ASSESING THE EFFECTS OF GEOGRAPHICAL EXPANSION OF
CONSUMER PRICE INDEX ON INFLATION IN UGANDA

BY

KAISIROMWE SAM

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DECLARATION

I declare that this thesis is my original work and has not been submitted for any other award of a degree or published at any institution of higher learning.
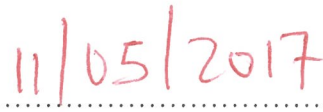
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APPROVAL

This thesis has been submitted for examination with my approval as a supervisor

Emenike Kalu O. (PhD)

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DEDICATION

This work is dedicated to my parents Mr and Mrs Stanley and Joyce Kaisiromwe.

ACKNOWLEDGEMENTS

LIST OF ACRONYMS

APR	Arithmetic Mean of Price Relatives
COICOP	Classification of Individual Consumption by Purpose
CPI	Consumer Price Index
CSO	Central Statistics Office
COMESA	Common Market for East and Central Africa
EAC	East African Community
EPI	Export Price Index
FIES	Family Income and Expenditure Survey
GDP	Gross Domestic Product
GM	Geometric Mean
HEC	Household Expenditure Classification
HES	Household Expenditure Survey
ILO	International Labour Organization
IMF	International Monetary Fund
LPI	Labour Price Index
PBS	Pharmaceutical Benefits Scheme
PPI	Producer Price Index
RAM	Random-Access Memory
SEE	Survey of Employment and Earnings
UNHS	Uganda National Household Survey
UBOS	Uganda Bureau of Statistics
UN	United Nations

TABLE OF CONTENTS

List of Tables

APPENDIX

ABSTRACT

This study details the effects of increasing Consumer Price Index (CPI) geographical coverage on inflation in the country. The study looked at the level of significance of Headline inflation and its related components, before and after geographical coverage increment. A comparison of analytical results obtained with two different CPI coverage, inflation numbers with Fort Portal Centre included in the computations and inflation numbers without Fort Portal Centre. The study applied Student's t-test for the comparison of two means assuming unequal variance. The before and after study indicated that Monthly Headline inflation is significantly different across the two data sets (P (T<=t) two-tail = 0.0096 is less than 0.05). In addition, the monthly core inflation is significantly different across the two inflation trends (P (T<=t) two-tail = 0.0003 is less than 0.05). However, the study showed that the monthly inflation of Food Crops and related items is not significantly different across the two inflation trends, P (T<=t) two-tail = 0.1361 is greater than 0.05). Similarly, the monthly Energy, Fuel and Utilities Inflation is not significantly different between the two inflation trends (P (T<=t) two-tail = 0.1361 is greater than 0.05). The result of Food Crops indicated that the expansion did not have any effect on the group's CPI trends in the region. Thus the price changes in the two urban centres in Food Crops are the same and this could be because of the same climatic conditions of the western region. However, a further comparison of the two centres of Mbarara and Fort Portal, gave a clear distinction of the inflation trends in the separate urban towns. The significant difference in the Core inflation indicated that the group items in different urban centres have unique prices and thus more urban towns should be brought on board in CPI computation to further improve on the accuracy of inflation estimates in the country. Since the study revealed that there were changes in headline inflation due to expansion of coverage, the Uganda Bureau of Statistics should continue expanding the coverage of CPI items especially in the far eastern part of the country which is not uniquely represented in the national CPI. The EFU inflation trends were not affected by expansion of coverage due to the fact that Utilities Such as Water and electricity have a uniform price throughout the country thus emphasis in expansion should be put on improving the core Inflation trends which is mostly used by policy makers in the country. This research has filled the gap of the effects of geographical coverage of CPI and its effects on Inflation trends in Uganda. This study sets itself apart from generic economic researches that have been done before because; it combines the tools of econometrics, mathematics and statistics to analyse a statistical phenomenon: inflation before and after geographical expansion. Due to the fact that these results of the rebased CPI are only reflecting the urban expenditure patterns of Uganda, it is recommended that a study be carried out including the rural expenditure patterns. This research recommends that Uganda Bureau of Statistics (UBOS) should begin the process of computing Rural Inflation trends in the country which will give a clear view of a complete picture of how inflation trends behave in the country.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter presents a brief introduction of the research by presenting a background, historical perspective, Conceptual perspective and theoretical perspective. It also presents the main rationale for the study by presenting the main and specific objectives that the research wishes to achieve in the subsequent sections. The scope and significance of the study are also discussed in this section.

1.1 Background of the study

1.1.1   Historical perspective

The Uganda CPI dates back to 1960 and has undergone several general rebasing or revisions. Before Independence, CPI, which was then referred to as Cost of Living Index, used to be compiled by the Uganda unit of the East African Statistical Department in the then East African High Commission. The first series constructed by the unit was in 1963 and the reference population target was households with high income. The High Income Cost of Living Index series covered Kampala using data collected from high income markets and retail shops. The High Income Cost of Living Index series covered a period of 15 years from 1963 to 1978. After independence, which was attained on 9th October 1962, the responsibility of compiling the index was transferred to the then Statistics Department in the Ministry of Planning and Economic Development (UBOS, 2008).

Rebasing is the process that involves a number of activities undertaken to ensure that an index reflects the current consumption pattern of goods & services consumed by households. (UBOS, 2008). The first general rebasing of the CPI was carried out by the Statistics Department, based on results of the 1989 Uganda National Household Survey (UNHS). During the rebasing exercise, the geographical coverage was expanded from the capital city which is Kampala to five urban centres and with a wider commodity coverage. The base period of the Index was September 1989 = 100.

The second general rebasing of the CPI was also carried out by the same Department. The base was changed from September 1989= 100 to 1997/98 financial year base

period (July 1997 to June 1998 =100). This was done by using weights calculated from the 1997 Household Integrated Survey (HIS) data. During the rebasing exercise, the number of urban centres was increased from five to six.

The department was transformed into the Uganda Bureau of Statistics (UBOS) under the 1998 UBOS Act of Parliament. The recent general rebasing of the CPI was carried out by the Uganda Bureau of Statistics by changing the reference period from financial year 1997/ 1998 = 100 to that of 2005/2006 =100. Weights were computed from the 2005/06 Uganda National Household Survey (UNHS 111). During the rebasing exercise, Kampala was decomposed into two baskets: Kampala High Income and Kampala Middle & Low Income. In addition, a seventh urban centre, Arua, was introduced into the Index to improve on the geographical coverage. The number of Elementary Aggregates also increased from 125 to 276. Consumer Prices were collected from seven urban centres: Kampala, Jinja, Mbale, Masaka, Mbarara, Gulu and Arua. Apart from Kampala, each of the urban centres had its own fixed basket of goods and services based on the expenditure pattern of that urban area. Kampala was decomposed into two baskets i.e. Kampala High Income basket and Kampala Middle & Low Income basket. Thus, there were eight baskets used currently to compute the national CPI, (UBOS, 2008).

The Uganda Bureau of Statistics embarked on the general rebasing of the CPI from the price reference period of 2005/2006 financial year base to that of 2009/2010. The main data source for the CPI rebasing exercise was the Household Expenditure module from UNHS IV. This exercise was finalised in December 2015 and results disseminated to all stakeholders.

1.1.2 Theoretical perspective
Mark-up theory of inflation was proposed by Ackley (1978). According to him, inflation cannot occur alone by demand and cost factors, but it is the cumulative effect of demand-pull and cost-push activities. Demand-pull inflation refers to the inflation that occurs due to excess of aggregate demand, which further results in the increases in price level. The increase in prices levels stimulates production, but increases demand for factors of production. Consequently, the cost and price both increases. In some cases, wages also increase without rise in the excess demand of products. This results in fall in supply at increased level of prices as to compensate

2

the increase in wages with the prices of products. The shortage of products in the market would result in the further increase of prices.

Therefore, Ackley (1978) had provided a model of mark-up inflation in which both the factors, demand cost, are determined. Increase in demand results in the increase of prices of products as the customers spend more on products. On the other the goods are sold to businesses instead of customers, then the cost of production increases. As a result, the prices of products also increase. Similarly, a rise in wages results in increase in cost of production, which would further increase the prices of products. So according to Prof Gardner, inflation occurs due to excess of demand or increases in wage rates; therefore, by increasing the coverage of data collection points, you are incorporating all the demand effects of some of the items covered under CPI.

In a changing world, it does not take very long before an index becomes out-of-date, for two main reasons: (i) The weights no longer reflect the patterns of expenditure, output or trade for both products and coverage and (ii) New products come on to the market that did not exist before. Traditionally, index number systems have been up-dated through a process of "rebasing". This process involves revising the weights putting into consideration of more recent data, introducing new products into the data collection process and resetting the index to 100 in the new "base year".

These days, it is not however regarded as essential to re-weight and re-reference an index at the same time. Indeed, several countries update the weights and coverage of their CPI every year, thus ensuring that the index always reflects recent spending patterns. However, it would clearly be very confusing for users if the reference period (in which the index equals 100) were also changed every year. So the reference period is kept the same, and the re-weighted index is linked to the old one to form a chained Lowe-type index, (ILO, 2003).

Unfortunately, many systems put in place for producing indices do not provide facilities for regular re-weighting, with the result that re-weighting (or rebasing) is more difficult for National Statistical Offices to achieve. In Uganda and many other African countries, the Exercise is supposed to be done every after 5 years as recommended by United Nations and IMF. However, due to limited resources the rebasing exercise can take more than the recommended 5 years, UBOS (2008).

1.1.3 Conceptual perspective

The Consumer Price Index (CPI) is a measure of the change in prices paid over time for a fixed market basket of goods and services, UBOS (2008). The Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them ILO (2003). In Uganda, the CPI is compiled by the Uganda Bureau of Statistics and dates back to 1960s and has undergone several general rebasing or revisions. For any chosen base period, a basket is fixed by selecting goods and services together with their relative importance within the basket. The relative importance of a product or a group of products in the basket is referred to as the weight. The list of goods and services together with their respective weights in the basket are fixed at the base period so that changes in the CPI entirely reflect a pure price change. The selected goods and services together with their weights indicate the consumption expenditure pattern of the households during that period, (UBOS, 2008).

The weights establish the impact that a particular price change will have on the overall CPI. These weights are mainly derived from the results of household consumption expenditure surveys. As a major source of data, such surveys should be normally conducted for a period, of at least twelve consecutive months. Households tend to spend more on some products and less on others. As a result, price movements for different items would have different impacts on given households.

As time goes on, however, household consumption patterns change due to factors such as changes in the demographic composition or social economic characteristics, changes in government policies, changes in technological advancements, among other factors. Thus, there is always a need to update the CPI basket of goods and services together with their respective weights. This can only be done during the general rebasing of the CPI.

General Rebasing of the CPI Involves a number of processes undertaken to ensure that an index reflects the current consumption pattern of goods & services consumed by households. Rebasing also ensures that the CPI is representative of the Households whose change in the cost of expenditure it intends to measure. General

rebasing also involves the introduction of newly recommended best practices of compiling the CPI.

1.2 Problem Statement

According to ILO (2003), the geographic scope of the Consumer Price Index should be defined well to include the appropriate target population. Therefore, during the rebasing of CPI from 2005/06 base year to 2009/10 base year, there were changes in geographical coverage. Mbarara regional centre was split into two centres with Mbarara remaining and Fort Portal introduced.

In their study, Nsubuga et al. (2012) assessed the robustness of the Kampala Consumer Price Index (CPI) by looking at inflation trends of Kampala with neighbouring urban centres. The study showed that there was no significant difference between the two trends of inflation. The study, however, did not look at the effects of introducing another regional centre on the inflation trends in the country. This thesis research was to study the effects of introducing Fort Portal as a new Centre on the National and Regional inflation trends in Uganda.

1.2.1 Research question

Since the study involved the expansion of data collection coverage of Consumer Price Index (CPI) in the country, the research question is; what are the effects of geographical expansion of consumer price index on inflation and its related components in Uganda?

1.3 Purpose of Study

The purpose of this study was to assess the effects of introducing Fort Portal regional urban centre in CPI data collection on inflation trends in Uganda.

1.4 Objectives

The objectives of the study were to:

i. Assess whether there is a significant difference in National Headline inflation after expanding the coverage of CPI data collection.

ii. Assess whether there is a significant difference in Core inflation after expanding the coverage of CPI data collection.

iii. Examine whether there is a significant difference EFU inflation after expanding the coverage of CPI data collection.

iv. Evaluate whether a significant difference exists in Food crops inflation after expanding the coverage of CPI data collection.

v. Investigate whether there is a significant difference between Mbarara and Fort Portal Inflation trends.

1.5 Hypothesis

In this study, the null hypothesis H_0, states that both inflation estimates with and without improved coverage provide the same analytical results. $H_0: \mu=\mu_0$ and $H_a: \mu\neq\mu_0$

In order to achieve the objectives of this study, the following null hypothesises were tested;

i. There is no significant difference in National Headline Inflation before and after expanding the coverage of CPI data collection.

ii. There exists no significant difference in Core Inflation before and after expanding the coverage of CPI data collection.

iii. There is no significant difference in EFU Inflation before and after expanding the coverage of CPI data collection.

iv. There exists no significant difference in Food Crops Inflation before and after expanding the coverage of CPI data collection.

v. There is no significant difference in inflation trends for Mbarara and Fort Portal.

1.6 Scope

The study is based on monthly data from July 2011 to November 2016 and covers the consumer price index and related inflation trend for Uganda. The data was obtained from Uganda Bureau of Statistics as secondary data under the Prices Section of Macroeconomic Statistics Directorate.

6

1.7 Significance of the study

This study sets itself apart from generic economic researches that have been done before because; it combines the tools of econometrics, mathematics and statistics to analyse a statistical phenomenon: inflation before and after geographical expansion. This study will contribute immensely to the overall goal of Uganda's macroeconomic policy, in particular price stabilization policy. It will provide a range of analytical tools towards a better understanding of rebasing and inflation path in Uganda. The study will also statistically enrich and add to the already existing economic statistics wealth in the area of price and Inflation for future.

Inflation changes represents one of the main economic challenges for the economic policy and the responsibility of achieving and maintaining it has been entrusted to the central banks, and in Uganda the task rests with the Bank of Uganda (BOU). Price stability has such high priority within economic policy because as part of the financial framework for a country's economic activity it ensures stable and predictable conditions which in turn have a positive impact on economic activity and the employment rate. To perform this task, Central Banks relies on economic analyses, such as this study, to make informed monetary policy decisions. Principally, these analyses focus on assessing the effect of rebasing Consumer Price Index (CPI) and economic activity developments and the factor assumed to propagate them.

This study is vital in that it will further assist in recognizing that expansion of geographic coverage of the CPI improves the measurement of the Consumer price index at both regional and national level.

1.8 Operational definition of terms

Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food and medical care. It is calculated by taking price changes for each item in the predetermined basket of goods and averaging them. Changes in the CPI are used to assess price changes associated with the cost of living; the CPI is one of the most frequently used statistics for identifying periods of inflation or deflation.

Inflation is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling. Central banks attempt to limit inflation, and avoid deflation, in order to keep the economy running smoothly (UBOS, 2015).

Elementary aggregate, the smallest aggregate for which expenditure data are normally available and used for CPI calculation to compute an elementary price index. The consumption expenditures associated with the elementary aggregates are used to weight the elementary price indices to obtain higher level indices, (CPI Manual, 2009)

Weight, a factor by which a component is multiplied to reflect the level of consumers' expenditure on that component, (CPI Manual, 2009).

Coverage, those transactions which it is possible to identify and measure in practice. This is determined by the expenditure categories for which weights are compiled.

Jevons price index, an elementary price index defined as the weighted geometric average of the sample price relatives.

Laspeyres price index, a basket index in which the basket is composed of the actual quantities of goods and services in the earlier of two periods to be compared (the price reference period).

COICOP, Classification of Individual Consumption by Purpose, is a nomenclature developed by the United Nations Statistics Division to classify and analyse individual consumption expenditures incurred by households, non-profit institutions serving households and general government according to their purpose. It includes categories such as clothing and footwear, housing, water, electricity, and gas and other fuels.

Reference base, the period in which the CPI is given a value of 100.0. The CPI is currently on a reference base of 1989-90. The reference base should not be confused with the weighting period.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Review

The Encyclopaedia Britannica states that "Inflation is generally thought of as an inordinate rise in the general level of prices" (1988). The New Palgrave: A dictionary of Economics (1987) quotes Laidler and Parkin (1975) to define inflation as "a process of continuously rising prices, or equivalently, of a continuously falling value of money" (1987). Moreover, "Since there are many different ways of measuring prices, there are also many different measures of inflation. The most commonly used measures in the modern world are the percentage rate of change in a country's Consumer Price Index or in its Gross National Product deflator" (New Palgrave: A dictionary of Economics, 1987).

Murali (2004) states that the word inflation owes its origin to the Latin word inflare, which literally means "to blow into", from flare, "to blow". This is an accurate description of the current understanding of inflation: an unsubstantiated increase in prices, i.e. not reflecting changes in relative scarcity. Over many centuries unsubstantiated increases in prices occurred, with the related problems of containing such increases. In this sense "Inflation is both a very old problem and a very new one. If we look back in history, we discover many inflationary periods. Diocletian tried (in vain) to curb a Roman inflation in the fourth century A.D.; between 1150 and 1325, the cost of living in medieval Europe rose fourfold; between 1520 and 1650, prices again rose between 200 and 400 per cent, largely as a result of gold pouring into Europe from the newly opened mines of the New World. In the years following the Civil War ... [in the United States] ... the South experienced a ferocious inflation, while prices in the North doubled; during World War I, prices in the United States doubled again" (Heilbronner, 1975). In many instances inflation was, however, followed by subsequent periods of deflation. In the United States, for instance, the " ... producer price index in 1943 was slightly below its 1810 value" (Haslag, 1997).

Diocletian was not content with half measures in containing inflation. He fixed the maximum prices at which beef, grain, eggs, clothing and other articles could be sold, and prescribed the death penalty for anyone charging higher prices. This is a very

early example of direct price controls aimed at containing price increases, but failed so miserably that it had to be abandoned after much blood was shed.

The current understanding of the word inflation is contrasted with its earlier meanings by Bryan, who states that "for many years, the word inflation was not a statement about prices but a condition of paper money – a specific description of a monetary policy. Today, inflation is synonymous with a rise in prices, and its connection to money is often overlooked" (Bryan, 1997). Bryan also states that "what was once a word that described a monetary cause now describes a price outcome. This shift in meaning has complicated the position of anti-inflation advocates. As a condition of the money stock, an inflating currency has but one origin – the central bank – and one solution – a less expansive money growth rate. But as a condition of the price level, which may have originated from a variety of things … the solution to – and the prudence of – eliminating inflation is much less clear" (Bryan, 1997). Bryan shows that the use of the word inflation originates from the period between the mid-1830s and the Civil War in the United States, when banks issued "… bank notes, a private paper currency redeemable for a specific amount of metal. That is, if the issuing bank had it. At times, banks did not have enough gold or silver to satisfy all of their claims. Bank notes … tended to depreciate.

It is during this period that the word inflation begins to emerge in literature, not in reference to something that happens to prices, but as something that happens to a paper currency" (Bryan, 1997). Bryan states that the earliest reference to inflation to be found in the library of the Federal Reserve Bank of Cleveland comes from a publication of 1855, although "the Oxford English Dictionary shows the earliest reference to be from Barnard: The property pledge can have no tendency whatever to prevent an inflation of the currency" (1997). Whereas "the term inflation was initially used to describe a change in the proportion of currency in circulation relative to the amount of precious metal that constituted a nation's money … by the late nineteenth century, however, the distinction between currency and money was becoming blurred" (Bryan, 1997).

Bryan concludes that "without being tied to the money supply, any price increase seems to have an equal claim to the word inflation. Indeed, today we regularly read

reports of a seemingly endless variety of inflations. When the word is used as a description of the price level, an anti-inflationary policy can easily be characterised as being against any price increase, including higher wages. This is simply not the case. An anti-inflation strategy is concerned with a particular type of price increase – a rise in the general price level stemming from excessive money creation. When viewed in this light – the light provided by the word's original meaning – a zero-inflation objective for the central bank becomes a much more sensible goal" (Bryan, 1997). Bernanke et al. state that " … in the long run, the inflation rate is the only macroeconomic variable that monetary policy can affect" (1999).

Friedman states that inflation originates in modern times from "… the actions of legislators and central banks, rather than from such acts of God as specie discoveries … [implying that] … inflation is not likely to proceed very long without being anticipated, and perhaps, over-anticipated" (1972). The implication is therefore that inflation experienced by modern economies is inevitably linked to bad policies in one way or another.

2.1.1 Conceptual Framework

In accordance with its main purpose, the CPI should conceptually cover all types of consumer goods and services of significance to the reference population. The CPI should also represent all the Geographical areas within the boundaries of a country. However due to limited resources, most countries sample selected areas for inclusion in the CPI.

Conceptual Framework for expansion of Geographical coverage of CPI in Uganda
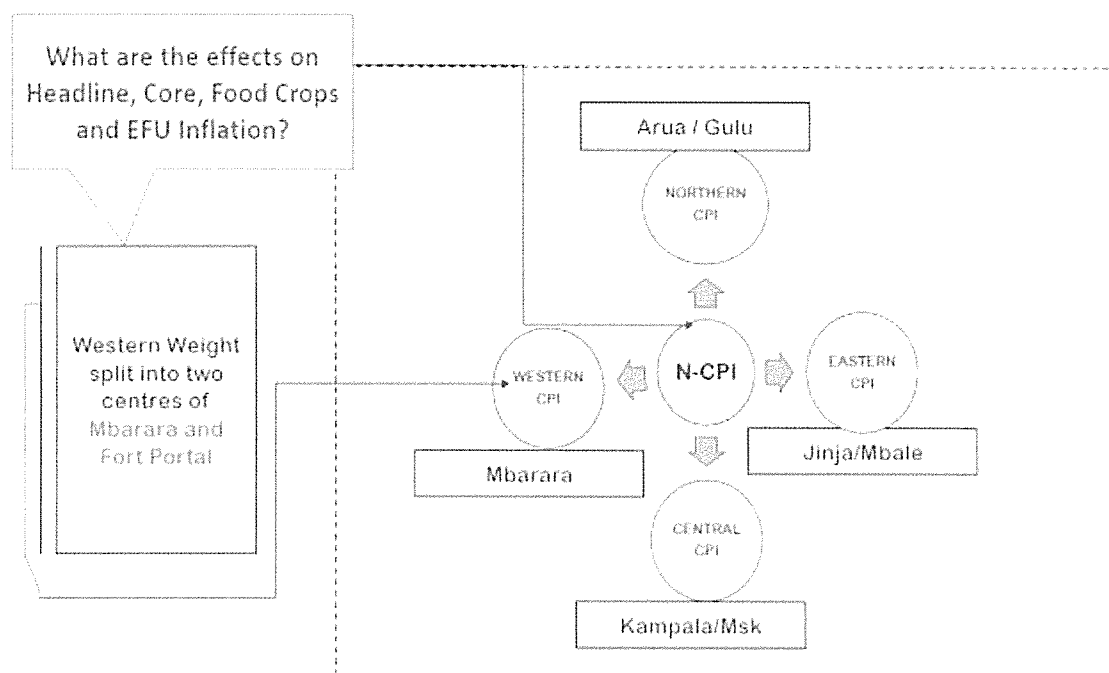
Source: Researcher's Results (2017)

Where appropriate, special aggregates may be constructed to assist those users who may wish to look at the performance of Inflation at regional level. They can also be constructed for users who would wish to exclude certain categories of goods or services for particular applications or for analysis. Whenever certain goods or services have been excluded or geographical areas changed with in the index, this should be clearly documented, (ILO, 2003).

The figure above shows the structure of National Consumer Price Index (N-CPI) coverage for Uganda. In the eastern Region, the CPI is represented by the urban centres of Jinja and Mbale, In Central region, the CPI is represented by the baskets from Kampala and Masaka, in the Western region, the CPI was being represented by the urban centre of Mbarara. In the northern region, the CPI is represented by the centres of Gulu and Arua.

During the rebasing, the Western region was split into two regional centres, Fort Portal was introduced in addition to original Mbarara Centre as shown from the conceptual framework.

The introduction of the Fort Portal Centre mean new products in the basket and expansion of Geographical coverage. This could have affected the N-CPI and its components of Core Inflation, Food crops & related Items Inflation, and Energy Fuel & Utilities Inflation.

2.2 Theoretical Review

When considering inflation in any economy, it is important that consensus should be reached about the interpretation of price increases to be classified as such, rather than adjustments in relative prices, and the measurement of such increases in terms of a predetermined indicator, as is explained in the next section. This is placed in perspective by the statement that "The issue of how best to measure inflation is very complex. Despite universal usage of the term inflation, there is no generally agreed definition that is sufficiently precise to develop an unequivocal measure" (Woolford, 2005). As inflation has been associated from the earliest years with the introduction of money into an economy, it can take the form of:

Literally debasing the currency, i.e. reducing the metal content of gold or silver coins, but not reducing their face value accordingly;

- Reducing the value of a currency in terms of another through an adjustment of the exchange rate; or

- Increasing liquidity in the economy without a commensurate increase in the production of goods and services for consumption – the form of inflation analysed in this study

Inflation may be described as a sustained rise in the general price level. Inflation is, therefore, reflected in a general and widely diffused increase in the prices of goods and services in the economy (Van der Walt, 1985). Mishkin (2004) states that "when inflation is defined as a continuing and rapid rise in the price level, most economists

13

... will agree ... that money alone is to blame." These definitions, as well as the viewpoint that inflation is a monetary phenomenon, apply in this study.

Authorities responsible for measuring price levels (and therefore price changes) in an economy periodically embark on initiatives to improve the accuracy of such measurement in terms of the CPI or similar indices. In Uganda, therefore, improvements in the coverage were incorporated during the rebasing of CPI to the base year 2009/10. If the index used for measuring price levels, and therefore to derive inflation or changes in cost of living, does not measure price levels accurately over time, the result would be distortions in the measurement of inflation and real economic activity, resulting in inaccurate adjustments to compensate for cost-of-living changes.

Of the available formulae used to compute the CPI, the most commonly used are the Laspeyres index (a fixed-weighted index), and the Paasche index where base quantities are chosen from the measurement period, rather than the base period (United Nations, 2004). A review of available literature shows, however, that the Laspeyres index is used by more developed economies than the Paasche index, e.g. Australia, Germany, New Zealand, the UK and the United States (Reserve Bank of Australia, 1998)

Over time, additional indices have been developed to measure changes in the price level. However, despite its shortcomings the Laspeyres index still has wide application as an instrument for the measurement of inflation, as two obvious virtues of the Laspeyres formula are its simplicity and its familiarity. It is easy to explain a measure to compare the price of a fixed market basket of goods over time, and anyone who has studied a bit of economics has learned about a Laspeyres index. Additional indices, other than the Laspeyres and Paasche indices (see for instance Silver and Heravi, 2003), include the following:

- Carli index, which is an evenly weighted average of the price ratios where the numerator price is the price of the commodity in the current month and the denominator price is the price of the same commodity in a base month (Diewert, 2003);

- Dutot index, the ratio of unweighted arithmetic means of base-period price-weighted price changes (Diewert, 2003);

- Edgeworth (or Marshall Edgeworth) index, " ... defined as the weighted arithmetic average of the current to base period price relatives which uses the quantities of an intermediate basket as weights. The quantities of the intermediate basket are arithmetic averages of the quantities of the base and current periods" (OECD, 2003);

- Fisher index, a geometric mean of the Laspeyres and Paasche indices (Mohr et al., 1988);

- Jevons index, which is calculated as the unweighted geometric mean of relative prices (Diewert, 2003);

- Lowe index, which measures the proportionate change between periods 0 and t in the total value of a specific basket of goods and services, which does not have to consist of the actual quantities in any period (OECD, 2003);

- Rothwell index, a short-term price index including seasonal fluctuations in monthly price changes (Van Mulligen and Oei, 2004);

- Törnqvist index (also known as the Törnqvist Theil index), a weighted geometric average of the price relatives using arithmetic averages of the value shares in the two periods as weights (OECD, 2003);

- Walsh index, "[a] price index defined as the weighted arithmetic average of the current to base period price relatives which uses the quantities of an intermediate basket as weights. The quantities of the intermediate basket are based on the geometric mean of the volumes of the base and current periods" (OECD, 2003); and

- Young index, which is calculated as " ... an expenditure share weighted average of price ratios where the numerator price is the price of the commodity in the current month and the denominator price is the price of the same commodity in a base month" (Diewert, 2003).

Despite its shortcomings, the majority of countries use Laspeyres-type indices to calculate inflation. Owing to the shortcomings in the accurate measurement of price changes highlighted above, certain countries have taken steps aimed at improving the accuracy of measuring either inflation or changes in cost of living and this study looks on one of the ways to improve the accuracy of CPI in Uganda.

In Uganda, the CPI is a current social and economic indicator that is constructed to measure changes over time in the general level of prices of consumer goods and services that households acquire, use or pay for consumption. The index aims to measure the change in consumer prices over time. This may be done by measuring the cost of purchasing a fixed basket of consumer goods and services of constant quality and similar characteristics, with the products in the basket being selected to be representative of households' expenditure during a year or other specified period. Such an index is called a fixed-basket price index.

The index may also aim to measure the effects of price changes on the cost of achieving a constant standard of living (i.e. level of utility or welfare). This concept is called a cost-of-living index (COLI). A fixed basket price index, or another appropriate design, may be employed as an approximation to a COLI.

The CPI is used for a wide variety of purposes, the two most common ones being: (i) to adjust wages as well as social security and other benefits to compensate, partly or completely, for changes in the cost of living or in consumer prices; and (ii) to provide an average measure of price inflation for the household sector as a whole, for use as a macro- economic indicator. CPI sub-indices are also used to deflate components of household final consumption expenditure in the national accounts and the value of retail sales to obtain estimates of changes in their volume.

CPIs are also used for other purposes, such as monitoring the overall rate of price inflation for all sectors of the economy, the adjustment of government fees and charges, the adjustment of payments in commercial contracts, and for formulating and assessing fiscal and monetary policies and trade and exchange rate policies. In these types of cases, the CPI is used as more appropriate measures do not exist at present, or because other characteristics of the CPI (e.g. high profile, wide acceptance, predictable publication schedule, etc.) are seen to outweigh any conceptual or technical deficiencies, (ILO, 2003).

Given that the CPI may be used for many purposes, it is unlikely that one index can perform equally satisfactorily in all applications. It may therefore be appropriate to

construct a number of alternative price indices for specific purposes, if the requirements of the users justify the extra expense. Each index should be properly defined and named to avoid confusion and a "headline" CPI measure should be explicitly identified, (ILO, 2003).

Where only one index is compiled, it is the main use that should determine the type of index compiled, the range of goods and services covered, its geographic coverage, the households it relates to, as well as to the concept of price and the formula used. If there are several major uses, it is likely that compromises may have to be made with regard to how the CPI is constructed. Users should be informed of the compromises made and of the limitations of such an index, (ILO, 2003).

The scope of the index depends on the main use for which it is intended, and should be defined in terms of the type of households, geographic areas, and the categories of consumer goods and services acquired, used or paid for by the reference population.

If the primary use of the CPI is for adjusting money incomes, a relevant group of households, such as wage and salary earners, may be the appropriate target population. For this use, all consumption expenditures by these households, at home and abroad, may be covered. If the primary use of the CPI is to measure inflation in the domestic economy, it may be appropriate to cover consumption expenditures made within the country, rather than the expenditures of households resident within the country.

In general, the reference population for a national index should be defined very widely. If any income groups, types of households or particular geographic areas are excluded, for example, for cost or practical considerations, then this should be explicitly stated.

The geographic scope refers to the geographic coverage of price collection and of consumption expenditures of the reference population and both should be defined as

widely as possible, and preferably consistently. If price collection is restricted to particular areas due to resource constraints, then this should be specified. The geographic coverage of the consumption expenditure may be defined either as covering consumption expenditure of the resident population (resident consumption) or consumption expenditure within the country (domestic consumption), (ILO, 2003).

Significant differences in the expenditure patterns and/or price movements between specific population groups or regions may exist, and care should be taken to ensure that they are represented in the index. Separate indices for these population groups or regions may be computed if there is sufficient demand to justify the additional cost.

When considerating inflation in any economy, it is important that consensus should be reached about the interpretation of price increases to be classified as such, rather than adjustments in relative prices, and the measurement of such increases in terms of a predetermined indicator, as is explained in the next section. This is placed in perspective by the statement that "The issue of how best to measure inflation is very complex. Despite universal usage of the term inflation, there is no generally agreed definition that is sufficiently precise to develop an unequivocal measure" (Woolford, 2005).

2.3 Rebasing of CPI in other countries and geographic expansion

Uganda Bureau of Statistics complies and disseminates the Consumer Price Index monthly in accordance with internationally accepted practices. The methods used and practices applied in Uganda and other members of EAC and COMESA have been largely harmonised to promote comparability among other pertinent objectives,

The CPI is computed for the relevant geographical coverage at national and regional levels, the national CPI is the outcome of the aggregation of the indices of Kampala and six other urban centres. These urban centres are spread across the eastern, western, northern and central regions of the country. Each of the urban centres has her own baskets of goods and services based on the expenditure patterns of the resident households of the area. On the other hand, Kampala has three baskets, one for the high income group, Middle Income group and the other for the low income group, (UBOS, 2016).

18

In Zambia, The first series of the Consumer Price Index was for urban households with an index reference period of 1962, (NSO Zambia, 2010). The index was compiled and published according to the High Income Wage Earners and Low Income Wage Earners. In 1997/1975 a full scale household budget survey was conducted and provided the basis for revising the weights for the Consumer Price Index. The survey covered rural as well as urban areas. However, the weights were computed from the expenditure profiles of urban households only. Price collection was restricted to urban areas along the line of rail and hence the CPI reflected changes in urban retail prices only. By the early 1990's the Government recognised the need to have a national index that was representative of the whole country and that would reflect current spending patterns of the population. In view of this, a provision was made to carry out a comprehensive house hold budget survey in 1993/1994. The 1993/1994 Household Budget Survey covered the whole country on a sample basis. A sample of 1800 households was selected. The overriding objective of the survey was to produce the weights for the new CPI and after consultation with users, it was agreed that three retail price indices were required, these would be for Urban lower –income households (lower 80% by income), urban upper-income households (top 20% by income) and rural households, (NSO Zambia, 2010).

As indicated by Komaki, 2014, Japanese CPI is revised every 5 years, including the change of the items employed in calculating CPI, their weights and base year all at once. But once the CPI growth rate of year-on-year increase announced, the numerical value of CPI does not change at all. For the reason, new base CPI growth rate is modified to correspond with the already-published CPI growth rate. In case of the change the base year of CPI for example from 1995 to 2000, decontrol of the zero rate policy was decided in spite of a big drop in prices on 11 August 2000, as the reaction function shows that inflation gap is not significant but output gap positive significant statistically.

In South Africa, since 1985, the composition of the South African CPI has been revised every five years, initially by the Central Statistical Service (CSS), which was subsequently replaced by Statistics SA. Earlier the composition was reviewed less frequently, as the revised consumer basket for 1985, introduced with effect from

November 1987, replaced a basket that was compiled for 1975. In announcing the rebasing of the consumer basket for 1985 spending patterns, the important point was made that the " ... basket of goods and services is, to some extent, fictitious since provision must be made for the purchasing abilities and preferences of all households – for example, in the housing component, elements appear for the rental of a flat, as well as for ownership costs such as interest and assessment rates" (Central Statistical Service, 1987).

When the rebasing was announced in November 1987, it was found that a recalculation of the CPI for October 1987 on the basis of both the 1975 and 1985 consumer baskets caused a decline of 3.83 per cent in the index implying that price levels of goods and services purchased by an average household were marginally overstated until October 1987 owing to the use of 1975 spending weights, rather than the 1985 weights. To account for this difference an adjustment factor was used for one year to ensure continuity in the index, (Central Statistical Service, 1987).

The most significant changes recorded in the relative importance of different goods and services as a result of the rebasing on 2000 spending patterns are spending on food that increased from 19.48 per cent in 1995 to 23.02 per cent in 2000 and housing, with a decrease from 22.45 per cent to 20.70 per cent, as well as a decline in the percentage of income spent on clothing. Moreover, by 2002 when the rebasing was announced, the comparative CPIX-figures (CPIX denotes changes in CPI in metropolitan and other urban areas excluding changes in mortgage interest costs) for 1995 and 2000 were also published. Subsequent to the announcement in 2002 of the spending weights following the rebasing in 2000, it was announced on 30 May 2003 that a systematic error was made in the revised data in respect of the residential rent component in the CPI (Statistics SA, [S.a.]). As a result of this error, the value and the rate of growth of the residential rent component in the CPI were overestimated

2.4 Inflation and rebasing

International investors and credit-risk rating agencies (see for instance Mishkin, 2004 on such agencies) take cognisance of inflation figures in assessing country credit risk. Developing economies accordingly stand to gain from initiatives to standardise the measurement and international comparison of inflation. Developing economies

20

should make every attempt within their limited economic means and resources to ensure the periodic rebasing of their inflation data. Lack of rebasing can lead to a situation where inflation is reported inaccurately by a large margin, which may solicit inappropriate advice on the conduct and implementation of macroeconomic policies. The publication of wrong inflation data, e.g. owing to a lack of timely rebasing, could also result in the implementation of inappropriate monetary policy by developing countries. This can be detrimental to international investment.

As mentioned earlier, the price index used as the basis for determining the inflation target is the CPI. Consumer prices for a representative basket are compared to a base year and weighted by the appropriate consumption pattern, Diwa 2012. Hence, the determination of the base year and the composition of the basket are important, lest the CPI become irrelevant. The survey, generation, and rebasing of the CPI are undertaken by the independent National Statistics Office (NSO). In Philippine for example, the CPI has been rebased seven times, most recently in 2000. As stated by Diwa 2012, rebasing an index is necessary to ensure that this barometer of economic phenomena is truly reflective of the current situation. Consumer tastes and technology change over time, causing the fixed market basket of goods and services to become outmoded. To capture such changes for a more meaningful price comparison, revision or updating of the fixed market basket, the sample outlets, the weights and the base year have to be undertaken periodically. For Philippine the market basket used in the construction of the 2000 CPI was drawn from the results of the updating activity of the 1994 market basket for the provinces and selected cities. The consumer items that constitute the CPI basket were determined by the nationwide Family Income and Expenditure Survey (FIES) conducted every three years by the NSO.

In Philippine, the year 2000 was also perceived to be a more politically, economically and socially stable year. To account for the geographical differences in consumption patterns, weights were generated for each province or city. The basket weight for each item of expenditure is a proportion of that item to total national expenditure. Likewise, geographical weights were also determined where the weight of a region

is equal to the sum of the weights of the provinces belonging to that region. The sum of the weights for the region is equal to the national weight.

The use of the CPI as the basis for policy setting under inflation targeting is largely governed by pragmatic considerations. The frequency with which it is published and the fact that it is an index readily understood by the public rendered its adoption appealing. The GDP deflator, while output-based, is available only on a quarterly basis and is subject to periodic revisions in the national income accounts. This makes it less reliable for target-setting purposes.

As part of a new framework that rests on anchoring inflation expectations towards the desired inflation path of the Philippine, the inflation target naturally has to be based on a price index with which the public is familiar. This aids in the explanation of the underlying factors that affect inflation performance. In this regard, building a constituency of support for the price stability objective of monetary policy will be facilitated. Given the usual asymmetry in perception about relative price changes and overall price changes, public understanding of the price index used for target-setting could be anouced as well. In this regard, the CPI has an inherent advantage. CPI inflation also tends to be affected by the transitory effects of volatile price movements of certain commodities.

Temporary shocks or disturbances that are due to factors outside the direct control of economic policy (eg oil price shocks) may cause fluctuations in CPI inflation that may not necessarily require a monetary response. As such, the Philippine also monitors "core" inflation to supplement its analysis of the appropriate stance of monetary policy. When the impact of such disturbances on price data is eliminated, core or underlying inflation serves as a useful alternative indicator of the path of inflation. Core inflation is computed by excluding selected unprocessed food and energy-related items from the CPI basket. Excluded items account for 18.5 percent of the CPI. Despite the reduction in the share of food over the years, it still accounts for a large part of the CPI.

In their study on implications of rebasing the CPI, Sharon and Barak (1999), approached the study by examining a pair wise correlation between the two series. The made the conclusions by saying that if the series are identical they will be perfectly correlated. They further said that for a correlation coefficient of less than one, provides an evidence of differences between pairs

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter looks at the Research design of the study including the nature and source of data used, the model specifications, description of research variables, techniques of data analysis and limitations of the study.

3.1 Research Design

In this study, a causal-comparative design (Ex-Post Facto) was employed. This method seeks to find relationships between independent and dependent variables after an action or event has already occurred, Creswell (2003). The researcher's goal was to determine whether the independent variable affected the outcome, or dependent variable, by comparing two or more groups of data sets. The design procedure was that inflation rates before geographic expansion was the control and after the expansion was the experimental group. The independent variable differentiating the data sets was the geographical Coverage, since each data set represents a different population area.

3.2 Nature and Source of data.

The main data source of computation of weights was the Uganda National House Hold Survey (UNHS IV). This was used to determine the regional and centre weights of the Ugandan CPI. However, the main objective of the UNHS IV was not to update the CPI weights, but to monitor the welfare of the households. Thus, additional data sources were used to supplement the UNHS data. One of the additional sources of information was a mini Household Budget Survey (HBS) that was conducted to supplement the UNHS IV data.

The main objectives of the mini HBS were to decompose the items reported in aggregate form during the UNHS IV 2009/2010, to identify specific products and items consumed by households, to identify outlet types and concrete outlets visited by resident households and to determine expenditures made by resident households outside the economic territory of Uganda, (UBOS, 2015). Consumer Price data for all regions covering all consumption products was obtained from Uganda Bureau of

Statistics as secondary data produced under the Prices Section of Macroeconomic Statistics Directorate.

3.3 Model Specification

3.3.1 Computation of Consumer Price Index (CPI).

All the new series of CPI Numbers in Uganda are compiled at the Uganda Bureau of Statistics headquarters. Compilation of CPI numbers generally consists of two stages Calculation of price indices for Elementary Aggregates (item level indices) and the aggregation of these elementary price indices to higher level indices using the weights associated with each level.

As indicated in the CPI user Manual, for Lower Level indices (Elementary Aggregates), where the specifications are different in terms of units, quality, different price schedules, prices relative of each product specification (base year average price and current Month) is worked out. Jevons index, defined as the unweighted geometric mean (GM) of the price ratios, which is identical to the ratio of the unweighted geometric mean prices is used at this level, equation (3.1), (UBOS, 2015).

$$\text{GM} = I^{t/0} = \left(\prod \frac{P_i^t}{P_i^0} \right)^{1/n} = \frac{\left(\prod P_i^t \right)^{1/n}}{\left(\prod P_i^0 \right)^{1/n}} \dots \dots \dots \dots (3.1)$$

Where,

P_i^t = price of an item i in period t

P_i^0 = price of an item i in base period

n = number of items in the Elementary Aggregate Level.

Higher-level price indices are constructed as weighted averages of elementary aggregate indices. When compiling the upper-level indices by aggregating the elementary aggregates or the micro-indices, the compiler faces similar choices with regards to which index formula to use as in the case of micro-indices. These various formulae differ in terms of the information content of the weighting system used to compile index values. In Uganda, modified Laspeyres formula is used for aggregation of indices, equation (3.2), (UN 2004, UBOS 2015).

$$P^{t/0} = \sum W_i^b \frac{P_i^t}{P_i^0} \quad . \quad \textit{where,} \quad \sum W_i^b = 1 \quad \dots\dots\dots\dots\dots\dots\dots \quad (3.2)$$

Where,

$P^{t/0}$ = denotes the overall CPI, or any higher-level index, from period 0 to t;

P_i^0 = price of an item i in base period

P_i^t = price of an item i in period t

W_i^b = is the weight attached to each of the elementary price indices

3.3.2 Inflation Measurement

The CPI is a statistical estimate constructed using the prices of a sample of representative items whose prices are collected periodically. The periodic percentage change in the CPI is what is used as a measure of inflation. Therefore, Inflation is the persistent rise in the general level of prices for goods and services within the economy, over a period of time. When the general price level rises, each unit of currency buys fewer goods and services, UBOS, 2012. When the Inflation announced by the office responsible for national statistics is lower than that of the previous period, it implies that rate at which prices increased in the current period is lower than the rate recorded in the previous period. Inflation can also be measured using the Retail Prices Index (RPI). Both CPI and RPI measure the prices of goods and services that consumers commonly buy. A price index includes prices of a basket of goods and services, chosen and weighted on the basis of the spending patterns of households within an economy. This measure is the change over time in the cost of purchasing a given consumption basket of goods and services bought by households during a reference period. Thus, CPI is defined more precisely as a measure of the changing cost, over time, of purchasing the base period fixed basket of goods and services.

The CPI measures the changes in the overall price of a basket of goods and services in which each item is exactly the same, according to a consumer, as the one, which was priced in previous periods. This is referred to as keeping the quantity and quality constant or as measuring a pure price change. If this were not done, it would not be possible to tell whether a change in the CPI was due to a change in the average price level or simply due to changes in quality or quantity in the products being price

surveyed. The CPI does not measure the price changes that result from improvements in goods or services. It does not also measure the changes in the quantities of goods that are being sold on the market.

Inflation can be measured in different ways. One method is to use the Implicit Price Index (IPI) often called the Gross National Product (GNP) deflator which by definition (for any year) is the ratio of GNP at current prices to the GNP at constant prices. Thus, in computation of IPI of all the goods and services produced in the economy, are involved. Another method of measuring the inflation is to use a price index. In principal, a Consumer Price Index (CPI) measures the changes over time in the level of prices of goods and services that a reference population acquires, use, or pay for consumption. The population that falls within the scope of an index is termed as the reference population, (UBOS, 2015).

In practice, a CPI measures the cost of purchasing a fixed basket of goods and services. The coverage and applicability of CPIs are generally limited to specified socio-economic groups.

$$\text{Inflation} = \left(\frac{CPI_t - CPI_{t-1}}{CPI_{t-1}} \right) \text{X } 100 \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.3)$$

Where, CPI$_t$ *= Consumer Price index in the current period*

CPI$_{t-1}$ *= Consumer Price index in the previous period*

From the viewpoint of a consumer, inflation concerns the purchasing power of his money. Under the assumption of a given utility function for the consumer, the CPI for period t+1 measures how much more or less money the consumer needs to spend in order to be as well off as in period t. Theoretically, a comprehensive and objective measure of inflation is a price index that measures changes in the monetary value of an entire set of consumption goods and services purchased by households in monetary transactions.

27

In measuring inflation as shown in equation (3.3), three elements are involved- the goods and services must be individual consumption goods and services as defined in the System of National Accounts (SNA), the expenditure must be incurred by households and not by other units, and the expenditure must be incurred in monetary transactions. The coverage of an ideal and comprehensive measure of inflation is thus, much more specific than that of a CPI. Inclusion of additional items that are not part of household consumption expenditure, in a CPI for arriving at a comprehensive measure of inflation, has got the danger of leading to degeneration of the CPI into a vague and ad-hoc short-term price index that lacks any clear meaning, coverage or purpose, (UBOS, 2015).

3.4 Description of research variables

3.4.1 Headline Inflation

Headline inflation is a measure of the total inflation within an economy, including commodities such as food and energy prices (e.g., oil and gas), which tend to be much more volatile and prone to inflationary spikes. Headline inflation may not present an accurate picture of an economy's inflationary trend since sector-specific inflationary spikes are unlikely to persist. The Headline Inflation is computed from The Headline Consumer Price Index. This index measures inflation in Uganda when all items in the basket are included.

3.4.2 Core Inflation

The Underlying/Core Inflation measures relative changes in prices for all goods and services excluding food crops, milk and tobacco leaves. Those items are excluded to eliminate the effects of drought and other weather changes that cause irregular price fluctuations. Prices of imported fuels, administered prices of electricity and metered water are also excluded while compiling the Underlying/Core Consumer Price Index. This is the index that is highly used in the country to monitor monetary policies and inflation targeting.

3.4.3 Food Crops

Uganda's food crops include Staple foods like Matoke, Irish Potatoes, Sweet Potatoes, cassava and vegetables like beans, peas, green vegetables and all fruits. This group of Elementary Aggregates contributed 10.2 percent in the rebased

Consumer Price Index. The Food Crops Index is an index that incorporates all goods whose production, supply and prices are more volatile with weather changes compared to the rest of the products, (UBOS, 2015).

3.4.4 Energy, Fuel and Utilities (EFU)

Energy Fuel and Utilities (EFU) was, before rebasing, being computed with six (6) components (Petrol, Diesel, Paraffin, Gas, Electricity and Metered water). The total weight of the group is 7.45 percent. After rebasing, EFU is now computed with nine (9) components (Petrol, Diesel, Paraffin, Gas, Electricity, Metered water, Un-Metered water, Charcoal and Firewood), (UBOS, 2015).

3.5 Techniques of data analysis

Analysis of data involved a variety of descriptive and inferential statistics. The means which indicated the average performance of inflation trends with improved coverage and that with no improved coverage was computed. The standard deviation, which indicated how spread out a set of inflation rates was around the mean, that is, whether the rates are relatively homogeneous or heterogeneous around the mean was calculated. Finally the t- test, used to determine whether the means of two inflation trends are statistically different from one another was also computed.

Fort Portal Centre was introduced in the National CPI by getting its weight separate from Mbarara regional Centre. Products, whose consumer prices were collected from this regional centre were incorporated into the elementary aggregates where they belong. The indices were computed as described above at both the elementary and higher levels, the Jevons approach at the elementary level and the Weighted Average approach at the higher level, (ILO, 2004).

By ignoring Fort Portal and its products, the regional Centre of Mbarara remained with its products and the weight of Fort Portal was added to the centre at each corresponding Elementary level. Indices were computed for a combined Mbarara and Fortportal Centre and aggregated for all other existing regional centres level to get a new National CPI.

The two CPI series were compared using student t-test conducted at 95% level of significance to determine the effects on the National CPI if the geographical area is

expanded to include a new Centre of Fort Portal. Data was analysed using Statistical Data Analysis Tool Pack (DATP) in Excel.

3.6 Decision rule and significance level

The study employed Student's t-test for the comparison of two means at 95% Confidence Level. If the p-value associated with the t-test is not small ($p > 0.05$), then the null hypothesis is not rejected, otherwise the null hypothesis is rejected.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Introduction

The chapter presents the findings of introduction of a new regional Centre to the National CPI and related Inflation trends.

4.2 Weights by Geographical areas and Income Groups

The Basket of Kampala High Income registered a highest weight of 31.4 percent in the rebased CPI compared to 30.5 percent for the old CPI. This was followed by Kampala Middle Income basket. Other regions contributions were as per indicated in Figure 4.1.
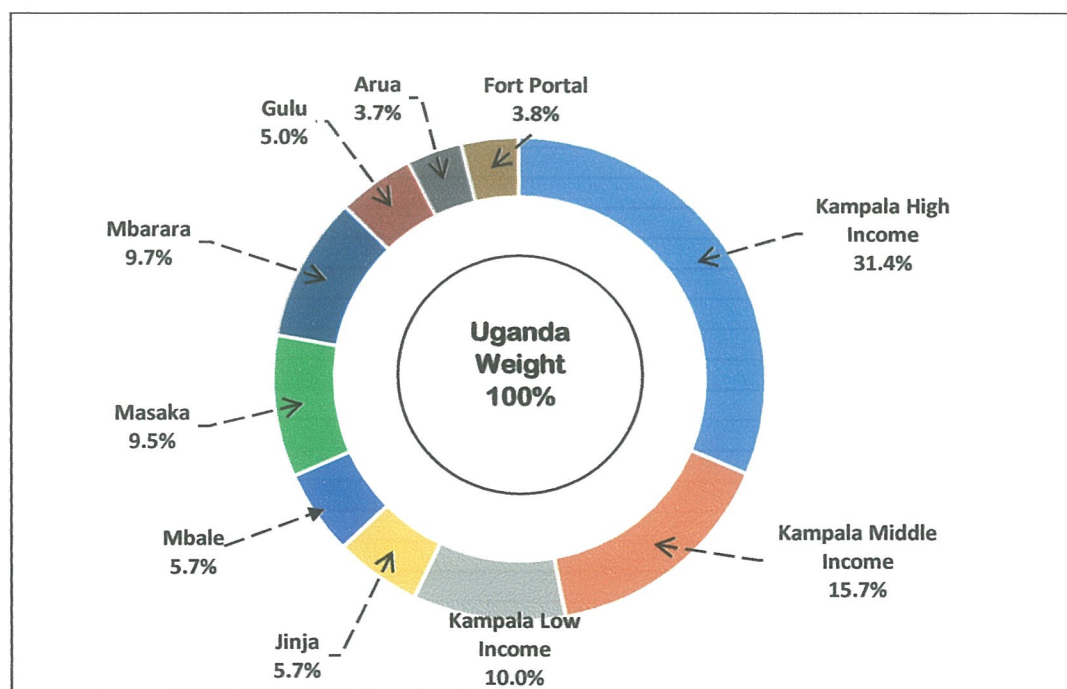
Figure 4.1: Weights generated for the rebased CPI by Region for Uganda.

Source: UBOS

The regional Centres of Mbarara and Fortpotal contributed 9.7 percent and 3.8 percent respectively. When Fort Portal regional Centre was excluded in the analysis, Mbarara took the combined weight of 13.5 percent.

4.3 Effects of Expanding CPI coverage on Headline Inflation

According to Table 4.1 the Monthly Headline inflation is significantly different across the two data sets (P (T<=t) two-tail = 0.0096 is less than 0.05). The research, therefore, rejects the null hypothesis that the means of National Headline Inflation before and after expanding the coverage of CPI data collection are the same.

Table 4.1: t-Test: Paired Two Sample for Means using Monthly Headline Inflation

	Headline- (No expansion)	Headline (Expansion)
Mean	7.8327	7.8732
Variance	43.7424	44.4158
Observations	65.0000	65.0000
df	64.0000	
P(T<=t) two-tail	**0.0096**	
t Critical two-tail	1.9977	

Source: Researcher's Results (2017)

4.4 Effects of Expanding CPI coverage on Core Inflation

The monthly core inflation is significantly different across the two inflation trends as shown on Table 4.2, (P (T<=t) two-tail = 0.0003 is less than 0.05). The research, therefore, rejects the null hypothesis that the means of Core Inflation before and after expanding the coverage of CPI data collection are the same.

Table 4.2 t-Test: Paired Two Sample for Means using monthly Core Inflation

	Core (No expansion)	Core (Expansion)
Mean	7.5880	7.6148
Variance	34.1121	34.2059
Observations	65.0000	65.0000
df	64.0000	
t Stat	- 3.7829	
P(T<=t) two-tail	**0.0003**	
t Critical two-tail	1.9977	

Source: Researcher's Results (2017)

4.5 Effects of Expanding CPI coverage on Food Crops and related Items Inflation.

Table 4.3 shows that the monthly inflation of food crops and related items is not significantly different across the two inflation trends, (P (T<=t) two-tail = 0.1361 is greater than 0.05). The research, therefore, fails to reject the null hypothesis that the means of Food Crops Inflation before and after expanding the coverage of CPI data collection are the same. This means that the rate at which National prices are changing in food crops and related items is more-or-less the same in National CPI when the geographical coverage is kept constant.

Table 4.3 t-Test: Paired Two Sample for Means using monthly Food Crops and related Items Inflation.

	Food Crops- (No expansion)	Food Crops (Expansion)
Mean	9.2359	9.3788
Variance	129.6490	137.2732
Observations	65.0000	65.0000
df	64.0000	
t Stat	- 1.5097	
P(T<=t) two-tail	**0.1361**	
t Critical two-tail	1.9977	

Source: Researcher's Results (2017)

4.6 Effects of Expanding CPI coverage on Energy, Fuel and Utilities (EFU) Inflation.

Energy Fuel and Utilities (EFU) was, before rebasing, being computed with six (6) components (Petrol, Diesel, Paraffin, Gas, Electricity and Metered water). The total weight of the group is 7.45 percent. After rebasing, EFU is now computed with nine (9) components (Petrol, Diesel, Paraffin, Gas, Electricity, Metered water, Un-Metered water, Charcoal and Firewood), (UBOS, 2015)

Table 4.4 shows that the monthly energy, fuel and utilities inflation is not significantly different between the two inflation trends (P(T<=t) two-tail = 0.1361 is greater than 0.05). The research, therefore, fails to reject the null hypothesis that the

means of National EFU Inflation before and after expanding the coverage of CPI data collection are the same.

Table 4.4 t-Test: Paired Two Sample for Means using monthly EFU inflation

	EFU- *(No expansion)*	EFU *(Expansion)*
Mean	9.0586	9.1114
Variance	148.6801	151.3432
Observations	65.0000	65.0000
df	64.0000	
t Stat	-1.5093	
P(T<=t) two-tail	**0.1361**	
t Critical two-tail	1.9977	

Source: Researcher's Results (2017)

4.7 Effects of expanding CPI coverage with in the western region.

The effects with in the western Region was also studied and the results in Table 4.5 indicate that there is a significant difference between Mbarara regional Centre and Fort Portal (P (T<=t) two-tail = 0.0102 is less than 0.05). The research, therefore, rejects the null hypothesis that the means of Mbarara inflation trends and that of For Portal Trends are the same. Figure 4.1 also shows that the trends of inflation in the two urban centres are indeed different.

Table 4.5 t-Test: Paired Two Sample for Means using Mbarara and Fort Portal

	Fortportal	*Mbarara*
Mean	8.3656	7.2932
Variance	60.2108	40.1276
Observations	65.0000	65.0000
df	64.0000	
t Stat	2.6464	
P(T<=t) two-tail	**0.0102**	
t Critical two-tail	1.9977	

Source: Researcher's Results (2017)
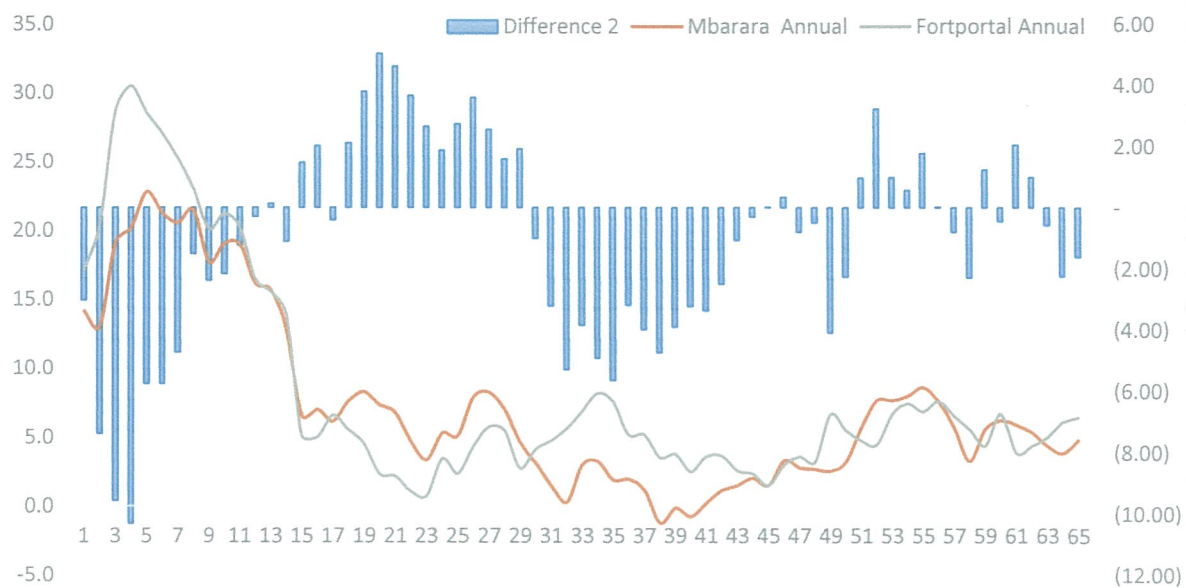
Figure 4.1: Separate Inflation trends between Mbarara and Fort Portal and corresponding differences.

CHAPTER FIVE

DISSCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter discusses the findings of chapter 4, concludes and gives recommendations in accordance to the objective of the study.

5.1 Discussions

Headline Inflation

Headline inflation is a measure of the total inflation within an economy, including commodities such as food and energy prices (e.g., oil and gas), which tend to be much more volatile and prone to inflationary spikes. Headline inflation may not present an accurate picture of an economy's inflationary trend since sector-specific inflationary spikes are unlikely to persist. The Headline Inflation is computed from The Headline Consumer Price Index. This index measures inflation in Uganda when all items in the basket are included.

Results in Table 4.1 shows that since this is a two tailed test, the result is statistically significant so the null Hypothesis is rejected and it has been disproven that the means of the two inflation trends are the same. Therefore, both Headline CPI series with Fort Portal and Headline CPI series without Fort Portal provide different analytical results.

In a study by Nsubuga et al. (2012), Assessment of the robustness of the Kampala Consumer Price Index (CPI), the headline Inflation for Kampala was not affected by introducing the the surrounding towns of Mukono, Matugga, Kyengera and Nansana. In this research, we see effects of introducing another centre at regional level on the headline inflation. A relative change in prices for all items in Fort Portal center has a significant change at national level. As stated by ILO 2003, wider geographical coverage of the index considerably increases the degree of its accuracy and validity.

Core Inflation

The Underlying/Core Inflation measures relative changes in prices for all goods and services excluding food crops, milk and tobacco leaves. Those items are excluded to eliminate the effects of drought and other weather changes that cause irregular price fluctuations. Prices of imported fuels, administered prices of electricity and metered water are also excluded while

compiling the Underlying/Core Consumer Price Index. This is the index that is highly used in the country to monitor monetary policies and inflation targeting.

To test the significance of the Core inflation before and after rebasing, a t-test was carried out. At 5 percent level of significance which equates to 95 percent level of certainty, therefore, $\alpha=$ 0.05, was set. The null hypothesis states that there is no difference between the average means of the two independent trends of Core Inflation rates in Uganda. Results in Table 4.2 shows that since this is a two tailed test, the P- value is statistically significant so the null Hypothesis is rejected and it has been disproven that the means of the two inflation trends are the same. Nsubuga et al. (2012), looked at the effect of including surrounding five towns to Kampala Centre and found out that the monthly core inflation is not significantly different across the five centres. However in this study, after expanding the geographical coverage of Uganda, it was found out that the National Core Inflation is affected by the expansion. This implies that the monthly core inflation for Uganda is now estimated better after the expansion.

Food Crops and related Items

Uganda's food crops include Staple foods like Matoke, Irish Potatoes, Sweet Potatoes, cassava and vegetables like beans, peas, green vegetables and all fruits. This group of Elementary Aggregates contributed 10.2 percent in the rebased Consumer Price Index. The Food Crops Index is an index that incorporates all goods whose production, supply and prices are more volatile with weather changes compared to the rest of the products, (UBOS, 2015).

Table 4.3 shows that the monthly inflation of food crops and related items is not significantly different across the two inflation trends. This means that the rate at which National prices are changing in food crops and related items is more-or-less the same in National CPI when the geographical coverage is kept constant. This is because the seasonality component of Fortportal and Mbarara are similar and therefore changes in prices of the food crops tend to move with similar trends. Therefore, including Mbarara food prices only in the national inflation is as good as including both western centres.

The same results were registered when Nsubuga et al. (2012), studied the effects of incorporating surrounding towns of Kampala centre to the centre's inflation trends. The study showed that the monthly inflation of food crops and related items was not

significantly different across the five centres. Which meant that the rate at which prices were changing in food crops and related items was more-or-less the same in Kampala and the surrounding towns of Mukono, Matugga, Kyengera and Nansana. This was partly because food crops were generally ferried into the city from the country side and redistributed to the surrounding towns from Kampala markets such as Owino, Nakawa, Kalerwe and a few others.

Energy, Fuel and Utilities (EFU)

Energy Fuel and Utilities (EFU) was, before rebasing, being computed with six (6) components (Petrol, Diesel, Paraffin, Gas, Electricity and Metered water). The total weight of the group is 7.45 percent. After rebasing, EFU is now computed with nine (9) components (Petrol, Diesel, Paraffin, Gas, Electricity, Metered water, Un-Metered water, Charcoal and Firewood), (UBOS, 2015).

To test the significance of the EFU inflation before and after incorporating in a new centre of Fort Portal, a t-test was carried out at 5 percent level of significance. equates to 95 percent level of certainty, therefore, $\alpha = 0.05$, was set. The null hypothesis states that there is no difference between the average means of the two independent trends of EFU Inflation rates in Uganda. The results in Table 4. 4 shows that the monthly Energy, Fuel and Utilities inflation is not significantly different between the two inflation trends, we therefore, cannot reject the null hypothesis.

Nsubuga et al. (2012), research conducted in Kampala centre and its neighboring towns, it found out that the monthly energy, fuel and utilities inflation is not significantly different across Kampala and the surrounding towns. This was because Kampala happened to be the preferred destination of most commodity traders and importers because of the huge demand and available storage. The commodities including energy, fuel and utilities are then redistributed to the neighbouring towns such as Mukono, Matugga, Kyengera and Nansana and therefore trail the price changes of the center.

5.2 Conclusions

The tests conducted presented that, the introduction of a new data collection centre of Fort Portal had a significant effect on National Inflation trends in the country as seen on the results. Therefore, including a new centre in the national CPI improved the representativeness of the price levels and movements of the Headline inflation in the country. This was because Fort Portal Centre is uniquely represented in the western side of the country. The trade activities are totally different from the Mbarara Centre especially in the manufactured goods and services.

For the Core inflation, it was concluded that the introduction of Fort Portal Centre had a significant positive effect. Since it is recommended that the CPI should cover most of the geographical areas in the country ILO (2003). Thus Expansion improves the inflation trends estimates. The difference in the inflation is because the trading pattern in Fort Portal is different from Mbarara. So adding on another urban centre improved on product coverage and thus better estimations of the core inflation at National level

There was no significant difference between Energy Fuel and Utilities (EFU) before and after the expansion of coverage of CPI. This research shows that the prices of these items are not controlled by geographic coverage of Uganda, but by a global market. This was because as these items reach the country, especially Kampala, the preferred destination of most commodity traders and importers because of the huge demand and available storage. They are then redistributed to other urban centres and a cost of transport is factored in which is a constant that will not affect price levels. This, therefore, causes the prices of these items to trail the price changes of the destination market. Moreover, utilities such us water and electricity has a uniform charge for the whole country and thus the price changes are the same throughout the country.

In the same way, the evaluation of Food Crops Inflation trends before and after expansion of CPI coverage indicated that there exists no significant difference between the two trends. Showing that the addition of Fort Portal Centre to Mbarara did not have any effect on the Food Crops CPI trends in the region. Thus the price

changes in the two urban centres in Food Crops are the same and this could be because of the same climatic conditions of the western region. Therefore, including Mbarara food prices in the national inflation is as good as including both western centres.

Comparing the two centres of Mbarara and Fort Portal Centres gave a clear distinction of the inflation trends in the separate urban centres. This implies that residents of Fortportal region and Mbarara region can use their corresponding inflation trends for wage indexation and other areas of indexation. Since it was already seen that the food crops have on effect on inflation of the two urban centres, it implies that the differences are brought by core items in the CPI. Thus the prices of tradable goods and services in Fortportal and Mbarara are totally different. Therefore, independent monitoring was needed.

5.3 Recommendations

Since the study revealed that there were changes in headline inflation due to expansion of coverage, the Uganda Bureau of Statistics should continue expanding the coverage of CPI items especially in the far eastern part of the country which is not uniquely represented in the national CPI.

The study also showed that there was a significant difference in the core inflation. This indicates that the core items in different urban centres have unique prices and thus more urban towns should be brought on board in Consumer Price index (CPI) computation to further improve on the accuracy of inflation estimates in the country.

The study also showed that both Food Crops & Related Items and EFU inflation trends are not affected by expansion of coverage, thus emphasis in expansion should be put on improving the core Inflation trends which is mostly used by policy makers in the country.

5.4 Contribution to knowledge

This research has filled the gap of the effects of geographical coverage of CPI and its effects on Inflation trends in Uganda. This study sets itself apart from generic economic researches that have been done before because; it combines the tools of econometrics, mathematics and statistics to analyse a statistical phenomenon: inflation before and after geographical expansion. This study contributed immensely

to the overall goal of Uganda's macroeconomic policy, in particular price stabilization policy. It provided a range of analytical tools towards a better understanding of geographical expansion and inflation path in Uganda. The study will also statistically enrich and add to the already existing economic statistics wealth in the area of price and Inflation for future.

5.5 Suggestions for further research

Due to the fact that these results of the rebased CPI are only reflecting the urban expenditure patterns of Uganda, it is recommended that a study be carried out including the rural expenditure patterns. This research recommends that Uganda Bureau of Statistics (UBOS) should begin the process of computing Rural Inflation trends in the country which will give a clear view of a complete picture of how inflation trends behave in the country.

5.6 Limitations

The consumer price index, or CPI, is considered one of the most fundamental and critically important economic indicators, not only in Uganda but in virtually every other nation as well. The release of monthly CPI numbers almost invariably has a significant impact on the financial markets, and unexpectedly high or low numbers often wreak investment havoc. But despite the CPI being followed so relentlessly, the index is far from perfect as a measure of inflation.

The CPI is a weighted index of goods purchased by consumers. While it may constitute a relatively good measure of price changes in the specific goods purchased in its "basket," a limitation of the CPI is that the consumer goods it considers, even if Fort Portal was added, do not provide an index that measures all production or consumption in the economy. Therefore, as a basic economic barometer, the CPI is inherently flawed.

Even the Uganda Bureau of Statistics that produces the CPI freely admits that the index does not factor in substitution. The economic reality is that when certain goods become significantly more expensive, many consumers find less expensive substitutes. The CPI does not take this common consumer practice into account but

instead presents numbers assuming consumers are continuing to buy the same amount of increasingly expensive goods.

Since the study was carried out on a basket of Goods and services purchased during the FY 2009/10, new products represent another weakness in the CPI. Products do not become included in the CPI's basket of goods purchased until they become virtually staple purchases by consumers. So even though new products may be widely purchased and represent considerable consumer expenditures, they may still be years away from possible inclusion in the calculation of the CPI.

Because the CPI is purposely constructed with a focus on the buying habits of urban consumers, it has often been criticized as not providing an accurate measure of either prices of goods or consumer buying habits for more rural areas. The CPI also does not provide separate reports according to different demographic groups.

Any pure price index is flawed by the fact it does not factor in changes in the quality of goods purchased. Consumers may gain a net benefit from purchasing a product that has risen in price as a result of significant improvements in the quality of the product and the purposes it serves. But the CPI has no standard for measuring such quality improvements and therefore reflects only the increase in price without any appreciation for additional benefits to consumers.

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APPENDIX TABLES

Appendix 1 : Uganda's Inflation Rates with Mbarara and Fort Portal Combined; July 2011 - November 2016

Month	Headline	Food Crops	EFU	Core
Jul-11	17.65	32.31	21.70	15.63
Aug-11	17.31	25.12	15.81	16.56
Sep-11	22.51	30.05	32.51	20.69
Oct-11	23.97	30.57	36.35	22.01
Nov-11	24.28	27.11	36.86	22.74
Dec-11	23.56	22.10	37.58	22.43
Jan-12	22.77	20.02	41.35	21.40
Feb-12	24.34	38.49	40.46	21.04
Mar-12	21.09	26.77	36.19	18.89
Apr-12	19.04	27.27	28.73	16.96
May-12	17.92	22.85	29.34	16.17
Jun-12	14.86	18.34	28.62	13.13
Jul-12	10.33	12.63	18.39	9.24
Aug-12	9.80	15.72	23.00	7.83
Sep-12	4.99	8.76	7.58	4.25
Oct-12	4.59	4.69	4.54	4.58
Nov-12	4.53	8.30	4.70	4.04
Dec-12	4.34	6.63	3.23	4.18
Jan-13	3.58	1.50	0.34	4.18
Feb-13	2.16	- 12.45	0.92	4.42
Mar-13	3.06	- 11.29	2.38	5.27
Apr-13	3.19	- 11.58	4.26	5.37
May-13	3.97	- 6.25	3.68	5.50
Jun-13	5.40	- 0.85	1.11	6.71
Jul-13	6.13	4.94	3.82	6.53
Aug-13	7.13	14.33	2.13	6.71
Sep-13	7.56	16.60	3.78	6.77
Oct-13	6.76	14.93	1.98	6.21
Nov-13	5.92	7.27	1.48	6.21
Dec-13	5.44	8.24	2.05	5.45
Jan-14	5.19	13.80	1.64	4.52
Feb-14	4.59	18.12	1.44	3.28
Mar-14	5.05	21.61	0.69	3.43
Apr-14	4.10	18.90	0.06	2.59
May-14	3.26	11.52	0.53	2.45
Jun-14	2.44	7.96	2.32	1.75
Jul-14	2.34	3.64	- 0.38	2.45
Aug-14	1.82	- 2.86	0.77	2.59
Sep-14	1.46	- 4.67	1.28	2.36
Oct-14	1.42	- 1.37	3.33	1.62
Nov-14	1.90	1.08	3.13	1.89
Dec-14	1.99	1.16	3.72	1.92
Jan-15	3.00	- 1.37	2.69	3.60
Feb-15	2.92	- 2.00	0.78	3.82
Mar-15	3.32	- 0.60	1.10	4.12
Apr-15	4.74	5.08	1.26	5.03
May-15	4.84	9.70	1.60	4.48

47

Appendix 1 : Uganda's Inflation Rates with Mbarara and Fort Portal Combined; July 2011 - November 2016

Month	Headline	Food Crops	EFU	Core
Jun-15	4.99	6.93	1.69	5.06
Jul-15	5.32	5.18	3.41	5.53
Aug-15	5.64	3.15	3.10	6.23
Sep-15	6.74	10.02	2.42	6.73
Oct-15	7.84	15.35	6.49	6.97
Nov-15	8.10	15.27	8.89	7.07
Dec-15	8.50	15.70	9.33	7.49
Jan-16	7.36	12.21	8.86	6.61
Feb-16	6.89	6.48	9.87	6.65
Mar-16	6.20	0.18	8.15	6.86
Apr-16	4.95	- 5.57	7.51	6.29
May-16	5.36	- 5.97	6.81	6.91
Jun-16	5.87	- 2.17	7.10	6.86
Jul-16	5.24	3.37	3.10	5.69
Aug-16	4.83	5.13	3.36	4.94
Sep-16	4.18	4.54	4.22	4.13
Oct-16	4.03	1.04	- 2.19	5.10
Nov-16	4.52	6.65	- 4.13	5.12

Source: Uganda Bureau of Statistics

Appendix 2: Western region (Mbarara and Fort Portal) inflation rates and their combined Rates: July 2011 - November 2016.

Month	Mbarara	Fort Portal	Combined
Jul-11	14.14	17.15	14.04
Aug-11	13.03	20.42	12.83
Sep-11	19.12	28.70	19.32
Oct-11	20.17	30.50	20.27
Nov-11	22.79	28.55	23.01
Dec-11	21.32	27.07	21.50
Jan-12	20.53	25.26	20.74
Feb-12	21.52	23.03	21.72
Mar-12	17.70	20.09	17.90
Apr-12	19.07	21.23	19.13
May-12	18.98	20.22	18.97
Jun-12	16.16	16.45	16.13
Jul-12	15.67	15.55	15.59
Aug-12	12.79	13.90	12.89
Sep-12	6.54	5.08	6.63
Oct-12	6.99	4.98	6.95
Nov-12	6.16	6.56	6.10
Dec-12	7.60	5.50	7.45
Jan-13	8.27	4.49	7.92
Feb-13	7.32	2.29	7.06
Mar-13	6.79	2.17	6.68
Apr-13	4.70	1.05	4.67
May-13	3.35	0.70	3.34
Jun-13	5.27	3.40	5.32
Jul-13	5.08	2.34	5.16
Aug-13	7.90	4.32	7.96
Sep-13	8.26	5.72	8.27
Oct-13	7.01	5.44	7.03
Nov-13	4.63	2.73	4.58
Dec-13	3.11	4.11	3.17
Jan-14	1.48	4.70	1.60
Feb-14	0.29	5.59	0.37
Mar-14	2.98	6.84	3.01
Apr-14	3.24	8.16	3.15
May-14	1.90	7.55	1.86
Jun-14	1.96	5.14	1.91
Jul-14	1.19	5.16	1.32
Aug-14	- 1.23	3.51	- 1.12
Sep-14	- 0.15	3.76	- 0.01

Appendix 2: Western region (Mbarara and Fort Portal) inflation rates and their combined Rates: July 2011 - November 2016.

Month	Mbarara	Fort Portal	Combined
Oct-14	- 0.75	2.48	- 0.70
Nov-14	0.20	3.58	0.32
Dec-14	1.15	3.65	1.19
Jan-15	1.50	2.55	1.60
Feb-15	2.03	2.33	2.08
Mar-15	1.51	1.50	1.64
Apr-15	3.30	2.97	3.41
May-15	2.79	3.58	2.82
Jun-15	2.68	3.19	2.73
Jul-15	2.54	6.64	2.58
Aug-15	3.22	5.47	3.17
Sep-15	5.70	4.72	5.61
Oct-15	7.66	4.44	7.68
Nov-15	7.65	6.67	7.63
Dec-15	7.97	7.42	8.00
Jan-16	8.61	6.83	8.64
Feb-16	7.61	7.59	7.66
Mar-16	5.73	6.53	5.65
Apr-16	3.28	5.57	3.22
May-16	5.58	4.35	5.48
Jun-16	6.21	6.66	6.12
Jul-16	5.91	3.86	5.73
Aug-16	5.35	4.35	5.11
Sep-16	4.37	4.95	4.21
Oct-16	3.84	6.07	3.67
Nov-16	4.80	6.41	4.49

Source: Uganda Bureau of Statistics

Appendix 3: Uganda's Inflation Rates with Fort Portal and Mbarara Separated: July 2011 - November 2016

Month	Headline	Food Crops		EFU		Core
Jul-11	17.77		32.90		21.42	15.71
Aug-11	17.63		26.29		15.89	16.79
Sep-11	22.85		32.27		32.94	20.80
Oct-11	24.36		32.29		37.08	22.20
Nov-11	24.48		28.35		37.41	22.78
Dec-11	23.75		23.44		38.07	22.46
Jan-12	22.92		20.34		41.84	21.50
Feb-12	24.36		38.80		40.60	21.00
Mar-12	21.14		27.38		35.99	18.88
Apr-12	19.12		27.47		29.17	16.96
May-12	17.97		23.83		29.38	16.09
Jun-12	14.89		18.83		28.93	13.06
Jul-12	10.36		12.15		18.94	9.28
Aug-12	9.84		16.03		23.34	7.80
Sep-12	4.92		8.39		7.24	4.24
Oct-12	4.52		4.61		4.39	4.52
Nov-12	4.56		8.43		4.63	4.05
Dec-12	4.29		6.33		3.00	4.17
Jan-13	3.49		1.16		0.27	4.13
Feb-13	2.01	-	13.23		0.76	4.39
Mar-13	2.90	-	12.09		2.50	5.22
Apr-13	3.06	-	12.35		3.84	5.40
May-13	3.86	-	7.58		3.70	5.59
Jun-13	5.32	-	1.80		1.05	6.76
Jul-13	6.00		4.24		3.62	6.49
Aug-13	6.97		12.61		2.21	6.72
Sep-13	7.46		15.22		4.13	6.77
Oct-13	6.69		14.49		1.82	6.19
Nov-13	5.85		6.43		1.28	6.25
Dec-13	5.47		7.98		2.22	5.48
Jan-14	5.30		14.08		1.58	4.61
Feb-14	4.79		19.09		1.82	3.35
Mar-14	5.21		22.26		1.01	3.48
Apr-14	4.31		19.90		0.65	2.64
May-14	3.49		12.68		1.02	2.53
Jun-14	2.58		8.43		2.41	1.84
Jul-14	2.48		4.69	-	0.41	2.49
Aug-14	1.99	-	2.02		0.83	2.68
Sep-14	1.60	-	3.63		1.20	2.40
Oct-14	1.54	-	1.04		3.48	1.71

Appendix 3: Uganda's Inflation Rates with Fort Portal and Mbarara Separated: July 2011 - November 2016

Month	Headline	Food Crops	EFU	Core
Nov-14	2.01	1.54	3.41	1.94
Dec-14	2.08	1.45	3.91	1.98
Jan-15	3.02	- 1.32	2.69	3.63
Feb-15	2.92	- 2.39	0.88	3.87
Mar-15	3.29	- 1.12	1.09	4.17
Apr-15	4.70	4.78	1.05	5.05
May-15	4.86	9.81	1.42	4.49
Jun-15	4.99	7.29	1.53	5.02
Jul-15	5.47	5.89	3.62	5.60
Aug-15	5.72	3.82	3.43	6.21
Sep-15	6.70	9.31	2.46	6.77
Oct-15	7.70	14.47	6.27	6.92
Nov-15	8.06	15.00	8.57	7.07
Dec-15	8.47	15.59	8.97	7.49
Jan-16	7.29	11.94	8.73	6.55
Feb-16	6.89	6.64	9.57	6.65
Mar-16	6.24	0.57	7.86	6.89
Apr-16	5.05	- 4.85	7.32	6.34
May-16	5.32	- 5.72	6.43	6.89
Jun-16	5.90	- 2.07	7.35	6.88
Jul-16	5.18	2.78	2.93	5.72
Aug-16	4.82	4.78	3.07	5.00
Sep-16	4.23	4.96	4.34	4.12
Oct-16	4.14	1.74	- 1.87	5.11
Nov-16	4.63	7.07	- 4.05	5.18

Source: Uganda Bureau of Statistics

Appendix 4: Regional Weights for Uganda

ision	National	Kampala high income	Kampala middle income	Kampala low income	Jinja	Mbale	Masaka	Mbarara	Gulu	Arua	Fort portal
	1,000.00	313.98	156.61	100.07	56.52	56.80	94.69	96.75	50.41	36.56	37.61
1	284.62	72.18	43.85	31.97	17.15	20.44	26.97	28.64	18.11	14.13	11.19
2	27.98	7.28	3.48	1.94	2.18	2.10	3.38	2.74	1.93	1.57	1.38
3	50.80	16.81	10.97	4.26	3.10	1.97	4.51	4.47	1.80	1.05	1.87
4	119.43	38.68	23.26	12.56	6.34	6.59	11.49	10.49	3.77	2.58	3.67
5	38.66	8.49	8.06	3.86	2.40	2.78	4.07	3.63	1.99	1.73	1.65
6	57.52	19.24	7.74	6.27	3.99	3.11	5.12	4.99	2.86	1.84	2.35
7	137.79	62.52	17.42	10.30	6.32	5.15	10.39	12.41	5.21	3.95	4.13
8	51.82	21.86	7.83	3.82	1.98	2.27	3.85	4.31	2.23	1.73	1.94
9	55.17	20.06	6.49	5.91	2.95	2.90	5.35	4.82	3.04	1.89	1.76
10	55.08	16.85	9.41	7.22	2.39	2.60	6.72	5.09	1.85	1.43	1.52
11	57.23	12.81	7.86	4.99	3.27	3.45	5.69	8.47	4.32	3.18	3.20
12	63.91	17.19	10.25	6.96	4.44	3.45	7.16	6.72	3.30	1.48	2.96

Key:
1= Food and Non-Alcoholic Beverages,
2= Alcoholic Beverages, Tobacco & Narcotics,
3= Clothing and Footwear, 4= Housing, Water, Electricity, Gas and Other Fuels,
5= Furnishings, Household Equipment and Routine Household Maintenance,
6= Health,
7= Transport,
8= Communication,
9= Recreation and Culture,
10= Education,
11= Restaurants and Hotels 12= Miscellaneous Goods and Services

Source: Uganda Bureau of Statistics