Ethiopian Consumer Price Index

Methodology and Data Collection

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1. Introduction

1.1 Background

This paper has been prepared to show the conceptual aspects and the technical procedures which the CSA has been following in the construction of Consumer Price Index (CPI). CPI is a key macroeconomic indicator used by many organizations including the government, international agencies and business community that wish to monitor changes in price movements and to observe its effect on their program implementation and policy decisions. The CPI rebasing is based on the two round 2004/2005 Household Income, Consumption and Expenditure (HICE) survey results. The two rounds were selected taking into account the two major seasons in the country, the wet/plough season and the dry/harvest season. This survey covers both urban and rural population of the country and a total of 1,554 sample enumeration areas and 21,688 households were covered by the survey. The information obtained through this survey was weighted to represent all regional households in the regions and the country as a whole.

Central Statistical Agency (CSA) of Ethiopia conducts a Household Income, Consumption and Expenditure (HICE) survey every five years. The result from this survey is used to identify the goods and services bought by typical consumers or households which should be included in the baskets of goods and services used to monitor price changes. Further more, the result from HICE survey is used to determine the weight of the goods and services included in the basket. The weight of specific goods and services are calculated by dividing the total expenditure spent by all households in a region/country on specific goods and services by the total expenditure spent on all goods and services by all households in the region/country. These calculated CPI weights are fixed for each goods

and services and stay the same for the next period until the result of the next HICE survey is become available.

1.2 The Historical Development of the CPI in Ethiopia

1.2.1 The 1963 Base Period of the Capital City, Addis Ababa CPI

The first ever CPI in Ethiopia, that is, the 1963 based monthly Addis Ababa CPI was constructed on the basis of the data collected on the spending pattern of the Addis Ababa HICE survey conducted in 1963. The survey covered 600 randomly selected households in the city. A total of 73 consumption expenditure items with a percentage cut-off point of 0.05 and above were included in the construction of the index and the CPI report was published on monthly basis and has been used until August 1996.

1.2.2 The 1981/82 Base Period National, Rural and Addis Ababa CPI

This CPI, that is, the quarterly National Rural Consumer Price Index, was developed in 1994 on the basis of the 1981/82 Rural Household Income, Consumption and Expenditure Survey that was carried-out on quarterly basis. That is, the indices have been constructed backwards starting from 1994 to get the series up to 1982/83. A total of 92 consumption expenditure items with a percentage cut-off point of 0.1 and above were included in the construction of this index. The 1981/82 National Rural CPI is served as a country level CPI. However, it has its own shortcomings; the major one being its coverage was limited to rural areas and the capital city only.

1.2.3 The 1995/96 Base Period CPI

In 1995/96 Consumer Price Indices at Country, Rural, and Urban levels and for Addis Ababa were constructed based on the 1995/96 HICE survey. The survey was conducted in two rounds, that is, at span of six months during the year taking into account the two major seasons in the country, the wet/plough season and the dry/harvest season, in randomly selected Enumeration Areas (EAs) in 11 Administrative Regions throughout the country.

The selection of EAs was done in such away that out of the total number of rural EA's in the country, 606 EA's were randomly selected and out of a total of urban EA's in the country 323 EA's were randomly selected. The survey was conducted on the basis of 12 rural households and 15 urban households randomly selected in each EA. The 1995/96 based CPI has been issued for the National, Rural, Urban and Addis Ababa up to November 2000.

1.2.4 The December 2000 Based CPI

The December 2000 based indices were constructed for each of the nine regional states, the Dire Dawa Administrative Council, the Addis Ababa City Administration and at Country level. It was based on the 1999/2000 HICE survey conducted in the rural and the urban areas of the country. For the purpose of the HICE survey, 722 EAs from the rural areas, and 542 EAs from the urban areas were randomly selected. The survey was conducted on the basis of 12 rural households and 16 urban households within each of the sample EAs were selected systematically from a fresh list of households prepared at the beginning of the survey's field work. The December 2000 based CPI has been issued until Oct. 2007. The new (existing) CPI series were released starting from Nov. 2007.

1.2.5 The December 2006 Based CPI

Like that of the 2000 based CPI, the December 2006 based indices were constructed for each of the nine Regional States, the Dire Dawa Administrative Council, the Addis Ababa City Administration and at Country level. It was based on the 2004/2005 HICE survey conducted in the rural and the urban areas of the country. This survey covered both urban and rural population of the country and a total of 1,554 sample enumeration areas and 21,688 households were covered by the survey. The information obtained through this survey was weighted to represent all regional households in the regions and the country as a whole.

The newly selected baskets are more diversified and robust than the previous ones and the weights are more accurate. In reviewing the baskets for each region, it was found out that many items had lost importance and replaced by new ones and the number of new items of importance, such as food taken out of home, causal wear, and mobile charges had to be added in the baskets. An effort also was made to add few items to the miscellaneous goods which mainly include expenditure on financial services, coffin, and wedding cards. Furthermore, the new CPI based on December 2006, includes aggregate index for non-food and more detailed housing, construction materials, water and fuel and power components. In the current CPI series it is also found that there is an increase in expenditure on food consumed away from home (Hotel foods and cafes), clothing, household personal goods and services. A number of items had to be added to these groups to improve the coverage.

The survey design focused on a market based approach by selecting 119 markets. These representative markets were selected with the aim of achieving acceptable coverage of both urban and rural markets in the country. For the Current CPI prices are collected for a total of about 400

goods and services every month through out the country at 119 markets. The total number of price quotations for the CPI is about 140,000 in each month.

1.3 Retail Price Survey

The retail price survey of goods and services started in Addis Ababa in 1963 and the survey expanded its coverage through time. Between 1986/87 and 1996/97 the survey has been conducted in about 760 EAs and in the year 1997/98 the number of EAs covered by the survey were substantially increased to 1420 EAs. Considering the substantial number of EA's to be covered and thereby the huge amount of price data to be collected were not manageable for processing and timely publishing of the data. Hence, after conducting an intensive exercise on the quality of the data, the CSA realized that the sample EA's could substantially be reduced without affecting the quality of price data the resulting CPI. Consequently, the CSA has arrived at a decision to reduce the sample EA's from 1420 to 446 EA's starting from September 1998.

Moreover, further improvements have been made starting from July 2001 on the number of market outlets to be covered for this exercise. As a result, the price survey data collection had been restricted and basically focused on a market based survey approach by selecting 119 representative market outlets serving both urban and rural residents. The shift to more representative markets was implemented with the aim of achieving acceptable coverage of urban markets for each region by dropping many remote rural markets. As a result, unnecessary time lag in the production of CPI and the average retail price report has been minimized. From the monthly retail price data the selected basket of goods and services are extracted and used in the monthly calculation of the CPI for each region and at the country level.

1.4 Why is it Necessary to Replace the Old CPI with the New CPI?

The Ethiopian CPI attempts to reflect the combined price movement of many retail transactions on a monthly basis. Because of the fact that the consumer price index is based on a fixed basket of goods and services consumed in the base year, it tends to become outdated over time. Changes in the consumption pattern can take place due to several reasons; some of the main ones are given below:

- ✓ Change's in social and economic characteristics of the population;
- ✓ new products and service come into the market as the old one disappears;
- ✓ changes in consumer's taste and preference;
- ✓ changes in consumers income;
- ✓ changes in relative importance of some goods and services;

1.5 The Major Groups in the Ethiopian CPI

The goods and services in the Ethiopian CPI are grouped according to the classification of individual consumption according to purpose (COICOP) with some country specific adjustment. The eleven major groups are: Food; Beverages; Cigarettes and Tobacco; Clothing and Footwear; House Rent, Construction Materials, Water, and Fuel and Power; Furniture, Furnishing, Household Equipment and Operation; Medical Care and Health; Transport and Communication; Recreation, Entertainment and Education; Personal Care and Effects; and Miscellaneous Goods and Services.

2. Uses of the CPI

The CPI is widely used as:

- a key indicator of an economy's performance and for monitoring and evaluation of a country's monetary and fiscal policy;
- the main measure of the inflation rate;
- a tool in wage negotiation and indexation, i.e. it is used to adjust taxes, determine wage levels in the event of trade disputes, social security benefits, public service remuneration and pensions, among others;
- a national accounts deflator of the consumption expenditure that is by deflating nominal values (current cost) of goods and services by the prevailing CPI, the real / constant value can be established;
- an input for Policy making, research and other purposes.

3. Selection of Basket and Weight Assignment

An important factor in constructing a Consumer Price Index is to select the representative basket of goods and services. Generally the index is based on a sample of items (goods and services) and the choice of what items to be included in the index is not always an easy task. Whatever choice is made, there is a need to ensure that the items (goods and services) are relevant, reliable, representative, and comparable over a period of time. In general, it is desirable that items chosen should be adequate in number and importance and representative of the items in the group. For most practical purposes, items (goods and services) are included in the basket because they are important in their own right or because they are considered as representative of other items in the group. It is expected that changes in the prices of such items are likely to approximate change for all items within the category. Though the

procedure for choosing an expenditure cut-off point is on the most part conventional, it is obvious that, resources play some role in this regard.

From the outset, the idea of including all consumption items into the market basket of goods and services is both cumbersome and unnecessarily costly in term of data collection and processing. Furthermore, it doesn't make sense to include an insignificant weight into an index basket which could not move the price relative up or downwards compared to the general market trend. Besides, it is common international practice to apply a suitable expenditure cut-off point to come up with manageable number of items (goods and services).

Keeping the above points in mind, the cut-off points for the determination of the baskets in the 1995/96 based indices were 0.04% for Addis Ababa and Urban level CPI's and 0.05% for the Rural CPI. For the December 2000 based indices, a cut-off point of 0.05 or above percent of total household's expenditure for most regional baskets was selected. Similarly, in December 2006 based CPI used a 0.05 cut-off point was used to identify the regional index baskets. In some cases, when special items that are common for a specific region are encountered even if, the expenditure weight are less than the cut-off points, that specification can be included in the basket of that region. The idea of a cut-off point means that the household goods and services whose relative importance fall on or above the relative expenditure shares of the mentioned percentage point are included in the final market basket of goods and services and are used in the construction of the index. Those falling below these percentage points are excluded from the baskets and their expenditure shares distributed within their respective sub-group or major group of items. In December 2006 based CPI, the number of items in the basket of commodities increased for all the regions except Gambella region which has showed a decline by two

items in the basket. This finding shows that new household goods and services are entering the market in the recent years. The total number of items included in the regional baskets in the December 2000 and December 2006 based indices are given in the table 1 below.

Table 1: All Number of Markets and Basket of Commodities by Regions

Ser. No	Region	Number of Markets	Basket of Commodities	
			Old (December 2000 based CPI)	New (December 2006 based CPI)
1	Tigray	8	114	143
2	Afar	4	85	153
3	Amhara	20	118	144
4	Oromia	24	127	161
5	Somali	6	85	122
6	Benishangul	6	111	142
7	SNNP	31	130	152
8	Gambella	3	105	103
9	Harari	2	102	158
10	Addis Ababa	12	175	193
11	Dire Dawa	3	121	150
	Total	119		

4. Survey Documents

Retail price survey has a data collection form. This data collection form with a list of goods and services is designed to collect the price data. In the price data collection form each item has got its quality specification, data collection units and standard units of measurement. In addition, each price data collectors has its own detailed item specification manual which explains the type of goods and services for which prices are

collected. The goods and services which are priced in the survey is correctly defined; which helps the price data collectors to price the same item or service not just once but several times throughout the year. The price collected should be the same item or service each time in order to monitor the price changes over several time periods in a given base period.

There is a manual for training field staffs (supervisors and enumerators) and it is also used as a reference during the field works. This manual presents the concerns of the enumerators who will execute the collection of data. Generally, it guides field workers during the training and fieldworks for better understanding of the survey questionnaire and enable them to collect and provide quality data. Every price data collector and supervisors are armed with a pocket calculator for calculating the average price. Every enumerator is given a portable weighing scale for measuring the amount of goods retailers are actually selling in the market.

5. Weight Matrix and Weight Updating

Weight matrix is a rectangular table of entries with regions in the columns and expenditure groups in the rows. Each entry in the matrix indicates the expenditure contributions of the regions in a particular CPI. This weight matrix is used to aggregate the regional group indices to the national consumer price index.

The December 2000 weights matrix is revised based on the 2004/5 HICE survey results. From the Current weight matrix it was observed that the national expenditure share of two regions, Oromia and Tigray, have increased substantially, mainly in the agricultural products while the share of other regions remained the same or declined.

6. Data Collection, Supervision and Data Processing in CPI.

6.1 Data Collection and Supervision

Price of goods and services included in the CPI are collected from the first to the fifteenth of each European calendar month. The price for each product and service is generally collected monthly from three outlets (quotations). The enumerators are expected to collect the monthly retail prices of goods and services by interviewing the retailers. For cereals, pulses, oilseeds, fruits and vegetables the enumerators actually measure the weight of the items on the spot. In some cases, price data are also collected from consumers at the time of purchase of the goods and services.

The data collectors are closely monitored and supervised by experts assigned by the CSA regional branch offices. In most cases, one supervisor is assigned to supervise three to five price data collectors. Data on house rent are collected from the owners of the residential units on quarterly basis. The public utility rates are also obtained from the government agencies on monthly basis. As stated earlier, a total number of 140,000 price quotations are collected every month.

6.2 Data Editing

The price that are quoted for different products/services are manually edited to ensure that the price is comparable with the price received for

other market places and for the same product in the previous months. The data editing comprise two steps:

- detection of possible errors and outliers; and
- verification and correction of data

The data editing and verification includes computerized checks to detect outliers in raw price data sent from the regions to the head office. If the price information is different from the expected limit and out side the expected range, the current price will be verified to determine if it is in fact an error or not. This clarification is usually made by asking the respondents to verify the price or by comparing the price change with comparable items. If the price is in fact an error, it will be corrected either by using imputation techniques or by omitting the price from that month's index calculation.

6.3 Index Calculation formula

The Ethiopian current CPI is based on Laspeyres weighted price index. The Laspeyres formula is used because it uses fixed base year quantities and there is no need to update weights monthly or even annually. The Ethiopian HICE is conducted every five years and the weights are also revised after obtaining the household expenditure data from the survey.

7. Linking of the New and Old Series Indices

To enable time series comparison for every CPI for long periods of time, the new and the old indices have been linked. During the previous CPI rebasing the old 1995/96 base year indices were linked to the 2000 base year indices. The linking of old indices to the new ones have been made by multiplying the reciprocal of the last index of the old base period (the

start of the new base period) by 100 and multiplying the result with old base year indices which results in a linked series.

8. Major Groups Included in the Current CPI and their Weights

The major groups included in the CPI and their corresponding weights are shown in Table 2 below. According to the weights in the table, about 57 percent of household expenditure on goods and services are spent on the food component, which reflects the country's low level of economic development. In the December 2000 based CPI the share of food was 60 Percent of total expenditures on household goods and services and this indicates that the food share has declined by 3 percentage points in the current CPI. On the other hand, the expenditure on non-food components increased from 40 percent to 43 percent indicating that households in the country began spending an increased share of their incomes on other non-food goods and services.

In the new CPI period, particularly the larger regions, resulted in a substantial decrease in the average weights for food (despite the increased food taken out of home) which was offseted mainly by an increase in housing, construction, water and fuel and power (particularly increase in rentals and fuel and power), furnishing and transport and communication.

As explained above, the food component of CPI takes the lion's share in household expenditures on goods and services. The second highest expenditure group in the household expenditure basket is house rent, construction materials, water and fuel and power (21 %). All the other goods and services constitute only 22 percent of household expenditures. Due to the high weight of the food component the Ethiopian CPI usually mainly fluctuates with a change in food prices. This indirectly reflects the

fact that the Ethiopian economy is basically an agrarian subsistence economy.

Table 2: Major Groups in the 2000 and 2006 Based CPI and their Weights

No.	Major Group	Weights	
		2000 based CPI	**2006 based CPI**
1	Food	0.6008	0.5701
2	Non-Food	0.3992	0.4299
3	Beverages	0.0201	0.0202
4	Cigarettes and Tobacco	0.0051	0.0048
5	Clothing and Footwear	0.0926	0.0832
6	House Rent, Construction Materials, Water and Fuel and Power	0.1544	0.2056
7	Furniture, Furnishing, Household Equipment and Operations	0.0494	0.0375
8	Medical Care and Health	0.0120	0.0111
9	Transport and Communication	0.0199	0.0249
10	Recreation, Entertainment and Education	0.0101	0.0109
11	Personal Care and Effects	0.0092	0.0083
12	Miscellaneous Goods	0.0264	0.0234
	Total	**1.000**	**1.000**