Construction Price Index

1. Introduction

A Construction Price Index measures the change in the level of construction prices. The construction sector produces not only residential buildings, but also non-residential buildings as well as civil engineering works such as roads, dams and bridges. The construction of an index for the whole of the construction sector is a long and relatively costly process. It is proposed to begin with indices for the housing sector only.

2. Alternative approaches

A construction index can be computed in different ways, but each resulting index has its own specific range of uses. One method is to look at the changes in the prices of inputs (labour, plant, materials and transport) which are used up in construction works. Another method is to look at the problem from the output side, that is, to measure the change in prices which the client has to pay the construction industry for construction works. The output price of a construction work such as a residential building, depends not only on the inputs but also on market conditions.

3. Scope

As mentioned earlier, an index to cover the whole construction sector would mobilise an unduly large amount of financial and human resources. Furthermore, the nature and amount of data needed would place a heavy burden all at once on operators within the industry. Therefore the Central Statistical Office (CSO) has decided to start with an input index for residential buildings only. Later, an output price index will also be constructed.

4. Methodology

(a) Selection of representative building type. Since it would have been too time-consuming and costly to include all major types of residential dwellings it was decided to restrict the index to the most common type identified at the 1990 Census. The model used for the index is described in detail at the Annexe.

(b) Weighting pattern. The heavy work schedule of the Ministry of Works did not allow it to undertake the technical work in connection with the index. The Central Statistical Office therefore had to turn elsewhere for the necessary expertise.

The drawings for the selected "typical" house were provided by the Mauritius Housing Corporation. The quantity survey work to determine the weighting pattern for the index was entrusted to a private firm after submission of tenders. The quantity surveyors worked in consultation with a CFTC (Commonwealth Fund for Technical Co-operation) consultant attached to the University of Mauritius.

Detailed inputs in terms of labour, plant, materials and transport were calculated under each of 19 broad work categories giving a total of some 240 entries. However, since the same item (e.g. cement, skilled labour, etc.) can appear under several work categories the actual number of items to be priced for the computation of weights was 124.

The weights have been worked out in such a way that they can be presented in terms of inputs as well as work categories. For publication purposes weights and sub-indices are shown not only for the 19 work categories, but also for the 4 broad input categories of labour, plant, materials and transport; the "materials" category is further subdivided into 17 sub-groups. The weights are shown in the annexe together with the overall and group indices for the first three months of 1994.

(c) **Base period**. The base period for the calculation of weights was the fourth quarter of 1993.

(d) **Data collection**. The price data needed for the calculation of the index are collected monthly by the Central Statistical Office staff from a sample of 48 outlets in 11 regions of the country. Prices are collected in respect of some 75 items representative of all items that go into the computation of the index.

(e) **Index calculation.** The Construction Price Index being presented is an input cost index calculated according to the modified Laspeyres formula

$$I_t = \frac{\sum w_i \, (P_{it} / P_{io}) \times 100}{\sum w_i}$$

where I_t is the index for the current period t

P_{io} is the price of the ith item in the base period

P_{it} is the price of the ith item in the current period t

W_i is the weight associated with the ith item

Thus the index is a weighted average of price relative for individual items or work categories.

(f) **Periodicity.** The Construction Price Index is computed on a monthly basis.

(g) **Revision of weights.** The specifications and weights used for the index need to be reviewed periodically to take account of changes that occur in the construction industry with respect to both inputs and techniques. The Central Statistical Office will keep in touch with experts in the field to monitor such changes and revise the index base when necessary. It is expected that a given set of base weights will not be used beyond a period of five years.

5. **Uses of construction price indices**

(i) Construction indices give an indication of the change in the level of prices of construction works in different sub-sectors of the industry. As such, they are used as deflators for the measurement of real growth in the construction sector.

(ii) They are also useful for adjusting business contracts regarding construction works and for renegotiating owner-tenant agreements.

6. **Changes in the index**. The index for the first three months of 1994 is shown at the Annexe. It is observed that the index has followed a slightly increasing trend, rising from 100.1 in January to 100.6 in February to attain 101.7 in March. These figures represent increases of 0.5 points (0.5%) for February (as compared to January) and 1.1 (1.1%) for March (as compared to February). The main contributor to the increase has been the "Materials" category. Thus cement increased by 1.4 points (1.4%) in February and 8.3 (8.2%) in March whilst steel bars showed an increase of 6.2 points (6.2%) in February and 0.9 (0.8%) in March.

Since cement and steel bars are predominant in work categories "Concrete" and "Reinforcement", the index for these categories also show the most important increases. "Concrete" increased by 0.5 points (0.5%) in February and 2.9 (2.9%) in March whilst "Reinforcement" rose by 3.8 points (3.8%) in February and 0.5 (0.5%) in March.

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ANNEXE

Description of the model used for establishing the Construction Price Index

The model used is a single storey (ground floor) detached house of 108.75 square metres (1,171 square feet) in floor area measured at plinth level to the external face of the external walls. It comprises two bedrooms, a living-dining room, a kitchen, W.C. and bathroom. The building has concrete block walls, reinforced concrete flat roof, internal flush plywood doors, glazed metal openings, screeded floor and roof, tiling to floor and walls of W.C. and bathroom and kitchen worktop; the ceiling and walls are rendered and painted both internally and externally. Plumbing, sanitary installation and electrical installation are included as well as drainage which is to be connected to the sewerage system. Site works are restricted to spreading and levelling surplus excavated material around the site.

The Index excludes the cost of the building permit and the draughtsman's fee; these two items represent 0.2% and 1.0.% of the total cost respectively.

It is assumed that although the house is not constructed by a contractor, the client has recourse to the services of a foreman.

Cost Price Index for the construction of a single storey house.
(Input price index)

January - March 1994
(Base: 4th Quarter 1993 = 100)

(A) BY INPUT CATEGORIES.

Input Categories	Weight	Index		
		January	February	March
LABOUR	**32.8**	**100.0**	**100.0**	**100.0**
HIRE OF PLANT	**4.0**	**102.4**	**102.4**	**102.4**
MATERIALS :	**58.7**	**100.1**	**100.9**	**102.7**
Hardware (compliasage)	1.0	100.0	100.0	100.0
Cement	12.0	100.0	101.4	109.7
Sand	5.3	100.0	100.0	100.0
Aggregate	2.4	100.0	100.0	100.0
Block	3.9	100.0	100.0	100.0
Steel bars (armature)	5.1	99.8	106.0	106.9
Galvanised corrugated cast iron sheeting	1.5	100.0	100.3	101.2
Timber: (a) Carpentry	6.1	101.4	101.3	101.4
(b) Joinery	2.4	99.1	98.2	99.1
Steel sections & ironmongery for metal openings	4.9	100.0	100.0	100.1
Ceramic tiles	1.4	99.7	100.7	100.7
Glass,putty and oil	0.8	100.5	100.5	100.5
Paint	1.9	100.1	100.1	100.1
Plumbing	2.1	100.0	100.0	100.0
Sanitary installation	2.0	100.0	100.1	100.0
Electrical installation	3.2	99.4	99.5	99.2
Other	2.7	100.0	99.7	99.6
TRANSPORT	**4.5**	**100.0**	**100.0**	**100.0**
	100.0	**100.1**	**100.6**	**101.7**

Cost Price Index for the construction of a single storey house.
(Input price index)

January - March 1994
(Base: 4th Quarter 1993 = 100)

(B) BY WORK CATEGORIES

Work categories	Weight	Index		
		January	February	March
1. Setting up	2.9	100.2	100.4	101.5
2. Setting out	0.5	100.4	100.3	100.5
3. Temporary works	1.1	100.0	99.8	100.3
4. Site preparation,excavation & disposal,hardcore filling	5.5	100.0	100.0	100.0
5. Concrete	20.1	100.0	100.5	103.4
6. Reinforcement	8.3	99.9	103.7	104.2
7. Formwork (coffrage)	9.8	101.7	101.7	101.7
8. Blockwork	7.6	100.0	100.1	100.9
9. Softwood joinery	2.8	99.2	98.4	99.2
10. Ironmongery	0.9	98.5	98.5	98.2
11. Steel windows & doors	5.3	100.0	100.0	100.1
12. Rendering to wall/ceiling (crepissage)	9.8	100.0	100.3	101.8
13. Bed & screed to floor/roof	4.1	100.0	100.7	104.7
14. Tiling	2.4	99.9	100.5	100.5
15. Glazing	1.0	100.4	100.4	100.4
16. Painting	4.3	100.0	100.0	100.0
17. Plumbing/sanitary inst.	5.9	100.0	100.0	100.0
18. Electrical installation	5.1	99.8	99.7	99.5
19. Drainage	2.6	100.1	100.2	101.2
TOTAL	**100.0**	**100.1**	**100.6**	**101.7**