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Updating the weights of the CPI

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A. Introduction

In line with standard international practice Statistics South Africa revises the weights and basket of goods and services of the CPI periodically. The International Labour Office (ILO) and United Nations suggest that the CPI should be reweighted at least every five years. New weights and the products selected to represent them are being implemented by Stats SA four years after the large scale changes made to the CPI in 2009. The new weights and basket will come into effect in the January 2013 publication of the CPI.

This document presents the changes to the CPI basket of goods and services and demonstrates the basis on which the new CPI weights have been calculated. It is important to note the information presented in this document may change due to price updating of the weights or for any other reason deemed important by Stats SA. The final version of the weights will be issued once the CPI for December 2012 has been published.

B. The Income and expenditure survey

The primary data source for the basket and weights of the CPI is the Income and Expenditure Survey (IES). The IES is the only comprehensive survey of household incomes and expenditure conducted in South Africa under internationally approved conditions of statistical practice. The most recent edition surveyed approximately 31 500 households over a period of 12 months ending in August 2011. The survey combines a diary for the recording of frequently purchased items, with a traditional recall questionnaire for recording purchases of durables and semi-durables as well as other household information. The 2010/11 IES was the third iteration of a diary-based expenditure survey carried out by Stats SA.

One significant change in the survey methodology introduced in 2010/11 was the shortening of the period assigned for diary completion from four to two weeks. The entire sample was therefore divided into 26 periods to ensure continuous recording of expenditure by representative households. This was an attempt to minimise under-reporting of food expenditure due to respondent 'fatigue'. The survey response rate of 91,6% is considered extremely successful by comparison with similar surveys conducted elsewhere.

A key finding of the 2010/11 IES is that in real terms (constant prices), South African households increased their expenditure from an average of R76 404 in 2005/06 to R95 183 in 2010/11 (2011 prices). This is a 24,6% increase in expenditure. Full results of the IES can be found on the Stats SA website, together with more detailed methodological information.

In addition to the usual quality control procedures, a number of IES results were carefully reviewed by comparing with counterpart data such as records on retail sales. Details of the use of alternative data sources will be discussed below.

C. The basket of goods and services

The list of the goods and services surveyed for the CPI is known as the CPI basket. The basket is updated on the basis of the results of the IES, combined with information sourced directly from major retail chains. The CPI is classified according to the Classification of Individual Consumption by Purpose (COICOP). Basket selection is conducted according to the COICOP hierarchy as detailed in Table 1. The items in the basket are selected so as to be representative of similar products and services within a particular level. There are currently 402 items in the CPI basket. There will be 393 items in the new basket.

Table 1: Classification of products within the CPI

COICOP	Name	Example
2-digit	Category	Food and non-alcoholic beverages
3-digit	Class	Food
4-digit	Group	Bread and cereals
5-digit	Product	Bread
8-digit	Indicator product	Loaf of white bread – lowest level of weights
12-digit	Sampled product	Albany 700g loaf of white bread

Currently, there is a CPI basket for each province. From next year, there will be a basket for each primary urban area (large town or city), secondary urban area (smaller town) and rural area in each province. Determining basket composition at a disaggregated level improves the relevance of the CPI to the purchasing patterns at a local level. Users should note that the baskets reflect the pattern of residence rather than the point at which purchases are made. Stats SA compiles indices for 31 different 'index' areas – nine of these being the rural areas in each province.

A basket selection exercise was conducted per 'index' area. The objective of the process was to ensure inclusion in the basket of those goods and services that represent the greatest share of expenditure within a group. Typically, products and services accounting for 90% of expenditure in each group are included. Because of the large number of food items available, the criteria for the selection of food products is that they should represent at least 0,5% of expenditure within their class and 5% of expenditure within a 5-digit product.

The following highlight some of the main changes. A complete list of new products in the basket and those falling out of the basket is included as Appendix .1

In the food category, (A)Mageu (maize-based drink), feta cheese, bread rolls and spreads such as Bovril and Marmite will be new items in the basket. Items that will no longer be in the basket include samp, savoury biscuits, dried fruits and nuts, frozen vegetables, dried lentils and peas, and vienna sausages.

Drinking chocolate, filter (ground) coffee and mineral water are among the new non-alcoholic beverages in the basket. Vodka is also included in the CPI basket (as an alcoholic beverage).

A longer list of meat cuts and seasonal fruit are to feature in the basket. Seasonal fruit will be weighted as an aggregate 'seasonal fruit basket', while a weight will be attached to the aggregates of meat from a particular animal, e.g. beef.

Electricians and plumbers will now make an appearance in the basket in the household maintenance class. The data also shows that bricks, cement and doors attracted a greater proportion of household expenditure compared with paint, thinners and varnish which will no longer be in the basket. Washing machines, hotplates and gas stoves/heaters now feature in the list of household appliances to be priced whereas pricing of toasters and electrical frying pans will cease. Energy-saving light bulbs will now be priced as a distinct product.

Satellite dishes and cameras will form part of the recreation basket. Tablet computers will join laptops as representative products in the computer product group. Package holidays is a further new product and will appear on its own in the CPI publication due to its position in the classification system (it should be noted that no year-on-year changes will be shown for this index during 2013). Parking

fees, swimming pool entrance fees and music hi-fi centres will no longer form part of the basket.

D. The new CPI weights

The weights of the CPI are based on the proportions of total household expenditure in a particular period. While the IES results form the basis of the CPI weights, the sections below illustrate some of the differences, their origin and the remedial action adopted to correct detected biases.

1. Differences between the IES and the CPI weights

Across the world, respondents to household expenditure surveys have a tendency to under-report their expenditure on certain products/services. Under-reporting can be caused by 'respondent fatigue' (which occurs when a respondent tires of recording the minutiae of their expenditure in the questionnaire and therefore omits a number of purchases), unwillingness to accurately report on specific expenditure items because of social or religious factors or lack of accurate information on expenditure patterns. This under-reporting mainly affects frequently purchased items such as food, non-alcoholic beverages and personal care items.

Respondents to expenditure surveys also tend to significantly under-report purchases of alcohol, tobacco and gambling

In cases of under-reporting, where there are better estimates on the supply side, adjustments are made to the results of the IES to obtain more accurate values of total expenditure.

Adjustments are also made to the IES results to deal with certain methodological differences between the IES and the CPI. Such improvements are aimed at improving the alignment of the CPI with the methods used to compile the national accounts and with international best practice in the compilation of CPIs.

Weight determination is done by consulting a number of alternative data sources. Most commonly these are based on surveys or other records of sales of specific products from businesses. Statistics South Africa conducts a number of industry

surveys from which it is possible to identify the extent of retail sales of food or the value of food and beverages sold through restaurants, for example. Periodic large sample surveys (LSS) of the retail and wholesale sector were carried out in 2010. A number of industry associations or regulatory bodies maintain data on sales of items, such as alcohol, tobacco and gambling, which are also reliable sources. A further important alternative data source for CPI weights is the National Accounts.

By combining these different sources, Stats SA attempts to determine the best estimate of household consumption expenditure within international norms and standards.

2. The new weights

This section will spell out the changes to the high level weights of the CPI. The complete weights, at publication level detail, are contained in a separate document available on the Stats SA website.

The first step in obtaining the weights is to arrive at a value for total expenditure on a specific set of goods and services. The weights are initially calculated on the basis of the entire country (Total Country CPI) as most other data sources do not split values into urban and rural areas. Proportions from the IES are then applied to get the detailed geographic and product details required for the different indices – including the All Urban Areas CPI which is the official headline CPI.

Table 2: Values and proportions for Total Country

Category	New weights		Current weights	
	Value Rm	%	Value Rm	%
Food and non-alcoholic beverages	216 747	17,5	143 401	18,3
Alcohol and tobacco	66 690	5,4	43 597	5,6
Clothing	56 169	4,5	34 638	4,4
Housing	281 560	22,8	165 002	21,0
Household contents	63 944	5,2	48 181	6,1
Health	17 794	1,4	11 620	1,5
Transport	190 054	15,4	139 509	17,8
Communication	35 288	2,9	24 533	3,1
Recreation	55 756	4,5	30 821	3,9
Education	33 355	2,7	16 894	2,2
Restaurants and hotels	41 773	3,4	21 834	2,8
Miscellaneous goods and services	177 498	14,4	104 315	13,3
Total	1 236 632	100	784 350	100

Table 3: Proportions for All Urban Areas

Category	New weights %	Current weights %
Food and non-alcoholic beverages	14,8	15,7
Alcohol and tobacco	5,5	5,6
Clothing	4,2	4,1
Housing	24,1	22,6
Household contents	5,0	5,9
Health	1,5	1,5
Transport	15,8	18,8
Communication	2,9	3,2
Recreation	4,5	4,2
Education	3,0	2,2
Restaurants and hotels	3,6	2,8
Miscellaneous	15,1	13,6

3. Adjustments to the IES results

This section discusses a number of specific products and services in which adjustments have been made to the IES results. Unless otherwise specified, all tables refer to the total country CPI as this is the basis on which adjustments were made.

a) Food

Due to the reasons mentioned earlier, it is believed that the IES underestimates food expenditure. The total weight for food has therefore been adjusted upwards. The proportions of different food sub-components as reported in the IES have been retained to estimate weights at a lower level.

The weight for food was calculated by taking the value of food sales in the Retail trade large sample survey (2010), and then increasing it by 10,7% to account for informal sector sales (sourced from the National Accounts). A value sourced from the Large sample survey of the wholesale sector representing direct wholesale sales to households was added. Finally the sum was adjusted using nominal increases in monthly retail sales to bring it into the same time period as the IES. This resulted in a total value of food expenditure of R216 747m compared with R159 973m as recorded in the IES. The overall weight for food (total country) drops slightly from 18,3% to 17,5%.

Table 4: Calculating total food and non-alcoholic beverages expenditure

		2010/11 Rm	2005/06 Rm
IES		159 973	100 971
LSS		170 477	
Adjusted with monthly retail sales	11,6%	190 320	
Add informal sector sales	10,7%	210 685	
Plus wholesale sales to households	6 063	216 747	
Final Value		216 747	143 401
Weight		17,5%	18,3%

b) Alcohol and tobacco

Viewed as 'sin' purchases, IES respondents appear to be reluctant to record the full value of their expenditure on alcohol and tobacco. Stats SA sourced data from industry bodies for total sales of alcoholic beverages in the country. Using Stats SA's supply and use tables, a value of sales to other businesses (including restaurants and bars) was subtracted. This resulted in a weight for alcoholic beverages of 3,9% – slightly higher than the 2005/06 proportion of 3,3%.

Table 5: Calculating expenditure on alcoholic beverages

Alcohol	Rm
Industry sales	66 521
Less sales through bars, restaurants and business	17 845
Final value	48 676
Weight 2010/11	3,9%
Weight 2005/06	3,3%

Using information on excise tax collection, the current value underlying the weight was adjusted by the percentage increase in excise tax revenue from cigarettes. This reduces the weight of tobacco in the CPI to 1,5%.

Table 6: Calculating expenditure on tobacco

Tobacco	2010/11 Rm	2005/06 Rm	Change
Excise tax collection	9 367	6 024	55,5%
CPI value	18 013	11 585	55,5%
CPI weight	1,5%	2,3%	

c) Owner-occupied housing

The rental equivalence approach to owner-occupied housing was introduced to the CPI in 2009. At that time the weight was based on a rental yield (6,9%) which was applied to the market value of the property as estimated by the owner occupier.

In applying the same method (albeit with a slightly higher rental yield), the latest IES computes a value for owner-occupied housing of R256 billion – almost 200% more than the value reported in the 2005/06 IES.

The CPI weights have been calculated using an alternative method. Housing data in the IES were split between (actual) rented and owner occupied. The dwellings were matched according to location and physical characteristics. The rental value for similar dwellings was then used to derive a rental equivalence for owner occupied dwellings. This approach leaves the weight for owner occupied housing little changed at 11,2%.

Table 7: Owner-occupied housing: IES and CPI

	2010/11 Rm	2005/06 Rm	Change
IES value	256 708	88 213	191%
Imputed rentals – matching	139 051	88 213	58%
Weight	11,2%	11,3%	

d) Motor vehicles

Where possible, Stats SA adopts concepts and methods in line with those used in the national accounts. Consequently, Stats SA has applied the ‘net purchases’ approach to expenditure on used vehicles. Sales between households are regarded as having a net expenditure of zero. Accordingly, only the margin imposed by the car dealer and purchases of vehicles from the corporate sector should be considered as expenditure for this product. The weight was calculated on the basis of data from the national accounts and applied to the IES expenditure for used vehicles.

The IES showed a significant drop in the purchase of vehicles as a proportion of total expenditure across both new and used vehicles as a result of changes in consumer spending. The weight for used vehicles dropped from 3,8% to 2,7% using the old method and dropped further to 0,8% using the net purchases method.

Table 8: New and used vehicles

	2010/11 – net weight		2010/11 – gross weight		2005/06	
	Value Rm	Weight %	Value Rm	Weight %	Value Rm	Weight %
Used motor vehicles	10 381	0,8	33 905	2,7	25 065	3,8
New motor vehicles			63 711	5,1	48 269	7,4

e) Gambling

Gambling is the third group of ‘sin’ expenditures for which respondents tend to under-report their spending. Data were sourced from the Gambling Board and the Lotto to obtain the value of bets made by punters, less payouts received.

Table 9: Gambling

	2010/11		2005/06
	Value	Weight	Weight
	Rm		
IES value	1 496		
CPI value	16 356	1,3%	0,4%

f) Restaurants and hotels

The values for restaurants and hotels have been adjusted both for under-reporting and for methodological reasons. Expenditure in restaurants is often incurred by different household members individually and they may not report all of this in the household diary. Expenditure on alcohol away from home may also be under-reported for the reasons discussed under alcohol and tobacco above.

Stats SA has adopted the domestic concept for the scope of the CPI. This includes all expenditure by private households/consumers within the boundaries of South Africa irrespective of the place of normal residence of the consumer. This clarification largely affects this category. Previously tourism-related expenditure of non-residents was excluded.

Using large sample and monthly surveys of the accommodation and catering industry, a value for total sales was established. An estimate for sales to businesses was then subtracted to arrive at a final value. The weight for restaurants and hotels climbs from 2,8% to 3,4%.

Table 10: Restaurants and hotels

	2010/11 Rm	2005/06 Rm	Change %
IES	30 331	15 354	98
CPI	41 773	16 894	147
Weight	3,4%	2,8%	

g) Personal care items

Similarly to food, consumers tend to under-report their expenditure on personal care items. Data from Stats SA's large sample and monthly retail sales was used to obtain a more accurate estimate.

Table 11: Personal care

	2010/11		2005/06
	Value	Weight	Weight
	Rm		
IES value	14 659		
CPI value	21 419	2,4%	2,2%

h) Insurance

The CPI insurance class includes short-term (dwelling, household contents, motor vehicle, funeral) insurance and medical aid/health insurance. The values from the IES have been adjusted to account for reporting errors, as well as to account for the premium net of claims approach.

Comparing IES results with the statutory reports of oversight structures, it is evident that medical aid premiums have been under-reported in the expenditure survey. This is most likely because the premium may be paid directly by an employer on behalf of the policy holder in part or in full. Data from the Council for Medical Schemes (CMS) have been used to arrive at a more realistic level for medical aid premium payments.

Data from the CMS and the Financial Services Board (which regulates the short-term insurance industry) was used to determine the amount of money that was paid out in claims directly to members. It is assumed that this money would be captured as expenditure elsewhere by the IES and it is therefore subtracted from the total premiums in order to avoid double counting. Claims paid directly to third-party service providers were not considered in this calculation. This approach has led to a decrease in the weight of short-term insurance.

Table 12: Insurance

	2010/11		2005/06	
	Value Rm	Weight %	Value Rm	Weight %
Total Insurance	114 665	9,3	56 554	7,2
Medical aid		7,2		3,4
Short term insurance		2,1		3,8

E. Price updating the weights

The Income and expenditure survey collected data over a full twelve-month period starting in September 2010. The recall questionnaire required details of expenditure going back a year from the date of the interview. This means that households sampled in the first month of the survey would report their expenditure on certain items from as far back as September 2009. In order to deal with the varying time periods, the IES data are inflated and deflated to a common reference point of March 2011.

In line with international practice, the weights of the CPI will be price updated to reflect the average price level of the most recent full calendar year (2012). Using the actual inflation rates at the lowest level possible, the new weights will be price updated to the average index of 2012. Price updating therefore adjusts the weights to account for differences in relative price movements, but does not account for any changes in consumer behaviour in response to those price changes.

Table 11 illustrates the results of price updating the new 2010/11 weights to the CPI level for September 2012. Based on the publication of the average indices for 2012 in the December 2012 CPI release, the final price updating adjustments will be calculated.

Table 13: Comparing original headline and price-updated weights

	Price updated* %	Original %
Food and non-alcoholic beverages	15,0	14,8
Alcohol and tobacco	5,5	5,5
Clothing	4,1	4,2
Housing	24,6	24,1
Household contents	4,8	5,0
Health	1,5	1,5
Transport	16,5	15,8
Communication	2,7	2,9
Recreation	4,1	4,5
Education	3,0	3,0
Restaurants and hotels	3,5	3,6
Miscellaneous	14,8	15,1

*Inflated from March 2011 to index level at September 2012

F. Timing of changes

The final version of weights will be published following the December 2012 CPI release (to be published in January 2013). All changes will then be incorporated into the January 2013 release to be published in February 2013.

APPENDIX 1: CHANGES TO THE CPI BASKET OF GOODS AND SERVICES

New products

Publication level	Product name
Bread and Cereals	Bread rolls
Milk, eggs and cheese	Feta cheese
Milk, eggs and cheese	Amageu
Fruit	Seasonal fruit
Vegetables	Mixed vegetables - tinned
Vegetables	Corn chips
Other food	Spreads (Marmite and Bovril)
Hot beverages	Ground coffee and coffee beans
Hot beverages	Drinking chocolate
Cold beverages	Mineral water/spring water (aerated and still)
Cold beverages	Other drinks (excluding fizzy and fruit drinks)
Spirits	Vodka
Spirits	Spirit coolers and ciders
Maintenance and repair	Bricks
Maintenance and repair	Cement
Maintenance and repair	Doors and doorframes
Maintenance and repair	Electricians
Maintenance and repair	Plumbers
Appliances, tableware and equipment	Washing Machines
Appliances, tableware and equipment	Gas stoves
Appliances, tableware and equipment	Fans
Appliances, tableware and equipment	Hotplates
Appliances, tableware and equipment	Crockery
Appliances, tableware and equipment	Glassware
Appliances, tableware and equipment	Graters
Appliances, tableware and equipment	Power drills
Appliances, tableware and equipment	Power driven garden tools - lawnmower
Appliances, tableware and equipment	Garden hand tools –spade, fork
Appliances, tableware and equipment	Garden water sprinkler
Supplies and services	Toilet care – Disinfectant bleaches eg. Domestos
Medical products	Eye drops
Medical services	Public General practitioners
Medical services	Public Specialists
Medical services	Public - Theatre fees
Medical services	Public - Ward fees

Private transport operation	Clutch kits
Private transport operation	Batteries
Postal and telecommunication services	Courier services
Recreational equipment	Aerials and satellite dishes
Recreational equipment	Cameras
Recreational equipment	Tablets
Recreational equipment	Blank DVDs
Recreational equipment	Musical instruments: Pianos
Recreational equipment	Sports boots
Recreational equipment	Swimming pool cleaning equipment – brush or net
Books, newspapers and stationery	Textbooks
Books, newspapers and stationery	Files
Package holidays	Package holidays
Personal care	Hair relaxers
Personal care	Hair colour
Personal care	Hair pieces
Personal care	Bubble bath
Personal care	Powder (including baby powder)

Products no longer in the basket

Publication level	Product name
Bread and cereals	Savoury Biscuits
Bread and cereals	Porridge
Bread and cereals	Samp
Meat	Whole Chicken - Frozen
Meat	Viennas
Meat	Beef Meat Patties
Meat	Meat Pies (Excl. Chicken Pies) - Frozen
Meat	Chicken Pies - Frozen
Fish	Fish Portions In Crumbs - Frozen
Fish	Fish Portions In Batter - Frozen
Fish	Fish Paste
Milk, eggs and cheese	Evaporated Milk
Fruit	Lemons – Fresh
Fruit	Dried Fruit
Fruit	Raisins
Fruit	Nuts (Excl Peanuts)
Fruit	Peanuts
Vegetables	Peas – Frozen
Vegetables	Green Mealies - Fresh
Vegetables	Carrots – Frozen
Vegetables	Peas – Dried
Vegetables	Lentils – Dried
Vegetables	Butter Beans - Tinned
Other food	Mustard
Cold beverages	Dairy Mixtures

Wine	Sherry
Wine	Port
Maintenance and repair	Tile Adhesive
Maintenance and repair	Paint Thinner
Maintenance and repair	Paint Brush
Maintenance and repair	Filler
Maintenance and repair	Varnish
Water and other services	Refuse Collection
Water and other services	Sewerage Collection
Electricity and other fuels	Firewood
Electricity and other fuels	Candles
Furnishings, floor coverings and textiles	Fitted Carpets
Furnishings, floor coverings and textiles	Floor Tiles
Furnishings, floor coverings and textiles	Loose Carpets
Appliances, tableware and equipment	Electrical Frying Pan
Appliances, tableware and equipment	Toaster
Appliances, tableware and equipment	Casserole Dish
Appliances, tableware and equipment	Dinner Set
Appliances, tableware and equipment	Cups And Saucers
Appliances, tableware and equipment	Coffee Mug
Appliances, tableware and equipment	Saucepan
Appliances, tableware and equipment	Plastic Bowl
Appliances, tableware and equipment	Garden Hose
Appliances, tableware and equipment	Ladder
Supplies and services	Bleach
Supplies and services	Air Freshener (Aerosol Or Pump Action)
Medical products	Sinus Medication
Medical products	Fungal Medication (Foot And Hand)
Medical products	Muscle Pain Relief Gel
Medical services	Consumables
Private transport operation	Engine Cylinder Head Gasket
Private transport operation	Clutch Friction Plate
Private transport operation	Fan Belt
Private transport operation	Car Wash
Private transport operation	Licence Issue And Application Fees
Private transport operation	Parking Fees
Recreational equipment	Portable Radio And CD Combination
Recreational equipment	Music Centre Or Hi-Fi
Recreational equipment	Printer
Recreational equipment	Calculator
Recreational equipment	Action Figures
Recreational equipment	Inorganic Fertilizers
Recreational equipment	Organic Fertilizers
Recreational and cultural services	Swimming Pool Entrance Fees
Books, newspapers and stationery	Pencil
Personal care	Roll-On Deodorant
Personal care	Clock
Personal care	Car-Seats For Babies