

Ministry of Commerce and Industry
Department of Industrial Policy and Promotion
Office of the Economic Adviser

**Subject: Revision of Index Numbers of Wholesale Prices in India with base
2004-05=100- Methodology, Basket and Weights**

The current series of Wholesale Prices Index with a base year of 1993-94 reflects the structure of economy nearly 15 years ago. In order that the index adequately reflects the current structure of the economy, a Working Group for the revision of the index numbers for wholesale prices in India was constituted on December 26, 2003 under the Chairmanship of Prof. Abhijit Sen, Member, Planning Commission.

2. It has generally been the practice to revise the weighting diagram and the series of WPI based on the recommendations of a Working Group appointed by the Government, roughly once every decade. Ever since the introduction of the WPI on a regular basis, five revisions have taken place introducing the new base years, viz., 1952-53, 1961-62, 1970-71, 1981-82 and 1993-94.

3. The Working Group for considering revision of current series of WPI was accordingly entrusted with the task of examining the issues relating to the choice of base year, selection of commodities, creation of weighting diagram and other aspects of the WPI while making recommendations for the introduction of the revised series.

4. The Working Group submitted its technical report in May, 2008. At the time of submission of the Technical Report, the commodity basket and quotations for these commodities were not finalized because of a poor response. The Working Group, therefore, could not look into the comparative picture of the prices in the current series and the proposed revision. The Working Group, however, gave detailed recommendations with regard to the choice of base year, the method of selection of items, preparation of weighting diagram and collection of prices.

Selection of the Base year

5. In determining the base year, the Working Group followed the well-established criteria that the base year chosen should have the desired properties of being a normal year and a year for which reliable price and other required data available. The Working Group also considered that the base year should be as recent a year as possible. Keeping these criteria in view, the Working Group proposed 2004-05 as the base year for the new series of Wholesale Price Index.

Examination of the New Series by TAC and EAC

6. A meeting of the Technical Advisory Committee (TAC) of CSO on Prices and Cost of Living examined the new series of WPI with 2004-05 as the base on December 31, 2009. TAC endorsed the Working Group recommendations of shifting the base year from 1993-94 to 2004-05. The Economic Advisory Committee to the Prime Minister has endorsed the proposal made for revising the WPI series. EAC agreed with (a) shifting the base year to 2004-05, (b) extending the coverage in terms of number of commodities and number of price quotations, (c) the procedure adopted for selection of items, and (d) the determination of the weighting diagram.

Universe of Wholesale Price Index in the new series:

7. The concept of wholesale price has hitherto covered the general idea of capturing all transactions carried out in the domestic market. The weights of the WPI do not correspond to contribution of the goods concerned either to value-added or final use. In order to give this idea a more precise definition, it was decided to define the universe of the wholesale price index as comprising as far as possible all transactions at first point of bulk sale in the domestic market.

Treatment of export and import:

8. In the 1993-94 series, the traded value (used for derivation of weighting diagram) was computed by subtracting exports from the domestic production and adding imports to the domestic production (Production +Import-Export). This method of computing the traded value had an inherent bias since all exports are not necessarily direct exports without getting traded in the economy. The Working Group on the new series, therefore, decided that while computing the domestically traded value, only the direct export from the factories should be excluded. Similarly, import of goods which reach the factory directly (without being traded in the economy) should not be added to domestic production.

Method of selection of products in the Manufactured Group:

9. The manufactured product basket in the 1993-94 series included all such products with traded value of Rs 120 crore or above. This led to poor representation of products in some of the product groups. In order to remove the anomaly in a selection method based on a uniform cut-off criterion and make the method of selection more representative, the Working Group, decided to adopt a method, in which each product group in the manufactured basket gets represented by such number of items which together cover at least 80 per cent of the traded value at the group level.

10. The New Series with 2004-05 as the base has 676 items in the commodity basket. A comparison of the number of items and price quotations at the level of the groups in the previous and the existing as well as in the revised base series is presented in **Table-1**. There has been a significant increase in number of items and price quotations for each item, particularly in the manufacturing segment to not only better reflect the structural shifts but also to make WPI more broad based.

Major Group/Group	Number of Commodities				Number of price quotations			
	1970-71	1981-82	1993-94	2004-05	1970-71	1981-82	1993-94	2004-05
All Commodities	360	447	435	676	1295	2371	1918	5482
Primary Articles	80	93	98	102	411	519	455	579
Food Articles	39	44	54	55	264	320	340	431
Non Food Articles	26	28	25	29	115	132	96	108
Minerals	15	21	19	18	32	67	19	40
Fuel and Power	10	20	19	19	30	73	72	72
Manufactured Products	270	334	318	555	854	1779	1391	4831
Food Products	37	35	41	57	117	231	168	406
Beverages, Tobacco and Tobacco Products	8	7	11	15	19	39	49	102
Textiles	12	27	29	55	99	120	100	457
Wood and Wood Products	4	2	2	10	13	14	9	64
Paper and Paper Products	4	11	11	18	16	74	67	138
Leather and Leather Products	4	3	1	13	18	26	9	91
Rubber and Plastic Products	7	13	15	45	42	73	55	351
Chemicals and Chemical Products	67	77	69	107	182	428	276	1111
Non-Metallic Mineral Products	21	22	9	26	63	125	42	225
Basic Metals, Alloys and Metal Products	42	57	53	69	125	235	203	696
Machinery and Machine Tools	35	44	56	107	104	266	312	903
Transport Equipments and Parts	21	22	21	33	39	118	101	287

Treatment of crude oil:

11. In the 1981-82 series, crude petroleum was included as an independent item in the mineral group of the major group Primary Articles. However, in the 1993-94 series, the crude petroleum was taken away from the mineral group as an independent item and its value was apportioned parametrically among the items in the mineral fuel group of the major group Fuel and Power. The Analytical Sub-Group of the Working Group for the new series observed that the prices of crude petroleum could now be collected from the open market which is interlinked with international market. Further, the existing practice of imputing crude oil weight to petroleum products leads to an upward bias in 'Fuel and Power Group Index' apart

from the fact that the movement of crude oil prices and the prices of petroleum products may not be similar due to “pass-on’ lag.

Classificatory System and Method of Calculation

12. The National Industrial Classification (NIC-98) being generally followed in the current series in respect of manufactured products has been retained for the revised series also. This has been done with a view to maintaining continuity and to facilitate linking of the revised series with the current one. There is no change in the method of compilation of the index in the new series. It should, in any case, be possible to rearrange the classificatory system to suit one’s requirements on the basis of the detailed individual commodity indices and their weights.

Weighting diagram

13. The weighting diagram for the new WPI series has been derived on the basis of Gross Value of Output (GVO). The output values at current prices, wherever available at appropriate disaggregation, have been obtained from the National Accounts Statistics (NAS), 2007 published by the Central Statistical Organization, Ministry of Statistics & Programme Implementation. The same have been reallocated and aggregated to conform to the structure of WPI basket. Detailed methodology of assigning weights was also included in the Report of the Working Group and can be accessed at eaindustry.nic.in. Specific group-wise approach for allocation of weights has been as under:

- a. **Primary Articles:** In the case of agricultural and related commodities, the average value of output for the triennium ending 2005-06 (i.e., 2003-04, 2004-05 and 2005-06) has been derived by using the value of output at current prices for the relevant years obtained from the National Accounts Statistics 2007 (Statements -55 & 56). The Marketed Surplus Ratios (MSRs) were supplied by the Sub-Group on Agricultural Commodities, which computed the MSRs for the agricultural and related commodities for the base year 2000-01, initially considered by the Working Group. The MSRs as supplied by the Sub-Group on Agriculture have been used for deriving the value of marketed output for the agricultural and related commodities for the base year 2004-05, as it was felt that the MSRs are unlikely to undergo any significant change within a short span of three to four years.
- b. **Minerals:** Minerals is a group under the major group Primary Articles. The value of output of minerals other than crude petroleum has been taken from the National Accounts Statistics, 2007 (Statement -59). Crude petroleum has

also been now been shifted to 'minerals' in the revised series. The output value of domestically produced crude petroleum has been taken from the Indian Bureau of Mines (IBM) and has been added to the value of output of minerals other than crude to arrive at the total value of output of minerals in the new WPI basket. The value of imported crude has not been taken into account while deriving the weighting diagram for the crude petroleum on the ground that crude is not traded as such in the domestic market and its derivatives are already included in the basket as independent items in the major group Fuel and Power.

- c. **Fuel Minerals (coal, coke and lignite):** The value of output for fuel minerals, i.e. coal, coke and lignite, has been taken from the NAS 2007 (Statement 59). The export and import figures for fuel minerals have been taken from the Office of the Coal Controller, Calcutta. As in case of minerals (except crude petroleum), the imported fuel minerals are taken as traded in the domestic market and the export of such minerals are taken as direct exports from the mines for estimation of traded value figures for the fuel minerals.
- d. **Mineral oils:** The value of mineral oils as a group as well as item-wise values of important mineral oils like petrol, diesel, naphtha, LPG, kerosene, lubricants etc. are not available in NAS 2007. The Ministry of Petroleum has made available the sales figures of the mineral oils by different oil companies for the year 2004-05. The Ministry has also provided the import and export figures for 2004-05 for such items. While computing the traded value of the items in the mineral oils group, the value of imports have not been included as the import figures are already included in the sales figures. It has been taken that the imported mineral oils are traded in the domestic market. The export of mineral oils has been treated as direct export for estimation of traded value figures for mineral oils and therefore subtracted from the sales value of the mineral oils to arrive at the traded value for mineral oils.
- e. **Electricity:** The quantum and value of output of electricity generated and as used by different sectors, i.e. agriculture, industry, domestic, commercial and railways traction in the year 2004-05 was supplied by Central Electricity Authority (CEA) to the Office of Economic Adviser. The value of generation of electricity has been used for derivation of weight for the electricity group and the item level weights have been derived by distributing parametrically the group level weight amongst different sectors of use as per the quantum of generated electricity used by these sectors.

- f. **Manufactured Products:** The National Accounts Statistics 2007 provides the NIC two digit group wise output figures for 2004-05 both for the registered (Statement 61) and unregistered (Statement 62-a) manufacturing sector. Necessary adjustments have been done in NIC group level output figures to arrive at the group level output figures for the 12 product groups of the Manufactured Products major group of the WPI basket. Adjustments were required in the NAS group level output figures for a few groups to harmonise it with the WPI manufactured product grouping.

The group-wise combined registered and unregistered manufacturing figures have been adjusted for import and direct export figures to arrive at the traded value figures in respect of each of the 12 groups. The group level weights, derived on the basis of respective traded value figures, have been distributed pro-rata amongst the items covered in the respective groups, as per the output figures of such items obtained from ASI data / Office of DCSSI.

14. The weights have been assigned on the basis of entire wholesale transactions in the economy. **Table-2** presents a comparative picture of weights.

Table 2: Comparative Statement of Weights assigned to Product Groups				
Major Group/Group	1970-71	1981-82	1993-94	2004-05
All Commodities	100.000	100.000	100.000	100.000
Primary Articles	41.667	32.295	22.025	20.118
Food Articles	29.799	17.386	15.402	14.337
Non Food Articles	10.621	10.081	6.138	4.258
Minerals	1.247	4.823	0.485	1.521
Fuel and Power	8.459	10.663	14.226	14.910
Coal		1.256	1.753	2.094
Mineral Oils		6.666	6.987	9.364
Electricity		2.741	5.484	3.452
Manufactured Products	49.874	57.042	63.749	64.972
Food Products	13.322	10.143	11.538	9.974
Beverages, Tobacco	2.708	2.149	1.339	1.762
Textiles	11.026	11.545	9.800	7.326
Wood and Wood Products	0.174	1.198	0.173	0.587
Paper and Paper Products	0.851	1.988	2.044	2.034
Leather and Leather Products	0.385	1.018	1.019	0.835
Rubber and Plastic Products	1.207	1.592	2.388	2.987
Chemicals and Chemical Products	5.548	7.355	11.931	12.018
Non-Metallic Mineral Products	1.415	2.477	2.516	2.556
Basic Metals, Alloys and Metal Products	5.974	7.632	8.342	10.748
Machinery and Machine Tools	5.045	6.268	8.363	8.931
Transport Equipments and Parts	1.673	2.705	4.295	5.213
Other Industries	0.546	0.972	0.000	0.000

Seasonal Items

15. There are a number of agricultural commodities, especially, some fruits and vegetables, which are seasonal in their availability and whose prices are quoted only during a particular period of the year. Such seasonal items are handled in the index in a special manner. When a particular seasonal item disappears from the market and its prices cease to get quoted, the index for such an item ceases to be compiled and its weight is distributed over the remaining items within the concerned sub-group on a pro-rata basis. This system has been in practice in all the previous series and will be continued in the revised series also with a clear delineation of the specific period during which the index of a particular seasonal item will be compiled.

Other Methodological Changes

16. The current series of WPI with base year 1993-94 had included the PDS price quotations for wheat and rice. The Working Group was of the opinion that since they did not represent the first point of sale, these may not be included. In view of this it was decided to include the procurement prices of paddy and wheat, which in a way represent the first point of sale in the price quotations for wheat and rice.

Method of Calculation

17. There is no change in the method of compilation of the index in the revised series. It is calculated on the principle of weighted arithmetic mean, according to the Lasperyre's formula, which has a fixed base-year weighting diagram operative through the entire life span of the series.

The formula used is:

$$I = \frac{\sum (I_i \times W_i)}{\sum W_i}$$

Where

S represents the summation operation,

I= Index Number of wholesale prices of a sub-group/group/major group/All commodities

Wi= The weight assigned to the ith item/sub-group/group/major group

Ii= Index of the ith item/sub-group/group/major group

18. Price relatives are calculated as the percentage ratios, which the current prices bear to those prevailing in the base period, i.e., by dividing the current price by the base period price and multiplying the quotient by 100. The commodity index is arrived at as the simple arithmetic average of the price relatives of all the varieties

included under that commodity. The indices for the sub-groups/groups/major groups/all commodities are, in turn, worked out as the weighted arithmetic mean of the indices of the items/sub-groups/groups/major groups falling under their respective heads.

Provisional Vs. Final Index

19. The weekly/monthly index of wholesale prices at the time of its initial compilation and release is provisional in nature because it does not take into account some of the price quotations that are received belatedly. In such cases, the prices of the missing quotations are either repeated or estimated depending on the nature of the commodity. The provisional index is made 'final' after a period of eight weeks/two months by which time almost all the required price quotations are expected to have become available.

Linking Factor

20. In order to maintain continuity in the time series data on wholesale price index, it is imperative to provide a linking factor so that the new series, when released, may be compared with the outgoing one. The Office of the Economic Adviser have been using the arithmetic conversion method to link the various prices index series. The linking factor for the three broad groups of commodities WPI are as follows. However, the detailed individual commodities indices and their weights are available from 2004-05 onwards. User may choose any other methods as may be considered appropriate.

Table 3: Linking Factor

	Average WPI in 2004-05	Linking Factor
All commodities	187.3	1.873
Primary articles	188.1	1.881
Fuel & Power	280.2	2.802
Manufactured products	166.3	1.663

Computerization of the index compilation

21. The National Informatics Centre and Office of Economic Adviser have been working in a cohesive manner for the successful release of the forthcoming Wholesale Price Index Series. The transition from series 1993-94 to the new series 2004-05, is expected to be smooth. For this purpose, appropriate software modules were developed by NIC. It is also proposed to make the revised series data available on the website of the Office of Economic Adviser, Ministry of Commerce & Industry from the first Press Release of the revised WPI series.

Comparable series of three broad groups and major groups

22. The comparable provisional indices of the current series of WPI and the proposed new series together with the inflation numbers for the broad groups and sub groups will be provided in the first release of the new series of WPI.

23. While for the purpose of analysis the index from 2004-05 will be provided on the website of the Office of the Economic Adviser, Department of Industrial Policy and promotion, www.eaindustry.nic.in. For other than research purpose, series would be effective from the date of release only. Release calendar of the new series of WPI would be as follows:

- i. The monthly release of the WPI would be on 14th of each month (if 14th happens to be a holiday, the WPI would be released on the next working day);
- ii. Weekly release of WPI for the primary articles and the articles in the broad group (fuel & power) would be released on Thursday (if Thursday happens to be a holiday, it would be released on next working day) [with a gap of two weeks].

24. The complete list of commodities and their weights including the number of quotations for each commodity is given at Annex – 1.

25. The new items, which are added to the new series, are at Annex – 2. The lists of items, which are common, are at Annex – 3. Broad group wise price responses are at Annex-4. The list of items dropped/revised is at Annex-5.