

CHAPTER 3

SOUTH AFRICA'S CONSUMER PRICE INDEX (CPI) FOR FOOD

3.1 Introduction

The consumer price index (CPI) measures how the price level of consumer goods and services purchased by households have changed between two periods of time. The CPI was first used in 1707 when William Fleetwood compiled a simple index to estimate the average change in the prices paid by Oxford University students over the previous two and half centuries. During 19th century, interest in price indices gathered momentum as a result of the work of Irving Fisher. In 1925 the CPI became institutionalised when the Second International Conference of Labour Statisticians convened by the International Labour Organisation (ILO) promulgated the first international standards of measurement. The original international standards have been revised three times, namely in 1947, 1962 and 1987, each revision being approved by the International Conference of Labour Statisticians. The present Manual contains the draft resolution for the fourth revision of these international standards submitted to the XVIIth International Conference of Labour Statisticians in 2003. The manual is available on the Website of the ILO¹⁹.

3.2 Calculating the CPI²⁰

The first step in calculating the CPI is to determine what goods and services should be included in the index basket, as well as their relative weights. This is conventionally done with the help of a Household Budget Survey/Household Expenditure Survey. A point-of-purchase or retail survey is also used to determine where the goods and services are acquired from, to determine where the prices should be collected.

The next step is to classify all these goods and services, so that they can be aggregated into different items/groups and in the end into the All Items Index. Products are grouped because they have a common end-use or because they are considered to be substitutes for each other. The weights attached to the lowest level of goods and services, the elementary aggregate, are assigned by means of a formula, which could either be an arithmetic mean (average) or a geometric mean²¹. The basket with the weights is constructed periodically, in most cases depending on the frequency of the surveys on which the weights are based is constructed.

Prices are then collected (mostly monthly, but there are some that are collected weekly, quarterly, biannually or even annually). These prices are calculated into an index with the help of a formula, the most commonly used being the Laspeyres formula²².

3.3 The CPI in South Africa

Currently Statistics South Africa (StatsSA) compiles and disseminates a number of different CPI aggregates, each serving a number of different analytical purposes. The various consumer price indices calculated for SA include:

- **Consumer Price Index:** This index is used to calculate the official or headline rate of inflation and consists of price increases for all goods and services in the main metropolitan areas of the country.
- **Core Index:** Certain items are excluded from the CPI basket on the basis that their prices are highly volatile, subject to temporary influences or affected by government policies. These exclusions include fresh and frozen meat and fish, fresh and frozen vegetables, fresh fruit and nuts, interest rates on mortgage bonds and overdrafts/personal loans, and changes in VAT and assessment rates. This index is used to calculate core inflation and is a reflection of the underlying inflationary pressures in the economy.
- **CPIX:** The CPI excluding interest rates on mortgage bonds (CPIX), a measure designed to assist with inflation targeting.

¹⁹ See Appendix 3 for a brief history of the development of the CPI, and Appendix 4 for an explanation of the evolution of the formal definition. References to the website are provided in the Appendices.

²⁰ The procedure for calculating the CPI is shown in more detail in Appendix 5, while the base data used for the calculation of the Food Price Index in South Africa are provided in Appendix 9.

²¹ See Appendix 7

²² The different formulae and their basis of calculation are explained in Appendix 3.

- **CPIF, or the Food Price Index:** Only the food items appearing in the CPI basket are included. The index is regarded as useful to assess the impact of price increases on poverty, as food is the single biggest item in the total basket for the CPI.

The more recent trends in these measures are shown in Table 28 as an illustration of the differences between these indices. It is evident that CPIF increased faster than the other indexes in this period, and thus contributed materially to the increase in the overall rate of inflation in the country.

Table 28: The different CPI indexes measured in South Africa, 2001-2002

Main Indices	Indices (2000 = 100)			Percentage change between Feb 2001 and Feb 2002
	February 2001	January 2002	February 2002	
CPI (Metropolitan areas)	104.1	109.0	110.4	+6,3
Core Index	104.4	110,7	111,4	+7.5
CPI X	104.1	111.2	111.9	+6.7
CPIF	102.4	113.9	114.8	+12.1
CPI excluding food price index	104.1	107.7	110.2	+4.8

Source: StatsSA Statistical release P0141.1 (19 March 2002)

The extent of expenditure on goods and services purchased is derived from a five-yearly survey on the Income and Expenditure of Households. The results of this survey are also used to determine the relative importance (weights) of each item in the 'basket' of goods and services. The survey is conducted every five years among a sample of 30 000 households. The sample is apportioned on a *pro rata* basis among households in the urban as well as the non-urban areas, and includes people living in all types and sizes of dwellings.

In South Africa, expenditure group categories are used instead of income group categories to group products and services. This is done in accordance with international guidelines set by the International Labour Office. The boundaries of the expenditure group categories are set as the quintiles of the total number of households in South Africa, i.e. of the lowest 20% of the population, the next lowest 20%, etc.

The sampling for the Survey on Retail Prices is conducted in three phases. First, a sample of goods and services, based on the information collected through the Survey of Income and Expenditure of Households, is designed and selected. Second, a geographical sample for price collection is designed and selected. Currently 13 major metropolitan areas, covering all nine provinces, are included in the geographical sample for price collection. The 'other urban areas' are covered by nine provincial samples of four to five urban areas each, depending on the population size of the area. Thirdly a retail trade and service outlet sampling frame is constructed, based on available data sources, mainly the business register of StatsSA, telephone directories and lists obtained from the head offices of chain stores. Specific retail trade and service outlets are selected randomly within each area. The sample of outlets is revised every five years when the weights are revised.

On this basis an average of 110 000 price quotations are collected each month from approximately 2 200 outlets by means of 6 700 questionnaires. The indices are based on retail trade and service prices. Price information refers to the first seven days of the relevant month, while the prices of all items include VAT where relevant.

Price indices are calculated using a geometric mean, while group price indices are calculated by weighting product indices with the relevant product weight, according to each weighting structure, using the Laspeyres formula.

Two problems can immediately be identified with respect to the measurement of CPIF. First, the definition of urban and non-urban areas is problematic, as it rests on the administrative distinction between formally proclaimed towns (urban) and other areas (non-urban) regardless of the actual circumstances prevailing. The result is that no accurate 'rural' food basket is calculated for South

Africa. Second, the price survey is confined largely to the formal sector, and ignores the substantial sales of food products through informal outlets in urban areas, (e.g. through spaza shops and hawkers) as well as formal and informal sales in rural areas. As the majority of the poor in the country live in these areas, this means that it is not possible to readily trace the impact of policies that affect prices on poverty.

3.4 Evaluations of the South African CPIF

The BTT report of 1992

The Board on Tariffs and Trade (BTT, 1992) report on the functioning of the price mechanism in the food chain had as part of its terms of reference an assessment of the CPIF from 1980 to 1991. The report found that CPIF rose by 397%, at an average annual rate of 15,7%, over this period, compared to 352% or an average annual rate of 14,7% for the all-items index. At that time cost-push factors were found to bear the most responsibility for food inflation.

The report also pointed to the dangers of misinterpretation and misuse of the indices. Simultaneously certain retail chains cast doubt on the published statistics, indicating that their own studies reflect a substantially lower figure for food price inflation. However, the BTT report recognised that the fact that wholesale and retail food prices had risen could in part be attributed to improvements in the quality of much of the produce offered, to changes in the way they are presented to the customer, and to changes in consumer tastes. Given the choice between cheaper prices, improved quality and greater convenience, some customers show by their own actions that cheaper prices are not always their first preference and seldom their only criterion when purchasing food. On the other hand, poor people are generally more interested in the lowest possible price.

External evaluations of the CPI

The base method used to calculate the CPI in South Africa has remained the same in recent years. Stats SA recently requested Statistics Sweden to evaluate the present CPI (Haglund, 2000). This report came to the conclusion that:

- The index is compiled by means of internationally recommended index formulas and methods for dealing with substitution and quality change are expected to be appropriate for most of the different product areas covered;
- In general the index, as well as the derived indexes that are presently published are likely to result in suitably reliable results regarding the rate of change of South African consumer prices;
- Although the report mentions areas where the methodology could be improved, there was no mention of any improvements specifically directed to the food index;
- Procedures used for dealing with substitution and quality changes should be reconsidered only for the clothing component index;
- The coverage of the index should be extended to all South African households - even if this must be done by imputing the metropolitan and other urban area indicator product indices for the rural areas.

The IMF has also evaluated the methodology for measuring the CPI in South Africa (IMF, 2001). They found that the method conforms to international best practice, and is consistent with the ILO guidelines. However, they also highlighted two points of concern:

- The exclusion of rural households and of rural outlets;
- The procedure for the introduction of new products and the treatment of quality changes.

With regard to the first concern, StatsSA responded by pointing out that in the October Household Survey of 2000 they had included a question on the place of purchase of goods and services. They had planned to take a decision on whether the prices of items sold in rural areas will be collected on a regular basis based on whether people in rural areas purchase their goods and services mainly in local rural shops. If this were the case, they would also include a weighting reflecting the purchasing patterns of people in the rural areas. As a result of this assessment, they planned to publish the total CPI (including rural areas) from early 2002. The second of these concerns is more of a generic problem, and will not be addressed further here.

The South African method in comparative context

Table 29 shows the share of food in the CPI in 13 countries of the world, selected to represent a spread of developed, developing, and middle-income food exporting countries, and on the basis of data availability. This shows that the weight of food in the CPI in South Africa is lower than that of developed economies such as Ireland, Australia, Canada and New Zealand, as would be expected. However, the share is lower than countries such as Japan, Hong Kong and Chile, where per capita income is higher than in South Africa.

A part of the reason why the share of food in the CPI for South Africa is lower than expected can be found in the last two columns of the Table, which shows that the South African CPIF excludes meals eaten away from the home. Food consumed away from home already represents more than 50% of food consumption in many developed countries. The example of Hong Kong in the Table is instructive in this regard, as food consumed at home represents only some 10 percentage points of the total contribution of food (26 percentage points) to the CPI. While it is less than half in New Zealand (20% of the food sub-group) and Australia (a third of the food sub-group), in Ireland it is allocated to an entirely different sub-group.

A more detailed analysis of the method of measurement of CPI in 22 countries is provided in Appendix 8.

Table 29: The share of food in the CPI, selected countries

Country	Base year	Per capita income (USD) ²	Share of food in CPI	Share of food away from home (%)	Basis of inclusion
Philippines	1994	1 040	51.00	na	
Uganda	1997/98	300	45.20	Not included	
Malaysia	2000	3 380	33.80	na	
Swaziland	1985	1 390	30.70	Not included	
Japan	2000	35 620	28.50	na	The cost of a bowl of rice topped with seasoned beef is included in the food category of the CPI
South Korea	2000	8 910	27.12	na	
Chile ¹	1997	4 590	27.00	na	
Hong Kong	1999/00		26.67	16.67	Included, i.e. food at home makes up only 10.28% of the total for food.
South Africa	2000	3 020	25.44	Not included	
New Zealand	1999	12 990	18.50	19.71% of the food sub-group	Includes an item 'restaurant meals and ready-to-eat' in the food subgroup
Canada	1992		18.00		
Australia	1998/99	20 240	17.72	4.93% of the food sub-group	Includes an item 'Meals out and take away foods' eat' in the food subgroup
Ireland	2001	22 660	12.75	17.76	Includes a separate item 'Restaurants and Hotels' (which includes take-away) in the CPI

Note: ¹Includes beverages

²**Source:** World Development Indicators database, World Bank, April 2002

3.5 Assessment of the CPIF

It is evident that StatsSA has gone to considerable trouble in complying with international best practice in the calculation of the CPI. Nevertheless, even if a rural weighting is added to the CPI (and hence CPIF), three problems still remain:

- StatsSA works with an unsatisfactory definition of rural areas.

- No provision is planned for sales through informal sector outlets.
- No provision is made for food consumed away from home.

Table 30 illustrates the problems that are encountered because of the use of the peculiar definition of ‘non-urban’ areas, and because the reality of sales through the informal sector is ignored.

The data show that hawkers in urban areas (East London in this example) charge a price premium over formal retail outlets that is lower than the premium charged by hawkers in more remote areas (King William’s Town and then Alice). Of course, these data do not reveal anything about price trends: all else being equal, if the ‘rural premium’ stays constant over time, inflation in the remote areas will remain the same as in urban areas. Yet this cannot be known until a more satisfactory definition of rural areas is used, and until the trends in the ‘rural premium’ (the result of lower population densities, higher transport costs, etc.) are measured over time. Until this is done, there has to be a presumption that prices are higher in remote areas of the country, and that this premium may not be getting smaller.

Table 30: Differences in price per kg between the East London market and hawkers/retailers (1996)¹

Commodity	East London market ²	Formal retail ³	East London hawkers	King William’s Town hawkers	Alice hawkers
Tomatoes (5kg Med.)	1.52	3.98	2.40	4.34	5.45
Onion (10kg Med.)	0.77	2.98	2.00	3.00	3.00
Cabbage (26kg)	0.23	2.91	1.15	1.34	1.15
Pumpkins (7kg each)	2.68	13.26	18.00	21.00	24.00
Butternut (13kg)	0.83	2.41	1.82	2.72	2.72
Potato (10 kg) July	0.83	2.98	2.50	3.52	4.23
Apples (11 kg)	1.23	1.33	3.92	6.98	8.82
Banana (20 kg)	1.47	2.74	2.00	3.75	3.75
Orange (7kg) Large	0.88	1.07	1.14	1.00	0.64

Notes:¹ These data should also be interpreted with care, as differences in packaging are ignored.

² Actual price per kg on the East London Market

³ Average at the three largest supermarkets in the nodal points

Source: Bediako and Kirsten, 2001.