



مركز الإحصاء
STATISTICS CENTRE

Construction Cost Index Methodology

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Overview

Statistics Centre - Abu Dhabi (SCAD) is the official entity responsible for calculating and issuing the Construction Cost Index (CCI) in the Emirate of Abu Dhabi. This index number is issued on a quarterly basis. Work has been carried out on this project since 2013 in cooperation with Contractors Association, Abu Dhabi Municipality and the Department of Economic Development, which are the competent entities in this field, to prepare the weights of materials and services basket of construction costs - medium-quality towers, adopting the classifications approved by the Department of Economic Development in respect of contractors.

The CCI achieves several goals and benefits of interest to economic decision- and policy-making, needs of the business sector and national accounts compilation, and to complement the set of indices that SCAD seeks to build, whether related to prices or production for various economic activities.

Therefore, Statistics Centre - Abu Dhabi has worked on establishing a construction cost index number that reflects changes in building and construction cost prices, to provide a detailed picture of developments in the construction sector, to serve as a reliable statistical indicator that measures changes in construction costs, in addition to being an important indicator that can be used by development planners and researchers in and production fields in general. This indicator was first calculated in the first quarter of 2014, and released in the first quarter of 2015.

The Construction Cost Index is going to be developed in the coming years to include other classifications, as this report includes weights for tower projects of medium quality, residential villas projects and bridge and road projects are going to be included later as a next stage in calculating the Construction Cost Index. The methodology used for calculating the Construction Cost Index is consistent with international recommendations and best practices in this field.

Importance

The Construction Cost Index is an important economic indicator that serves as a key input for planning and research in various urban and economic fields. The Construction Cost Index provides quarterly estimates of rates of change in the prices of list of building materials and services used in construction projects in Abu Dhabi city. The indicator is intended to meet the needs of real estate developers, the prices of building materials. Below are some important uses of the Construction Cost Index:

- Calculating inflation / deflation in building and construction cost prices.
- Informing contractors and interested entities about movements in the prices of building and construction materials in the Emirate of Abu Dhabi.

Objectives

The Construction Cost Index measures changes in the costs of constructing medium-sized towers during specified periods of time inside the Emirate of Abu Dhabi, and the most important objectives of the Index Number are as follows:

- Identifying changes in costs of constructing medium-sized towers of all kinds.
- Identifying developments in the construction sector, by identifying the volume of demand for building materials as reflected by the rises or falls in the prices of these materials.
- Construction Cost Index is an analytical tool for identifying trends of prices and forecasting any price changes in prices of building materials by decision makers and policy makers.
- Internal use in Statistics Centre to calculate other statistical indicators, including short-term economic indicators and Gross Domestic Product (GDP) at constant prices.
- Used by specialized companies and commercial establishments in the construction and building materials sector.

Concepts and Definitions

Construction Cost Index: a statistical tool for measuring relative change in the cost of constructing a medium-quality tower.

Price: the market value of a unit of material or service, expressed in monetary terms. It can be defined as the value paid for a particular material or service.

Average price: The sum of the prices of a commodity / service collected from more than one source divided by the number of sources for that commodity.

Relative Quarterly price change: It is the rate of increase or decrease in the average price of the current quarter compared with the average price in the previous quarter or the same quarter of the previous year.

Towers of Medium quality: Construction buildings of 15-20 floors that are prevalent in the Emirate of Abu Dhabi and made of medium-quality materials.

Relative Importance: the ratio resulting from dividing the monetary value of the cost of a good/service by the monetary value of the cost of all goods and services required to build a medium-quality tower.

Source: is the outlet for selling materials and services, such as building materials companies and factories.

CCI Survey Frequency: It is the approved period of time to repeat the process of collecting the prices of for the different groups of goods and services. It may be monthly or quarterly.

Comparison Period: the "current" or most recent period for which the index was calculated. However, the term is used to refer to any period that is being compared with the base period.

Base Period: the year in which the residential rental price index equals 100. The base period serves as a benchmark for future periods, allowing economists to judge rates of increase and decrease in prices compared to that year.

Geographical Coverage

Construction Cost Index is representative of the average cost of the list of goods and services in CCI basket in the Emirate of Abu Dhabi.

Frequency

The Construction Cost Index report is issued on a quarterly basis.

Classifications

A local classification approved by Department of Economic Development, Contractors Association and Abu Dhabi Municipality was used in preparing Construction Cost Index, containing 10 main groups and 70 sub-groups, including 592 construction materials and services.

The main groups of the CCI are listed below:

Table 1: Main groups of CCI

No.	Group's Name
1	Construction materials
2	Finishing materials
3	Electrical work materials
4	Mechanical works - sanitary drainage and its tools
5	Mechanical works - fire fighting
6	Mechanical works - HVAC
7	Equipment
8	Manpower
9	Services
10	Insurances and Guarantees

Main Data Sources

The main data source to calculate the construction cost index is the monthly field survey carried out by the Income and Prices Section at the Statistics Centre - Abu Dhabi. Prices are collected from a total of (61) sources.

Questionnaires

The questionnaire was designed to collect data on goods and services within the CCI basket. The questionnaire sent to the sources on a quarterly basis.

Sample Design

The target sampling methodology is used in CCI to determine the sources from which the data will be collect. The target sources are chosen to represent the prices of building materials within the Emirate of Abu Dhabi. This was done through field visits carried out by a team from the Income and Prices Section in coordination with the experts in the department, which identified a number of sales sources representing the building materials trade in the Emirate of Abu Dhabi. The enumerator assigned to follow up on the sources periodically informs the section about the closure or transfer of any source in order to ensure accurate coverage of the data collection sources for preparation of construction costs statistics.

The basket of building materials used in the construction cost statistics, was selected in cooperation with the Contractors Association to ensure that it covers all materials affecting the construction sector, and is constantly updated by adding new items in the market, and deleting items that have disappeared from the market.

Data Collection

Data Collection starts with an initial field visit to sales outlet, and after the enumerator has introduced the survey and its objectives to the official at the sales outlet, they mutually determine the mechanism of collecting data (field / by telephone / electronically), in order to facilitate the collection process for the enumerator and the sales outlet official.

Calculation of CCI and Data Editing

The price editing process is carried out in three stages, as follows:

- The first stage includes examination of the data by the statistical enumerators, as the building materials price series are entered into the monthly / quarterly data tables where the variables are coded, so that they can be compared with corresponding for verification in the event of outlying values. The variables are assigned individually for each item according to: “usual” and “unusual” changes in prices, based on analysis of data from previous quarters. Upon detection of outlying data, the enumerator communicates with the data providers to verify the accuracy of their entered data and write down any explanations they may provide.
- The second stage includes a comparison of the current prices with the prices of the previous quarter. After the prices are entered and verified, the average monthly / quarterly price for each commodity is determined. When the price is not available from a specific source through the monthly or quarterly collection process, the values of these prices are estimated in comparison with the previous quarters, and in the event that the material disappears from the market, it is replaced by a material of comparable price and specifications.
- Third stage involves editing and analyzing the contribution rates of the main groups that make up the index and, compared with previous periods.

Weights

Construction Cost Index Number is a weighted average of change in the price of the index basket materials and services. The weight of the material / service reflects the relative importance of the materials or service.

The relative importance of the materials and services used in medium-quality tower projects prevailing in Abu Dhabi city for the year 2013 was established through cooperation with the Contractors Association at Abu Dhabi City.

There are 10 main groups of construction materials and services shown in the following table:

Table 2: Main groups of CCI and weights

No.	Group's Name	
1	Construction materials	13.00 %
2	Finishing materials	26.00 %
3	Electrical work materials	8.00 %
4	Mechanical works - sanitary drainage and its tools	4.00 %
5	Mechanical works - fire fighting	3.00 %
6	Mechanical works - HVAC	7.00 %
7	Equipment	2.00 %
8	Manpower	29.50 %
9	Services	4.50 %
10	Insurances and Guarantees	3.00 %
	Total	100.00 %

Calculation of CCI

The Construction Cost Index is calculated according to the mathematical formula of the Laspeyres equation. The weights used represent projects in 2013

$$CCI = \frac{P_1}{P_0} * W_0$$

CCI = current CCI

P_1 = current price

P_0 = base Year price

W_0 = base year weight

The index is calculated at the level of the primary groups using the Jevons method according to the equation below

$$P_J = \prod_{i=1}^n \left(\frac{P_t^i}{P_0^i} \right)^{\frac{1}{n}} = \frac{\prod_{i=1}^n (P_t^i)^{\frac{1}{n}}}{\prod_{i=1}^n (P_0^i)^{\frac{1}{n}}}$$

P_j : Jevon's index

P_t : comparison period price

P_0 : base period price

$i = 1, 2, 3, \dots, n$

n : number of items in the primary list

Upward aggregation is applied in calculating the construction cost index, and after multiplying the Jevons index by the weight of the good/service, the weights are aggregated at the level of sub-groups and then the main groups. The index is then calculated by dividing the new weight by the weight of the base period multiplied by one hundred.

Calculation of relative change

The relative change in the index for the current quarter compared to the same quarter of the previous year is calculated according to the equation

$$RC = \frac{HPI_c}{HPI_p} * 100 - 100$$

RC: relative change

HPI_c : current index

HPI_p : previous index

Outputs

- The construction cost index for the current quarter of medium-quality tower projects in the Emirate of Abu Dhabi.
- Relative change in the construction cost index compared to the same quarter of the previous year for medium-quality tower projects in the Emirate of Abu Dhabi.
- Relative change in the construction cost index compared to the previous quarter for medium-quality tower projects in the Emirate of Abu Dhabi.
- Relative change in the annual Construction Cost Index for medium-quality tower projects in the Emirate of Abu Dhabi compared with the previous year.

Timeliness

The CCI report is released within 75 days after the end of the reference quarter.

Dissemination

The report on Construction Cost Index and all related tables are published on a quarterly basis through several channels, chief among which are:

1. Statistics Centre - Abu Dhabi's website
2. Regular press news.



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