

**Methodology**

**Construction Cost Index – 2015**

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**First: Background on Survey**

**1.1 Introduction:**

The construction sector has an impact in the national economy due to its association and direct impact on many economic activities, The Construction Cost Index (CCI) achieves many goals and benefits to economic decision and policy makers, businessmen and the authors of the national accounts. DSC seeks to build index system, which represents accurate reference for those interested in the development of data whether data related to the prices of all kinds or data related to production development of various economic activities.

Therefore, DSC has created Construction Cost Index, which reflects construction and building cost prices change in order to present a complete image about the development of the construction sector and relied upon as a statistical index that measures construction cost changes. Moreover, it is an important index used by planners and staffs in the fields of development and production.

Based on the available data collected for purposes of calculating construction cost indices since 2012. The available numbers have been prepared and processed according to ISIC4, serving the calculation of current construction cost index, where the number of commodities and services included in the calculation of CCI is 421 commodities and services collected from 83 establishments distributed to most areas of Emirate of Dubai.

Results have been prepared within tables through which the user can identify building costs movement. Buildings type classified into residential building and non-residential building, and residential buildings classified into villa building and Multi-storey building. Non-residential buildings classified into public buildings and industrial buildings.

* 1. **Survey Objectives**

Construction Cost Index measures the construction cost changes of prevailing types of buildings during certain periods within Emirate of Dubai, survey key objectives summarized as follows:

* Monitoring changes that occur in the prices of commodities and services included in buildings construction costs.
* Identifying changes that take place in construction costs of buildings of all types whether residential buildings or non-residential buildings.
* Identifying the progress and development in construction sector in a certain period versus another through defining the demand size on building materials reflected by high or low prices of those materials.

**Second: Target Population and Survey Sample Frame**

* 1. **Target Population:**

Studying the prices of a set of commodities and services included in construction costs prices system, classified according to ISIC4 in order to calculate the index based on the following types of buildings:

* Residential buildings:
  + Villas
  + Multi-storey buildings
* Non-residential buildings:
  + Public buildings
  + Industrial buildings

**2.2 Survey Sample Frame:**

For survey sample frame, it has been relied on sales and production sources of building materials due to the privacy of the survey; specialists have selected the sources, which provide the materials included in the basket taking into account to be always available.

**Third: Survey Sample**

**3.1 Sampling Units:**

A purposive sample used to reach commodities and services categories prices of building materials sales and production sources distributed to all areas of Dubai. The number of commodities and services included in the sample is 421 commodities and services collected from 83 establishments distributed to most areas of Emirate of Dubai.

**Fourth: Stages of the Survey**

The survey phases included a series of overlapping and integrated operations carried out by the team, depending on the methodology of the governance and management of statistical operations phases to prepare the action plan and timetable for its implementation to ensure completion of the work within the highest quality standards. It included the following:

**4.1 Design Phase**

This phase included the preparation and review and approval of preliminary statistical form also includes sample design and its methodology, preparation of description variables and the design and adopt the validation, auditing and reviewing rules, as well it include the methodologies of data processing and reports for the statistical systems.

**4.2 Building Phase**

This phase includes design, preparation and adoption of statistical form, and develop systems for input and calculation of the consumer prices index. As well as, the design and build reports for the statistical systems.

**4.3 Field Data collection Phase**

This phase includes collection of data from the field and it is consider as the important and largest phase of the survey. As it includes the preparation phase where the frame is define and the sample units selected and known. Moreover, it includes develop field data collection methodology, training programs and coordination with target sources. In addition, it includes the field work that involve collection of data from the field and progression report, verification of filling the form, and numbering the forms and data entry and archive paper forms.

**4.4 Data Processing Phase**

This phase includes processing of data, which includes the classification and variables coding, implementation of auditing rules, auditing data, adopt raw data, editing missing values, as well it includes linking variable from different sources, weight calculation, calculate results of division and approved pre final database.

**4.5 Analysis Phase**

This phase includes calculating preliminary results and initial indicator calculation, Auditing overall results, and comparison of pervious statistics, Data Analysis, Review result and its privacy level. Approve the results after revision and in this phase, the general mythology and the approved working methods will be documented.

**4.6 Dissemination Phase**

In this phase, the dissemination process will start by ensuring the results of all reports and its dissemination liability, coordination with concerned statistician to agree on the dissemination level. In addition, the dissemination level should defined, reviewed and determined, publish data on the statistical systems. As well as the electronic publication, Press releases on media, manage the DSC social networking channels, Handle CRM Request and respond to our customers inquiries.

**Fifth: Main Documents of the Survey**

Survey documents included data collection forms, index calculation program, outputs tables, results presentation.

**5.1 Survey Form:**

A form created to collect data for each source of sales. The form shall include the source name; the month in which data is collected; name, description, and unit of the commodity in addition to the country of origin, previous month price, and the price of the month about which the data is collected.

**5.2 Coding Data:**

Through classifying works in construction processes provided by contractors' agreements, the commodities included in each group identified, and a field survey conducted to identify and approve the commodities and consequently collect data on a monthly basis. Data classified through the following steps:

* Classifying the available commodities and services data by using ISIC Rev. 4, including fourth, third, second, and first categories.
* Designing commodities frame according to the new classification to include all categories available, containing mining and quarrying activities (chapter B), manufacturing (chapter C), and services cost (rental of equipment and labor).
* Preparing a statement of the average annual prices of commodities and services prices from 2012.

The following is the classification adopted according to ISIC Rev. 4:

|  |  |
| --- | --- |
| **code (ISIC4)** | **section/division/group/class** |
| **Firstly** | **Raw materials** |
| **Chapter B** | **Mining and quarrying** |
| **08** | **Other activities of mining and quarrying** |
| **081** | **Stones, sand and gravel** |
| **0810** | **Stones, sand and gravel** |
| **Chapter C** | **Manufacturing** |
| **16** | **Wood, products of wood & cork, except furniture** |
| **161** | **Saw-timber or planed wood** |
| **1610** | **Saw-timber or planed wood** |
| **162** | **Products of wood** |
| **1621** | **Veneer sheets and pressed wood-based panels** |
| **1622** | **Products of wood used in construction** |
| **19** | **Coke and refined petroleum products** |
| **192** | **Refined petroleum products** |
| **1920** | **Refined petroleum products** |
| **20** | **Chemicals and chemical products** |
| **202** | **Other chemical products** |
| **2022** | **Paints, varnishes and**  **similar coatings** |
| **22** | **Rubber and plastics products** |
| **221** | **Rubber products** |
| **2219** | **Other rubber products** |
| **222** | **Plastics products** |
| **2220** | **Plastics products** |
| **23** | **Other non-metallic products**  **mineral products** |
| **231** | **Glass and glass products**  **products** |
| **Code (ISIC4)** | **section/division/group/class** |
| **2310** | **Glass and glass products** |
| **239** | **Other non-metallic mineral products n.e.c.** |
| **2392** | **Constructional clay products (ceramic)** |
| **2394** | **Cement, lime and plaster (gypsum)** |
| **2395** | **Manufacture of varieties concrete, cement and plaster** |
| **2396** | **Fabricated or formed stone, marble, alabaster** |
| **2399** | **Other non-metallic mineral products n.e.c.** |
| **24** | **Base or basic metals (basic metal products)** |
| **241** | **Basic iron and steel** |
| **2410** | **Basic iron and steel** |
| **242** | **Basic precious metals other non-metals** |
| **2420** | **Basic precious metals other non-metals** |
| **25** | **Fabricated metal products, except machinery and equipment** |
| **251** | **Structural metal products, tanks, reservoirs and steam generators** |
| **2511** | **Structural metal products** |
| **2512** | **Tanks, reservoirs and containers of metal** |
| **259** | **Fabricated metal products; metalworking service activities** |
| **2591** | **Forging, pressing, stamping and roll-forming of metal; powder metallurgy** |
| **2593** | **Cutlery, hand tools and general hardware** |
| **2599** | **Other fabricated metal products n.e.c.** |
| **26** | **Computer, electronic and optical products** |
| **263** | **Communication equipment** |
| **2630** | **Communication equipment** |
| **264** | **Consumer electronics** |
| **2640** | **Consumer electronics** |
| **265** | **Measuring, testing, and control tools and equipment** |
| **2651** | **Measuring, testing, navigation and control equipment** |
| **27** | **Electrical equipment** |
| **Code (ISIC4)** | **section/division/group/class** |
| **271** | **Electric motors, generators, transformers and electricity distribution and control apparatus** |
| **2710** | **Electric motors, generators, transformers and electricity distribution and control** |
| **273** | **Wiring, cables, and wiring devices**  **devices** |
| **2732** | **Electronic and electric wires and cables** |
| **2733** | **Electrical wiring devices** |
| **274** | **Electric lighting equipment** |
| **2740** | **Electric lighting equipment** |
| **275** | **Domestic appliances** |
| **2750** | **Domestic appliances** |
| **28** | **Machinery and equipment n.e.c.** |
| **281** | **General-purpose machinery** |
| **2813** | **Other pumps, compressors, taps and valves** |
| **2816** | **Lifting and handling equipment** |
| **2819** | **Other general-purpose machinery** |
| **31** | **Furniture** |
| **310** | **Furniture** |
| **3100** | **Furniture** |
| **5** | **Equipment, labor and other costs** |
| **501** | **Equipment rental** |
| **502** | **labor wages and costs and other** |

**Sixth: Survey Staff**

**6.1 Survey Staff Functional Structure**

The survey staff who participated in technical, administrative, and fieldwork organized as follows:

* Technical Supervisor of the Survey: Key functions include preparing all the technical methodologies related to the study “the integrated methodology, auditing methodology, results methodology… etc.” In addition, he is the only reference for any technical instructions related to questions, concepts, definitions, and variables of the survey form and any other technical aspects related to the form, in addition training and testing the survey staff and preparing a detailed report that includes the key survey outputs.
* Field Staff: The number are two staffs distributed to outlets. Staff's duties include conducting data collection process, and making sure all data filled out before leaving the outlet, and auditing the data completed on the field in order to input data in the program designed for index calculation.

**6.2 Selecting and Training Staffs:**

Since the field staff working in the survey is from the Department staff, two members selected to work in the survey at different supervisory and executive levels according to several bases, including prior experience. The survey staff-training plan was developed and the staff trained before beginning collecting data from field, including defining the survey, its objectives, the data to be collecting, and collection mechanism. They were also training practically on the entry software.

**Seventh: Fieldwork Phase**

This part includes a brief presentation of the fieldwork stages, which easily included fieldwork progress procedures and desk audit.

**7.1 Organizing the Fieldwork:**

The fieldwork was organized and executed in a way that ensures the survey data will obtained easily and accurately. The work distributed to all different outlets to provide the required commodities and cover all items of basket of commodities.

**7.2 Data Collection Method:**

Data collection conducted through the field visit to the outlet for the first time. After the responsible person defined of the survey and its objectives, it shall be agree with him on the data collection method (field/phone/internet) to facilitate collection method, for the staff and responsible person in the outlet in order to collect the commodities prices on a monthly basis. Review the prices and it is rational among different sales sources and various periods, make sure certain prices are accurate through the field review and get rid of some abnormal prices non-confirming with the logical chain of the prices movement.

**7.3 Field Audit:**

Data collection form includes commodities prices of the previous month at the time of field visit of data collection to enable the staff check the accuracy of data collected. After the collection stage concluded before leaving the outlet, all data shall audited and verified by the staff.

**Eighth: Data Processing Phase:**

Data collection form was designed and automated in a manner facilitated the work which has had a significant impact on ensuring all data required is completed. The input process in the program shall made by staff and he shall audit once more all data to make sure the data collected and entered to the system is accurate and ensure data is processed for index calculation phase.

**8.1 Office Processing:**

During collecting data from the field, the data collected from the field and sent electronically was audited by the staff and reviewed on the spot after being entered into the system. After making sure of the data readiness, the desk audit on data shall conducted by survey general technical supervisor. The focus in this stage was particularly on auditing the consistency and completion of the data to minimize the error size as much as possible, in an overlapped way with the fieldwork stage.

**8.2 Electronic Processing:**

A program developed to calculate the index by department specialists. Staffs and technical supervisor trained on how to use the program and finish the predesigned auditing process. The available devices utilized at the highest possible efficiency to speed up the auditing process. It made certain that the consistency rules implemented to make sure the data entered is logical and consistent with each other as per other variables. Implementing auditing rules were effective in preparing a file with error free data. Then, some results classified by pre-suggested structural tables and the extracted tables audited.

**8.3 Presenting and Disseminating Results**

To present results, outputs tables created as follows:

* Tables that include monthly, quarterly, and annually construction costs indices and sixth, fifth, fourth, third, second, and first categories according to types of buildings: villa, multi-storey building, (total residential buildings), public buildings, industrial buildings (total non-residential buildings and the general index).
* Tables that include change rates in monthly, quarterly, and annually construction costs indices and sixth, fifth, fourth, third, second, and first categories and according to types of buildings: villa, multi-storey building, (total residential buildings), public buildings, industrial buildings (total non-residential buildings) and general index.
* Tables that include monthly, quarterly, and annually construction costs indices and sixth, fifth, fourth, third, second, and first categories and according to types of buildings: residential buildings, non-residential buildings, and general index).
* Tables that include change rates in monthly, quarterly, and annually construction costs indices and sixth, fifth, fourth, third, second, and first categories and according to types of buildings: residential buildings, non-residential buildings, and general index).
* Tables that include construction costs indices and fourth, third, second, and first categories and according to types of buildings: residential buildings, non-residential buildings, and general index).
* Tables that include annual change rates for construction costs indices fourth, third, second, and first categories and according to types of buildings: residential buildings, non-residential buildings, and general index).

Survey results will presented through Dubai Smart Statistics Suite available at DSC via the Interactive Statistics and Statistical Indicators systems, a specialized bulletin that reviews the survey main results, and through a detailed analytical report of results including all tables related to the index. These outputs disseminated in several ways most important of which are:

1. DSC's website.
2. Dubai Smart Statistics Suite.
3. Periodic press news.

**Ninth: Key Definitions**

The definitions and classifications used were prepared based on the international criteria issued by UN and some of its specialized agencies. You can find below the key definitions used in the survey:

|  |  |
| --- | --- |
| Places in which commodities and services sold. | **Data collection sources:** |
| Price index is a mathematical gauge that measures the changes in commodities and services prices between two certain periods. | **Price index** |
| The mathematical equation (developed by Statistician Laspeyres) which calculates the index by using the price levels weighted by the base quantities (weights). | **Laspeyres Equation:** |
| Costs of materials and services required to construct buildings. | **Construction cost:** |
| A period by which the current period compared with. | **Base period:** |
| Weights are the relative distribution of construction materials and costs size distributed by chapters, main sections, and groups and items which commodities are composed of according to ISIC. Such weights used in the calculations that depend on Laspeyres equation. | **Weights:** |
| The prices of a commodity or service during the base period, with which the commodity and service prices of other periods compared. | **Base prices:** |
| A set of commodities and services included in construction cost prices system, classified by ISIC Rev.4, | **Commodities frame:** |
| A separate or semidetached building intended with its all storeys to occupy by one family, with one ground entrance and separate parking in addition to independent external spaces. | **Villa:** |
| All buildings which consist of ground floor + first floor or repeated floors, the first floor and repeated floors are usually used for residential and office purposes, while the ground floor is used for car parking and/or commercial activity (this means it is used for investment purposes and at the same time must be distinguished from investment villas). | **Multi-storey building:** |
| All buildings that constructed for public use purposes. Their stories vary by the type of usage such as hospitals, schools, mosques, libraries, gardens, embassies, and sport clubs, etc.) | **Public establishments:** |
| All buildings that are constructed for purposes of industrial production | **Industrial buildings:** |
| ISIC is the international reference classification of productive activities. Its main purpose is to provide a set of activity categories that can utilized for collecting and classifying statistics according to such activities in a form designed for economic analysis purposes. ISIC consists of a coherent and consistent structure for the economic activities based on the internationally accepted set of concepts, definitions, principles, and classification rules. | **International Standard Industrial Classification of All Economic Activities (ISIC):** |

**Tenth: Improvement Plans**

* Updating the list of commodities and services in the industrial production basket.
* Following-up the update of internationally accepted methodologies and classifications.