



مركز الإحصاء  
STATISTICS CENTRE

## Methodology

# Building Materials Prices

## 2024

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# 1. Overview

## 1.1. Introduction

Building materials prices (BMP) statistics provide estimates of monthly average change in the prices of building materials in the construction sector. The monthly prices for the materials included in the building materials basket are the theoretical basis for the building materials prices used in the Emirate of Abu Dhabi

## 1.2. Concepts and definitions

BMP statistics represent indicators to illustrate changes in actual building materials prices between adjacent periods. Other than most price statistics collected by SCAD, it is not a price index but simple price changes in BMP reflect the average monthly change in the transaction prices for the building materials in the Emirate of Abu Dhabi, where the prices are collected for each building material in the basket.

The building materials price statistics are used as an input for the broader construction cost index, which is more comparable to publications released in benchmark countries. It is subject to indexation when used as input for the CCI.

## 1.3. Abu Dhabi special considerations

It should be noted that Abu Dhabi is an emirate, it's one of 7 emirates in UAE, therefore certain limitations apply in collecting and obtaining data. The BMP however is primarily based on a survey tailored to the emirate of Abu Dhabi. Therefore, the BMP compilation can be considered as accurate as otherwise for a sovereign state and is not subject to any particular constraints.

## 1.4. Classifications and standards applied

Central Product Classification (CPC) is used for the varieties (items) as a stable international classification for both international and local comparable purposes. Additionally, for a more detailed classification, two more digits are adding to identify each variety in the basket.

Goods included in the BMP basket are typically classified into categories, subcategories, and items based on a local Classification created by experts from SCAD's Income and Prices Section, in collaboration with the UAE Contractors' Association, according to the nature of construction sector in the Emirate of Abu Dhabi. The classification is based on their characteristics, usage patterns, and economic significance. This aims to ensure minimum variation within each subgroup, thereby enhancing the accuracy of the statistics.

The main groups in the classification used for building materials statistics in Statistics Centre – Abu Dhabi:

No	group	No-sup-group	Number of products	Number of varieties
1	Cement	–	4	15
2	Gravel and Sand	2	2	10
3	Concrete	–	2	12
4	Iron	–	7	25
5	Wood	–	6	31
6	Blocks	–	5	21
7	Roofing Materials	–	2	5
8	Waterproofing Products	–	3	10
9	Waterproofing Bituminous Membranes	–	1	2
10	Natural Stone	–	1	3
11	Tiles and Marble	2	6	34
12	Sanitary wares	–	5	34
13	Aluminium	–	2	8
14	Paints	–	3	8
15	Glass	–	5	15
16	Pipes	2	4	16
17	Wires	4	4	42

### 1.5. Importance and objectives of the indicator

The prices of building materials are important economic indicators and inputs in planning and research in various urban and economic fields, taking into consideration the continuous urban development and growth in the construction sector in Abu Dhabi.

Therefore, it is considered as an analytical tool in monitoring price trends and forecasting changes in building materials prices. This indicator assists decision and policy makers, planners and researchers to make appropriate decisions supporting the construction and associated sectors. In addition, it is a tool used by companies specialized in construction and building materials.

#### Objectives

- For internal use to calculate other statistical indicators (short-term economic indicators and GDP at constant prices).
- Used internally in the calculation of other price indices within the Income and Prices Section (Construction Cost Index).
- Used by companies specialized in construction and building materials to follow up material prices related to construction and building.
- Used in settling legal disputes arising in connection with construction contracts.

## 2. Indicator information

### 2.1. Geographical coverage

The BMP statistics cover the Emirate of Abu Dhabi.

### 2.2. Statistical population

The population of interest for BMP includes all transactions involving building materials in the emirate of Abu Dhabi.

The target population comprises all establishments engaged in wholesale of building materials, economic activities 4663 in the emirate of Abu Dhabi.

This observed unit includes all establishments(outlets) in ISIC 4663 that are registered and licensed in the Department of Economic Development in the Emirate of Abu Dhabi

### 2.3. Periodicity

The BMP report is issued on a monthly basis.

### 2.4. Timeliness

The BMP statistics report is issued to all users on the SCAD website one month after the reference month.

### 2.5. Measurement Units

The BMP statistic is measured in percent.

### 2.6. Reference period

The reference period for building material price statistics is every calendar month.

## 3. Methodology

### 3.1. Alignment to international standards (Bench marking)

The compilation of the BMP statistics broadly follows where possible, the recommendations outlined in sources and methods construction price indices (See <https://www.oecd.org/industry/business-stats/2372435.pdf>), published jointly by Eurostat and OECD. This means that procedures for data collection and validation and data imputation are consistent with the methodology outlined there in and is broadly consistent with other national statistical offices' best practices.

When comparing the Abu Dhabi BMP statistics to other countries or regions' price indices, users should be aware of potential differences in compilation methods. For example, comparing the Abu Dhabi BMP statistics to that of the UK is not straightforward as the UK published BMP in

index form, including seasonal adjustments. However, when contrasting with Saudi Arabia and Dubai, the BMP statistics methodology aligns.

## **3.2. Data sources**

Data for the BMP statistics are collected from the monthly field survey, conducted by SCAD.

### **3.2.1 Survey data**

The survey questionnaires are designed to collect data on product's varieties with each group/subgroup in the BMP basket. Currently SCAD is working on building an input system to digitalize the collection process, ensuring more accuracy and efficiency.

#### **3.2.1.1 Collection method**

A number of options are offered to facilitate data collection for both the enumerator/interviewer and the person responsible at the sales outlet, including field visits of the source, telephone interviewing or online collection of data. Prices collection Start from the third week of the month.

#### **3.2.1.2 Sample design**

The BMP frame was constructed utilizing data from the Establishment register for the Emirate of Abu Dhabi in 2023, representing a comprehensive and contemporary database of all establishment operating within the building materials wholesale. The BMP frame encompassed establishment. The coverage ratio within the frame can be deemed high.

A cut-off sample was implemented based on the establishment total number of employees, with a threshold set at 90%, resulting in approximately 129 outlets. The building materials providers vary from one outlet to another, each specializing in specific types of building material products. For each variety in our basket, we select at least five sellers from our sample. If an outlet offers more than one product, it has a higher probability of being selected. For materials exhibiting frequent price fluctuations and items that regularly run out of stock / out of season, a larger sample is chosen.

To identifying the specific outlet as a source for each variety in the basket the numerator contacted the outlets in the sample to obtain a list of the most selling varieties in the building material basket as following

- Step One: Identifying the main and sub-groups of products in the BMP basket that available for each outlet, example: (Cement, Bricks, Concrete, Sanitary Ware)
- Step Two: For each outlet, after identifying the main and sub-groups available in the previous step, a list of available varieties is determined for each group (main or sub), according to the following approach:
  - Identifying the top-selling varieties for each group (main or sub), ensuring that this list does not exceed five goods, meaning selecting the top five goods among the best-selling items,

example: Suppose "Company 1" sells various types and varieties of the first sub-group "Complete Bathroom Sets without Accessories": 30 types. When asked about the best-selling types, they identified 8 types out of 30. In this case, a request is made to list the top five types out of the 8.

Step Three: For each listed item at a specific source, the following data is provided:

Product specifications (the most detailed descriptive details enabling identification of the product in question at a later time). Example: Material type, dimensions, Country of origin, Measurement unit, Price

In case of any new items not listed within the building materials basket, they are collected for studying the possibility of adding them to the basket in the future.

The data sources are continually reviewed as assigned enumerators regularly follow up with chosen sources and submit regular reports listing any indication of closure or relocation of any source, to ensure the sample for BMP can be revised accordingly.

The building materials basket used in BMP statistics was selected in collaboration with the UAE Contractors' Association. To ensure best coverage of all materials affecting the construction sector, the basket is Annually updated by BMP teams, with addition new items in the market and removal of materials no longer in the market.

### **3.2.2 Administrative data**

No administrative source used.

## **3.3. Data validation and editing**

### **3.3.1 Data validation**

Outliers and unusual movements are detected based on historical experience, both in terms of absolute prices and growth rates. Data collection forms are designed in a manner that facilitates initial editing of data, several validation steps are taken, as follows.

New prices are compared against a price range assigned individually for each item, derived from previous years' data using the confidential interval method.

$$CI = \bar{x} \mp z\left(\frac{\sigma}{\sqrt{n}}\right)$$

Where:

$\bar{x}$  is the sample mean,

$z$  is the z-score corresponding to the desired level of confidence (e.g., 1.96 for a 95% confidence interval),

$\sigma$  is the population standard deviation, and

n is the sample size.

Logical consistency checks are applied to identify inconsistencies or errors in the dataset.

Cross validation is carried out, where data is compared from different sources or methods to assess consistency and identify discrepancies.

If additional verification of the data is required, the enumerators communicate with the data providers to ensure accuracy of their inputs, noting any clarifications they may have.

Besides standard field editing and validation procedures and independent reviews, random inquiries are carried out after collection for additional data quality assurance.

BMP statistics are also checked prior to feeding the CCI compilation, where contributions to the overall index are compared with previous periods' contributions.

### **3.3.2 Missing data adjustments**

Imputation methods are used to estimate missing values based on available information, such as mean imputation (If, for a given quarter, the price of a service cannot be observed, the change in this price is estimated by the average of the price changes of items belonging to the same class (subclass) of items).

## **3.4. Data processing**

### **3.4.1. Sample weighting**

As the sample design is no probability sample, so no need for weighting procedures.

### **3.4.2. Statistical calculation method**

The rate of change in monthly, quarterly prices is calculated as follows:

- Prices are collected monthly for each material, after which the average price is calculated for each item to determine the monthly price through use of a geometric mean (Jevons) formula.
- Simple price relatives are calculated for the basket materials and services, which means the price of each item divided by corresponding previous price (previous month, quarter or the same month of the previous year).

$$RP = \frac{p_1}{p_0}$$

RP = Simple Price Relative

P<sub>1</sub> = Current Price of the Materials / Service

P<sub>0</sub> = Previous Price of the Material / Service

The geometric mean (GM) of the price relatives for the items within each group are calculated to obtain the price relative for the group.



$$GM = \sqrt[n]{RP_1 \cdot RP_2 \cdot RP_3 \dots RP_n}$$

The rate of change in prices is calculated on the level of the material or group as per the following equation:

$$RC = \left( \frac{p_1}{p_0} \times 100 - 100 \right)$$

RC = Monthly, quarterly or annual rate of change

### **3.4.3. Seasonal adjustment**

To improve to applied for medium term.

### **3.4.4. Chain linking**

Chain linking is not applied to this production.

## **4. Special cases**

No special cases

## **5. Outputs and quality**

### **5.1 Dissemination and accessibility**

Building Materials Prices Statistics shall be published monthly on the website of Statistics Centre – Abu Dhabi.

### **5.2. Length of available dataset**

The BMP statistics dataset starts in 2016.

### **5.3. Data coherence and comparability**

When comparing the Abu Dhabi BMP statistics to other countries or regions' price indices, users should be aware of potential differences in compilation methods for example, comparing the Abu Dhabi BMP to that of the UK is not straightforward as the UK published BMP in index form, including seasonal adjustments.

In general, SCAD follows, where possible, internationally recommended classification and indexation methodologies to facilitate cross-country comparisons of the building material price statistics.

### **5.4. Data accuracy and potential sources of errors**

Data accuracy describes how closely the statistical indicator resembles the true value of the concept it measures, in this case building material price changes in Abu Dhabi.

Several sampling and non-sampling errors can arise along the design, collection, and calculation stages of BMP. SCAD takes several measures to mitigate errors as follows:

- **Sampling:** While a certain degree of sampling error cannot be avoided when taking a sample of observations as opposed to recording all prices or all items in Abu Dhabi, focusing on the largest outlets through cut off criterion can mitigate the bias substantially
- **Data collection:** SCAD tries to minimize collection errors by employing well-trained enumerators that are considered specialists in their field. Those collectors know the products well and have experience in checking quality and price changes of products. Enumerators follow a strict validation procedure that requires passing several data checks before the data is submitted to the statistical office, where further automated checks are carried out.
- **Data processing:** calculation steps for BMP statistics are relatively simple, but some scope for errors remains as some errors can arise in data coding and tabulation.

### 5.5. Revision policy

BMP statistics are not subject to revision unless a serious error is made during the data recording and calculation process.

## 6. Institutional environment

Statistics Centre – Abu Dhabi (SCAD), as the competent government entity in charge of organizing statistical activities in the emirate, plays a pivotal role in supporting decision-makers, and policymakers in Abu Dhabi. The statistical activities in the emirate are organized by SCAD, with its strategic partners in the Statistical System of Abu Dhabi. The Law entrusts SCAD with the task of developing and organizing statistics in Abu Dhabi Emirate.

## 7. Glossary

### **Average Price:**

Sum of the material prices that are collected from more than one source divided by the number of sources of that material.

### **Monthly / Quarterly Relative Price Change:**

The percentage increase or decrease in the average price of the current month or quarter compared to the average price of the previous month or quarter or the same month / quarter of the previous year.

### **Price relative:**

the ratio resulting from the dividing the price of the item/service in the current month on the earlier price of the same item/service (e.g. in the previous month, the previous quarter or the same month of the previous year).

### **Geometric mean:**

an average calculated by n-th square root of the product of n elements.

## **Enhancements that are planned to be implemented before the end of 2024**

- To ensure the BMP Basket is representative of the building materials in the Abu Dhabi market in collaboration with the UAE Contractors' Association, according to the nature of the construction sector in the Emirate of Abu Dhabi

- The basket will be Annually updated by BMP teams, with addition new items in the market and removal of materials no longer in the market.

- Used forecast method (medium term) to validate and edit the collected prices. The seasonal adjustment series also allows to produce intervals for future price validation (forecasting). These intervals, which depend on a degree of confidence, can be used to validate the data introduced.

- Seasonal adjustment will be applied for medium term. The seasonal adjustment series needs to be tested (stationarity, ...). designing a model based on ARIMA models, for example, can help in the case of missing values and in the control of the collected data

The seasonal adjustment series allows to produce intervals for future price validation (forecasting). These intervals, which depend on a degree of confidence, can be used to validate the data introduced.



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