

TECHNICAL NOTES

Concepts and Definitions

Introduction

The CPI measures the percentage change through time in the cost of purchasing a constant “basket” of goods and services which represents the average pattern of purchases made by a particular population group in a specified time period. The “basket” is of an unchanging or equivalent quantity and quality of goods and services, consisting of items for which there are continually measurable market prices over time. Changes in the costs of items in the basket are therefore due only to “pure” price movements, i.e. price movements that are not associated with changes in the quality and / or quantity of the set of consumer goods and services in the basket.

The “basket” covers a wide range of goods and services, classified according to the United Nations “Classification of Individual Consumption According to Purpose (COICOP)” in the following thirteen groups:

- *Food & Beverages*
- *Alcoholic Beverages & Tobacco*
- *Clothing and Footwear*
- *Housing, Water, Electricity, Gas & Other Fuels*
- *Furnishings, Household Equipment & Routine Household Maintenance*
- *Health*
- *Transport*
- *Information & Communication*
- *Recreation, Sport & Culture*
- *Education*
- *Restaurants & Accommodation Services*
- *Insurance & Financial Services*
- *Personal Care, Social Protection & Miscellaneous Goods & Services*

The Consumer Price Index is calculated according to states in Peninsular Malaysia, Sabah and Sarawak. All the state indices will be combined to produce Malaysia’s index. Malaysia’s index is a composite index weighted by states expenditure weights of each state’s indices.

Coverage

Commencing January 2024, the weights used in the calculation of the CPI are based on the pattern of expenditure obtained from the Household Expenditure Survey conducted in 2022.

Price

The prices used in the calculation of the CPI are retail prices or transacted prices including all taxes imposed on those goods and services.

Prices are collected on a monthly basis for all items and especially for perishable food items, it was collected both on monthly as well as on weekly basis. Meanwhile, rents are collected once every quarter.

The selection of outlets in which prices are to be collected is purposive (other than for rents) with the sample designed to cover outlets with high sales turnover. Prices of 573 items are used in the computation and these are obtained from 23,300 retail outlets in Malaysia.

Weights

The weights used in the calculation of the Consumer Price Index are periodically updated. This procedure is necessary to ensure that the weights reflect the changes in consumer expenditure pattern.

Index Calculation Methodology

Effective with the release of data for January 2016, Laspeyres chain index method is used in the calculation of the CPI. It employs December 2015=100 as the reference base. The same method will be used in the calculation of the CPI publication January 2018 using the reference base December 2017=100, while the calculation of the CPI publication January 2024 using the reference base December 2023=100.

The consumer price indices are calculated as a chain of fixed-basket indices. This means that a sequence of fixed-basket indices have been chained together to create a continuous time series. This is necessary to avoid having breaks in an index when the basket is updated.

In order to chain indices across baskets, hybrid expenditure weights for the old and new baskets must be expressed at the prices of a common period. This common period is called the link month.

Link month weights are obtained by updating the price of the original expenditure weights to obtain the hybrid expenditures expressed at the prices of the link month.

In the month following the basket link month, price indices calculated using the new basket are multiplied by the index levels previously published for the old basket.

$$I_{2010:t \text{ chained}} = I_{\text{Dec2023}:t \text{ 2022}} \times I_{\text{Dec2017}:t \text{ 2016}} \times I_{\text{Dec2015:Dis2017:Dec2023 2014}} \times I_{2010:\text{Dec2015 2010}}$$

where:

- $I_{2010:t \text{ chained}}$ *is a chained index for the price observation period t with a price reference period equal to 2010;*
- $I_{\text{Dec2023}:t \text{ 2022}}$ *is an index for the price observation period t with December 2023 as the price reference period, calculated using the 2022 basket;*
- $I_{\text{Dec2017}:t \text{ 2016}}$ *is an index for the price observation period t with December 2017 as the price reference period, calculated using the 2016 basket;*
- $I_{\text{Dec2015:Dec2017:Dec2023 2014}}$ *is a chained index for December 2023 with December 2017 with December 2015 as the price reference period, calculated using the 2014 basket;*
- $I_{2010:\text{Dec2015 2010}}$ *is a chained index for December 2015, with 2010 as the price reference period calculated using the 2010 basket;*

In the case of the chain index, the weighted averages of indices of lower level groups or items do not match those of the corresponding upper level groups (the chain index has no additivity).

Rate of Change

A rate of change representative of movement in prices may be derived in several ways. The current method of calculating CPI uses three measures of change, i.e the percentage change between any given month and the same month a year ago (year-on-year); the current month over previous month (month-on-month) and the percentage change between annual average for the specific current year to the same fixed period on the previous year. The following example illustrates the computation of index point and percentage change.

Index Point Change

Consumer Price Index	125.4
Less Previous Index	124.3

Equals to	1.1

Percentage Change

Index point
difference
divided by the
previous index,
multiplied by one
hundred

$$\begin{aligned} &= \frac{125.4 - 124.3}{124.3} \times 100 \\ &= 0.9 \% \end{aligned}$$

Seasonal Adjustment

Time-series data are very useful for economists, policy & decision makers and analysts to identify the important features of economic series such as direction, turning point and consistency between other economic indicators. Sometimes this feature is difficult to observe because of seasonal movements. Thus, if the seasonal effect can be removed, the behaviour of the series would be better viewed. The estimation and removal of the seasonal effects is called seasonal adjustment.

Seasonal adjustment is a process to identify and to remove the regular within-a-year seasonal pattern, which may also include the influences of moving holidays and working/trading days effect in each period. The ultimate objective of the process is to highlight the underlying trends and short-term movements in the series.

In Malaysia, most of the time series data are affected by seasonal effects. Hence, to eliminate the seasonal effect as well as to seasonally adjust the Malaysian economic time series data, a standard seasonal adjustment package, X-12 ARIMA was used by Department of Statistics,

Malaysia. Malaysian economic time series data also often affected by major religious festivals such as Eid-ul Fitr for Muslims, Chinese New Year to the Chinese and the Indian Deepavali. These festivals' dates are fixed according to the lunar year but vary according to the Gregorian calendar. Therefore, to estimate and remove moving holiday effect from time-series data, a procedure was developed, namely Seasonal Adjustment for Malaysia (SEAM).

Revision

Revision will be made to the published figures based on the latest data available.

Abbreviation

kg : kilogram

g : gram

l : litre

ml : millilitre