical	10% Critical
	Statistic	Value	Value	Value
Z(t)	-3.255	-4.380	-3.600	-3.240

MacKinnon approximate p-value for Z(t) = 0.0741

The unit root test above was carried out under the null hypothesis that the data/series is non-stationary and contains a unit root. The alternative hypothesis was that the data was stationary and did not contain a unit root. Rejection of the hypothesis is based on the results of critical values associated with the MacKinnon critical and probability values as summarized in the table above.

The results of MacKinnon test for unit root show that there is sufficient evidence for rejection of the null hypothesis (Test statistic = -3.255, P-value = 0.0741). Consequently, it can be said that the data is stationary or does not contain a unit root.

4.2.2 Autocorrelation Function and Partial Autocorrelation Function (ACF)

The researcher also uses time series- Autocorrelation Function and Partial Autocorrelation Function for analysis. These look at the in interest rate, real exchange rate and private sector investment respectively

ACF is denoted by the formulae below

$$\hat{\rho}_k = \frac{(y_k - y_{k-1})}{\text{var}(y_k)}$$

$\hat{\rho}_k$ is the autocorrelation coefficient value.

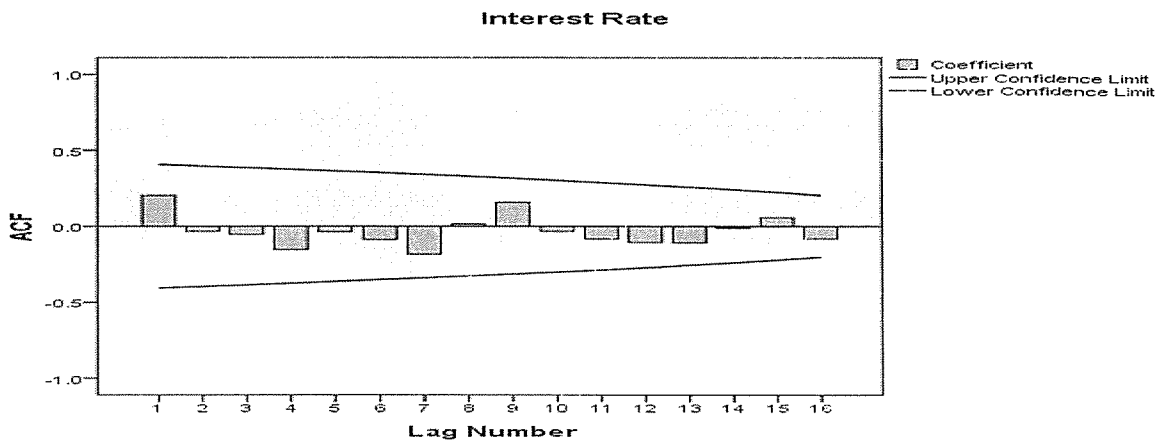
The value of the correlation coefficient lies between -1 and +1

The autoregressive of order one is denoted by formulae

$$\hat{\rho}_k = \mu + \alpha_1 (y_{t+k} - \mu) + e_t$$

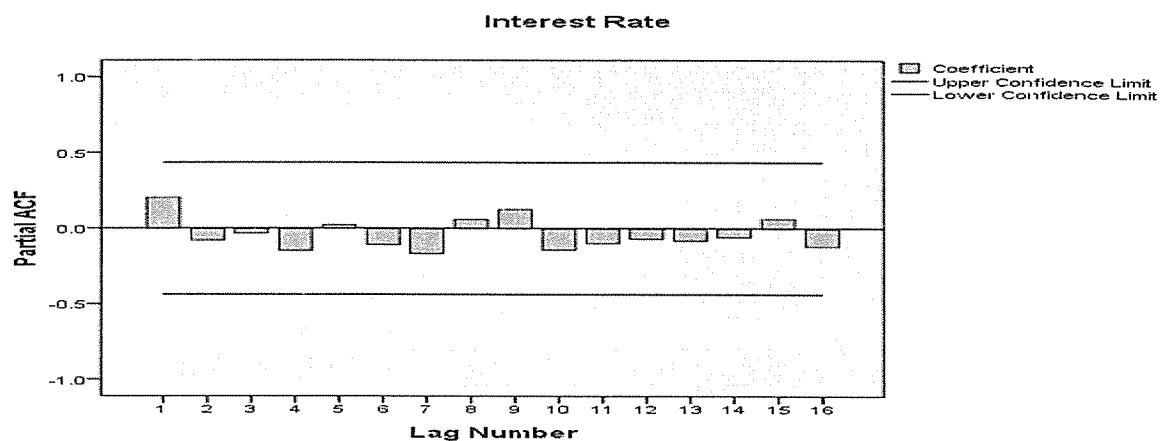
e_t is the uncorrelated error term with zero mean and variance σ^2 .

Figure 1: Autocorrelation Function (ACF) of interest rates from 1995-2015



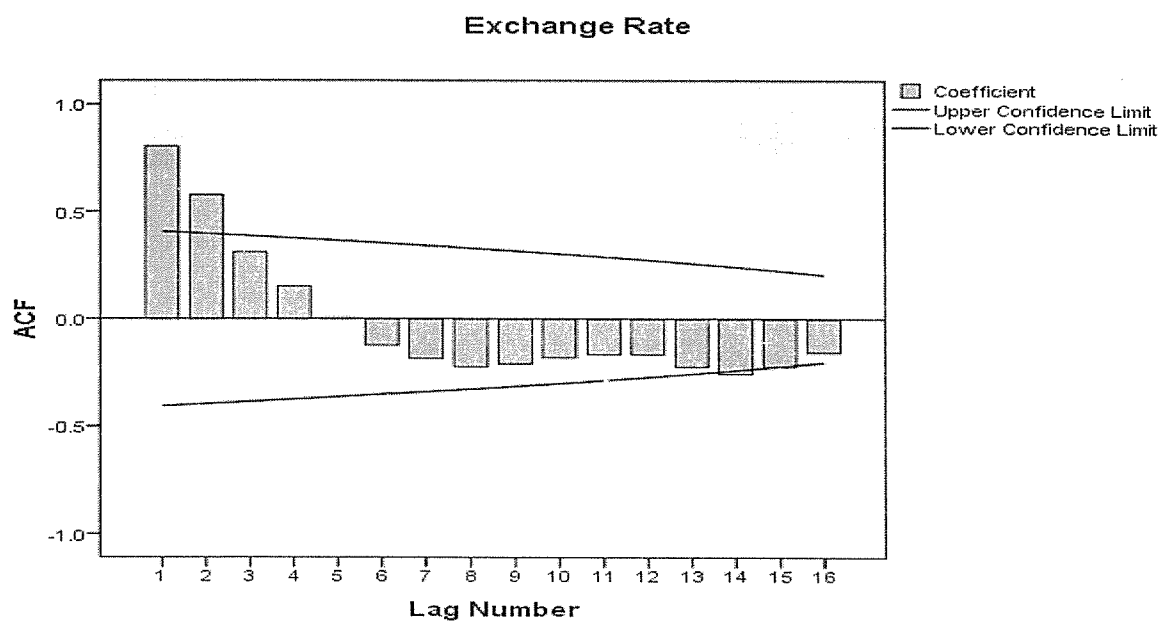
There is an abnormal distribution of interest rate in Uganda from 1995 to 2015. This because it has a varying mean and the variance is small as can be observed from Appendix ii and the $(\text{sig}=0.976) > (\text{sig}=0.05)$ therefore we reject the alternative hypothesis and conclude that there is stationarity in the interest rates of Uganda from 1995-2015.

Figure 2: Partial Autocorrelation Function (PACF) of Interest rates in Uganda 0.05)



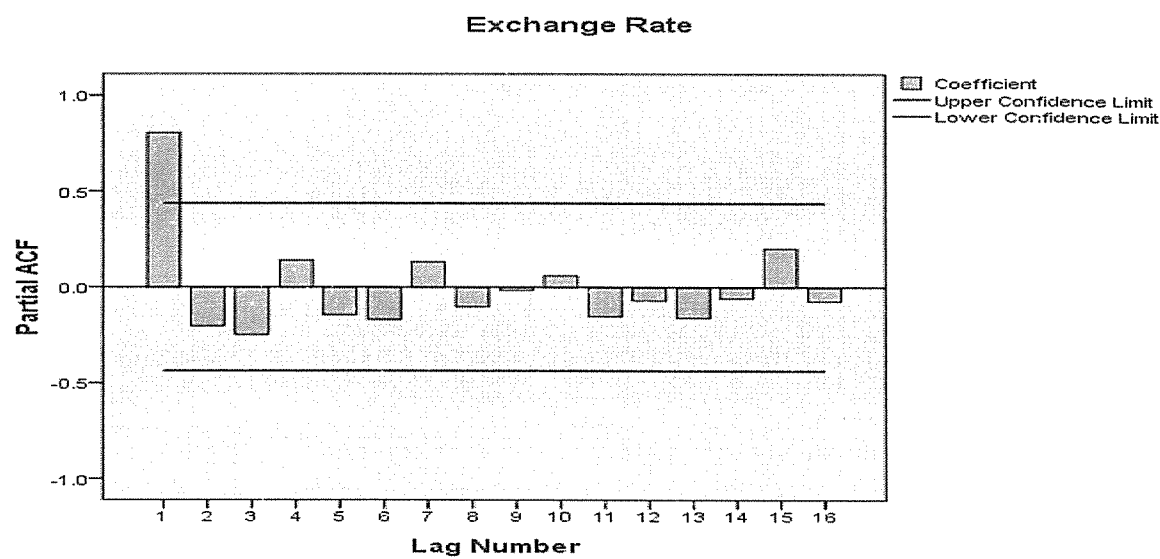
PACF of Interest rate has not shown much of normal distribution this might be due to some other variable which may affect interest rates rate like inflation and production from *Appendix iv* ($sig=0.218$)>($sig=0.05$) we reject the alternative hypothesis and conclude that there is stationarity in Interest rates for the period under study.

Figure 3: Autocorrelation Function (ACF) of Real exchange rate in Uganda (0.05)



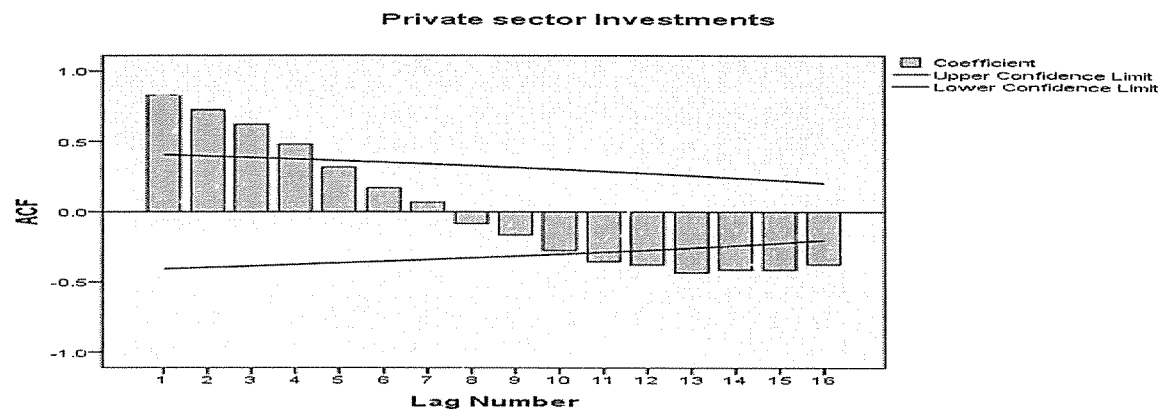
There is a normal distribution of real exchange rates in Uganda from 1995 to 2015, this is because it has a constant mean and the variance are small as can be observed from Appendix ii and the $(sig=0.00)<(sig=0.05)$ therefore we reject the alternative hypothesis and conclude that there is no stationarity in Real exchange rates in Uganda from 1995-2015

Figure 4: Partial Autocorrelation Function (ACF) of Real exchange rate in Uganda (0.05)

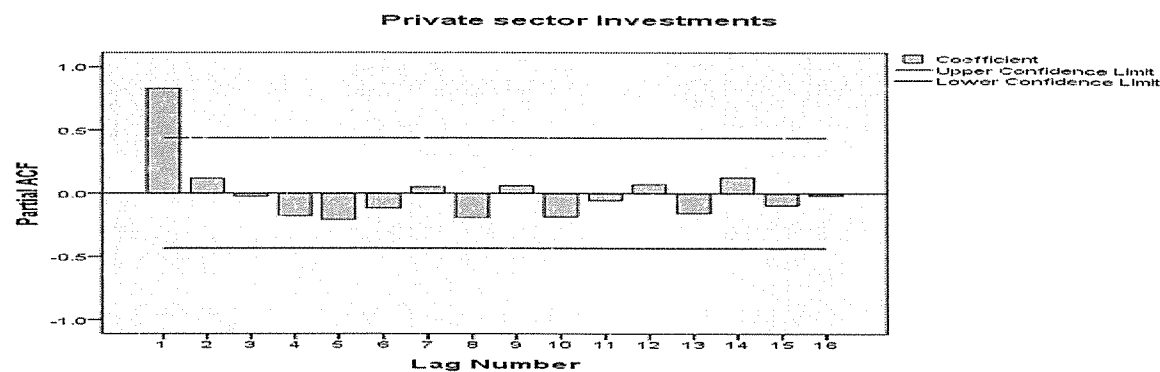


PACF of real exchange rate has not shown much of normal distribution, this might be due to some other variable which may affect real exchange rate like low exports and high importation, $(sig=0.218).$ $(sig=0.05)$ we reject the null hypothesis and conclude that there is stationarity in real exchange rate of Uganda for the period under study.

Figure 5: Autocorrelation Function (ACF) of Private sector investments in Uganda (0.05)



There is a normal distribution of private sector investments in Uganda from 1995 to 2015, this is because it has a constant mean and the variance are small as can be observed from Appendix ii and the $(sig=0.00)<(sig=0.05)$ therefore we reject the alternative hypothesis and conclude that there is no stationarity in private sector investments in Uganda from 1995-2015



There is a slight normal distribution of private sector investments in Uganda, this because it has a slightly changing mean and the variance are quite large as can be observed from Appendix iv and the $(sig=0.218)<(sig=0.05)$ therefore we reject the null hypothesis and conclude that there is stationarity in private sector investments of Uganda in the period under study.

4.2.2 Normality Test

Test	P-value
JarqueBera	0.72059

The normality test for the residual series is undertaken using the Jarque-Bera (J.B.) statistic. The J.B. test from Table above shows that the model is not suffering from the problem of abnormality. This is due to the high p-value of **0.72059**, implying that the residuals of the above model are normally distributed. Because of the high p-values in the model above, we fail to reject that null hypothesis of normality and rather conclude that our residuals are normally distributed.

Other tests in variables under study

Table 4.5: Heteroscedasticity and Autocorrelation statistics

Diagnostic	Test statistic	Test statistic	P-value
Heteroscedasticity	Breusch-Pagan	0.452	0.0271
Autocorrelation	Durbin Watson statistic	0.516	0.7251

The results of the tests for heteroscedasticity as reported by Breusch-Pagan tests of heteroscedasticity reveal that the residual associated with the regression model are homoscedastic. Further analysis of the auto-correlation in the model also implies that the residuals associated with the second regression model are insignificant implying that there is no auto-correlation in the data.

4.3 Interest rates and private sector investment in Uganda.

It is always imperative to investigate the effect interest rate can have on the overall level of private investment in any given economy. Economic theory contends that an increase in the interest rates in any given economy is expected to decrease people from borrowing money as the interest they pay on the borrowings will be high. It will also lead to an increase in the savings on some accounts like the current and fixed deposit accounts since these benefit from an increase in the interest rates.

Similarly, when the interest rates are low, investors will be encouraged to borrow money from expected to result into an increase in the private investments. In this study, it was an objective investing the relationship between interest rates and private investment in Uganda, using the data on each of this variable. A Pearson correlation coefficient accompanied by significance level statistic is adopted in this study to investigate this relationship.

Table 4.6: interest rates and private investments

Interest rates and private investments	
Pearson coefficient	-0.31311244
T-statistic	-1.474421101
P-Value	0.155315

The summary results above indicate that there exists a very weak negative correlation between the interest rates and the level of private investment in the country as implied by Pearson correlation coefficient ($r = -0.31311$). This figure is also associated with a very large P-value statistic implying that it is insignificant ($t = -1.4744, P - Value > 0.05$). Thus, there exists an insignificant negative correlation between the interest rates and private investment in Uganda.

4.4 Real exchange rates and private sector investment in Uganda

It is imperative to investigate the effect that the real exchange rates can have on the overall level of private investment in any given economy. Economic theory contends that an increase in the real exchange rates in any given economy is expected to result into an increase in the number of foreign investors in the country. The logic behind this is when these rates are high, individuals from abroad will find it cheap to invest in any given economy. The study thus investigates the relationship between real exchange rates and private investment in Uganda.

A Pearson's correlation coefficient is used to study the relationship between these two variables. This is followed by estimation of the significance level as reported by the T- statistic associated

with the Pearson's value. From the P-value obtained, preliminary tests of the relationship between these two variables are thus conducted to investigate how they influence each other as shown in the subsequent sections of the study.

Table 4.7: Real exchange rates and private investments

Real exchange rates and private investments	
Pearson coefficient	-0.63870
T-statistic	-3.712210731
P-Value	0.001291

Source: Researcher, 2016

The summary in table 4.4 indicate that there exists a very strong negative correlation between the real exchange rates and the level of private investment in the country as implied by Pearson correlation coefficient ($r = -0.63870$). This figure is also associated with a very large P-value statistic implying that it is significant ($t = -3.7122, P - Value < 0.05$). Thus, there exists a very strong and significant negative correlation between the real exchange rates and private investment in Uganda.

4.5 Regression output for the variables understudy

Regression analysis was used to establish the extent to which independent variables affect private sector investment in Uganda, and the results are presented in the table below.

Table 4.8: Regression output for interest rate, real exchange rate and private investment

```
. regress LPRIN LEXR LIR
```

Source	SS	df	MS	Number of obs =	21
Model	1.88352063	2	.941760316	F(2, 18) =	12.37
Residual	1.37057866	18	.076143259	Prob > F =	0.0004
				R-squared =	0.5788
				Adj R-squared =	0.5320
Total	3.25409929	20	.162704964	Root MSE =	.27534

LPRIN	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
LEXR	-2.112999	.4521791	-4.67	0.000	-3.062992	-1.163006
LIR	-.6865516	.4215258	-1.63	0.121	-1.572144	.1990411
_cons	13.82395	2.347991	5.89	0.000	8.891006	18.7569

4.5.1 Interpretation of the regression model above

The findings of the above regression model indicate that interest rate impacts private sector investment negatively. This means that as interest rate increases, private sector investment will decrease. These can be seen by observing the value of the coefficient interest rate which in this case is -0.6865516 implying that a unit increases in interest rate it will decrease private sector investment by -0.6865516. The negative coefficient of real exchange rate implies that when the exchange rate increases, there will be reduction in the levels of private sector investment in the country according to the above model.

The R-squared value from the above model is 57.8% indicating that the independent variables of interest rate and exchange rate account for 57.8% changes in private sector investment in Uganda.

$$\text{Private sector Investments} = \text{Constant} + \beta_1 \text{Interest rate} + \beta_2 \text{Real exchange rate}$$

$$\text{PSI} = 13.823 - 0.686 - 2.1139$$

The Table further illustrates the regression analysis between interest rates, real exchange rates and private sector investment. The regression analysis shows that the rate of private investments that does not depend on interest rates and real exchange rate is 13.823. The rate of change in private sector investments to interest rates is -0.686 and to real exchange rates -2.1139. This means that a unit increase in interest rate and real exchange rate leads to a reduction in private sector investments by -0.686 and -2.1139.

4.6 Hypothesis

H01: There is no significant relationship between interest rates and private sector investment in Uganda.

H02: There is no significant relationship between real exchange rates and private sector investment in Uganda.

The hypothesis above has got two separate hypotheses in one and will be analyzed and conclusions drawn independently. The first pertains to the relationship between interest rates and private sector investment. This hypothesis was tested in this study using the t-statistic obtained in the regression model and its associated P-value for ascertaining the significance of this value. Each of these values was produced by the regression model that ran each of the independent variable in the model on the dependent variable. In this hypothesis test, the study is interested in studying the relationship between the interest rates and private sector investment. The data summarized in table 4.3 indicates that there exists a negative and significant relationship between interest rate and private sector investments in the country ($t = -1.4744, P\text{-Value} > 0.05$). These results imply that there is no sufficient evidence for rejection of the null hypothesis as per the results of the regression analysis. Thus,

There is no significant relationship between interest rate and private sector investment in Uganda.

The second hypothesis pertains to the relationship between real exchange rates and private sector investment in Uganda. This hypothesis was tested in this study using the t-statistic obtained in the regression model and its associated P-value for ascertaining the significance of this value. Each of these values was produced by the regression model that ran each of the independent variable in the model on the dependent variable. In this hypothesis test, the study is interested in studying the relationship between the real exchange rates and private sector investment.

Looking at the findings of the model between the two variables, the p-value of **0.001291**, which is less than **0.05**; it implies that there is sufficient evidence at 95% for rejection of the null hypothesis. Thus,

There is a significant relationship between real exchange rate and private sector in Uganda.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This section presents an empirical and through discussion of the observed results in the analysis section of the study with conclusions and recommendations regarding the observed statistical relationships.

5.1. Discussion

5.1.1 Interest rates and private sector investment in Uganda

The results reveal that there is significant negative relationship between interest rates and private sector investments in Uganda from 1995-2015. This implies that lower Interest rates encourage additional investment spending, which gives the economy a boost in times of slow economic growth. It adjusts interest rates to affect demand for goods and services. Interest rate fluctuations can have a large effect on the stock market, inflation and the economy as a whole. Lowering interest rates is one of the most powerful tools for increasing investment spending in and economy and to attempts to steer the country clear of recessions.

In Uganda's case, the data reveals that there is a weak negative relationship between the interest rates and the level of private investment in the country. The negative sign is commensurate with economic theory as it implies that a decrease in the interest rates will lead to an increase in the private investment in the country.

5.1.2 Real exchange rates on the level of private sector investment in Uganda

The data reveals that there is a strong negative relationship between the real exchange rates and level of investment in the country. It implies that as the real exchange rates collectively called the price level is increased; the level of investment in the country will decrease. Comparatively, as the real exchange rate is decreased, the level of private investment is expected to increase. This is true because as the prices of goods increase due to a decrease in the real exchange rates, individuals will be compelled to invest more since they will receive higher returns on their investment. This is particularly true for investors in businesses like farming and purchase of agriculture produce since these have got seasonal changes in their prices. On the contrary, when the real exchange rates increase, the goods in Uganda may appear more expensive compared to those in the other countries.

Conventional economics theory has it that increasing price or real exchange rate uncertainty will depress investment. Using the Dixit-Pindyck model, we find that there are situations where this does happen and situations where it does not, i.e., increasing uncertainty leads to more investment. It depends first on the risk of being stuck with (ex-post) unwanted investments, then on the ratio of that risk to the opportunity cost of waiting, and finally on the initial level of uncertainty. There are important threshold effects as you switch from one determinant to another.

This will entice foreign investors to come into the country since they will be buying goods at relatively cheaper prices abroad and will be generating higher profits for their sale in Uganda further stimulating investment. That explains why the data showed a very strong negative relationship between the real exchange rates and level of private investment through it does not imply causality between these variables.

5.1.3 Interest rates, real exchange rate and the level of investment in private sector

Previous discussions have clearly showed that there exist simplistic relationships between the interest rates and real exchange rates on the overall level of investment in the country without implying causality. The regression analysis investigated the pupated causal relationship between the interest rates and real exchange rates on the overall level of private investment in the Uganda. These were then used to investigate the percentage of the variation in private investment explained by these two variables.

The analysis indicates that there is a negative causal relationship between the level of interest rates and private investment in the country. These results are consistent with previously conducted correlation analysis of the relationship between the interest rates and private investment in the country. It implies an increase in the interest rates is expected to lead to a decline in the level of private investment in the country. However, in Uganda's case, the regression results show that this relationship is not significant enough. In other words, interest rates alone cannot lead to an observed change in the overall level of private investment in the country. One of the reasons to explain this is that some people do not save their money in the bank implying that it is not possible to explain how an alteration in the interest rates will affect their tendencies to invest. On the contrary, some private investors do not necessarily use bank savings or loans to carry out investment implying that it's not possible to investigate how a change in interest rates can have on the level of private investment.

The data also revealed that the price level collectively called the real exchange rate has a very strong negative significant causal relationship with the level of private investment in the country. An increase in the real exchange rate (price level) will spur a decrease in the level of private investment in the country and vice versa. This is particularly true because relatively differences in the prices of goods between countries or economies can effect investment too. The relationship is also direct because changes in the price level take significant effect and the demand-supply relationship will always ensure that this effect is passed on directly throughout the economy.

5.2. Conclusions

The major aim of this study was to analyze the relationship between interest rate and exchange rate on private investment in Uganda, over the period of 1995-2015.

The study concludes that there is a very weak negative relationship between the interest rates and the level of private investment in the country. The negative sign is commensurate with economic theory as it implies that an increase in the interest rates is expected to lead to a decline in the level of private investment in the country. it implies that a decrease in the interest rates will lead to an increase in the private investment in the country.

These results are consistent with previously conducted regression analysis of the relationship between the interest rates and private investment in the country.

Also the study concludes that there is a significant negative causal relationship between real exchange rate and the level of private investment in the economy. In other words, an increase in the average value of real exchange rate in the economy is expected to result into a decrease in the average level of private investment in the economy.

5.3. Recommendations

The study has revealed that the interest rates have got a negative relationship with the overall level of private investment in the country. There recommend that fiscal and monetary strategies for stimulating private investment like offering tax holidays to prospective investors would be a better option since relying on interest rates alone is not significant enough.

Due to the very significant relationship between the real exchange rate and private investment in Uganda, the study recommends the policy makers ought to adopt strategic and systematic ways of controlling and adjusting the real exchange rate since their impact on the overall level of private investment can easily be felt. However, these should be adjusted with an informed perspective since they can crowd out domestic investment at the expense of foreign investment instead.

The government's strategy to scale up infrastructure investment is well conceived. It is intended to lift growth while maintaining debt at a sustainable level.

To achieve these goals means that investment must be efficient. That calls for strong institutions to keep mismanagement in check and ensure maximum value for money. There is work to be done. The World Bank has estimated that, if Uganda's investments were better managed, annual growth could be 2.5 percentage points higher

The researcher recommend for the establishment of a strong finance mechanism that will improve the state of functional of interest rates, real exchange rates through establishing a strong policy framework that can guide the execution of the duties of financial system controls in Uganda.

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APPENDICES

Appendix I: Data used in the study

Year	Real exchange Rates (%)	Interest Rates (%)	Private investments (% of GDP)
1995	144.04	12.55	4.59
1996	144.58	9.68	5.29
1997	151.39	9.53	4.83
1998	134.15	9.51	5.62
1999	122.17	12.82	6.36
2000	115.53	13.08	6.23
2001	112.67	14.19	7.11
2002	107.84	13.53	7.95
2003	94.48	9.09	8.40
2004	97.88	12.86	8.06
2005	102.32	10.85	8.62
2006	102.36	9.61	10.11
2007	105.60	9.84	10.23
2008	109.20	9.78	13.90
2009	107.32	11.20	11.58
2010	100.00	12.49	13.34
2011	95.78	8.81	15.44
2012	109.05	10.08	13.68
2013	110.90	11.41	13.50
2014	114.28	10.72	14.37
2015	105.60	9.83	15.23

Source: <http://data.worldbank.org>

Appendix I: Transformed Data of the three variables under study

Year	LEXR	LIR	LPRIN
1995	4.970091	2.529721	1.52388
1996	4.973833	2.270062	1.665818
1997	5.019859	2.254445	1.574847
1998	4.898959	2.252344	1.726332
1999	4.805414	2.551006	1.850028
2000	4.74953	2.571084	1.829376
2001	4.724463	2.652537	1.961502
2002	4.680649	2.604909	2.073172
2003	4.548388	2.207175	2.128232
2004	4.583742	2.554122	2.086914
2005	4.628105	2.384165	2.154085
2006	4.628496	2.262804	2.313525
2007	4.659658	2.286456	2.325325
2008	4.693181	2.280339	2.631889
2009	4.675815	2.415914	2.44928
2010	4.60517	2.524928	2.590767
2011	4.562054	2.175888	2.736962
2012	4.691806	2.310553	2.615935
2013	4.708629	2.43449	2.60269
2014	4.738652	2.372111	2.665143
2015	4.659658	2.285439	2.723267

Appendix iii: Data for normality distribution of data

Autocorrelations

Series:Interest Rate

Lag	Autocorrelation	Std. Error ^a	Box-Ljung Statistic		
			Value	df	Sig. ^b
1	.205	.203	1.010	1	.315
2	-.034	.198	1.040	2	.594
3	-.054	.193	1.119	3	.772
4	-.155	.188	1.797	4	.773
5	-.037	.182	1.838	5	.871
6	-.087	.176	2.083	6	.912
7	-.184	.170	3.252	7	.861
8	.016	.164	3.262	8	.917
9	.156	.158	4.239	9	.895
10	-.034	.151	4.290	10	.933
11	-.083	.144	4.627	11	.948
12	-.106	.137	5.235	12	.950
13	-.108	.129	5.934	13	.949
14	-.012	.120	5.944	14	.968
15	.056	.111	6.197	15	.976
16	-.081	.102	6.830	16	.976

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

Series:Interest Rate

Lag	Partial Autocorrelation
1	.205
2	-.079
3	-.032
4	-.146
5	.023
6	-.110
7	-.166
8	.059
9	.126
10	-.141
11	-.099
12	-.070
13	-.081
14	-.059
15	.063
16	-.119

Autocorrelations

Series:Real exchange
rate

Lag	Autocorrelation	Std. Error ^a	Box-Ljung Statistic		
			Value	df	Sig. ^b
1	.804	.203	15.627	1	.000
2	.576	.198	24.047	2	.000
3	.310	.193	26.621	3	.000
4	.150	.188	27.260	4	.000
5	.003	.182	27.260	5	.000
6	-.125	.176	27.760	6	.000
7	-.186	.170	28.948	7	.000
8	-.224	.164	30.808	8	.000
9	-.209	.158	32.572	9	.000
10	-.182	.151	34.030	10	.000
11	-.167	.144	35.369	11	.000
12	-.167	.137	36.874	12	.000
13	-.223	.129	39.881	13	.000
14	-.258	.120	44.461	14	.000
15	-.223	.111	48.450	15	.000
16	-.156	.102	50.799	16	.000

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

Partial Autocorrelations

Series:Real exchange
rate

Lag	Partial Autocorrelation	Std. Error
1	.804	.218
2	-.203	.218
3	-.248	.218
4	.139	.218
5	-.145	.218
6	-.170	.218
7	.129	.218
8	-.103	.218
9	-.016	.218
10	.058	.218
11	-.153	.218
12	-.070	.218
13	-.161	.218
14	-.058	.218

15	.201	.218
16	-.074	.218

Autocorrelations

Series: Private sector Investments

Lag	Autocorrelation	Std. Error ^a	Box-Ljung Statistic		
			Value	df	Sig. ^b
1	.829	.203	16.606	1	.000
2	.724	.198	29.943	2	.000
3	.620	.193	40.264	3	.000
4	.479	.188	46.787	4	.000
5	.317	.182	49.818	5	.000
6	.169	.176	50.740	6	.000
7	.067	.170	50.896	7	.000
8	-.085	.164	51.163	8	.000
9	-.164	.158	52.249	9	.000
10	-.274	.151	55.543	10	.000
11	-.352	.144	61.529	11	.000
12	-.377	.137	69.139	12	.000
13	-.434	.129	80.505	13	.000
14	-.411	.120	92.187	14	.000
15	-.413	.111	105.946	15	.000
16	-.375	.102	119.501	16	.000

a. The underlying process assumed is independence (white noise).

b. Based on the asymptotic chi-square approximation.

Partial Autocorrelation	Std. Error
.829	.218
.117	.218
-.024	.218
-.177	.218
-.207	.218
-.116	.218
.050	.218
-.192	.218
.061	.218
-.186	.218
-.055	.218
.070	.218
-.157	.218
.123	.218
-.095	.218
-.018	.218



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