The Rebased Consumer Price Index

12th November 2013
Fixed Basket Approach

Index numbers are used for decomposing a change in value into a price change component and a volume change component. A CPI is intended to measure the price component of the change in households’ consumption expenditure. Can be done by measuring the change in the value of an aggregate holding the quantities constant i.e. the fixed basket.

The compilation of a CPI involves two stages. The calculation of price indices for un-weighted elementary aggregates. The building blocks of the CPI. The aggregation of these elementary price indices to higher level indices using relative levels of consumer expenditure as weights. The compilation of the all-items consumer price index itself consists of a weighted average of higher-level indices.
Laspeyres-type Index

\[ p^{t/0} = \frac{\sum_i p_i^t q_i^b}{\sum_i p_i^0 q_i^b} \]
Laspeyres-type Index

\[ p_{t/0} = \frac{\sum p_i^t q_i^b}{\sum p_i^0 q_i^b} \]

Using the arithmetic mean for illustrative purposes, the index \( P_{t/0} \) in period \( t \) and which uses period 0 as the price reference period, is a Laspeyres-type or fixed base weight index.

The Namibian Consumer Price Index
Laspeyres-type Index

\[ p^{t/0} = \frac{\sum_i (p_t^i q_i^b)}{\sum_i (p^0_i q_i^b)} \]

Price for ith item (or product) at time t.
Laspeyres-type Index

\[ p_{t/0} = \frac{\sum_i p_i^t q_i^b}{\sum_i p_i^0 q_i^b} \]

*Price for ith item (or product) at time 0, the price reference period (or base period).*
Laspeyres-type Index

\[ p_{t/0} = \frac{\sum_i p_i^t q_i^b}{\sum_i p_i^0 q_i^b} \]

Quantity of ith item purchased during the weight (or basket) reference period.

The Namibian Consumer Price index
Laspeyres-type index

\[ p^{t/0} = \frac{\sum_{i} (p_i^t / p_i^0) w_i}{\sum_{i} w_i} \]

An algebraically equivalent equation

The Namibian Consumer Price index
Chain Linking

- We update weights & basket to minimise substitution bias to keep the CPI relevant but users need a “continuous” series.
- A CPI requires that the old series be combined with the new one so as to create one continuous series.
  Constructing a continuous price series by multiplying together price indices that have been constructed with different baskets or weighting regimes. – using a link month/year.
- Can also be used when baskets & weights haven’t changed (e.g. methodological changes).

A series of bilateral price indices can be chained together.
- For example when basket & weights updated annually.
Chain Linking

New Series
Jan 1997 = 100

Questions:
2006
2007
2008

The Namibian Consumer Price Index
Chain Linking Formula

\[ 270 \times \frac{100}{300} = 270 \times \frac{1}{3} = 90 \]
Chain Linking

New Series
Jan 1997 = 100

The Namibian Consumer Price index
Chaining to Update the Basket & Weights
Namibia CPI - the new CPI (December 2012=100) chain-linked to corrected back-series

New weights have been computed from the 2009/2010 NHIES. Adjusted for potential under-reporting in the NIES of alcohol & to bacco (a common problem for household budget surveys).

All weights were price-adjusted to the price reference period i.e. to account for the increases in prices since the HIES was conducted in 2009/2010.

2009/2010 NHIES is generally considered a better survey than previous ones

New weights reflect the significant changes in expenditure patterns that can be expected, as measured by the 2009/2010 NHIES, compared with 1993/94.
Re-calculation of old index

Adoption of Zone weights specific to items/groups to compute national CPI from CPIs for Zones (current index uses “All Items” zone weights).
- No impact on “All Items” CPI.

Applying appropriate weights to goods & services indices.
- No impact on “All Items” CPI.

A re-classification of some items as “service” to be in-line with COICOP.
- E.g. Takeaway food, ready-made coffee, sit down meal.
- No impact on “All Items” CPI.

Misclassification of some items to wrong product groups.
- Meat products (Zones 1 & 3).
- Glassware (Zones 1, 2 & 3).
- Heating & cooking appliances (Zones 2 & 3).
- Audio, visual, photographic & data processing equipment (Zone 3).
- No impact on “All Items” CPI.

Re-calculated index may also reflect changes made to spreadsheets after publication.
- E.g. Correcting a price after CPI publication, failure to carry forward a missing price, inputting of late data.
- Will impact on “All Items” CPI & any re-computation of CPI from spreadsheets.
Namibia CPI - the New Weights

New weights have been computed from the 2009/2010 NHIES. Adjusted for potential under-reporting in the NIES of alcohol & tobacco (a common problem for household budget surveys).

All weights were price-adjusted to the price reference period i.e. to account for the increases in prices since the HIES was conducted in 2009/2010.

2009/2010 NHIES is generally considered a better survey than previous ones

New weights reflect the significant changes in expenditure patterns that can be expected, as measured by the 2009/2010 NHIES, compared with 1993/94.
Namibia CPI – the Old Weights

NCPI Weights 1993/94

1.62
Hotels, Cafes and Restaurants

20.59
Housing, Water, Electricity, Gas and other Fuels

0.90
Communications

2.50
Recreation and Culture

5.61
Furnishings, Household Equipment and Routine Maintenance of the House

5.13
Clothing and Footwear

1.51
Health

7.11
Recreation and Culture

14.79
Transport

3.26
Alcoholic Beverages and Tobacco

29.63
Food and Non-Alcoholic Beverages

7.36
Education

The Namibian Consumer Price Index
Namibia CPI – The New Basket

A new and more representative basket of goods and services has been introduced at the time of re-basing.
Based on 2009/2010 HIES, price collection experience, expert judgement.

Examples of new items
- Sportswear, boys & girls suits,
- garden & patio furniture,
- power-driven tools,
- plastic bags for food storage/garbage,
- motor cycles,
- driving lessons, creches & playgroups.

Items dropped
- Goat meat.
- Peas.
### Namibia CPI – Revisions to Back-series

<table>
<thead>
<tr>
<th>Month</th>
<th>Difference: corrected CPI minus uncorrected CPI as published (All Items)</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2012</td>
<td>0.0</td>
</tr>
<tr>
<td>November 2012</td>
<td>0.0</td>
</tr>
<tr>
<td>December 2012</td>
<td>0.0</td>
</tr>
<tr>
<td>January 2013</td>
<td>0.2</td>
</tr>
<tr>
<td>February 2013</td>
<td>0.2</td>
</tr>
<tr>
<td>March 2013</td>
<td>0.0</td>
</tr>
<tr>
<td>April 2013</td>
<td>0.1</td>
</tr>
<tr>
<td>May 2013</td>
<td>0.1</td>
</tr>
<tr>
<td>June 2013</td>
<td>0.0</td>
</tr>
<tr>
<td>July 2013</td>
<td>0.0</td>
</tr>
<tr>
<td>August 2013</td>
<td>-0.1</td>
</tr>
<tr>
<td>September 2013</td>
<td>-0.1</td>
</tr>
</tbody>
</table>
Namibia CPI- the new CPI (December 2012=100) chain-linked to corrected back-series

<table>
<thead>
<tr>
<th>Month</th>
<th>New chain-linked CPI (includes corrections to back-series)</th>
<th>New chain-linked CP – annual inflation rate</th>
<th>Previously published CPI – annual inflation rate</th>
<th>Difference in inflation rates – New CPI compared with previously published CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 2012</td>
<td>99.6</td>
<td>7.1</td>
<td>7.1</td>
<td>0.0</td>
</tr>
<tr>
<td>November 2012</td>
<td>100.3</td>
<td>7.5</td>
<td>7.6</td>
<td>-0.1</td>
</tr>
<tr>
<td>December 2012</td>
<td>100.0</td>
<td>6.4</td>
<td>6.3</td>
<td>+0.1</td>
</tr>
<tr>
<td>January 2013</td>
<td>101.0</td>
<td>6.2</td>
<td>6.6</td>
<td>-0.4</td>
</tr>
<tr>
<td>February 2013</td>
<td>101.4</td>
<td>5.8</td>
<td>6.2</td>
<td>-0.4</td>
</tr>
<tr>
<td>March 2013</td>
<td>101.9</td>
<td>5.9</td>
<td>6.3</td>
<td>-0.4</td>
</tr>
<tr>
<td>April 2013</td>
<td>102.3</td>
<td>5.9</td>
<td>6.1</td>
<td>-0.2</td>
</tr>
<tr>
<td>May 2013</td>
<td>102.4</td>
<td>5.8</td>
<td>6.1</td>
<td>-0.3</td>
</tr>
<tr>
<td>June 2013</td>
<td>102.7</td>
<td>6.3</td>
<td>6.2</td>
<td>+0.1</td>
</tr>
<tr>
<td>July 2013</td>
<td>103.4</td>
<td>5.9</td>
<td>5.8</td>
<td>+0.1</td>
</tr>
<tr>
<td>August 2013</td>
<td>103.8</td>
<td>6.1</td>
<td>6.0</td>
<td>+0.1</td>
</tr>
<tr>
<td>Sept 2013</td>
<td>104.1</td>
<td>5.5</td>
<td>5.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>