

# ASSESSMENT OF THE ROBUSTNESS OF THE KAMPALA CONSUMER PRICE INDEX (CPI)

By

Nsubuga Vincent Musoke<sup>1</sup>, Yeko Mwanga<sup>2</sup>, Chris Mukiza<sup>3</sup> and Agnes Ssekiboobo<sup>4</sup>

*This study was co-authored by Uganda Bureau of Statistics (UBOS) and School of Statistics and Planning (SSAP) with financial support from the African Development Bank (AfDB)*

*Errors, omissions and commissions should be addressed to the authors*

August 2012

---

<sup>1</sup> Price Statistics Section, Uganda Bureau of Statistics

<sup>2</sup> School of Statistics & Planning, College of Business and Management Sciences, Makerere University

<sup>3</sup> Directorate of Macro Economic Statistics, Uganda Bureau of Statistics

<sup>4</sup> School of Statistics & Planning, College of Business and Management Sciences, Makerere University

## **ABSTRACT**

Consumer Price Index is the measure of average price levels of a fixed basket of consumer goods and services. The research was aimed at assessing the robustness of Kampala Consumer Price Index during the month of March, April and May 2012. Data collection was conducted from Kampala, Nansana, Kyengera, Matugga and Mukono. The Price Indices were computed at both the elementary and higher levels. Generally, the test revealed that inflation is not significantly different across Kampala and the surrounding towns. Kampala happens to be the destination of most commodities from the country side and imported goods because of the huge stores and markets. This implies that residents of Kampala and neighbouring towns can still use the Kampala inflation for wage indexation and other areas of indexation.

We recommend that Uganda Bureau of Statistics should continue monitoring prices for all items in Kampala. In addition, during the next rebasing exercise the Kampala CPI basket should include the surrounding areas which should also be checked to determine the representativeness of the Kamapla basket without the surrounding towns.

**Contents**

**ABSTRACT..... 2**

**1. INTRODUCTION ..... 4**

1.1 National CPI composition ..... 4

1.2 Kampala CPI ..... 5

1.3 Justification of the survey..... 5

1.4 Objectives of the Survey..... 5

1.5 Scope and Coverage of the Survey..... 6

**2. LITERATURE REVIEW ..... 6**

**3. METHODOLOGY..... 7**

**4. RESEARCH FINDINGS..... 7**

4.1 Headline Inflation ..... 8

4.2 Monthly Core Inflation ..... 8

4.3 Monthly Inflation of Food crops and related items ..... 8

4.4 Monthly of Energy, Fuel and Utilities (EFU)..... 9

4.5 Inflation Movements over the Months of March to May 2012 ..... 9

**5 CONCLUSIONS AND RECOMMENDATIONS..... 9**

**REFERENCES ..... 10**

**APPENDICES ..... 11**

Appendix 1: Monthly and Annual percentage changes for March, April and May 2012 ..... 12

Appendix 2: Monthly price percentage changes by Group, March, April and May 2012 ..... 13

Appendix 3: Training timetable..... 14

Appendix 4: List of outlets..... 15

Appendix 5: List of Trainers and Participants ..... 17

## 1. INTRODUCTION

Inflation in Uganda has for long been monitored using changes in the Consumer Price Index (CPI) which is a measure of average prices for a fixed basket of household consumption goods and services. This measure is taken as the change over time in the cost of purchasing a given 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 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 quality constant, or as measuring “pure” price change. If this was 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 in the commodities being price surveyed. The CPI does not measure price changes that result from improvements in goods and services that are being sold.

### 1.1 National CPI composition

Currently, Consumer prices in Uganda are collected from seven urban centers; Kampala, Jinja, Mbale, Masaka, Mbarara, Gulu and Arua. Apart from Kampala, each of the remaining six urban centres has its own basket of goods and services based on the expenditure patterns of the households within the area. Kampala is sub-divided into two baskets: Kampala High Income and Kampala Middle & Low Income baskets. Thus, there are eight baskets that constitute the National CPI. An index for each basket is computed separately thereafter a combined national index is computed as a weighted average of the eight baskets.

The national consumer price index is computed and published on a monthly basis. Generally, prices are collected from the first working day of the month until the 15th of the same month i.e. consumer prices are collected within the first two weeks of the month.

The index numbers are computed in two stages, namely: Elementary Aggregate stage and Higher Level Aggregate stage. The elementary aggregate indices are computed using the Jevons approach where prices for all items within each Elementary Aggregate are averaged by taking a geometric mean (International Labour Organisation (2004). The higher-level indices are computed as a weighted average of the elementary aggregate indices. Given below are the Higher Level Indices that are computed and published by UBOS:

- (a) The Headline Consumer Price Index. It measures inflation in Uganda when all items in the basket are included.
- (b) The Underlying/Core Consumer Price Index. It 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.

- (c) The Food Crops Index. It is an index that includes staple foods, fresh fruits, fresh vegetables, fresh milk and tobacco leaves. It 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.
- (d) The Food Index. This is the index that measures the relative changes in prices of food items.
- (e) The Non-Food index. This is the index that excludes all food items during the CPI computations.
- (f) Energy, Fuel and Utilities Index. This is an index that includes prices for gas, petrol, diesel and paraffin. It also includes charges for metered water and electricity.

## **1.2 Kampala CPI**

The consumer price data collection is mainly centered in Kampala city markets and other outlets excluding the surrounding towns of Mukono, Nansana, Kyengera, and Matugga etc. Price collection is centered in the city and yet a big number of people residing in these areas work in Kampala city while others live in the city and work in those areas on a daily basis. Thus the need to find-out the sensitivity of price levels and price movements on the Kampala CPI by expanding the Kampala CPI geographical coverage by including prices from the neighbouring towns.

## **1.3 Justification of the survey**

Inflation in Uganda has become the most widely used economic statistical indicator and its demand is increasing steadily. Its use is not limited only to inflation numbers but also its byproducts most especially the actual prices for individual products. The Kampala CPI is used by her residents and those from neighbouring towns for wages indexation and other areas of indexation. The same category of people use Kampala prices for individual products since it is the only proximate measure available. However, when such information is supplied to these types of data users, the assumption is that changes in CPI price levels and movements are the same for Kampala and the surrounding towns. This study is therefore to provide empirical evidence of similarity or non-similarity of price levels and movements within Kampala and neighbouring towns.

This information will also enable UBOS to choose if those neighbouring towns should be considered separately in future for price collection and revision of the CPI basket for Kampala and advise the stakeholders accordingly.

## **1.4 Objectives of the Survey**

The general objective of this study was to assess the robustness of the Kampala CPI by including neighboring towns of Mukono, Nansana, Matugga and Kyengera.

The specific objectives of the study were to:

- i. Assess the robustness of the Kampala Headline CPI by including prices from the neighbouring towns.
- ii. Evaluate the robustness of the Kampala Underlying/ Core CPI by including prices from the neighbouring towns.
- iii. Appraise the robustness of the Kampala Food crops CPI by including prices of food crops from the neighbouring towns.
- iv. Assess the robustness of the Kampala Energy, Fuel and Utilities (EFU) CPI by including prices of those products from the neighbouring towns.

## **1.5 Scope and Coverage of the Survey**

The study covered the same markets/outlets which are included in the usual Kampala CPI price collection survey and expanded to include the surrounding towns of Mukono, Nansana, Kyengera, and Matugga. The price collection period stretched through the months of March, April and May 2012. Prices were collected between 1<sup>st</sup> and 15<sup>th</sup> of each month so as to allow for comparability with those collected regularly for computation of the national CPI. The basket of commodities for Kampala CPI was maintained even with the expanded geographical area.

## **2. LITERATURE REVIEW**

Uganda Bureau of Statistics compiles 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 (EAC 2012 and COMESA 2010).

The CPI is computed for the relevant geographical coverage at national and regional levels (ILO 2008 and EAC 2012). 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 two baskets, one for the high income group and the other for the middle & low income groups (Report on the Rebasings and Reweighting of The Ugandan Consumer Price Index from the Current Base of 1997/98 Financial Year to the New Base of 2005/2006 Financial Year).

According to ILO 2003, the geographic scope of the Consumer Price Index should be defined well to include the appropriate target population. The Kampala CPI includes only the expenditure patterns and price movements of the city excluding the neighbouring towns and yet it is used by residents of these towns. EAC 2012 recommends that the sample outlets for price collection should be re-selected every five years so as to maintain its representativeness of the purchasing patterns of the relevant population. The last reselection/rebasing of the market outlets was in August 2008. (Report on the Rebasings and Reweighting of the Ugandan Consumer Price Index from the Current Base of 1997/98 Financial Year to the New Base of 2005/2006 Financial Year). It was therefore necessary to test for robustness of the Kampala

CPI with inclusion of the price movements and the basket of goods and services of the neighbouring towns in its computation.

### 3. METHODOLOGY

The survey was jointly conducted by School of Statistics and Planning (SSAP) and the Uganda Bureau of Statistics (UBOS). The current data collectors and those who ever worked with Uganda Bureau of Statistics on CPI data collection were engaged during the data collection exercise. Data collection and entry was conducted with close supervision by the staff of the two organizations. The training of data collectors, preparation of field instruments, identification and opening of outlets was conducted during the first week of March, 2012. Data collection, processing and computation of the CPI was carried out during the months of March, April and May 2012.

Products, whose consumer prices were collected from the towns' neighbouring Kampala, were incorporated into the elementary aggregates where they belong in the existing Kampala CPI Structure. The indices were computed at both the elementary and higher levels using the same approach used by UBOS namely the Jevons approach at the elementary level and the Weighted Average approach at the higher level (ILO 2004 and COMESA 2010). The two CPI series were computed and Analysis of variance (ANOVA) test conducted at 95% level of significance to determine the robustness of the Kampala CPI if the geographical area is expanded to include the surrounding towns. Data was analysed using Statistical Package for Social Scientists (SPSS) and Excel.

### 4. RESEARCH FINDINGS

The research was set to determine the robustness of the Kampala CPI especially if the neighbouring towns are included in its computation. The monthly inflation of Kampala combined with each neighbouring town was compiled. The analysis of variance tests were performed to determine if the Kampala CPI is affected by the introduction neighbouring towns in the computation. Table 1 shows the organization of the centres and months for the analysis of variance test.

Table 1: Centres and Months

		N
Centre (Treatment)	Kampala	3
	Kampala & Kyengera	3
	Kampala & Matugga	3
	Kampala & Mukono	3
	Kampala & Nansana	3
Month (Block)	April	5
	March	5
	May	5

#### 4.1 Headline Inflation

According to table 2 the Monthly Headline inflation is not significantly different across the five centres. This implies that a relative change in prices for all items is similar for the current Kampala CPI and the one which includes the surrounding towns of Mukono, Matugga, Kyengera and Nansana.

Table 2: Analysis of Variance using Monthly Headline Inflation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Centre	5.567	4	1.392	.393	.809
Month	59.724	2	29.862	8.427	.011
Error	28.349	8	3.544		
Corrected Total	93.640	14			

#### 4.2 Monthly Core Inflation

The monthly core inflation is not significantly different across the five centres as shown on Table 3 which implies that the monthly core inflation for Kampala is representative of the City and surrounding towns.

Table 3: Analysis of variance using Monthly Core Inflation

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Centre	6.743	4	1.686	.402	.802
Month	84.388	2	42.194	10.075	.007
Error	33.505	8	4.188		
Corrected Total	124.636	14			

#### 4.3 Monthly Inflation of Food crops and related items

Table 4 shows that the monthly inflation of food crops and related items is not significantly different across the five centres. This means that the rate at which prices are changing in food crops and related items is more-or-less the same in Kampala and the surrounding towns of Mukono, Matugga, Kyengera and Nansana. This is partly because food crops are 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.

Table 4: Analysis of variance of Monthly Inflation of Food crops and related items

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Centre	6.624	4	1.656	.435	.780
Month	516.421	2	258.211	67.790	.000
Error	30.472	8	3.809		
Corrected Total	553.517	14			



#### 4.4 Monthly of Energy, Fuel and Utilities (EFU)

Table 5 shows that the monthly energy, fuel and utilities inflation is not significantly different across Kampala and the surrounding towns. Kampala happens 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.

**Table 5: Analysis of variance using monthly EFU inflation**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Centre	.017	4	.004	.138	.963
Month	67.729	2	33.865	1080.787	.000
Error	.251	8	.031		
Corrected Total	67.997	14			

#### 4.5 Inflation Movements over the Months of March to May 2012

The Headline inflation in Kampala and Kampala combined with other four centres showed a decrease in March 2012 as shown on Appendix 1. It was followed by an increase in April and decrease in May 2012. In April the increase in prices for food, rent, fuel & utilities was due to the effect of Easter season as a result of high demand. A similar pattern was observed for core inflation in Kampala and surrounding towns because in March all centres recorded decreases in the core inflation followed by an increase in April. Generally, the food prices inflation and energy, fuel and electricity and utilities inflation followed a similar pattern with the April inflation showing an increase compared to March and May in all the centres.

Generally, inflation for most commodities tended to be lower in March and May compared to April in Kampala and when Kampala in combined with the other centres as shown on Appendix 2. This pattern is in line with the headline inflation as well as the core inflation in Kamapla and across all the neighbouring towns.

## 5 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the tests conducted showed that, the introduction of prices from the neighbouring towns had no significant effect on Kampala CPI. Therefore, Kampala CPI is representative of the price levels and movements within the city and the neighbouring towns such as Matugga, Kyengera, Nansana and Mukono. This implies that residents of Kampala and neighbouring towns can still use the Kampala inflation for wage indexation and other areas of indexation.

We recommend that Uganda Bureau of Statistics should continue monitoring prices for all products in Kampala. In addition, during the next rebasing exercise the Kampala CPI basket should include the surrounding areas which should also be checked to determine the

representatively of the Kamapla basket for computation of inflation without the surrounding towns.

## **REFERENCES**

Common Market for Eastern and Sothern Africa (2010), Final Report for the Third Joint COMESA/SADC HCPI Working Group Meeting 17-21 May 2010, Harare, Zimbabwe

East African Community (2012), Draft Regulations concerning the Establishment of Harmonised Consumer Price Index (HCPI) in the East African Community Partner States, Arusha, Tanzania, EAC Secretariat

International Labour Organisation (2003), Resolutions on Consumer Price Indices, Geneva, Switzerland, ILO

International Labour Organisation (2004), Consumer Price Index Manual: Theory and Practice, Geneva, Switzerland, ILO

International Labour Organisation (2008), Consumer Price Index Handbook, Geneva, Switzerland, ILO

## **APPENDICES**

**Appendix 1: Monthly and Annual percentage changes for March, April and May 2012**

Centre	Headline inflation <i>(All items)</i>						Core Inflation						Food crops and related items						EFU					
	Month of			Year ending			<i>Month of</i>			Year ending			Month of			Year ending			Month of			Year ending		
	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May
<b>Kampala</b>	0.8	2.3	-1.4	19.6	19.1	16.7	-1.0	1.7	-0.9	22.6	22.2	19.4	10.7	7.3	-4.0	7.2	8.3	6.4	-0.2	-4.2	0.4	19.5	13.9	13.4
<b>Kampala &amp; Mukono</b>	-0.1	1.6	-0.5	18.5	17.2	15.8	-1.7	1.2	0.1	21.7	20.6	19.0	8.6	5.5	-3.6	5.1	4.5	3.2	-0.3	-4.4	0.6	19.4	13.5	13.3
<b>Kampala &amp; Matugga</b>	-2.5	0.7	-0.4	15.6	13.3	12.1	-5.0	0.3	0.1	17.6	15.5	14.0	9.7	4.3	-2.9	6.2	4.4	3.9	0.1	-4.3	0.3	19.8	14.1	13.5
<b>Kampala &amp; Nansana</b>	-0.7	4.7	-1.4	17.7	19.9	17.5	-2.8	4.2	-0.9	20.4	22.9	20.1	9.8	9.6	-3.9	6.3	9.7	8.0	0.1	-4.3	0.2	19.8	14.1	13.4
<b>Kampala &amp; Kyengera</b>	-2.1	6.8	-1.8	16.1	20.7	17.7	-4.3	6.7	-1.3	18.5	23.9	20.6	8.4	11.1	-4.8	5.0	9.9	7.2	-0.1	-4.5	0.4	19.5	13.7	13.1

**Appendix 2: Monthly price percentage changes by Group, March, April and May 2012**

ITEM	CENTERS														
	Kampala			Kampala & Mukono			Kampala & Matugga			Kampala & Nansana			Kampala & Kyengera		
	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May	Mar	Apr	May
<b>Food</b>	3.3	5.3	-2.1	1.7	5.4	-1.7	2.2	2.8	-0.4	3.0	6.7	-1.9	2.9	8.1	-2.4
<b>Beverages &amp; tobacco</b>	2.3	-1.2	0.2	1.6	-0.7	0.6	0.2	-0.6	1.0	3.0	-2.2	0.6	2.3	0.2	-0.1
<b>Clothing &amp; footwear</b>	-1.3	-0.5	-6.3	-8.2	-14.3	0.9	-18.8	-5.6	-1.2	-13.2	1.3	-4.7	-11.8	-1.1	-1.8
<b>Rent,fuel &amp; utilities</b>	-1.2	-0.4	-4.4	-1.1	0.0	-0.5	0.5	-4.3	-5.0	-1.0	10.7	-2.9	-8.4	21.9	-5.9
<b>Household and personal goods</b>	-1.3	-0.5	1.4	-3.5	0.6	0.7	-6.8	-2.2	3.1	-0.7	-1.0	-0.6	-1.5	0.5	-0.1
<b>Transport &amp; communication</b>	0.2	0.4	-2.8	0.2	-0.8	-2.8	-0.1	-0.1	-2.4	1.1	0.4	-2.4	0.1	-0.8	-2.3
<b>Education</b>	-0.5	-0.2	0.7	-1.1	0.8	0.3	-0.3	0.2	-0.9	0.3	0.5	-1.0	0.4	-0.6	0.2
<b>Health, Entertainment &amp; others</b>	0.0	4.5	3.3	1.0	2.4	1.9	-13.8	6.8	5.4	-7.8	2.9	2.7	-7.4	2.8	3.2

*Source: Uganda Bureau of Statistics*

### Appendix 3: Training timetable

The training took 1 day on 3<sup>rd</sup> March 2012 at the Uganda Bureau of Statistics. The details are shown in the table below:

<b>Time</b>	<b>Activity</b>
09:00-09:15am	<ul style="list-style-type: none"><li>• Remarks by Dr. Yeko Mwanga</li><li>• Overview of the Survey</li></ul>
09:15-10:00am	<ul style="list-style-type: none"><li>• Remarks by Mr. Nsubuga Vincent Musoke</li><li>• Overview of the Survey</li><li>• Field guidelines</li></ul>
10:00-10:30am	<ul style="list-style-type: none"><li>• <b>Tea break</b></li></ul>
10:30-11:30am	<ul style="list-style-type: none"><li>• Field guideline</li><li>• Discussion of the questionnaire</li></ul>
11:30-1:00pm	<ul style="list-style-type: none"><li>• Discussion of the food group</li><li>• Discussion of Services</li></ul>
1:00-2:00pm	<ul style="list-style-type: none"><li>• <b>Lunch break</b></li></ul>
2:00-4:00pm	<ul style="list-style-type: none"><li>• Discussion of clothing, fuel, electricity &amp; water, soap, toiletries</li></ul>
4:00-6:00pm	<ul style="list-style-type: none"><li>• General Discussion</li></ul>

**Appendix 4: List of outlets**

<b>Table Outlet Type</b>				
<b>Record ID</b>	<b>Outlet Type Code</b>	<b>Outlet Type Name</b>	<b>Description</b>	<b>Priority Code</b>
1	OUT001	Market		001
2	OUT002	Clothing		002
3	OUT003	Footwear		003
4	OUT004	Housing Rent		004
5	OUT005	Electricity		005
6	OUT006	Fuel/Gas Station		006
7	OUT007	Water charges - Piped, Metred		007
8	OUT008	Water charges - Piped, Unmetred (per Jerrycan)		008
9	OUT009	Mattress shop		009
10	OUT010	Furniture		010
11	OUT011	Electronics		011
12	OUT012	Transport Fares		012
13	OUT013	Communication Service provider		013
14	OUT014	Internet Service/Café		014
15	OUT015	Bicycle And Spare Parts dealer		015
16	OUT016	Motor car depot/dealer		016
17	OUT017	Street Parking Service Provider		017
18	OUT018	Education - Pre-Primary School		018
19	OUT019	Education - Primary School		019
20	OUT020	Education - Secondary School		020
21	OUT021	Education - Tertiary 1 (University)		021
22	OUT022	Education - Tertiary 2 (Computer School)		022

**Table Outlet Type**

<b>Record ID</b>	<b>Outlet Type Code</b>	<b>Outlet Type Name</b>	<b>Description</b>	<b>Priority Code</b>
23	OUT023	Education – Other		023
24	OUT024	Bookshop - Text Books		024
25	OUT025	Photocopying		025
26	OUT026	Health/Medical Service/Clinic		026
27	OUT027	Entertainment – other		027
28	OUT028	Entertainment - Stadium admission (Soccer)		028
29	OUT029	Entertainment - Theatre Admission		029
30	OUT030	Entertainment - Film Shows		030
31	OUT031	Entertainment - Discotheque Admission		031
32	OUT032	Laundry & Dry Cleaning		032
33	OUT033	Lodging/Guest House/Hotel		033
34	OUT034	Photographic Studio		034
35	OUT035	Video Coverage Studio		035
36	OUT036	Radio/Broadcasting station - Announcement		036
37	OUT037	Hairdressing Salon		037
38	OUT038	Restaurant		038
39	Xx	Other (Not specified)		



## **Appendix 5: List of Trainers and Participants**

### **Coordinators**

- Mrs. Ssekibobo Agnes
- Dr. Mwangi Yeko
- Dr. Chris Mukiiza
- Mr. Nsubuga Vincent Musoke

### **Facilitators**

- Mr. Magoma Godfrey
- Mr. Engole Stephen
- Mr. Mutyaba Andrew

### **Trainees**

- Mr. Lwanga Nicholas
- Mr. Wanadi Alfred
- Mr. Ssekandi Possiano
- Mr. Mr. Mulawa Siliman
- Miss. Dorothy Namutebi
- Mr. Mutebi Lawrence Kasozi