

**EXCHANGE RATE FLUCTUATIONS AND PRICES
OF CONSUMER GOODS
IN UGANDA 1995-2005**

A Thesis

Submitted to the school of Post Graduate Studies

Kampala International University

In partial fulfillment for

The award of

Masters of Arts in Economics

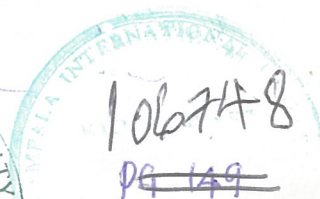
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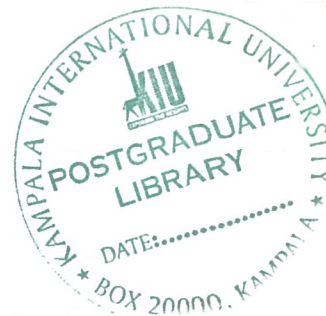
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DECLARATION



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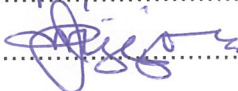
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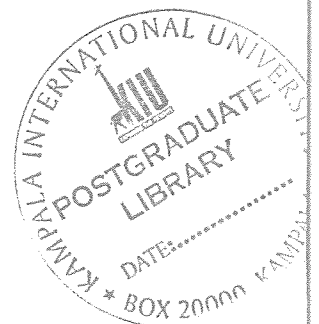
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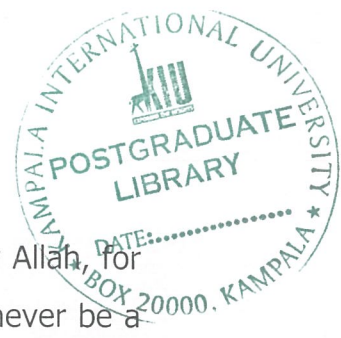
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(Supervisor)

DEDICATION.

I dedicate this work to my lovely and supportive uncle, Ahmad Ssewagudde and my caring grand mother Namakula Jalia, who have endeavored to give in both materially and spiritually for the success of my education.





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I wish to extend my sincere gratitude and appreciation to the Almighty Allah, for without His Will, power, protection and guidance, all this work would never be a reality.

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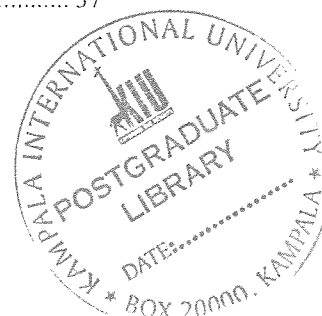
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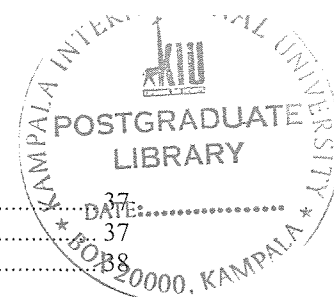
I greatly thank my courageous mother, Namuzimule Teo and my father, Mr. Ndege Musa, my brother Mr. Kafumbe E and my in-law Mr. Ssempiira Mukasa for their sacrifice, financial and moral support towards my education.

May almighty Allah bless you and reward you abundantly!

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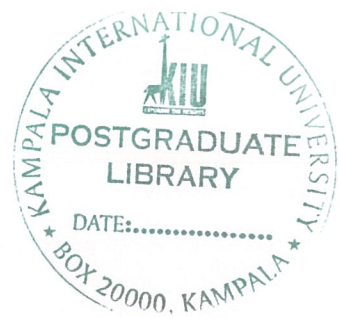
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LIST OF ABBREVIATIONS.

GDP	Gross Domestic Product.
IMF	International Monetary Fund.
MWLE	Ministry of Water Lands and Environment.
BOU	Bank of Uganda.
GOU	Government of Uganda.
WB	World Bank.
KIU	Kampala International University.
SPGS	School of Post Graduate Studies.
MD	Managing Director.
RER	Real Exchange Rate.
ER	Exchange Rate.
NEER	Nominal Effective Exchange Rate.
CPI	Consumer Price Index.
IPI	Import Price Index.
EPI	Export Price Index.
PPP	Purchasing Power Parity.
OLS	Ordinary Least Squares.
NRM	National Resistance Movement.
LDC's	Less Developed Countries.
SIP1	Special Import Program 1.
USA	United States of America.

DEFINITION OF TERMS.

Exchange rate.	Price of a currency in terms of other currencies.
Exchange rate fluctuations.	Continuous movements in the exchange rate.
Exchange rate depreciation.	A fall in the value of a currency in terms of other currencies in a flexible exchange rate.
Flexible exchange rate.	Is where the exchange rate is determined by demand and Supply forces.
Exchange rate appreciation.	An increase in the value of a currency in terms of other currencies in a flexible exchange rate system.
Trends.	Upward or downward movements in any variable.
Consumer goods.	Commodities used for domestic use (not for production).
Food crops.	Mainly agricultural foods both processed and none processed.
Stabilization strategies.	Ways to reduce exchange rate fluctuations.
Export potentials.	Goods produced and consumed domestically but are some times exported.
Tradable goods.	Goods mainly sold in the international markets.
Non tradable goods.	Goods produced and consumed locally.
ER depreciation.	Government deliberate action to reduce the value of its currency in terms of other currencies.
Revaluation.	Government deliberate action to increase the value of its currency in terms of other currencies.
Narrow money supply.	It is total amount of money in people, hands plus demand deposits (money on current accounts)
Significant relation ship.	When a change in one variable causes a change in another variable.





ABSTRACT.

This study intended to explore the impact of exchange rate fluctuations on prices of consumer goods in Uganda for the period 1995-2005.

Exchange rate fluctuations impact negatively the macro economic variables like employment, investment, inflation, consumer's standards of living, traders and government popularity. This calls for immediate investigation to find out with empirical evidence how much such fluctuations affect these economic variables, specifically prices of consumer goods.

The study investigated on movements in exchange rates, the consumer price index, price of food crops, prices of imports and exports, Gross Domestic Product (GDP), money supply and rainfall.

A model was constructed and regressions were run. The Pearson's correlation test was used to test the relationship between the variables. The Ordinary Least Square (OLS) estimation technique was applied to times series data for the period 1995-2005. Computer packages like **EXCELL**, **SPSS** and **STATA** were used in data processing.

The research tested the general hypothesis that there is no significant relationship between exchange rate movements and the above explanatory variables.

The findings indicate that using monthly data, Nominal Exchange Rate is positively related to the general price level, food crop prices and the price of imports, but negatively related with the price of exports and rainfall. Thus a one unit increase in the nominal exchange rate increases the general price level by **0.033**, import price by **0.010** and reduces export prices by **0.069**. Nominal Effective Exchange rate Increases food crop prices by **15.794**.

Results further indicate that a one percent increase in the price of import increase the general price level by **0.209**. A one percent increase in the price of exports increase the general price level by **0.144** and a one percent increase in rainfall reduces the price level by **0.011**.

The researcher recommends that in order to improve people's welfare, increase trader's profits and have relative price and exchange rate stability the government should implement policies to reduce fluctuations and maintain relative exchange rate stability, increase exports to increase foreign exchange in the country, carry out trade liberalization, privatization and exchange rate depreciation with a lot of care to avoid damaging the nationals. Maintaining a managed float exchange rate system other than a free float. Bank of Uganda should improve on data collection especially regarding foreign exchange.

CHAPTER ONE.

Back ground

Since the liberalization of trade in Uganda, in early 1990's, the Exchange rate (ER) and the pricing policies changed greatly, and they became mainly determined by market forces. Before this period, governments in Uganda had an upper hand in determination of ER and prices of consumer goods through price legislations (minimum and maximum prices) plus a fixed ER, which prevailed in the economy. The political turmoil in the country in the late 1970's and early 1980's, destroyed the trend and the economy stagnated. In 1986, the National Resistance Movement (NRM) government came to power and implemented a number of recovery programs in which it liberalized trade, including foreign exchange trade. The ER was now left to float to a certain level, through the formation of the foreign exchange market. Today the ER changes almost every day, due to a floating ER system. In Uganda, prices of consumer goods are ever changing especially prices of fuel, sugar, meat, rice and other food staffs. Most of these goods are imported and those produced locally are some times exported apart from being consumed locally. So whenever the ER changes, prices of all such goods are likely to be affected. The impending question is, 'how will a one percent increase (decrease) in the ER affect prices of such goods for the case of Uganda'? The effect is not the same in all countries, so the magnitude of change in prices depends on the economic conditions in the country concerned. For example, a one percent increase (decrease) in the ER may increase (decrease)





prices of imported consumer goods and reduce (increase) prices of exports in country **A**, which may not be the case in country **B**.

In this paper, the researcher examined the effect of ER fluctuations on imported consumer goods, potential exports, food crops and other locally produced goods from 1995 to 2005. Potential exports here mean goods, which are produced and consumed locally but are some times exported. So whenever the ER changes, such goods are also affected.

Governments, businessmen and consumers find it more important today than ever before to understand how currencies are traded and what affects their relative values and how they affect domestic economic variables like prices of consumer goods.

Exchange rate trends and exchange rate regimes in Uganda.

Uganda has experienced various ER regimes between 1966 and 1998. The fixed ER regime of 1966 to 1981, the managed float of 1981 and 1982, the Dual windows regime of 1982 to 1984, the auction period of 1984 to 1986, the ER management of 1987 to 1990, the special import program1 (S.I.P1), the open general licensing (OGL), the special Import Program2 (S.I.P2), the crawling peg, 1989 to 1990, the special Import program3 (S.I.P3), the ER management of July 1990 to April 1995, the foreign exchange Auction of January 1992 to October 1993 and the flexible ER regime of 1993 to 1998. Much as the ER regimes of

1966 to 1992 have been criticized for generating ER misalignment in the country, the later regimes are criticized for generating continuous ER Volatility (Abuka, 1983)

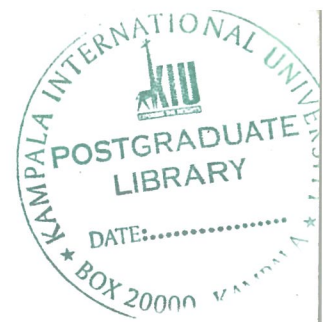
Trends in the ER in Uganda (Ushs V^s US\$).

Uganda has experienced rampant ER volatility and due to this, various reforms have been made like currency devaluation, adoption of a Dual ER system, the Dual licensing scheme and the liberalization of the foreign exchange market.

In 1970s, the Ugandan shilling was severely over valued. The un official "kibanda" market rate was always about ten times higher than the official market rate. High prices in the parallel market always benefited traders who reaped excessive profits.

Between 1981 and 1988, the government repeatedly devalued the shilling in order to stabilize the economy. Before 1981, the value of the shilling was linked to the IMF's special drawing right (SDR). In mid 1980, the official ER was 9.7 per SDR or Ushs 7.3 per US\$. When the Obote government floated the shilling, in mid 1981, it dropped to only 4% of its previous value, before settling at a rate of Ushs 78 per US\$. In August 1982, the government introduced a two tier ER. This dual ER was of window1, as the official rate, covering mainly exports like coffee, tea, tobacco and cotton. Window two covered other transactions. This system lasted up to June 1984, when the government merged the two rates at Ushs 299 per US\$. Due persistent shortage of foreign exchange, the shilling depreciated to





Ushs 600 per US\$, by June 1985 and Ushs 1450 in 1986.

Economic recovery Programs (ERP) 1987 – 1990.

The instabilities in 1970's and 1980's deteriorated the economy especially the external account. When the NRM government came to power, it implemented a number of recovery programs. To restore and maintain export incentives and reduce domestic prices, the government devalued the shilling in several stages. In May 1987, the government introduced a new shilling along with an effective 76% devaluation. As a result the revised rate of Ushs 60 per US\$ was soon out of line with the "kibanda" rate of Ushs 350 per US\$. Following the devaluation of May 1987, money supply continued to grow at a rate of 500% until the end of the year.

In early 1988, under the ERP, the open licensing system of importation was introduced. Import licenses were only given to a selected number of firms, dealing in specific products and only for the purchase of industrial inputs and spare parts. The system faced problems of constrained availability of import support funds. In July 1988, the government again devalued the shilling by 60% setting it at Ushs 150 per US\$, but at the same time, the parallel rate had already risen to Ushs 450 per US\$. The government announced further devaluations in December 1988, to Ushs 165 per US\$, in March 1989, to 200 per US\$ and in October 1989, to 340 per US\$. By late 1990, the official rate was Ushs 510 per US\$, but the black market rate was Ushs 700 per US\$.

Before 1990, the government implemented one of a number of special import programs (SIP1), which became effective in December 1988. Then in 1989, under the SIP2, the range of eligible imports was broadened further to include all consumer goods and funds were sold at a more depreciated rate than the official rate, to contain the expanding money supply. In February 1990, SIP3 was launched and the funds were sold at the official rate and unlike the SIP2, importers were allowed to borrow from commercial banks.

These adjustments helped to achieve a realistic ER, reduced distortions and helped to improve and maintain diversification of exports and reduction of imports.

All the government's efforts to bring the economy under control, succeeded in reducing the country's stagflation from over 300% in 1986, to about 72% in 1988. However the increase in money supply there after, increased inflation to more than 100%. This was caused by increased coffee prices, low rainfall in south, shortages of consumer goods, transport bottle necks, distribution and marketing problems and the depreciation of the US\$, which increased costs of Uganda's imports from Japan and Europe. The government tried to reduce inflation by increasing disbursements of import support fund and controls on credit. This helped to reduce inflation to 30% by mid 1990, but by late 1990, inflation had once again resumed its upward spiral.

Up to October 1993, Uganda's foreign exchange rate system comprised of three





channels. The official ER flow, the donor import support fund, through the weekly Dutch auction system, and the foreign exchange system financed by the private sector.

To eliminate ER instabilities that existed before, the government introduced the inter bank foreign exchange market with effect from 1st November 1993. There after the government adopted a floating ER, to determine an efficient mechanism of allocating the scarce foreign exchange resources and to minimize administrative costs of interference.

With this, the surrender requirements of export receipts and weekly auction of donor resources and the foreign exchange market at Bank of Uganda (BOU) and the requirements for commercial banks to surrender their excess invisibles were abolished. The inter bank market was at first restricted to commercial banks and the foreign exchange bureau operated along side, to cater for small customers. Authorized dealers were free to set their ER and the BOU ceased to set the official ER and instead used rates set in the inter bank market. It could however intervene to reduce fluctuations and to achieve macro-economic objectives. During this period there was appreciation of the ER from 1215.31 to 973.32 per US\$, between 1993 and 1994. This was possibly due to increased inflows emanating from increased coffee prices, transfers and due to stability and confidence of traders in the economy (BOU, 1993/94 AER)

With these actions, the official ER depreciated by 2.4% from shs 1030 per US\$ in

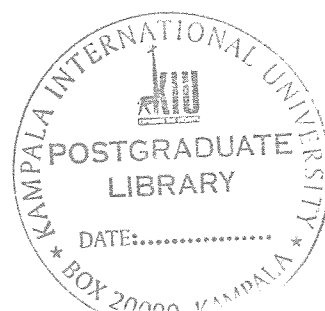
September 1992, to shs 1055 per US\$ in 1993. By the end of November 1993, the parallel market for foreign exchange had been fully absorbed into the foreign exchange system, as a recognized bureau market.

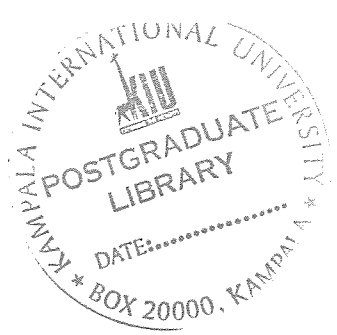
The research problem

Although economic theory posits that changes in the exchange rate of a country will bring equal changes in the prices of consumer goods depending on the direction the exchange rate takes, there are conflicting theories about the real effect of a movement of the exchange rate on the prices of consumer goods.

Movements in the exchange rates affect prices of consumer goods, due to their impact on various economic variables like money supply, interest rate, employment levels, resource allocation and capital flows. However, the nature and degree of these effects is not so clear to many individuals. Consumers and traders often complain about the rampant price fluctuations and loss of profits, as a result of these fluctuations. This is because so many goods dealt in are imported, which are the most highly affected by such fluctuations (Gloria, 1999), yet there has been no enough research to explain this problem to the concerned people and if possible propose a solution.

So the researcher being a candidate of masters of Arts in economics (MA.ECON), was forced to investigate into the matter and come out with empirical evidence, about the degree to which exchange rate fluctuations affect prices of consumer goods in Uganda, using auto correlation and regression techniques.





Objectives of the study.

The general objective of the study was:

1. To find out whether there is a significant relation ship between exchange rate movements and prices of consumer goods in Uganda.

The specific objectives were to examine the effect of:

- 1.1. Exchange rate movements and prices of consumer goods in Uganda 1995-2005
- 1.2. Exchange rate movements and prices of food crops in Uganda
- 1.3. Exchange rate Movements and the price of imports
- 1.4. Exchange rate movements and the price of exports in Uganda.

Research questions.

The researcher investigated upon the following questions, which are answered in chapter four.

- i) How do exchange rate movements affect the prices of consumer goods in Uganda?
- ii) What is the effect of exchange rate movements on prices of food crops?
- iii) How do exchange rate fluctuations affect the prices of imported goods in Uganda?
- iv) How do Exchange rate fluctuations affect the prices of exports in Uganda?

Statement of the null hypotheses.

The researcher tested the following hypotheses;

- (i)) There is no significant relationship between exchange rate fluctuations and the prices of consumer goods in Uganda.
- (ii) Depreciation of the Exchange rate does not increase prices of food crops.
- (iii) Exchange rate movements do not affect prices of imports in Uganda.
- (iv) A depreciation of the Ugandan shilling does not reduce prices of exports in Uganda.

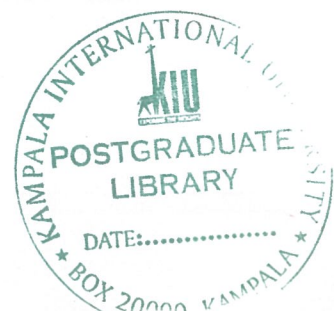
Significance of the study.

The study intended to create awareness about the relationship between exchange rate movements and prices of consumer goods in Uganda. This is useful to businesspersons and consumers.

The findings are also useful to the government in formulation and implementation of monetary policies, especially concerning the interest rate, money supply and foreign exchange.

Basing on the findings, the study came up with recommendations, on consumer prices and exchange rate stabilization policies, and the way forward to avoid adverse effects of a change in any of the variables on consumers, traders and the whole economy in general.

Students, economists, traders and other policy makers can be acquainted with





enough data on foreign exchange regimes, exchange rate movements and movements of consumer prices in Uganda.

The findings are also useful for financial institutions such as bank of Uganda, other commercial banks and forex bureaus

It also helped the researcher to build his experience and competencies in research, and as one of the requirements in partial fulfillment of the course.

Outline of the study.

The paper is divided into six chapters and they are laid down as follows;

The first chapter gives a brief introduction to the study, including, problem statement, objectives, research questions, statement of hypotheses and significance of the study. The conceptual frame work is also presented here, including exchange rate trends and regimes in Uganda. Chapter two looks at the literature review and chapter three shows the research methodology.

Chapter four is a description of data, followed by a section of empirical tests, to investigate the relationship, hence a presentation and discussion of the results.

Chapter five gives the summary, conclusion and policy recommendations, which brings this research to an end.

CHAPTER TWO

LITERATURE REVIEW

Introduction.

This chapter reviews some of the theoretical and empirical studies on the effect of the ER on the economy. It identifies the transmission mechanism from ER volatility to commodity prices. Empirical studies on the effect of ER movements on prices of consumer goods from different countries are presented. It explains how Real Exchange Rate (RER) movements cause internal and external price fluctuations and measures to correct the imbalances are outlined. The effects of ER fluctuations on various economic variables like exports, imports and the BOP are presented, followed by an over view.

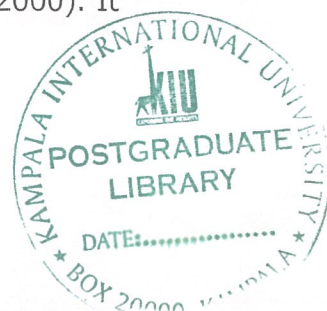
Theoretical review.

Introduction.

This section shows the theories developed in respect to ER movements. Theories are deductions that explain a relation ship between variables and the nature of the relation ship. In respect to this research several theories have been advanced in economics and econometric literature, in a bid to explain the effect of ER movements on prices of consumer goods. The most common ones being, the elasticity approach, the monetarist approach and the absorption approach.

The elasticity approach.

This is proposed by Robinson (1947), Mundell (1974), Marshall and Lerner (1964), and popularized by Kruger (1983), as cited by Wilson and Jans (2000). It





posits that in the short run, prices of goods for consumers under contracts will change following a change in the ER. As pointed out by Upadhaya and Dhakal (1997,pg 343), that a depreciation of the ER would cause prices to fluctuate badly in the short run but over a time, export and import quantities adjust and this causes elasticities of both, to increase and for the elasticities to adjust. This tends to reduce foreign prices of the exports of the country in question and raises the prices of imported goods, which directly reduce their demand. Consequently, prices of imports will go higher and higher. It is also stated by the J-curve approach that the effect of devaluation on an economy will be negative in the short run but may be positive in the long run depending on the elasticities of the commodities in question (Brown and Jans, 2000). So it is clear according to this theory that the effect of a change in the ER on prices of consumer goods depends on elasticities of these goods, which can include exports, imports and export potentials. This research tested the effect of ER movements in respect to all these goods.

Williamson (1983) is critical of the elasticity approach, saying that, the higher import prices caused by a depreciation of a currency could stimulate increases in domestic prices of non tradable goods and the consequence is a rise in inflation. This means that a depreciation of a currency causes prices of both tradable and non-tradable goods to rise.

The monetarist approach.

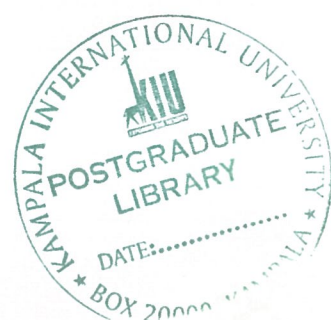
This approach, as expressed by Mundell (1971), Don Busch (1973) and Frankel

is based on the argument that a depreciation of a currency reduces the real value of cash balances and changes the relative prices of tradable and non tradable goods. This implies that a depreciation of a currency decreases the real supply of money, resulting into excess demand for money, the effect being hoarding and a decrease in prices of goods. This means that a depreciation of the ER decreases money supply and reduces prices for all goods.

The absorption approach.

Proponents of the absorption approach, Mills (1979), note that Alexander and Johnson (1967) argue, that a depreciation of a currency may increase production, switch expenditure from foreign to domestic goods or have other effects on domestic absorption relative to production. This means that the real costs of production as regards exports will reduce while costs of importation will increase. Thus resources will be transferred to production of domestic goods hence a fall in their prices. Nevertheless, if the prices of exports have excessively risen, resources may be diverted to producing exports, leading to scarcity of domestic goods hence an increase in their prices.

In summarizing the theories, the elasticity approach focuses on the commodity elasticity of demand and supply, the monetarist approach emphasizes money demand and supply and the absorption approach shows that an increase in domestic income relative to foreign income would affect prices accordingly.





Real Exchange Rate (RER) and its determination.

Real exchange rate refers to the relative prices of domestic goods in relation to foreign goods (Mukwaya, 2001). It measures the purchasing power of the ER. Nominal ER measures the number of a domestic currency required to purchase one unit of a foreign currency, for example US\$1= Ushs1000 (Mike Moffat, 2004). RER determines the aggregate out put of a sector and is important in determining the expansion of the economy. So a depreciated RER shows less powers to export than to import.

Crystal and Lipsy (1997) put it that an increase in money supply drives the ER down. Increase in money supply lowers the interest rate and increases capital out flow. Therefore, the economy will adjust to high money supply and the price level will be higher than before. When money supply increases, the ER rises and there for domestic goods become more expensive than foreign goods (Crystal *eta*/1997).

Edwards (1988), Abuka and Sajjabi (1996) suggest that the RER is influenced by both internal and external factors. The internal factors include productivity especially of exports, quality of the products, consistence in macro economic policies, and domestic terms of trade between tradable and non tradable goods, public sector consumption, changes in the commercial policy, credit policy, monetary growth and domestic interest rates. The external factors include the

changing world conditions like inflation, adjustment to credit barriers, capital flows and changes in world interest rate. This means that RER is determined by both internal and external factors. Therefore it impacts on both local and foreign goods.

In Uganda, the RER is sensitive to changes in the terms of trade (TOT), donor support, government consumption, import tariffs and domestic productivity (Abuka and Sajjabi, 1996). Frankel and Khan (1990) put it that RER is not related with income growth in sub Saharan African countries. Atingi and Sebudde (2000), using the moving average methodology, observed an inverse relationship between RER and the export sector performance. This means that the export sector in Uganda greatly influences the RER and therefore the prices, no matter what method is used in estimation.

Real exchange rate in Uganda.

Real exchange rate refers to the real relative price value of tradable (P_T) to non-tradable (P_N) i.e.

$$RER = P_T/P_N$$

The RER indicates the relative profitability of producing tradable relative to non-tradables. An increase in the RER increases the price of tradable goods and makes them more profitable. The non-tradable goods will also be affected because of increased competition for resources.

Appreciation of the RER indicates an increase in the prices of exports and a decrease in the prices of imports. Figure 4.3 indicates the relationship between



the RER and the prices of goods in Uganda. It indicates that as the RER depreciates, the prices of non-food crop goods decline while prices of food crops are not so much affected. In this study, the RER is specified as the independent variable and assumed to possess a positive sign a priori.

Exchange rate and commodity prices.

Fluctuations in the ER influences the external trade flows, the BOP, the level and structure of production, consumption and employment, the allocation of resources and the domestic price (Khan et al, 1987). Since a change in the RER affects all these macro economic variables, then it must affect prices of consumer goods as well. The focus of this research was to find out the nature of the association and the transmission mechanism from ER fluctuations to a change in consumer prices.

A rise in the commodity prices brings a rise in the ER, for example, increased demand for a good like timber, causes the price of that good to rise and the quantity demanded of that good to goes up. This causes the local currency to gain value, relative to foreign currency. This is due to the increased demand for the local currency to buy the commodity in question (Mike Moffat, 2004).

Jabara and Swartz (1987), studied the notion that changes in the ER may not be transmitted into changes in commodity prices, once there are market imperfections. They suggest that commodity pricing by private producers may be set, to offset any potential negative impact on producers. Therefore, the real

impact of a change in the RER on commodity prices depends on various economic conditions in the country concerned. This research intended to examine such an impact for Uganda's case specifically, much as researchers like Mike Moffat, in his article, 'a beginner's guide to exchange rate and the exchange market', have tested the correlation between the ER and energy prices and discovered that the consumer price index was correlated with ER movements in USA, over the period 2001- 2004. Uganda has an open economy, so changes in the RER are thought to affect the prices and thus the flow of profits for businesspersons.

As indicated by Jabara and Swartz (1987), in their own words that; "...exporters could increase their exports prices, in response to a dollar depreciation and there by increase profit margins from export trade or they could lower their prices in response to a dollar appreciation in order to forestall any decline in sales or market share, since the (importing economy's) import costs do not change. On the import side, price stabilization policies implemented by importers or whole salers marketing intermediaries, could also limit the extent of ER pass through". However such effects do not consider the issues of elasticities of both imports and exports in determination of the direction of change in prices. Government policies may also off set such price adjustments, so the above statement is so general and a mere hypothesis that needs to be proven empirically from country to country.

As pointed out by Dohner (1984), Lipsy (1978) and Isard (1977), that where





market imperfections hinder the existence of arbitrage, price revisions involve costs and there for firms producing manufactured goods, tend to revise their prices only when changes in price and costs are perceived to be permanent. If not so, then prices may not be changed in response to ER variations. Exporters and importers may not pass on the effect of ER appreciation or depreciation and may instead resort to absorbing the change in profit margins on sales, both domestic and foreign (Field man, 1988).

Jabara et al (1987), indicate that ER movements is a function of a firm's objectives, number of foreign competitors, the speed at which importers change suppliers, expectation of future ER changes, government policy in terms of domestic pricing, marketing and the level of price stabilization policies. This shows that ER movements is a function of various factors since these factors are different, then even the effects must be different in different areas. The expected impact of ER fluctuations on prices of consumer goods in Uganda is stipulated at the end of this research.

According to the economist leader (25th July 1998), the higher domestic demand forced the bank of England to raise interest rate several times which pushed the price higher. This shows that there is a relation ship between ER movements and prices of consumer goods. However, the direction and magnitude of this relation ship needs to be highlighted (<http://www.tandsf.co.uk/journals>, 2006).this implies that whenever resources are re allocated, prices of the concerned goods will change.

Edwards et al (1989) looks at the RER as the domestic relative price of tradable goods (PT), to non-tradable goods (PN). So $RER = PT/PN$. This approach directly links the RER to commodity prices, as does the purchasing power parity approach (PPP). It puts it that RER_{PPP} is the nominal ER (E) multiplied by the ratio of the foreign price level (P^*) to the domestic price level (P). so $RER = E \times P^*/P$. such an expression implies that whenever the nominal ER (E) changes, both the foreign price level and the domestic price levels will have to change. In Uganda the nominal ER (E) fluctuates always, that is why the researcher wanted to estimate the magnitude, the direction and the impact of such changes. As pointed out by Edwards (1989), that the RER gives guidance to resource allocation across tradable and non-tradable goods and measures the degree of a country's international competitiveness. For example, a depreciation of the ER means that tradable goods are relatively more profitable. This acts as a pull factor for resources to be re-allocated from the non-tradables to tradable sector. This also implies that the cost of producing domestic exports goes higher. In Uganda this is hindered by data problems, as it is indicated by ssemwogere and kasekende (1994) that prices of especially international commodities at disaggregated level, are difficult to obtain. However due to globalization and technological advancement, such hindrances are being reduced and so knowledge of the impact of ER fluctuations is of paramount importance to traders, producers and others.

Producers base their production decisions on the profitability of exports relative





to the domestic prices. The RER shows the relative profitability of producing tradable relative to non-tradable. An appreciation of the RER, makes production of tradable more profitable thus resources will be re-allocated from the non-tradable sector to the tradable sector (mukwaya 2001).

Using the ppp approach, a change in the ER between two countries like Britain and USA, will leave the prices unchanged, for example if there is an inflation in Britain, the value of the US\$ will be adjusted to the same proportion. However, this approach compares the general price level in two countries, yet prices of international and domestic goods differ. That is why the researcher tested the effect on domestic prices and international goods when each one is considered independently.

BOU annual report (1999/2000), reveals that much as there was depreciation of the shilling against other major trading currencies, imports were not curtailed, as they continued to increase significantly. This implies that a change in the ER has different effects on different economies, depending on the conditions prevailing. This is the case in Uganda because imports have inelastic demand yet exports almost have inelastic supply.

Brahamananda (2001) showed that in United Kingdom (UK), the exchange rate has a negative but significant relationship with the price level. This means that as the ER increases, prices go down and vice versa.

Consumer prices (inflation trends) in Uganda.

This section looks at the determination of prices of consumer goods in Uganda and the CPI_A is used. From Uganda's independence up to 1986, consumer prices were largely determined by the government. Uganda experienced a moderate rate of inflation in the 1960's. But in 1970's, due to Amini's economic war, the inflation rate soared. In early 1980's, there were economic recovery programs that received considerable foreign assistance. Prices of important commodities like coffee, sugar, meat, and others, continued to be determined by the central government and the rate of inflation was low. However, the renewed civil war in early 1980's destroyed this trend and by 1986, the inflation rate was beyond 200%.

In 1986, Museveni's government took important steps towards economic recovery. The government negotiated with the International Monetary Fund (IMF) and the World Bank (WB), hence in 1987, Structural Adjustment Programs (SAPs) were implemented and proper pricing policies were put in place. Inflation which was at 240% in 1987, was finally reduced to 5.4% and 7.3% in 1995 and 2003 respectively. Table 2.01 below shows the inflation levels in Uganda.

Table 1.02: Inflation trends in Uganda 1995-2001.

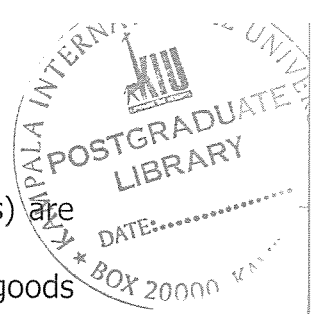
year	1995	1996	1997	1998	1999	2000	2001
Inflation rate	6.7	7.1	6.8	1.8	5.8	3.4	1.9

Source: UBOS statistical abstract 2002 and BOU Annual reports

Import prices and the exchange rate trends in Uganda.

In Uganda, the demand for imports and the supply of exports is almost inelastic.





This is because, most of the consumer goods (save agricultural food crops) are imported. This implies that whenever the ER is over valued, prices of most goods are reduced and whenever the ER is under valued, most export goods will increase in price. This explains why the ER in Uganda has been always on the upward move. This is so because authorities like the Bank of Uganda (BOU) cannot press the ER down due to the nature of the economic structure of Uganda, where most consumer goods are imported and exporters, export less competitive primary agricultural products. Thus if the ER is over valued, the already uncompetitive Uganda's exports will worsen. Thus, the alternative has always been that BOU struggles not to allow the ER to over appreciate. Mr. Enoch, an experienced researcher in, BOU, observes that a weak shilling is beneficial for Uganda. A weak shilling means that exports will appear cheaper to the foreigners hence fetching more income to the exporters and the nation at large. On the other hand, if it is so, weak it is dangerous because import prices will explode, yet Uganda imports most of its consumer goods. That is why BOU decides to keep the ER with in minimum flexibility levels, so that it does not over depreciate and it does not over appreciate.

Table 2.02: Uganda's import price index and the exchange rate.

5	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	113.73	108.88	94.60	94.60	95.30	104.62	99.35	101.64	101.64	131.77
.655 2	1045.36	1083.008	1240.23	1455.56	1644.53	1755.75	1713.67	1963.67	1887.167	

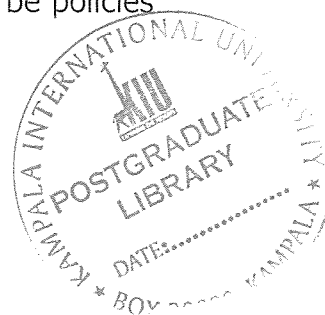
Source: BOU annual reports 1997-2004

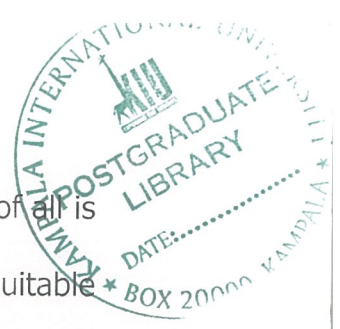
Exchange rate movements and the price of exports in Uganda.

The impact of an over valued shilling is more complex. Exports become more expensive and thus less competitive. This impacts negatively on government revenue. This is the case in Uganda because, Uganda's exports have elastic demand and thus can be affected by such shocks.

In Uganda, there is an inverse relationship between the drop in the ER and the increase in the inflation level, according to the Ministry of Finance and Economic Planning policy paper No.9, 1994. There fore export oriented policies remain the highest priority of the government in its economic stabilization and development strategies.

AS already observed in chapter one, Uganda's shilling has been depreciating always. This shows that, there has been more foreign exchange out flow than in flow. The Ministry of Finance in 2001 recommended that there should be policies





implemented to increase foreign exchange inflow and the most important of all is increasing exports as quoted in the following words; 'Thus the most suitable measure for Uganda is to boost exports and domestic supply'. Although increased foreign exchange inflow can lead to appreciation of the shilling, which makes Uganda's exports less competitive, it is always possible that the government can always come in to subsidize the exporters so that they reduce their export prices, thereby making Uganda's exports more competitive. Although such a policy calls for increased government expenditure, it is projected that the increased revenue from exports exceeds government expenditure on exporter's subsidies.

The government policy of devaluation raises the cost of imports, including imported inputs. This affects prices of exports as it makes them more expensive hence less competitive. Thus, repeated devaluation erodes confidence in the local currency (Kasekende and Semwogere, 1994). Honorable Kaijuka in February 1996 presented a paper on Uganda's exports in which he showed that Uganda has not done what it should actually do to promote exports and to move the country towards self reliance. Thus a proper ER policy that promotes exports and discourages imports is required to boost Uganda's exports. Kaijuka noted that the government has a major role to play in promoting and directing exports. One way to do this is stabilizing both local prices and the ER. The ER affects the cost of raw materials and hence the local exports become costly.

It is noted by the BOU that Uganda exports only 8% of the local production and this is among other things attributed to the uncompetitiveness of the local products on the international markets. Table 4.02 below shows Uganda's export price index 1996-2005.

Table 3.02: Export price index trends 1996-2005.

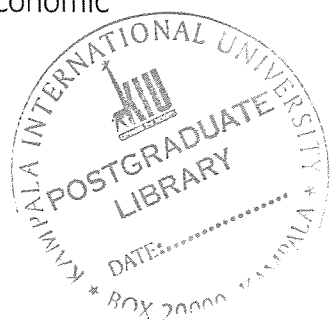
Period	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Export Unit Value Index	142.69	140.15	143.53	108.07	90.83	72.78	66.09	79.94	86.59	110.26

Source: BOU research department.

According to Kasekende and Semwogere, Ugandan exporters receive less prices due to poor quality control and marketing. Prices of local export potentials need to be published to the exporters to compare profitability of exporting and supplying the local market, as it is done in Kenya.

In an open economy like that of Uganda, the BOU can increase (lower) prices of exports through open market purchase of bonds that depreciates the domestic currency.

There has been a general improvement in the exports of Uganda for the last five years and this is attributed to improved export prices, especially for the non-traditional exports. Exports were projected to increase in the year 2006 2007 and this projection is resulting mainly from increased investment in processing facilities and reduction in smuggling. The Ministry of Finance and Economic





Planning noted that the increase in exports in 2003/ 2004 was off set by increase in imports of both government and private sector by 24% and 19% respectively.

Table 4.04 below shows Uganda’s export earning from the year 2000 to 20005.

Table 4.02: Export earnings (in millions of US dollars).

2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
677.3	699.0	766.3	979.7	1071.0

Source: Background to the budget, 2005/2006

Natural factors and the ER.

For a long time Uganda depends on coffee as its major foreign exchange earner. But due to various natural factors and general decline in coffee prices on the world market, coffee contribution to foreign exchange earning and annual incomes has greatly declined. Not forgetting to mention that most of Uganda’s exports are agricultural products so seasonal changes greatly affect Uganda’s foreign exchange earning and thus the ER.

Such changes do not only affect the ER but also the local prices of various goods especially the food crops. The transmission mechanism from seasonal changes to prices is not though very easy to understand. But as noted from various Annual reports of the BOU whenever there is a prolonged drought in Uganda the inflation rate tends to escalate. This is so because, a reduction in supply of food crops puts pressure on industrial foods, which are mainly imported, and so the

inflation level is spread throughout all goods.

Brahamananda (2001) showed that good rainfall has a negative effect on the price level whereas bad rainfall has a positive effect on the price level. Therefore variations in the rainfall index will have opposite effect on the price level. This means that good rainfall leads to more supply of especially agricultural crops, which leads to a reduction in prices. Bad rainfall creates inadequacies in supply hence demand pressure and thus an increase price level.

The Real effective exchange rate (REER).

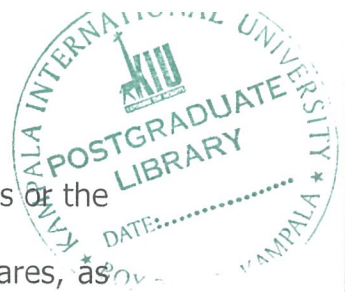
The REER of a country is the nominal effective ER adjusted for inflation differentials among the countries it trades with. It is a special price that links all domestic prices with all foreign prices of the major trading partners of a country. It is use full in showing the competitiveness of a country in foreign trade.

The BOU uses the PPP definition, which indicates that in the long run, the REER is the nominal ER (e) that is adjusted by the ratio of foreign price level (pf) to the domestic price level (p). In Uganda the underlying consumer price index is used as a proxy for domestic prices and the following equation is tested

$REER = e \frac{P_f}{P}$ 4

It is seen from the above equation that a decline in the REER shows the real appreciation of the ER and the opposite is true for a depreciation.





Foreign prices as used in the REER are index of the consumer price indices of the whole sale indices of Uganda's trade partners, weighted by the trade shares, as indicated in the equation bellow;

$$P_f = \sum \rho_i^{\alpha_i} = \rho_i^{\alpha_1} \times \rho_2^{\alpha_2} \times \dots \times \rho_k^{\alpha_k} \dots\dots\dots 5$$

Where;

K = number of trading partners.

P = the price index of a country (whole sale or consumer)

α_i = the export trade weight of i^{th} country and $\sum \alpha_i = 1$.

Nominal Effective Exchange Rate (NEER) and consumer prices in Uganda.

NEER is an index used to measure the local currency of a country against the currencies of its major trading partners. It is measured using the formula bellow

$$NEER = \sum_{i=1}^k e^{\alpha_i} = e_1^{\beta_1} \times e_2^{\alpha_2} \times \dots \times e_k^{\alpha_k} \dots\dots\dots 6$$

Where;

K = number of trading partners

e = the exchange rate of the Uganda shilling against it major trading partners.

α_i = the export trade weight of i^{th} country and $\sum \alpha_i = 1$.

Devaluation and consumer prices.

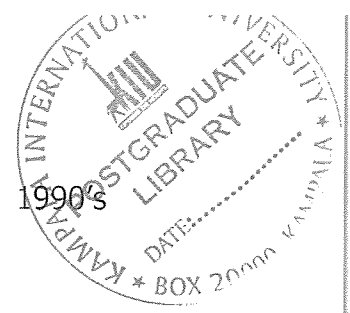
Devaluation is a Government's deliberate reduction in the value of a country's

currency in terms of other currencies (Wilson and Jans, 1994). Devaluation changes the prices of both imports and domestic goods and the direction of change will depend on some economic conditions in the economy like, elasticity of demand for both imports and exports, elasticity of supply, government policy, e.t.c.(sodersten and Geoffrey, 1994). Where the demand for imports is elastic, devaluation changes the prices more significantly than other wise. Devaluation is equivalent to currency depreciation in a floating ER system. This means depreciation or appreciation of the ER, has more significant effects on commodity prices with elastic demand than other wise. In most Less Developed Countries (LDC's), Uganda in particular, the supply of exports is inelastic, therefore a free floating ER benefits more the importers than the exporters. Where the exporters benefit, it means that they re-allocate resources from production for domestic consumption to production for export. This creates scarcity in the domestic market hence an increase in prices.

As pointed out by Edwards (1986), devaluation can generate a redistribution of income from groups with low marginal propensity to save to groups with high marginal propensity to save hence a decline in demand and thus prices.

A depreciation of a country's currency, impacts negatively on the interest rate, which tends to absorb resources that would be employed in current spending and production (if wages are tied up with the consumer price index and are forced via the social pressures rather than social contracts, a rise in wages causes the ER to rise and working capital increases). The effect will be a rise in





unemployment as was the case in Ghana during the 1980's and 1990's devaluations (Nashashibi, 1993).

Mukwaya (2001), cites the work of ssemwogere and Kasekende (1994), who put it that as the rate of inflation subsides, devaluation should be used more sparingly, as it may have other adverse effects on the economy such as increasing the cost of imports. Their findings indicate that between 1981 and 1984, devaluation in Uganda enlisted a positive response with export producers in terms of high prices in local currency. They recommended that effective consistent macro economic policies such as domestic credit fiscal and monetary policies should be adopted.

ER movements, trade liberalization and consumer prices.

Trade liberalization refers to giving private individuals great power to participate in trade without much government intervention.

Gloria (1999), carried out a survey that revealed that 60% of the private firms depend on imported raw materials by more than 75%. Also, that of 80% the firms surveyed reported 100% dependence on imported spare parts and machinery. She founded that the liberalization of access to foreign exchange had decreased import costs. Her survey on managers of 265 Ugandan private enterprises, carried out in November and December 1994, reported that among the existing constraints, fluctuations in the level of the ER, registered two on a scale of one to five. Since producers are affected by ER fluctuations, then prices

of consumer goods must be affected as well. The researcher wanted to know the extent to which prices are affected and the direction of the effect in Uganda, given a given movement in the ER. Younger (1992), reveals that 100% increase in the ER causes prices to rise by 5– 10%. His findings indicate that there is a chance for African countries to depreciate their currencies, since it has very little impact on inflation and the ability to redistribute income from the importers to government, assuming that export prices will not be adjusted in line with ER movement in other countries. However, in practice such assumptions may always hold because most of the researchers indicate a significant effect.

Other factors affecting the ER.

Other factors that may affect the ER of a country include, export supply, elasticity of export supply and demand, elasticities of import demand, political instability reaction of other trade partners and other government policies.





CHAPTER THREE

RESEARCH METHODOLOGY

Introduction.

This chapter explains the methodology used in carrying out this research, data type and sources; the procedures of estimation, data analysis, the problems encountered, the research design, research environment, as well as the econometric model used to determine prices of consumer goods in Uganda and how they are affected by exchange rate movements.

Research design and methodology of data analysis.

This study is based on a descriptive survey method of research. Time series observations from 1995 to 2005 are used and Ordinary Least square (OLS) method is used to for estimation. Regression techniques of analysis are used to estimate the price level function. Auto correlation tests are also employed to detect the relation ship between the consumer price index (CPI) and other predictors like the exchange rate. Computer packages such as **SPSS**, **EXCEL** and **STATA** are used for data processing, analysis and estimation.

The conceptual frame work

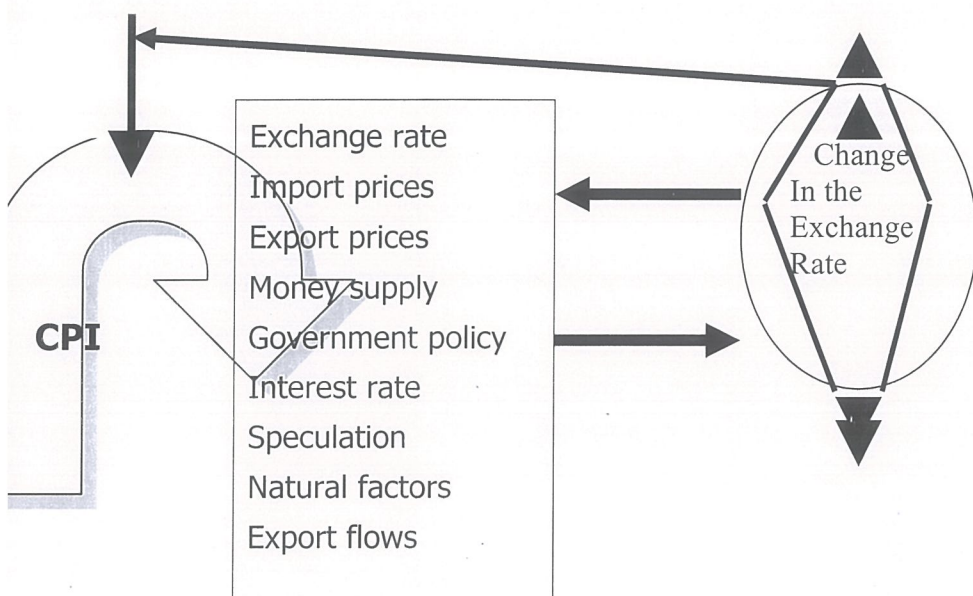
Exchange rate fluctuations and instabilities in the inflation rate directly affect the key policy objectives of the government and thus the macro economic policies concerning inflation, GDP growth, fiscal deficit, interest rate, investment, un

employment and so on. Therefore the government must understand the sources of such instabilities, in order to draw meaningful plans to reduce their impact on the economy.

ER fluctuations and prices of consumer goods are taken here to mean how the prices of consumer goods and other factors affecting the consumer price vary with a movement in the ER over a time. Economic literature indicate that the CPI is affected by demand, supply of both imports and exports, government policy, interest rate, money supply, level of the exchange rate, future price expectations, and so on. The Import Price Index is mainly affected by the level of the ER movements, exports and import elasticities of demand and supply, government policy (of interventions in the ER determination), foreign exchange in flow and future ER expectations.



The conceptual model.



Changes in the consumer price index are brought by a number of factors such as changes in the exchange rate, import and export prices, money supply, government policy, interest rate, speculation, natural factors like rainfall etc.

An increase in the country's exports, increases foreign exchange inflow, which lowers the ER, in a case of a floating ER regime and vice versa. The increase in foreign exchange inflow increases money supply hence an increase in the prices.

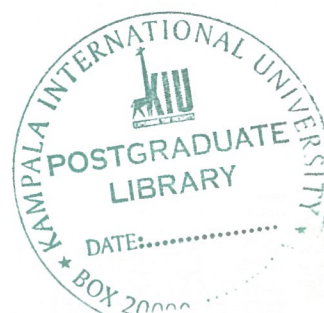
An increase in the price of imports of a country increases the demand for foreign exchange to import such goods. This increases the price of the currency in question. Therefore the ER also affects prices of domestic goods through imported raw materials. An increase (decrease) in money supply at a local scene, reduces the demand for that currency (due to its fall in value) and increases the demand for foreign currency (because people desire to convert their money into

foreign currencies), hence an increase in the exchange rate and vice versa. More so an increase or decrease in the interest rate, reduces (increases) capital inflow, and increases (decreases) capital out flow. So if capital inflow (out flow) increases (decreases), foreign exchange reserves of a country reduce (increase). This propels the ER up wards and vice versa. Whenever the exchange reserves of a country reduce (increase) it implies a decrease (an increase) in money supply, implying an increase (a decrease) in prices. The underlying assumption is that there is no (less) government intervention in the foreign exchange market. However where there is a great deal of government intervention, the ER can move down wards or up wards depending on the policy the government undertakes and its interest. For example, if the government devalues (revalues) its currency, it implies that the ER will have to go up wards (down wards), irrespective of the trends in other factors seen above. Unfortunately the details of a fixed ER management are beyond this study.

There are situations however, when price changes are brought about by a direct interaction of the price and the ER. Another assumption is that there is no government intervention in fixing the minimum or a maximum price. But if so, a movement in the ER brings changes in other economic variables other than price.

Modeling the ER and inflation trends in Uganda.

In this study, a modification of Brahamananda's theoretical framework of the





price level function (2001) is used to estimate the relation ship between the ER and prices of consumer goods in Uganda. This theoretical framework uses the classical economists' price level function, stated as;

$$P = f(y, m_i).....1.$$

Where;

P, is an index of prices

Y, is a proxy for real out put or supply, and

m_i, is narrow money.

This model states that money supply (m_i), and the real out put y, (after here replaced by Q), directly affect the general price level. However the expanded model of Brahamananda shows that money supply, import and export supply, expected changes in the price level, movements in the ER, weather variations and international factors all affect the price level.

Therefore the standard econometric function to be tested becomes;

$$CPI_A = \alpha_0 + \alpha_1 Y + \alpha_2 M_i + \alpha_3 REXD + \alpha_4 PEX + \alpha_5 NRFX + \alpha_6 REER + \alpha_7 NER + \alpha_8 NEER + U_i$$

Where;

U_i, is the error term.

α₀, is the constant term.

and $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7$ and α_8 are the regression coefficients.

Other variables remain as they defined in the conceptual frame work.

Research environment.

This study looks at movements in consumer prices and the exchange rate in Uganda. This is a macro economic issue there fore it was conducted at a national level. Relevant government offices were visited to obtain data. These included the Bank of Uganda (BOU), the Ministry of Finance and Economic planning (MOFEP) the Uganda Bureau of statistics (UBOS) and the Meteorological department of Entebbe.

Data type and sources.

This study is based on secondary data. Libraries and official publications of the relevant offices like BOU, MOFEP and UBOS, are used to extract data. Some information was obtained from simple consultations with the BOU research experts is also included.

Basic data here involves time series observations of the exchange rate movements, the consumer price index, real and nominal effective exchange rates and time series of food crop price index, import and export price index and rainfall totals.

Data collection procedures.

The preliminary: This involved writing and sending a letter to the BOU as a major center for this research. An introductory letter was also obtained from the postgraduate school, which helped the researcher in the many offices entered.





Then the researcher organized the key issues to research about and the simple interview questions with the BOU research experts. Copies of these are presented in the appendices.

The third step involved visiting the relevant offices, libraries and organization of resources. Then data was collected, processed, statistically treated and then interpreted before a conclusion is drawn.

Data problems encountered.

The biggest problem was inconsistent data. There are so many gaps in the time series data. Therefore, it was not easy to analyze such data. A lot of time thus had to be taken to formulate various combinations and modifications to obtain the best results. Data on CPI, ER, REER, NEER and money supply consisted of many gaps. In such a problem, the researcher was forced to reduce the number of years used for analysis. For example, due to lack of consistent data on rainfall, the period was reduced to 1997 to 2003, because at least data for these years was generally consistent and was obtained.

Another problem was that data was not uniform. Some data for example on CPI and the ER is collected on a monthly basis, but output (GDP) is measured on an annual basis. Although one can convert monthly data into annual terms, analysis based on an annual basis may not give the best picture on the actual effect of the ER on CPI because these take place every day so to analyze them on an annual basis cannot be the best. For this reason, the researcher was forced to test the two kinds of data, one based on a monthly basis and another on an annual basis. This

takes a lot of time and it is very tiresome.

The other problem was access to data, which was in various sensitive offices, which are not very easy to access. A lot of money and time was taken moving up and down to obtain permission to access these premises and in some cases, the researcher was denied access and referred to internet, which was not very easy because most of the files are in PDF format, which needs acrobat reader program which is not available at the university. However, the researcher was allowed access to BOU information for one month which was very helpful.

Another problem was that of choice of estimation methodology. Auto correlation testing of time series data, may show a relation ship, when it is not actually there and econometric diagnostics literature, always question non stationarity of such data. Problems of multicollinearity, heteroskedasticity and model specification errors were constantly detected due to gaps and missing data. So a number of diagnostic tests and modifications had to be carried out in order to obtain meaning full regression results. Thus many variables were dropped from the model.





CHAPTER FOUR

EMPIRICAL ESTIMATION AND ANALYSIS

Introduction.

This chapter presents data analysis and presentation of data, major findings and the decision on the null hypothesis. The analysis here was based on the econometric model constructed in the conceptual frame work.

Estimation procedures.

Before using data to estimate the model, econometric methods require testing for data stationarity. Regressions with non-stationary data lead to problems wrong conclusions based on conventional t-and f- tests, which may falsely imply a relation ship between two variables, when all that is present are correlated time trends (Phillips, 1986, as cited by Mukwaya, 2001). So one needs to ensure that the long run relation ship reflect that the variables move together.

Model estimation.

In this research, data is first put to a number of diagnostic tests, using **STATA** and **SPSS**. The model as tested here is a linear regression model, which appears as follows:

$$CPI_A = \alpha_0 + \alpha_1 Q + \alpha_2 mi + \alpha_3 PEX + \alpha_4 NER + \alpha_5 NEER + \alpha_6 REER + \alpha_7 IPI + \alpha_8 EPI + \alpha_9 NFR + U$$

Where;

CPI_A = the consumer price index for all items in Uganda.

α_0 = constant.

Q_1 = out put measured by Uganda's GDP.

M_i = narrow money supply.

PEX= price expectations.

NER= nominal exchange rate.

NEER=nominal effective exchange rate.

REER= real effective exchange rate.

IPI= import price index.

EPI= export price index.

NFR= natural factor of rainfall.

U= the error term.

In running a regression, the variable PEX was dropped because precise data to measure it was not available.

Testing for normality.

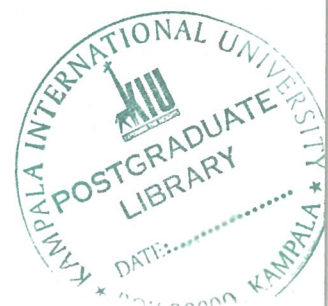
Normality tests help to show whether the variables in the model are normally distributed and there fore can be used for estimation. *Stata* results indicate that the variables in the model are normally distributed.

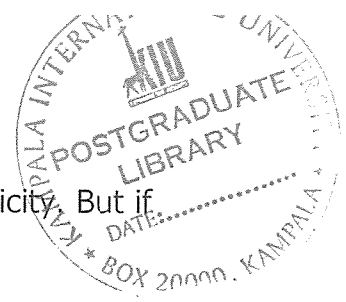
Testing for linearity.

This helps to show whether the variables are related before estimating the model. In this test, the model shows that there is a linear relation ship between the predicting variables and the dependent variable, in this case Q, mi, NER, NEER, REER, NFR, IPI, EPI and CPI respectively.

Testing for heteroskedaciticity.

This tests for variances of the variables in the model. It assumes that the predictors have equal variances. It is based on the null hypothesis that if it is





equal or greater than 0.05, then there is no problem of heteroskedasticity. But if it is less than 0.05 then there is a problem.

In this model, this problem was detected and so some variables were dropped.

Testing for multicollinearity.

Multicollinearity is a situation when there is a perfect relationship among the explanatory variables. It means that one or more explanatory variables can explain a movement in another explanatory variable in the same model. This reduces the significance of regression results. The value inflation factor (vif) of the predictors is the statistic used. If it (vif) is above, for any variable in the model, then there is a problem of multicollinearity.

In this model, this problem was detected and so variables which were responsible, were dropped from the model, in this case NEER, RER and REER

Testing for model specification error.

This helps to check whether the model was correctly specified or not. It helps to check for omitted variables, which would otherwise have been included and are very vital in explaining variations in the dependent variable. This problem is very common in econometric models. It is caused by failure to identify the relevant factors that affect a movement in the dependent variable, misinterpretation of variations in the dependent variable, or lack of data on some predictors hence inability to measure their effect on the dependent variable. This test also helps to show variables wrongly included in the model.

Statistical literature indicates that if the results of this test indicate a figure

greater than 0.05, then the model was correctly specified. But if the figure is less than 0.05, then there is a problem of model specification error, some important variables are omitted so the model should be re stated. However one can go ahead to estimate the model if it has passed all other tests.

In this research, this problem was detected. This is attributed to the fact that data on some factors like rainfall, out put and money supply was missing on a monthly basis. In response to this problem, another form of regression was run, basing on annual data, here data was available.

Testing for auto correlation.

This test helps to show whether there is a relation ship between the independent variable and the dependent variable in the model. In this research, this test indicates a significant relation ship between the CPI and its predictors like rainfall and the exchange rate. The results of the correlation tests are indicated in table 5.03 below.





Table: 5.04: Results of Pearson Correlations.

		CPI	NER	Exports	Imports	Rainfall
CPI	Pearson Correlation	1	.920 **	-.654 **	.266 *	.069
	Sig. (2-tailed)		.000	.000	.011	.518
	N	90	90	90	90	90
NER	Pearson Correlation	.920 **	1	-.861 **	.048	.017
	Sig. (2-tailed)	.000		.000	.653	.877
	N	90	90	90	90	90
Exports	Pearson Correlation	-.654 **	-.861 **	1	.088	-.001
	Sig. (2-tailed)	.000	.000		.408	.993
	N	90	90	90	90	90
Imports	Pearson Correlation	.266 *	.048	.088	1	-.096
	Sig. (2-tailed)	.011	.653	.408		.368
	N	90	90	90	90	90
Rainfall	Pearson Correlation	.069	.017	-.001	-.096	1
	Sig. (2-tailed)	.518	.877	.993	.368	
	N	90	90	90	90	90

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The compressed model.

As a result of the above regression diagnostic tests, some variables were dropped and the compressed model that was tested using monthly data is stated below;

$$CPI_A = \alpha_0 + \alpha_1 NER + \alpha_2 IPI + \alpha_3 EPI + \alpha_4 NFR + U \dots\dots\dots 7$$

Although a model specification error was detected still, the model was used since all other tests were passed. This shows that the regression assumption that the expected mean value of the error is equal to zero ($E(U) = 0$), no longer stands. So the results must imply that other omitted variables explain significant



proportion of the movement in the CPI.

Estimation of the effect of exchange rate movement on the CPI in Uganda.

In estimation of the effect of exchange rate movement on the price of consumer goods in Uganda, two kinds of regressions were run .The first regression was run basing on monthly data, from 1997 to 2003. The second regression is run basing on annual data from 1995 to 2004.

The regression model including annual data is specified including more explanatory variables, and it is specified as below;

$$CPI_t = \alpha_0 + \alpha_1 Q + \alpha_2 mi + \alpha_3 NER + \alpha_4 IPI + \alpha_5 EPI + \alpha_6 NFRU \dots\dots\dots 8$$

So, NEER, REER, PEX, and RER were not included in the model because of the problems detected in the diagnostic tests above.

Table: 6.04: Results from the regression model based on monthly data from 1997 to 2003.

		Unstandardized Coefficients		Standardized Coefficients	95% Confidence Interval B			
Model		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	20.073	4.020		4.993	.000	12.080	28.067
	Exports	.144	.016	.441	8.843	.000	.112	.176
	Imports	.209	.031	.172	6.725	.000	.147	.270
	Rainfall	-.011	.004	.065	2.620	.010	.003	.019
	NER	.033	.001	1.290	25.945	.000	.030	.036

Dependent Variable: CPI

Table: 7.04: Results from the regression model based on annual data from 1995- 2004.

		Coefficients ^a					95% Confidence Interval for B	
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Lower Bound	Upper Bound
Model		B	Std. Error	Beta				
1	(Constant)	18.693	57.983		.322	.763	-142.295	179.680
	GDP	-.004	.005	-1.471	-.755	.493	-.018	.010
	Narrow money	.041	.030	1.986	1.384	.239	-.042	.124
	NER US vs SHS	.000	.026	.023	.015	.989	-.072	.073
	Export unit value index	.036	.219	.164	.162	.879	-.573	.644
	Import price index	.369	.265	.641	1.395	.235	-.366	1.104
	Rainfall	.389	.320	.325	1.214	.292	-.500	1.278

a. Dependent Variable: CPI

Table: 8.04: monthly and annual regression results.

Model	Monthly			Annual		
	B	t.value	P.value	B	t.value	P.value
1 constant	2.073	4.993	.000	18.693	.322	.763
Exports	.144	8.843	.000	-.004	.755	.493
Imports	.209	6.725	.000	.041	1.384	.239
Rainfall	-.011	2.620	.010	.000	.015	.989
NER	.03	25.945	.000	.036	.162	.879
Out put	***	***	***	.369	1.395	.235
mi	***	***	***	.389	1.214	.292

Source: regression results, tables, 6.04 and 7.04

Note; *** was not used for monthly regressions.





Empirical results and interpretation.

Results of the estimated price level function, using the CPI as the dependent variable, based on monthly data, are presented in table 6.04, and are interpreted as follows;

Nominal exchange rate.

A significant positive coefficient was obtained. So nominal exchange rate has a significant positive effect on the prices of consumer goods in Uganda. Thus if the nominal exchange rate appreciates (depreciates), the price level (CPI) will decrease (increase). The coefficient of **0.033** obtained, indicate that, holding other factors constant (h.o.f.c), a one percent appreciation (depreciation) of the nominal exchange rate, precipitates a **0.033** decrease (increase) in the price level.

Rainfall.

Rainfall is expected to assume a negative sign, since an increase in the volume of rainfall a country receives, is apriori expected to result into increased out put and hence a fall in the price level. In the regression results above, a coefficient of **-0.011** was obtained, implying that (h.o.f.c), a one percent increase (decrease) in the rainfall volume, results into a **-0.011** decrease (increase) in the price level.

Import price index.

Import price index is expected to assume a positive sign, since an increase in the price of imported goods, contributes to a general increase in the price level at home. Uganda imports most of her manufactured goods and these are used in

computing the CPI for all items. There fore an increase in the price of such imports has a positive significant effect on the price level. In the regression results in table 6.04, a coefficient of **0.209** was obtained, implying that, an increase in the price of imports, leads to an increase in the general price level in the domestic market. In international monetary economics, this is called imported inflation. It means that if goods are imported from countries already suffering from inflation, they will bring such inflation in the domestic economy in question.

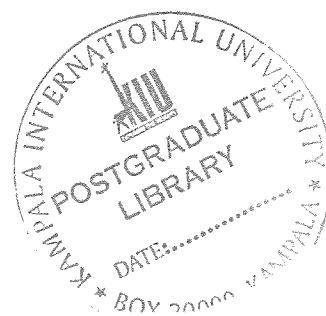
In Uganda, a one percent increase (decrease) in the price of imports, results into a **0.209** increase (decrease) in the domestic price level. In theory, such a conclusion can only apply to a country that imports a biggest percentage of her manufactured goods.

Export price index.

The export price index assumed a positive sign as expected. This implies that an increase in the price of exports of a country apriori, leads to an increase in the general price level of the domestic economy in question.

In the regression results here, a coefficient of **0.144** was obtained, implying that an increase in the price of Uganda's exports, leads to an increase in Uganda's general price level. There fore (h.o.f.c), a one percent increase (decrease) in the price of exports, leads to a **0.144** increase (decrease) in Uganda's general price level (CPI).

Argued theoretically, an increase in the price of exports encourages producers to



increase supply of exports. Therefore resources will be transferred from production for domestic market, to production for exports. This creates a shortage in the domestic market, creating demand pressure, hence an increase in prices. However, this conclusion can only stand for a country for which most of her exports can also be consumed locally. In Uganda, many commodities exported, are also consumed locally. The most important examples here are fish, electricity, groundnuts and so on.

Regression results based on annual data.

Results from the regression model based on annual data, using a compressed model as indicated in equation 7, showed that the explanatory variables do not significantly explain variations in CPI, since they all had a P value above 0.05, which is the most statistically accepted level of significance. The variables also had insignificant t values. The value of the adjusted R^2 was also insignificant, which emphasized this point.

However, a clear look at the coefficients, indicate that GDP has a negative sign implying that the increase (decrease) in GDP reduces (increases) prices. Thus, a one percent increase (decrease) in GDP reduces (increases) the price level by - 0.04.

Narrow money supply.

Narrow money supply assumed a negative sign as expected. A coefficient of 0.041 was obtained. This implies that a one-unit increase in money supply

increases the price level by 0.041. However, this is a very small effect and thus its P value was not significant (0.493). This means that narrow money supply (if considered using annual aggregates), has an insignificant effect on the price level.

Nominal Exchange Rate (NER).

NER had a positive but highly insignificant coefficient of 0.000. This means that, NER is not affecting the price level, if considered using annual data. Both the p (0.989) and t (0.015) values are insignificant.

Export price index.

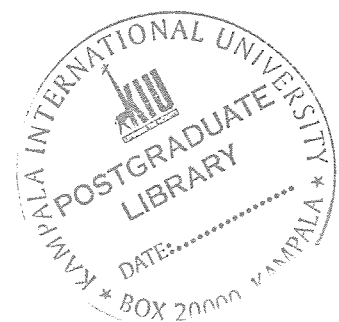
This also assumed a positive sign as expected with a coefficient of 0.036. However the P and t values are insignificant. So the increase in the price of exports has a very small effect of 0.036.

Import price index.

Like the exports, the import price index also assumed a positive sign as expected with a 0.369 coefficient but with an insignificant P value.

Pearson correlation test based on annual data.

Results of this test as indicated in table 5.06 indicate that apart from export price index, all other explanatory variables are positively related with the CPI. This implies that as GDP increases, CPI increases, which is inconsistent with theory, since an increase in output is expected to bring a decrease in the price level. But since GDP is measured in monetary terms, then an increase in prices must also show an increase in GDP. So consistent results are expected, if one was to use





real out put, which the researcher in this case failed to obtain.

Narrow money supply shows a small but positive relation ship, with a coefficient of 0.378. NER is also having a positive coefficient of 0.359, which shows a rather weak relation ship. Import prices showed a coefficient of 0.744, indicating a significant positive relation ship. So a one percent increase in the price of imports increases the CPI by 0.744.

However, the so many inconsistencies in both Pearson and regression results are expected to have been caused by data which is not collected uniformly. Some data is corrected on monthly, annual, weekly, dairy or quarterly basis. Some is based on regions and some regions are left out. For example, there is no national data on rainfall. Data that exists is based on regions and some region's data is missing. This is why analysis of such data is still very difficult in Uganda. There is need to up date the formats of collecting data, which can be used for meaning full analysis of macro economic issues.

Exchange rate movements and the price of food crops.

After testing for the effect of exchange rate movements on the general price level of consumer goods, the researcher also carried out specific tests for the effect of exchange rate movement on prices of food crops. Any thing that affect price of food crops, affects directly peoples welfare. There fore it is important to investigate on such things so as to make informed decisions on policies to improve people's welfare.

In this research, the food crop index, after here referred to as FCI, refers to the

prices of mainly agricultural food crops. The FCI is used as the dependent variable against other explanatory variables as seen in the following, model,

$$FCI_A = \alpha_0 + \alpha_1 Q + \alpha_2 mi + \alpha_3 NER + \alpha_4 IPI + \alpha_5 EPI + \alpha_6 NFR + U \dots\dots\dots 8$$

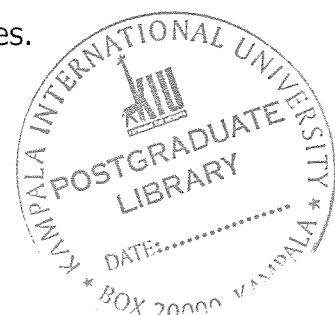
Results of this regression model are represented in table 5.07 below;

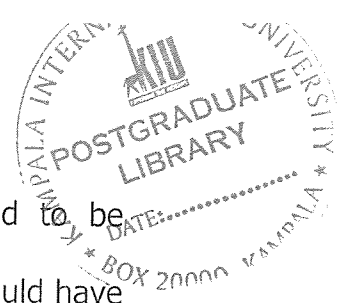
Table 9.04: Results of the estimated regression model using FCI.

Model		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B	
		B	Std. Error	Beta	t	Sig.	
1	(Constant)	61.585	296.791		.208	.836	
	NER	-.352	.236	-.997	-1.487	.141	
	NEER	15.794	6.763	2.091	2.335	.022	
	REER	-9.707	6.413	-1.044	-1.514	.134	
	Exports	-.636	1.478	-.141	-.430	.668	
	Imports	.415	2.130	.025	.195	.846	
	Rainfall	.049	.238	.022	.204	.839	

a. Dependent Variable: food crop index

It is indicated from the table 5.05 above that apart from the Nominal Effective Exchange Rate (NEER), all other explanatory variables are insignificant, with their P values greater than 0.05. The adjusted R² also indicate that the predictors in the model all together have a small impact on the price of food crops. There fore analysis is based on NEER, which is significant. As can be seen, NEER assumed a positive sign as expected and a significant p value of 0.022. This implies that depreciation (appreciation) of the NEER, results into an increase (decrease) in the price of food crops. A coefficient of 15.794 was obtained, implying that, a one percent depreciation (appreciation) of the NEER, leaving other factors constant, will bring a 15.794 increase (decrease) in the food crop prices.





Although factors like rainfall, import and export prices are expected to be significant, they were not. This theoretical inconsistency in this model could have come from non uniformity of data collecting, as already indicated above.

Results show that as the price of exports increase, food crop prices reduce but as price of imports increase, food crop prices also increase. But given that their p values are insignificant, data adjustments need to be made first before a conclusion is drawn.

Table 10.04: Pearson Correlations.

	food crop index
Pearson Correlation	1.000
	NER
	NEER
	REER
	Exports
	Imports
	Rainfall
Sig. (1-tailed)	
	NER
	NEER
	REER
	Exports
	Imports
	Rainfall
N	90
	NER
	NEER
	REER
	Exports
	Imports
	Rainfall

It is observed that there is a positive relation ship between food crop index and NER, NEER, REER and import prices. However, there is a negative relation ship with rainfall and exports. This means that as NER, NEER, REER and import prices increase, the food crop prices increase, but the effect is very small as seen from the correlation coefficients of 0.160, 0.234, 0.246 and 0.81 respectively.

Rainfall has a negative but a small coefficient of -0.022, which shows that as rain fall increase, food crop prices reduce. Theoretically, increased rain fall increase out put, hence a decline in prices.

Exchange rate movements and import price index (IPI).

A regression with IPI as the independent variable was run and the results are indicated in table 5.07 below;

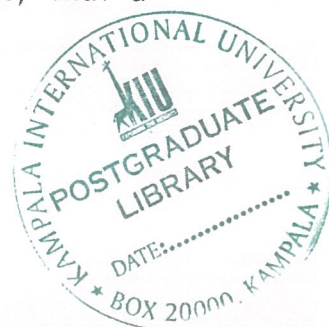
Table 11.04: Regression results of the import price index.

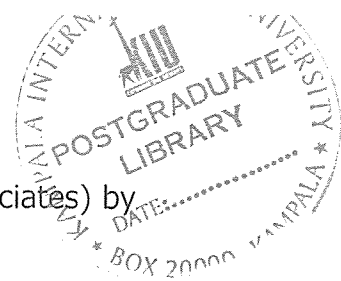
a

Model		Unstandardized Coefficients	Standardized Coefficient	t	Sig.	95% Confidence Interval for B	
		B	Beta			Lower Bound	Upper Bound
1	(Constant)	72.30		6.206	.000	49.563	96.296
	NER	.010	.471	2.247	.027	.001	.019
	food crop	.002	.033	.304	.762	-.011	.015
	Exports	.103	.495	2.391	.019	.022	.244
	Rainfall	-.014	-.103	-.984	.328	-.042	.014

a. Dependent Variable : Import price index

Results indicate that NER assumed a positive coefficient of 0.010, with a





significant p value of 0.027. This means that as NER depreciates (appreciates) by one percent, import prices will increase (decrease) by 0.010 percent.

Food crop prices are not significantly related with import prices. Export prices are positively and significantly related with import prices, with a coefficient of 0.133.

Thus a decline in the export prices by one percent, results into a 0.133 increase (decrease) in import prices in Uganda. Thus, as export prices increase, exporters earn more profits and increase their demand for imports especially raw materials.

Rainfall has a negative sign as expected but with an insignificant p value.

Pearson correlations.

The results as indicated in table 15.04 below, indicate that NER, FCI and export prices are all positively related with import prices. They all have a positive coefficient of 0.048, 0.081 and 0.088 respectively. Rainfall has a negative coefficient of 0.096.

In respect to NER, if it depreciates (appreciates) by one percent, import prices will increase (decrease) by 0.048.

Table 12.04: Pearson Correlation results.

		Imports
Pearson Correlation	Imports	1.000
	NER	.048
	food crop index	.081
	Exports	.088
	Rainfall	-.096
Sig. (1-tailed)	Imports	
	NER	.327
	food crop index	.224
	Exports	.204
	Rainfall	.184
N	Imports	90
	NER	90
	food crop index	90
	Exports	90
	Rainfall	90

Exchange rate and export prices (EPI).

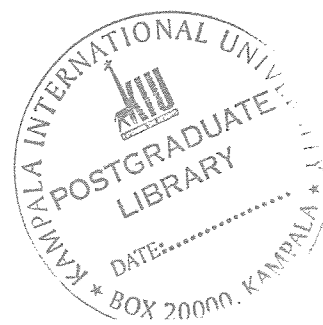
A regression with EPI as the dependent variable was run and the results are shown in table 13.04 below;

Table 13.04: Regression results of export price index.

a

		Unstandardized Coefficients		Standardized Coefficients		95% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1	(Constant)	152.464		7.262	.000	110.718	194.209
	NER	-.069		-16.418	.000	-.077	-.061
	food crop index	.016		1.348	.181	-.008	.040
	Rainfall	.014		.517	.606	-.039	.067
	Imports	.474		2.391	.019	.080	.867

a. Dependent Variable: Exports





Results from table 13.04 above show that NER has a negative sign as expected, with a coefficient of -0.069 and a significant p value of .000. This means that as NER depreciates (appreciates), export prices will fall (increase). This indicates that in Uganda a depreciation of the NER reduces the price of exports thus increasing their competitiveness. However, the impact is not very big, meaning that export prices in Uganda respond slowly to a depreciation of the shilling. It further implies that a policy to depreciate the exchange rate in order to increase exports in Uganda does help but not so much.

Food crop prices had a very small but a positive coefficient of 0.016 and a non-significant p value of 0.181. This shows that food crop prices are not highly related with export prices. However, in Uganda, there is a great deal of food commodities, which are exported, for example dairy products, maize, fish, groundnuts etc. There fore a quite closer relation ship is expected between the two.

Pearson correlation results.

Results of this test are indicated in table 5.10 below;

Table14. 04: Pearson Correlation results.

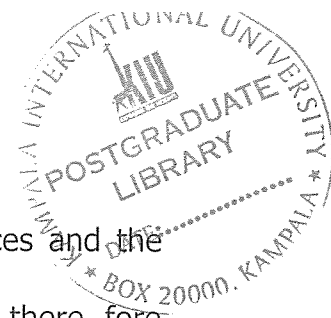
		Exports
Pearson Correlation	Exports	1.000
	NER	-.861
	food crop index	-.059
	Rainfall	-.001
	Imports	.088
Sig. (1-tailed)	Exports	
	NER	.000
	food crop index	.291
	Rainfall	.497
	Imports	.204
N	Exports	90
	NER	90
	food crop index	90
	Rainfall	90
	Imports	90

From table 14.04, results indicate that NER is negatively related with export prices with a coefficient of -0.861, which shows a strong relation ship than what is indicated from the regression results. However, the OLS regression tests are superior in estimating the magnitude of the relation ship, thus a conclusion is made basing on regression results.

Import prices are positively related with export prices with a coefficient of 0.088, which shows a very small relation ship. Thus, as prices of imports increase by one percent, export prices will increase by only 0.088.

Other variables like rainfall and food crop index assumed negative signs with a coefficient of 0.059 and 0.007 respectively, implying a negative relation ship with exports.





Conclusion.

Using monthly data, nominal exchange rate, import and export prices and the nominal effective exchange rate, had the correct signs and are there fore significant in explaining price movements in Uganda. Rainfall had a negative sign but with a small coefficient which shows that it is not so significant in explaining price movements in Uganda. However using annual data, not all the above, plus narrow money supply and GDP, are significant due to their insignificant R^2 . Nevertheless, money supply alone had a correct sign although with an insignificant p value.

There fore, using monthly data, ER movements play a significant role in explaining price level movements in Uganda. However, using annual data, the exchange rate has no significant effect on the price level, but there is a need for further investigation using improved data.

In addition, the NEER movements play a significant role to increase (decrease) prices of food crop commodities, but NER and REER do not.

It is also seen that the NER has a significant role it plays in increasing the price of imports in Uganda.

NER depreciation plays a less significant role in decreasing the price of exports in Uganda and there fore does not make them more competitive.

However, the constant contribute 20.1 percent and other variables left out in the model contribute 40 percent in explaining the price level movements in Uganda.

These factors include money supply, political instability, government policies etc.

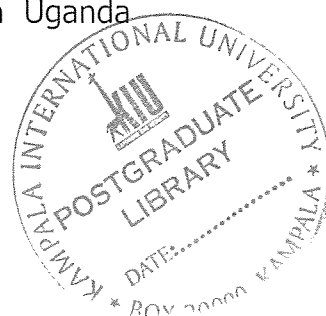
Major findings.

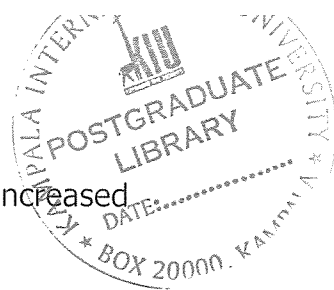
Econometric regression results indicate that, using monthly data series, a one percent increase in the nominal exchange rate will increase prices of consumer goods by 0.033%, import prices by 0.010%, export prices reduce by 0.069 and nominal effective exchange rate increase food crop prices by 15.794.

On the other, hand a one percent increase in rainfall will reduce the general price levels by 0.011%. But rainfall had no significant effect on prices of food crops and exports although it was expected. However, this could have been due to data inconsistencies, other wise a significant effect is expected as it was found out by researchers like Brahamananda (2002) in UK.

More so a one percent increase in prices of imports and exports brings an increase in the general price level by 0.209% and 0.144% respectively. Other factors like GDP, narrow money supply, political instabilities and government policies contribute 40.227% in variations of the price levels in Uganda.

Using annual data, the exchange rate has no significant effect on the price level. However, it is revealed that a 1% increase in narrow money supply, NER, import and export prices will increase the price level by **0.041%**, **0.000%**, **0.369%** and **0.036%** respectively. However, these findings do not show a big effect on the price level, thus it is true that as time elongates, the effect of such variables reduce because the affecting factors become very many and therefore the impact is not highly felt. A weak shilling therefore is not useful in Uganda





because it does not increase exports so much, yet import prices are increased greatly.

Decision on the narrow hypotheses.

Basing on the above findings, all the four hypotheses are rejected, basing on monthly data, since a one percent increase in NER, increase the general price level by 0.033%, import prices by 0.010% export prices reduce by 0.069% and food crop prices increase by 15.794% in case of a unit increase in the NEER.

However basing on annual data, the narrow hypotheses are accepted.

CHAPTER FIVE

Summary, Conclusion and policy recommendations.

Introduction.

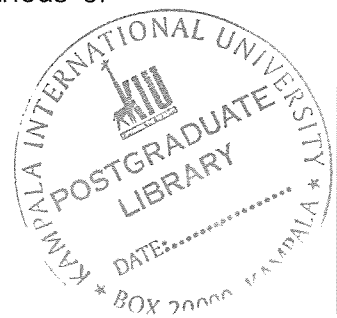
This chapter presents the summary and major findings of the study, in light of the objectives and hypotheses. It also presents some policy recommendations for exchange rate and price stability, as well as areas that need further investigations.

Summary.

The exchange rate and prices of consumer goods in Uganda have been determined by the government before 1990's. There was considerable stability, apart from the high inflation rate, price and exchange rate fluctuations between 1972 to 1979 and 1982 to 1986.

After liberalization of the economy from 1990 onwards, the exchange rate and consumer prices are now determined by market forces and so there has been a great deal of fluctuations in the two.

The objective of this study was to investigate the effect of exchange rate movements on prices of consumer goods in Uganda from 1995 to 2005. The factors investigated upon included the real exchange rate, real effective exchange rate, nominal exchange rate, nominal effective exchange rate, output, narrow money supply, export and import prices, food crop prices and natural factors. The researcher employed both descriptive and econometric methods of





analysis.

In econometric analysis, some factors were dropped as a result of data problems encountered and statistical diagnostic tests. A compressed model was finally tested in two ways, one basing on monthly data and another on annual data.

The models tested respectively were;

$$CPI_A = \alpha_0 + \alpha_1 NER + \alpha_2 IPI + \alpha_3 EPI + \alpha_4 NFR + U$$

$$CPI_A = \alpha_0 + \alpha_1 Q + \alpha_2 mi + \alpha_3 NER + \alpha_4 IPI + \alpha_5 EPI + \alpha_6 NFR + U$$

Analysis was based on a number of hypotheses, that is, there is no significant relationship between the nominal exchange rate, real exchange rate, real effective exchange rate, nominal effective exchange rate and prices of consumer goods in Uganda. The second was that depreciation of the shilling does not increase food crop prices. The third was that exchange rate movements do not affect prices of imports in Uganda. The fourth was that a depreciation of the shilling does not decrease export prices.

The Pearson correlation test and regression econometric modeling were the employed methods of data analysis. Computer packages like **excel**, **SPSS** and **stata** were used in estimation of the regression models.

Policy recommendations.

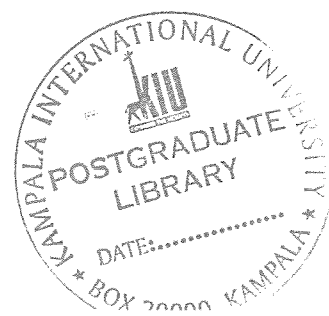
Exchange rate policy recommendations.

Exchange rate fluctuations adversely affect the general price level in Uganda.

Therefore, whenever there is fluctuation or exchange rate volatility, there will also be fluctuations in prices of consumer goods. Price fluctuations discourage traders and investors and make planning and economic forecasting difficult. Therefore, in order to encourage traders and investors, and to promote people's welfare in Uganda, there is a need to reduce exchange rate fluctuations so as to allow relative price stability in the country.

Bank of Uganda should continue to pursue a conscious exchange rate policy, to secure competitiveness of the economy and improve people's welfare. This can be done by maintaining a relatively stable exchange rate.

Although it is no longer feasible to return to a fixed exchange rate system, for a small open economy like that of Uganda, a managed float exchange rate system is more viable than a free float. Therefore the government through the BOU should maintain a managed float to avoid the destabilizing effects of excessive volatility of the exchange rate on trade, investment and human welfare, employment and inflation. Since Uganda's economy is still small and poor, a free-floating exchange rate regime cannot preserve independent functioning of monetary policy and achievement of macro economic objectives. Countries like France, Belgium, Germany, maintained a managed float and a pegged exchange rate between 1970's and 1980's, and they succeeded in solving problems of unemployment and inflation (Marston, 1985). Successful liberalization of a small and poor economy like that of Uganda must be accompanied by necessary macro economic and structural reforms in order to control inflation and to achieve





macro economic objectives.

There is need to increase Government revenue and reduce the deficit budget to stabilize the exchange rate and prices. In order to stabilize the exchange rate and possibly strengthen the shilling, two possibilities are proposed here.

One is to increase foreign exchange inflow and reduce its outflow through increased exports and reduction of repatriation of profits by foreign investors.

The second measure is to restructure records of foreign exchange outflow, inflow and their balancing. As already observed, the Ugandan shilling has been depreciating always. This proves that there has been always more foreign exchange outflow than inflow. So policies to increase foreign exchange inflow will be the most important solution. Such solutions may be increasing exports, reducing imports and encouraging capital in flow for example through non-government organizations (NGO's).

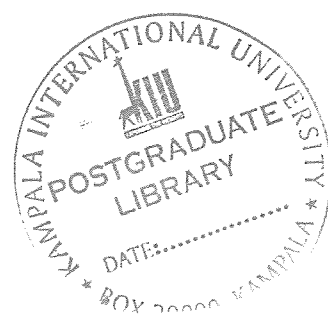
Monitoring of foreign exchange inflows and outflow must be strengthened if Uganda is to have relative price and exchange rate stability. Presently there is an arrangement in the bank of Uganda where forex bureaus have to submit in their list of sales and purchases. However, it is noted that many do not do it (the forex news December 2002). The solution to this can be that BOU should send these forms to all forex bureaus and commercial banks and possibly to link their information systems to bank of Uganda through an internet project. Another

form to capture information should be sent to all customs offices in different parts of the country and below is a hypothetical form for capturing data on foreign exchange inflow and outflow, on a daily basis.

Table 15.05: A hypothetical form to capture foreign exchange inflow and outflow.

Date	Name	Amount inflow	Amount outflow	Source	Purpose
Days total					

There should be an independent board of foreign exchange and exchange rate control as a special department with in the bank of Uganda and ministry of finance. It is necessary that the government, BOU and the exchange rate board intervene in the exchange rate after estimating a benefit on a macro economic level. External interventions from IMF, World Bank and other aid sources should be limited because in most cases, they lead to un desirable results and yet they do not suffer the consequences. Exchange rate regulations should not be abolished wholesomely because Uganda is still a poor country with a lot of interest to protect. The exchange rate is a very important catalyst in the economy, it affects all other prices and touches interests of all people directly or indirectly. So any attempt to allow large and frequent changes in it bring disruptive and un desirable side effect as it is quoted from EPADU policy paper number 9 (1994), that, "this is why no government in the world can leave it





(exchange rate) to the vagaries of the market.....). Even a country like USA which is the custodian of free markets, can intervene, as was the case in April 1994 when the dollar depreciated against the Germany mark, Japan's Yen and on a trade weighted basis by only 4.6%, 6.5% and 3.6% respectively. The Federal Reserve Bank intervened and purchased 500million dollars and 200 million dollars respectively and there after the treasury secretary issued the following statement. "US monetary authorities intervened today in the foreign exchange markets, to counter disorderly conditions. This is in line with our previous articulated policy which recognizes that excessive volatility is counter productive to growth". So if such giant economies do intervene to protect national goals, then what about a poor country like Uganda?

Price recommendations.

The exchange rate policy affects prices through imported final goods, raw materials and exports. Therefore the exchange rate and the price policy should be addressed together. The results in this study indicate that exchange rate movements affect the general price level, the price of imports and exports and food crop prices. Price fluctuations are a disincentive to traders and investors. Therefore macro economic policies should be directed towards reduction of rampant price and exchange rate fluctuations. The market forces need to be directed towards the direction of achieving macro economic objectives. All price stabilization policies should be directed towards increasing domestic production and reducing fluctuations in domestic supply. Increased domestic production

makes the local currency more competitive, which makes policies to stabilize the price easier than when the country's production is very low. Policies to increase exports will also stabilize the price than if goods are imported.

Among the major causes of inflation in Uganda is increased government liquidity arising from donor funds of domestic expenditure. There fore inflation challenges need more consolidation via deficit reduction to ease monetary management and produce favorable environment of low interest rate and a competitive exchange rate.

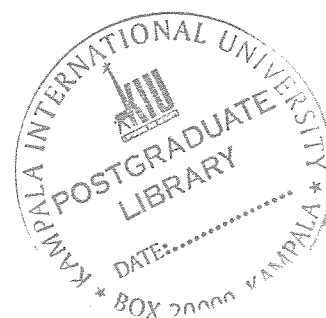
Adopting a managed float will help to solve the problem of inflation as it helped Finland, Iceland, Norway and Sweden in 1970's and 1980's.

Import p

rices are very much affected by exchange rate depreciation yet Uganda imports most of her essential commodities like fuel. There fore depreciation of the shilling should be allowed mare sparingly as it affects people's welfare greatly.

Import policies.

Import prices are usually affected by exchange rate fluctuations, so the Government should maintain a managed float exchange rate system and avoid over depreciation of the shilling as most imports in Uganda have inelastic demand. This means that most imports are essential and so increase in their prices affects the people greatly. The Government should use other tools of





monetary policy to discourage those imports, which are not so essential.

There is need to capture data on the nature and volume of imports. This helps to estimate the amount of foreign exchange required, in order to avoid exchange rate volatility.

To counteract the effects of over importing, so earnings from exports replace that over expenditure on imports.

Export policies.

It is revealed in this study that a depreciation of the exchange rate increases exports by a very small margin and yet if one compares the volume of Uganda's imports, it is very big there fore, the pains from increased prices of imports will be more felt than the little benefits from increased exports. There fore maintaining a managed exchange rate and thus relatively stable prices is highly recommended here. This will avoid over burdening the Ugandans who must inevitably use imported goods like fuel, whatever the case!

To make the shilling stronger, exports must be promoted. This will help to supply more foreign exchange and increase demand for the shilling.

Investors' policy should be amended to give priority to firms producing exports than those investing in imports.

The Government and BOU through their economic planning departments and economic indicators surveys should establish and strategically allocate best

international markets faster and encourage producers and exporters to exploit them. This can be done through international market surveys in various countries. In Keya this is done through computer net works and using the national television display bars.

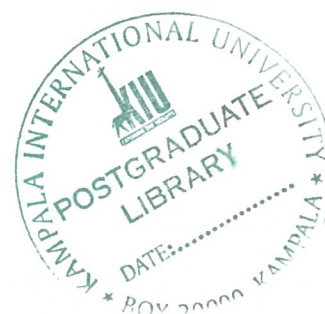
It is here noted by the researcher that no county can succeed in strengthening the local currency without boosting its exports and at least controlling the exchange rate at one time or another. There fore increasing and promoting exports remains the most important weapon to reduce exchange rate and price fluctuations in Uganda.

Government taxation policy should also favor and promote exports

Although Uganda is running an export led growth economy, economic growth has not been yet achieved, simply because, the exchange rate in Uganda does not practically promote exports, although theoretically it does so. It was also noted by Hon. Richard Kaijuka (1996) that the government has not done what it should actually do to promote exports and to move the economy towards self-reliance.

There fore the government has the obligation to direct and promote export investment and one way to do this is the local price and the exchange rate. This is because the exchange rate affects the cost of raw materials and hence the local exports cease to be attractive.

In addition, a proper method to capture data on the nature and volume of exports should be drafted and a formal model should be developed to capture





such data. This together with imports data can be used to estimate the equilibrium exchange rate.

Over all Conclusion.

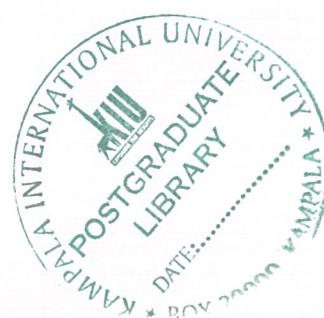
Exchange rate fluctuations in Uganda have had a significant effect on the general price level, price of food crops, price of imports and exports. In most cases the effects are undesirable. Therefore a stable and realistic exchange rate is a prerequisite to achieve key macro economic policy targets as well as Government's proclaimed export oriented development strategy, to restore economic stability, promote growth and move the economy towards more self-reliance.

There is need for the BOU to play a more active role and adopt the most appropriate foreign exchange stabilization mechanism. BOU should increase its level of intervention and the Government should take the underground move to stabilize the price level and the exchange rate in Uganda. A free-floating exchange rate system is not yet viable for a small and poor economy like that of Uganda.

Suggestions for further investigations.

It is here that the researcher suggests that further studies be carried out focusing on strengthening the shilling and stabilizing the price of consumer goods as well as the exchange rate. A study can be conducted assessing the effect of exchange rate fluctuations on GDP, using Kalman's filter (1960), which helps in calculating the exact likelihood, in a situation where there is unequally spaced data series or missing data. A study like this one can also be carried out

to assess the effect of exchange rate movements on employment and investment level. Another study can be conducted using both primary and secondary data.





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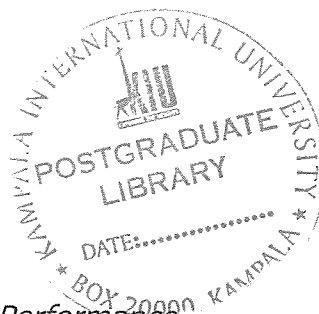
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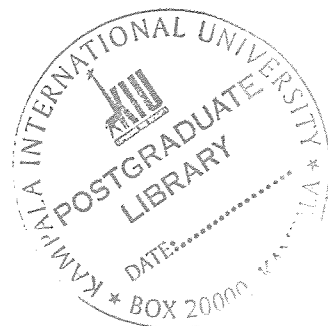
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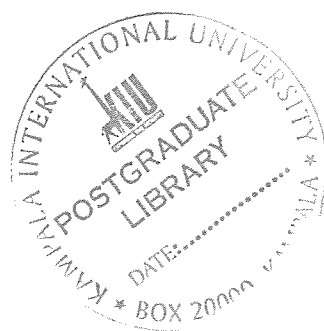
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APPENDICES

APPENDIX A1

TRANSMITTAL LETTER

KAMPALA INTERNATIONAL UNIVERSITY
SCHOOL OF POST GRADUATE STUDIES
P.O BOX, 20.000,
KAMPALA -UGANDA.

Date 10/7/2006.....

TO THE DIRECTOR RESEARCH DEPARTMENT
BANK OF UGANDA
P.O BOX, 7120
KAMPALA- UGANDA.

Dear Sir/Madam,

RE: PERMISSION FOR CONDUCTING RESEARCH STUDY

I here by humbly request for your permission to conduct my study in your department. Iam currently conducting research about **Exchange Rate Fluctuations and Prices of Consumer Goods in Uganda 1995 - 2005**. I am a student in the above stated university pursuing a degree of **Masters of Arts in Economics**. A copy of specific issues to investigate upon is attached. Hoping a positive response to my request!

THANKS

Yours;

Kibuuka Muhammad

Researcher

A

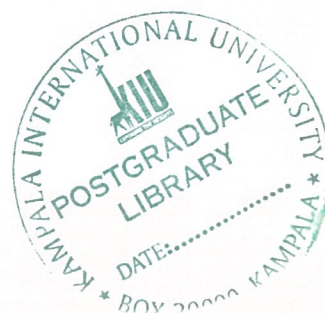


Exchange Rate Fluctuations and Prices of Consumer Goods in Uganda

1995 – 2005

ISSUES TO INVESTIGATE UPON

1. Exchange rate movements in Uganda 1995 – 2005
2. Trends in the consumer price index for all goods in Uganda 1995 – 2005
3. Foreign exchange inflow and out flow in Uganda 1995 – 2005
4. Nominal exchange rates and real exchange rates in Uganda
5. The consumer price index for export potentials (non tradable goods)
6. The consumer price index for imported consume goods in Uganda
7. Trends in the Ugandan BOP
8. General inflation trends in Uganda
9. Import and export flow in Uganda 1995 – 2005



A2.

ACCEPTANCE LETTER.

BANK OF UGANDA

OFFICE OF THE DIRECTOR
HUMAN RESOURCES



37/43 KAMPALA ROAD
P.O. BOX 7120
KAMPALA

DIRECT LINE 256-41- 259958
GENERAL LINE 256-41- 258441
FAX LINE 256-41- 250298
TELEX 256-41-61059

CABLES UGABANK
Web site www.bou.ug

HR/113

8 August 2006

Mr. Muhammad Kibuka
C/o Dr. Angela Pescadero-Canene
School of Post Graduate Studies
Kampala International University
P.O. Box 20000
Kampala

Dear Mr. Kibuka,

Academic Research

I am pleased to inform you that you have been offered the opportunity to undertake your academic research, in Bank of Uganda Research Department, with effect from the date you report, for a period not exceeding ONE month.

On arrival, please report to the undersigned.

I hope that you will find your stay in Bank of Uganda fruitful and you will achieve your objectives.

Yours faithfully,

Evah MweneBirinda (Mrs)
Director Human Resources

Copy: EDA
EDR
Director Research



APPENDIX B

DATA PRESENTATION TABLES.

**Table B1.01: Average annual exchange rate movements in Uganda
1995-2004**

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
ER Shs/\$	1009.5	1029.6	1140.1	1362.7	1506.0	1766.7	1727.4	1852.6	1935.3	1738.6

Table B1.02

Nominal monthly Exchange rate movements in Uganda (Official middle rate got by the average inter bank middle rate).

Years	1995	1996	1997	1998	1999	2000	2001	2002	2003
Jan	925.04	1017.72	1044.85	1148.07	1369.21	1526	1830	1739	1868
Feb.	925.53	1022.37	1033.11	1152.52	1377.35	1519	1743	1741	1884
March	927.04	1016.6	1024.95	1152.39	1381.16	1514	1754	1771	1944
April	928.83	1013.56	1046.46	1174.51	1449.73	1526	1774	1792	1977
May	941.02	1018	1065.3	1223.48	1518.97	1580	1783	1798	1998
June	964.81	1041.36	1067.59	1231.02	1447.22	1566	1768	1797	1998
July	968.93	1055.44	1068.02	1235.02	1454.51	1596	1726	803	1995
Aug	970.03	1067.44	1098.17	1244.37	1463.4	1676	1751	1806	1998
Sept	977.7	1074.97	1117.12	1284.84	1491.67	1771	1753	1813	1994
Oct	1043.38	1105.05	1140.4	1314.19	1507.8	1827	1738	1827	1991
Nov.	1028.3	1081.48	1147.19	1353.82	1503.54	1850	1736	1832	1974
Dec.	1023.25	1030.35	1142.94	1368.44	1502.47	1784	1713	1845	1943

Source:BOU Annual reports1996-2004.

Table B1.03: Exchange rate movements and prices of imported and export potential consumer goods.

Year	CPI(M)	CPI(XP)	NER
1995	-----	-----	1009.5
1996	113.73	142.69	1029.6
1997	108.88	140.15	1140.1
1998	94.60	143.53	1362.7
1999	95.30	108.07	1506.0
2000	104.62	90.83	1766.7
2001	99.35	72.78	1727.4
2002	96.34	66.09	1852.6
2003	101.64	79.94	1935.3
2004	106.04	86.59	1738.6
2005	131.77	110.26	-----

Source: BOU annual reports 1997-2005.



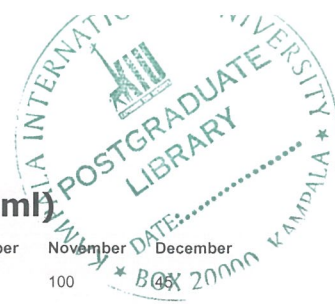


Table B1.04: Rainfall statistics for selected regions in Uganda (mm)

	January	February	March	April	May	June	July	August	September	October	November	December
ngTermAverage	19	46	87	139	147	129	150	189	171	184	100	45
97	43	0	84	170	81	121	73	128	73	196	230	99
98	72	23	73	90	147	191	209	122	160	224	105	32
99	1	21	81	84	86	125	250	215	214	220	49	57
00	19	46	87	139	147	129	150	189	171	184	100	45
01	0	0	15	74	84	62	149	140	242	213	179	239
02	0	6	36	69	87	163	241	108	105	105	166	120
03	6	5	65	77	225	84	85	140	285	78	138	142
ngTermAverage	90	96	177	274	258	102	67	83	80	111	162	119
97	223	35	179	271	169	197	80	69	29	301	253	512
98	..	110	266	365	132	138	40	126	71	109	27	36
99	187	110	270	516	308	166	252	141	45	154	374	156
00	90	96	177	274	258	102	67	83	80	111	162	119
01	69	159	242	..	210	120	31	46	193	195	184	54
02	185	115	193	326	121	123	30	52	54	100	309	302
03	60	39	118	203	223	160	99	111	61	162	94	124
ngTermAverage	14	43	92	173	195	152	167	228	177	171	98	45
97	7	..	46	208	120	67	150	115	60	241	192	90
98	35	1	3	173	57	90	130	164	106	226	151	23
99	19	0	65	171	131	80	141	251	197	300	102	26
00	19	0	65	171	131	80	141	251	197	300	102	26
01	0	7	162	142	168	178	195	166	36	21	158	13
02	6	23	69	197	181	164	127	224	75	218	126	39
03	29	14	64	212	86	126	128	284	206	69	141	97
ngTermAverage	68	84	135	193	140	60	58	77	93	152	166	95
97	107	5	80	195	88	39	27	73	35	191	291	259
98	160	91	239	189	155	42	18	75	54	74	95	35
99	139	27	246	237	193	15	43	80	118	134	140	172
00	68	84	135	193	140	60	58	77	93	152	166	95
01	121	58	109	148	208	139	49	152	161	214	280	52
02	90	49	184	407	148	9	14	72	66	54	222	116
03	98	20	118	109	149	164	10	69	71	217	111	25
ngTermAverage	61	91	117	139	93	27	20	52	97	96	110	91
97	101	..	114	122	149	33	27	37	25	155	196	151
98	183	97	101	171	170	19	25	23	87	154	58	79
99	77	37	145	72	45	0	0	167	65	87	116	49
00	61	91	117	139	93	27	20	52	97	96	110	91
01	86	51	84	137	78	22	47	66	231	202	95	64
02	120	90	63	75	116	..	4	48	50	188	92	91
03	67	81	75	139	96	29	23	26	83	87	94	57
ngTermAverage	51	62	113	182	140	75	50	86	101	109	114	97
97	112	54	86	229	90	62	14	98	120	169	251	280
98	153	81	266	210	74	19	26	88	222	158	50	23
99	81	48	156	154	148	98	113	174	185	253	231	48
00	51	62	113	182	140	75	50	86	101	109	114	97
01	105	64	136	205	153	53	100	132	229	138	96	73
02	58	65	152	197	79	88	27	37	141	188	268	141
03	61	47	68	193	117	86	120	199	44	144	155	182

ngTermAverage	31	40	116	152	106	54	31	84	64	123	101	68
97	60	..	99	228	81	19	34	8	51	86	191	79
98	38	23	77	127	152	22	6	3	55	108	131	69
99	38	4	132	39	69	22	5	122	68	122	115	93
00	31	40	116	152	106	54	31	84	64	123	101	68
01	5	31	109	225	110	48	50	79	59	157	95	66
02	5	18	147	12	88	23	10	84	41	108	107	57
03	19	9	44	67	145	96	9	37	59	61	63	..
ngTermAverage	29	41	91	172	190	126	126	215	168	149	84	43
97	23	0	31	329	126	79	102	122	32	250	202	..
98	36	48	18	110	74	74	140	180	101	246	155	8
99	36	42	141	107	128	102	115	184	202	198	110	10
00	29	41	91	172	190	126	126	215	168	149	84	43
01	78	21	156	213	145	108	163	137	151	225	229	26
02	7	1	138	171	176	148	142	337	186	204	119	76
03	17	17	61	257	155	87	147	102	126	172	107	106
ngTermAverage	32	56	107	162	146	97	109	137	141	147	122	48
97	33	0	31	267	107	122	176	48	136	262	237	177
98	82	33	112	114	130	37	148	74	171	128	70	7
99	16	6	206	51	187	55	56	106	119	246	130	43
00	32	56	107	162	146	97	109	137	141	147	122	48
01	16	13	130	162	173	31	138	139	164	142	221	5
02	5	21	212	185	103	72	81	135	119	155	171	95
03	22	4	224	166	186	51	3	..	100	..	131	93
ngTermAverage	45	64	96	123	78	23	20	61	95	105	120	75
97	70	26	60	207	119	26	75	37	21	122	76	231
98	99	102	74	90	100	2	3	90	65	183	76	42
99	35	6	58	75	4	0	1	68	136	189	135	41
00	45	64	96	123	78	23	20	61	95	105	120	75
01	25	62	158	121	91	3	55	51	209	198	142	67
02	61	131	161	98	130	0	5	21	35	164	108	65
03	41	31	104	78	77	36	0	36	92	107
ngTermAverage	20	49	83	184	190	119	121	176	141	123	75	31
97	23	0	43	252	23	26	112	172	8	201	231	104
98	48	56	20	108	259	87	285	132	55	183	99	25
99	89	0	177	113	160	44	147	169	111	138	36	37
00	20	49	83	184	190	119	121	176	141	123	75	31
01	57	4	188	180	238	171	231	165	101	351	89	14
02	16	6	78	146	195	164	35	51	171	229	118	103
03	53	48	31	219	188	302	84	184	171	74	107	19
ngTermAverage	55	78	138	225	224	108	96	118	111	125	109	75
97	55	1	95	174	140	96	74	20	..	239	338	216
98	30	119	131	266	206	29	70	112	85	183	99	25
99	111	0	273	137	107	75	66	170	142	154	141	101
00	55	78	138	225	224	108	96	118	111	125	109	75
01	103	39	186	163	229	128	117	88	150	170	137	7
02	97	44	117	279	145	64	49	81	71	104	349	231
03	141	160	78	170	182	123	67	99	93	99	207	89

Source: meteorological department Ministry of Water Lands and Environment.

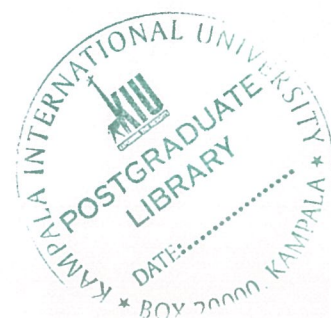




Table B1.05: Raw data used regression estimation.

NER	NEER	REER	CPI	food crop index	Exports	Imports	Rainfall
				252.4			
				246.3			
				241.6			
				256			
				259.3			
				251			
				247.6			
				244.7			
				269.8			
				280.8			
				278.8			
				277.3			
1044.85	80.64	83.66	93.50	66.30	105.86	120.65	71.42
1033.11	78.94	83.04	92.30	86.60	115.04	111.64	13.44
1024.95	78.11	82.19	94.80	91.40	125.65	108.40	79.00
1046.46	79.84	83.36	98.90	99.90	133.08	105.69	221.00
1065.30	82.00	86.40	100.70	104.00	145.41	108.09	107.75
1067.59	81.98	85.37	98.90	99.10	142.71	105.70	73.92
1068.02	79.86	82.67	99.00	97.90	127.19	106.14	78.67
1098.17	76.57	80.15	97.60	95.50	121.72	105.36	77.25
1117.12	79.18	83.21	98.30	97.00	120.16	103.93	53.64
1140.40	81.48	86.15	99.90	101.40	130.28	103.59	201.08
1147.19	81.13	85.80	101.80	106.70	126.46	102.09	224.00
1142.94	79.86	83.10	102.80	107.50	133.87	100.88	199.82
1148.07	80.09	82.04	103.10	107.00	142.07	98.22	85.09
1152.52	81.35	82.94	101.40	102.00	140.26	98.48	65.33
1152.38	81.26	83.38	99.50	96.40	136.64	95.96	115.00
1174.51	82.91	85.18	99.30	97.50	140.81	96.31	167.75
1223.48	84.65	86.69	99.20	96.10	127.93	95.46	138.00
1231.02	84.87	86.85	98.00	93.00	122.05	93.14	62.50
1235.02	84.19	87.19	96.20	89.50	109.74	92.19	91.67
1244.37	84.47	87.44	95.90	89.60	113.51	90.83	99.08
1284.84	88.98	91.90	96.80	91.40	113.04	91.70	102.67
1314.18	93.12	96.02	98.30	93.80	118.47	92.12	164.67
1353.82	95.76	98.25	98.30	93.80	116.86	90.74	93.00
1369.44	95.67	97.18	100.40	97.80	116.42	90.97	33.67
1369.21	95.48	96.80	100.70	98.30	122.84	91.42	69.08
1377.35	94.59	93.52	102.30	98.30	118.49	90.66	25.08
1381.16	93.15	93.00	102.50	101.10	116.01	88.89	162.50
1449.73	96.68	95.97	104.30	104.70	106.33	91.98	146.33
1518.97	99.29	99.23	103.60	102.40	101.62	91.47	130.50
1447.22	92.14	91.69	103.20	100.00	99.04	91.33	65.17
1454.51	92.66	92.18	103.10	99.00	96.75	94.28	99.08
1463.40	93.01	92.64	104.20	100.50	97.75	96.22	153.92
1491.67	95.28	94.73	106.60	103.60	93.06	97.22	133.50
1507.80	96.93	96.34	107.70	106.10	92.84	97.65	182.92
1503.54	96.26	95.72	107.80	106.60	86.66	99.22	139.92
1502.47	96.29	95.23	108.90	108.40	96.81	101.02	69.42
1525.75	99.32	98.80	106.70	103.67	99.55	102.89	43.33
1519.43	96.35	96.09	104.50	97.29	108.00	103.90	58.92
1513.68	94.98	95.25	105.80	100.15	100.34	101.89	110.42

1525.86	95.33	95.72	106.80	102.24	90.53	100.91	176.33
1579.67	95.94	96.87	105.90	100.36	84.52	101.51	153.58
1565.57	95.36	96.76	105.20	97.62	79.59	103.31	83.33
1596.41	97.47	98.30	105.70	97.25	85.71	103.31	82.42
1676.30	101.25	102.03	107.30	101.46	79.94	103.14	127.42
1770.51	104.84	105.49	109.40	105.60	80.10	105.35	121.58
1826.59	106.70	105.82	112.20	109.40	78.13	103.52	143.67
1850.26	107.71	105.72	114.40	113.80	76.57	104.47	113.75
1783.67	104.75	103.15	113.50	113.30	75.92	100.07	67.75
1830.44	108.01	107.61	111.50	107.00	77.26	102.16	55.42
1742.97	102.38	101.01	111.00	104.30	79.81	103.16	42.42
1753.79	102.75	101.52	110.50	103.90	83.34	99.91	139.58
1773.82	102.98	101.60	112.00	106.00	80.17	101.04	160.91
1782.68	102.85	101.97	111.30	105.10	79.23	100.63	157.25
1767.64	101.10	97.69	111.30	101.50	73.57	99.42	88.58
1725.74	98.61	94.38	110.70	98.80	76.22	97.35	110.42
1750.61	101.05	97.62	109.40	96.50	71.48	96.85	113.42
1752.90	101.14	98.08	108.60	94.70	61.54	97.06	160.50
1737.69	99.12	95.00	108.70	94.60	63.76	92.06	185.50
1736.22	98.01	93.89	108.20	94.10	63.11	89.77	158.75
1713.41	94.92	89.50	108.50	92.40	62.20	89.25	56.67
1738.74	95.77	90.45	107.70	91.80	61.16	92.06	54.17
1741.44	95.82	90.41	107.80	91.30	60.11	91.20	47.42
1771.03	97.72	92.40	107.90	90.90	71.78	93.15	129.17
1792.19	99.50	94.38	108.60	93.50	64.91	95.84	180.17
1797.59	101.59	96.48	108.60	93.50	61.71	96.14	130.75
1797.18	102.56	97.73	108.50	92.80	62.83	95.66	92.55
1802.83	104.36	99.26	107.90	91.20	62.71	96.97	63.75
1805.85	103.61	98.83	108.80	93.40	61.83	97.39	104.17
1812.64	104.13	99.32	110.10	96.20	61.55	97.99	92.83
1827.20	104.78	100.20	113.00	102.40	66.76	97.06	151.42
1832.29	105.69	100.45	114.30	105.20	75.53	95.66	179.58
1845.01	108.34	102.59	114.70	106.00	74.96	98.21	119.67
1867.69	112.23	106.39	115.00	104.90	84.19	103.69	51.17
1883.78	114.51	108.88	116.00	106.30	85.36	105.99	39.58
1944.45	118.73	114.91	117.10	113.30	82.05	102.80	87.50
1976.53	121.54	114.00	120.50	113.60	78.09	100.80	157.50
1997.85	127.27	120.17	120.20	111.10	81.65	100.54	152.42
1998.23	126.10	118.18	119.90	110.20	78.22	100.63	112.00
1995.28	125.16	115.73	119.90	109.50	77.65	101.90	64.58
1998.49	124.25	114.98	120.00	109.50	78.99	101.83	117.00
1993.55	124.09	115.29	120.50	110.60	79.93	99.69	115.92
1990.46	126.34	117.95	121.20	112.40	79.78	101.24	115.45
1974.49	126.43	118.10	121.20	113.10	81.71	101.83	122.55
1942.38	126.86	118.89	121.40	1113.90	82.64	103.78	93.40
1936.60	126.41	124.73	119.60	108.60	87.57	109.39	61.38
1865.58	122.46	120.70	119.30	106.10	85.98	109.55	41.74
1926.98	125.19	124.29	119.20	106.00	92.87	110.75	117.60
1917.99	124.09	123.15	121.00	109.50	93.85	112.65	172.86
1852.34	117.86	117.52	122.10	111.50	89.39	114.44	138.61
1815.76	116.96	117.85	120.60	108.30	87.75	113.73	82.58

BOU annual Reports1996-2004, IMF international statistics,2000-2004, UBOS and Ministry
of lands and Environment.

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