

UNDERSTANDING THE ARUBAN CPI

The Aruban Consumer Price Index (ACPI) measures the average change over time in prices of goods and services consumed by people for day-to-day living. It does this by following the prices of a fixed set of goods and services commonly purchased by Aruban households. This fixed set of goods and services (basket) is based on the Household Income and Expenditure Survey (HIES). The ACPI is the chief measure of average price change in the consumption sector of the Aruban economy. The Central Bureau of Statistics (CBS) produces the CPI and strives to do so in accordance with the best international practices. The ACPI is a complex construct that uses economic theory, sampling and other statistical techniques to produce a measure of the average change over time in prices of goods and services that all people in a country consume for day-to-day living.

COICOP AND THE ACPI FRAMEWORK

The universe of the Aruban CPI is all goods and services that Aruban households consume. Because this universe is so vast, the CBS stratifies it (breaks it into smaller parts called elementary aggregates). The stratification of ACPI universe has one dimension: an item dimension (all consumption goods and services), which covers the entire population and island. To stratify the item dimension into item strata, the CBS uses the Classification of Items According to Purpose (COICOP). COICOP is the international standard for classifying consumption goods and services and defining the scope of consumption (what is part of consumption and what is not). COICOP divides the consumption universe into 12 Divisions, 47 Groups, and 117 Item Classes. The CBS divides the set of all consumption goods and services into 12 Divisions, 43 Groups, 97 Item Classes, 169 Subclasses and in 408 Elementary aggregates. The Aruban CPI excludes COICOP item classes that are not relevant or important in Aruba and combines some COICOP item classes that have small weights. Both the expenditure weights and price collection cover the whole island, with no distinction made between urban and rural areas.

MAIN COMPONENTS OF THE CPI CALCULATION

A consumer price index is a weighted average of price changes (geometric average); the main inputs needed to compile a CPI are expenditure weights and price changes. The weights are based on households' total consumption, while the price changes are derived from prices of specific goods and services that are collected repeatedly over time.

FROM HIES TO THE CPI: GATHERING EXPENDITURE DATA

The expenditure data comes from the HIES, which was conducted during May 2016 and June 2016. The HIES canvassed households spread over the whole island. The HIES consisted of two surveys: the retrospective questionnaire and the daily expenditure questionnaire. The retrospective questionnaire asked the sampled households for data on household spending for consumption for the last year, while the daily expenditure survey covered expenditures made during a period of two weeks. The data needed for the CPI weights was derived from these two questionnaires.

STEPS IN THE ACPI PRICE COLLECTION

The CBS staff collects the prices for the CPI. To obtain prices, the CBS defined specific goods or services (products) to represent the 408 CPI items and chose which retail outlets to visit based on the size of the outlets. The CPI statistician selected the products (consumer goods or services) for each item stratum based on the results of the HIES. The CPI price collectors visit (or otherwise contact) the outlets periodically (monthly, bimonthly, quarterly, thrice, or semiannually) to collect the current prices of each selected product. Price collectors record the prices on either paper forms or tablets, which are submitted daily to the CBS office and entered into Excel spreadsheets. On average around 7,100 price quotations are collected each month for the ACPI.

MAINTAINING DATA INTEGRITY IN PRICE COLLECTION

It is important that the same product be priced each month from a given outlet; however, identical products do not need to be priced across different outlets. When a product in a particular outlet has not been priced for a period of six (6) months, the statistician instructs the price collector to identify a replacement product and report its price and its detailed specifications. Special procedures are applied for handling replacement products and products that cannot be collected in a given month.

HOW THE ACPI INDEX IS COMPUTED

The CBS calculates the Aruban CPI in two steps: (1) Elementary indices for the 408 elementary aggregates based on the collected prices, and (2) Higher-level indices as weighted averages of these elementary indices. To calculate elementary indices, the ACPI applies a two-stage geometric average (GA) formula. The index in the current month (period t) equals the index in the previous month (period t-1) multiplied by the change in prices from the previous month to the current month. This change is measured as the ratio of average prices in the two months, more specifically, the ratio of the geometric mean of item prices in period t to the geometric mean of their prices in period t-1. Both averages must be based on the same set of items. For items priced less frequently than monthly, prices are carried forward, so the period t-1 price is the last collected price (for example, the period t-2 price if collected bimonthly).

$$x_{ELAgg}^t = x_{ELAgg}^{t-1} \times \left(\frac{\left(\prod_{j=1}^{n_{ELAgg}^t} p_{ELAgg;j}^t \right)^{\frac{1}{n_{ELAgg}^t}}}{\left(\prod_{j=1}^{n_{ELAgg}^{t-1}} p_{ELAgg;j}^{t-1} \right)^{\frac{1}{n_{ELAgg}^{t-1}}}} \right) x_{ELAgg}^0 = 100$$

COMPUTATION OF HIGHER-LEVEL INDICES

To calculate higher-level indices, the ACPI applies a weighted arithmetic average of elementary indices. The weights are expenditures from the HIES and normalized to sum to 10,000.

$$X_{H,Young}^t = \sum_{ELAgg \in H} \left(x_{ELAgg}^t \times \frac{w_{ELAgg}^{WgtPeriod}}{10,000} \right)$$

$$w_{ELAgg}^{WgtPeriod} = \frac{Exp_{ELAgg}^{WgtPeriod}}{\sum_{ELAgg \in H} (Exp_{ELAgg}^{WgtPeriod})} \times 10,000$$

CBS MONTHLY CPI RELEASES

The CBS publishes monthly indices on its website, using June 2019 as the index reference period (June 2019=100).