

A RESEARCH PAPER ON A STUDY ON PRICE INDICES METHODS IN INDIA

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ABSTRACT

It is expected that the price index numbers which are universally used as the scientific tool of measures of price changes all over the world must reflect the real and true position of prices in economy every time since they are the only arithmetic source of measuring the price fluctuations and economic fluctuations thereby. But unfortunately, they do not seem to fulfill these expectations fully especially in India. Many times it has happened that price index numbers have failed in reflecting real economic conditions through price changes. So, this research is attempt to study all the different price indices model and try to find out the effective way out.

Introduction :

This research work peeps into highly untouched and rarely attended the field in the area of statistics and economics. It critically examines the reliability and validity of the price index numbers used at present for measuring the changes in wholesale prices.

It is often found, for example, that WPI have shown the downward trends as a matter of calculation and actual prices of consumption product in real market move sharply with upward trend.

It is, therefore, tried in this research work to examine as to why there prevails the synchronization gap between the theoretical price situation presented in price index numbers and the real price situation prevailing in market. There may be any one or more hypothetical explanations there to from among the following.

- a) Either the tool itself may be defective to measure the price changes properly, or
- b) There may be something wrong with the technique and preparation of price index numbers, or
- c) The methodology of making their practical use may be faulty.

It any of them or else one is tried to examine properly in this research work.

Types of price index numbers :

Three types of price index numbers are being used popularly by different countries. They are,



(1) Whole sale Price Index Number – WPI

(2) Consumer Price Index Number – CPI

(3) Production Price Index Number – PPI

In most countries, CPI is most widely understood and recognized measure of inflation. It is available relatively frequently and it is typically not subject to revisions. The overall CPI is meant to represent the cost of representative basket of goods and services consumed by the average urban and rural household.

As we have different inflation measures, it is very important to study various price indices available in India are to be examined as to how far they represented the real price movements in the country.

Whole sale Price Index (WPI) :

Basket of Commodities :

The New Series with 2004-05 as the base has 676 items in the commodity basket. A comparison of all the items and price quotations in the previous and the existing as well as in the revised base series is presented in the following table.

Major Group/Group	No. of Commodities				No. 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

Weights:

The weights for different groups in latest series are given in the following table.

Major Group/Group	2004-05
All Commodities	100.000
Primary Articles	20.118
Food Articles	14.337
Non-Food Articles	4.258
Minerals	1.521
Fuel & Power	14.910
Coal	2.094
Mineral Oils	9.364
Electricity	3.452





Major Group/Group	2004-05
Manufactured Products	64.972
Food Articles	9.974
Beverage, Tobacco & Tobacco Products	1.762
Textiles	7.326
Wood & Wood Products	0.587
Paper & Paper Products	2.034
Leather & Leather Products	0.835
Rubber & Plastic Products	2.987
Chemicals & Chemical Products	12.018
Non- Metallic Mineral Products	2.556
Basic Metals, Alloys & Metal Products	10.748
Machinery & Machine Tools	8.931
Transport Equipment & Parts	5.213
Other Industries	0.000

(www.eaindustry.nic.in)

Formula :

WPI is calculated by Laspeyere’s formula using the principle of weighted arithmetic mean. The formula has a fixed base- year for the entire life span of the series.

The formula used is:

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

Where ;

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

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

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

Price relatives are calculated 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.

An example of compilation of WPI for a particular item having 11 Quotations is given below:





Quotation No.	Base Price	Current Price	Price relative = (current price/base price)x100
01	2840.50	5614.00	197.64
02	2775.30	6700.00	241.42
03	2980.20	3400.00	114.09
04	3148.90	6150.25	195.31
05	3220.65	5400.00	167.67
06	1950.00	3700.00	189.74
07	2740.50	5700.00	207.99
08	2975.50	5100.00	171.40
09	2670.90	6200.00	232.13
10	2780.40	2850.00	102.50
11	1370.30	4350.00	317.45
Average of Price Relatives =			194.30

WPI for the particular item is the average of the price relatives, i.e., 194.3

CONSUMER PRICE INDEX – (CPI)

Meaning :

A Consumer Prices Index (CPI) is constructed to measure the change in the retail prices of selected goods or services for which consumers of a specific group spend their money.

Concept :

The main concept of Consumer Price Index is that, it should be pre-defined. It means, the population group say, urban, rural, agricultural labourers etc should be specified. Further, the geographical area covered e.g. a city, area or a state should also be specified.

Family Budget Enquiry :

The first thing, is to conduct of a family budget enquiry. Atmost care should be taken for selecting perfect sampling method for family budget enquiry.

Base Year :

The base year should be (i) a normal year i.e. a year in which there are no abnormalities, (ii) a year for which reliable price data are available and (iii) a year should be recent, and comparable with other price index series.

Formula :

The index is compiled by using the Laspeyre's weighted formula. The formula is expressed as below:-



$$I_n = \frac{\sum q_o p_n}{\sum q_o p_o} \times 100 \text{-----(1)}$$

The alternative algebraic expression of the above formula is :

$$I_n = \frac{\sum q_o p_o X (p_n / p_o)}{\sum q_o p_o} \times 100 \text{-----(2)}$$

where the $q_o p_o$ denotes the expenditure of base period and is known as weight, and the p_n / p_o is called the price relative which is the ratio of the price of an item in the current period to its price in the base period.

Producer Price Index (PPI)

Definition of PPI :

The Producer Price Index measures the average change over time in the selling prices received by domestic producers of goods and services. PPIs measure price change from the perspective of the seller. This contrasts with other measures, such as the Consumer Price Index (CPI), that measure price change from the purchaser's perspective.

Difference between PPI and CPI :

Basically, the PPI differs from the CPI in terms of the composition of the goods and services covered, the types of prices collected and the extent of coverage of the services sector.

Also the PPI measures sales of non-finished goods used along the chain of production and output. Whereas, CPI measures purchases of finished goods and services by urban households.

It's Calculation :

The formula used to calculate PPIs is a modified Laspeyre's index. The Laspeyre's index compares the base period revenue for a set of products to the current period revenue for the same set of products.

The formula is :

$$I_i = [(\sum Q_o P_o (P_i / P_o)) / \sum Q_o P_o] \times 100$$

Where;

P_o is the price of a commodity in the base period;

P_i is the price of a commodity in the current period; and

Q_o is the quantity of the commodity shipped during the base period.



Products and Producers for PPI:

Producers are usually selected for the survey using a systematic sampling from a list of all firms that file with the Unemployment Insurance System. Occasionally, supplementary information from other publicly available lists is used.

Strengths of the Producer Price Index:

- Most accurate indicator of future CPI
- Long "operating history" of data series
- Can move the markets positively

Weaknesses of the Producer Price Index:

- Volatile elements, such as energy and food, can skew the data.
- Not all industries in the economy are covered.

Limitations of present price index numbers :

In India, at present, two types of price indices are used to measure the price changes in economy. One is Wholesale Price Index (WPI) and another is Consumer Price Index (CPI). Production Price Index (PPI), the third one, is not being practiced in India at present.

So far as WPI is concerned, it is the price index of representative basket of wholesale goods. Earlier, the WPI figures were released weekly on every Thursday. But since 2009, it has been made monthly. WPI mainly focuses on the price of goods traded between corporations rather than goods bought by consumers. The purpose of WPI is to monitor price movements that reflect supply and demand in industry, manufacturing and constructions. This helps in analysing both macro and micro economic conditions. It also influences stock and fixed price markets.

WPI is based on the wholesale price of few relevant commodities of over 240 commodities available. The commodities chosen for the calculation of WPI are based on their importance in the region and the point of time. Thus, they are time and place oriented. WPI calculation changes from time to time. For example, WPI was being calculated by using 435 commodities in base year 1993-94, while in the advanced base year 2004-05 and there after changed to 2011-12, 616 commodities are covered in calculation in place of old 435 commodities. This indicator tracks the price movement of each commodity individually. Based on this individual movement, the WPI is determined through the averaging principle.

So far as the inflation measure through price index is concerned, WPI has not been the proper tool for the job inflation, for all practical purpose, is the sensitive matter mainly related to the cost of living of common people of the country. How the standard of living through increased cost of living is affected is the crux of the study through inflation. WPI in this respect proves to be very less significant for this purpose. Since it covers the general whole sale price of all the commodities produced in economy including the items used by the industrial sector WPI happens to be square fitted into round for the measure of real inflation since all the items included in WPI are not universally used by all groups

of the society with the equal weightage. Inflation, therefore, has to be measured in terms of Consumer Price Index (CPI). Following data depict the inconsistency between WPI and inflation in reality.

WPI and Inflation

Calendar Year	WPI (% Change)	Inflation Rate (% Change)
2005	4.95	5.57
2006	6.00	6.53
2007	4.88	5.51
2008	8.68	9.70
2009	2.35	14.97
2010	12.76	9.47
2011	8.90	6.49
2012	7.50	11.17
2013	5.11	9.13
2014	4.99	5.86

(Source : RBI data)

It is observed that in last ten years from 2005 to 2014, WPI has been recorded always lower than actual inflation in respective years.

Monthly data of inflation as measured in terms of WPI for 12 months from May, 2015 to April, 2016 are also interesting to observe.

Month	Inflation Rate (%)	Month	Inflation Rate (%)
May,15	-2.20	Nov.,15	-2.04
June,15	-2.40	Dec.,15	-1.06
July,15	-4.05	Jan.,16	-1.07
August,15	-4.59	Feb.,16	-0.91
Sept.,15	-4.59	March,16	-0.85
Oct.,15	-3.70	April,16	+0.38

WPI inflation rate has been registered negative continuously for 11 months from May, 15 to March, 16. Only after 11 months, it has been positive by 0.34 %.

But even when WPI was running in negative zone, CPI inflation rate of moving 4.8% to 5.3% in positive zone. Inflation numbers thus continue to confuse rather than clarity.

In this regards, I have following few observations



- (1) In June 15, the divergence between CPI and WPI was - 7.8%. It was widest in the year. In whole 2014, it was less than 4%. It cannot merely be due to the base year difference between CPI and WPI.
- (2) Average CPI numbers during the calendar year 2015 has been stable while WPI has been negative during the same year. There is no consistency between two.
- (3) Surprisingly, there is strong convergence in CPI and WPI food inflation, especially when we look at 12 months average. It is 5.02% for WPI food inflation and 5.84% for CPI food inflation.

The analysis so far is adequate to establish the failure of WPI to represent the actual price changes in reality correctly.

Now, let us turn to CPI. It is said that it is CPI and not WPI which represents the retail inflation. But CPI has also been unable to reflect the real incidence of retail inflation on all consumers perfectly. For example, prices of all vegetables and pulses during calendar year 2015 and 2016, increased by 20 to 25 percent in each quarter causing overall price rise of these commodities by more than 10 times. Have a look at the facts below.

Commodity	Retail Price As On			Aggregate Change (%)
	March, 2016	April, 2016	June, 2016	
I. Vegetables (<i>Bringle, Gwar, Tomato, Mutter, Lemon etc.</i>)	Average Rs. 60 per Kg.	Average Rs. 80 per Kg.	Average Rs. 120 per Kg.	+ 100%
II. Pulses				
1. <i>Chana (gram) Dal</i>	Rs. 5300 per Quintal	Rs. 6500 per Quintal	Rs. 9000 per Quintal	+ 69.8%
2. <i>Tur Dal (Rantio)</i>	Rs. 13000 per Quintal	Rs. 16500 per Quintal	Rs. 20000 per Quintal	+ 53.8%
III. Others				
1. <i>Ground nut oil</i>	Rs. 1400 per Tin	Rs. 1700 per Tin	Rs. 2000 per Tin	+ 42%
2. <i>Other edible oils</i>	Average Rs. 1100	Average Rs. 1250	Average Rs. 1260	+14.5%

Such galloping rise in the prices of primary articles like vegetables, pulses and ground nut oil has lifted in inflation to the paining peak of common man's life. But CPI has reflected it as only negligible monthly increase of average 1.0 to 1.1 percent from March-June, 2016.

This analysis leads to a striking observations that CPI also, like WPI has failed in properly reflecting the real retail price changes.

The reason of it lies in existing method of allocating the weightage of different commodities in CPI. Weightage to the commodities are given category wise e.g. food articles, vegetables, clothing, electricity etc. Along with it, CFPI (Consumer Food Price Index) is also prepared separately which includes all food items. Besides, rural and urban CPIs are also prepared separately.





But above all, what is seriously lacking is income group wise weightage of all commodities covered by CPI. Present CPI gives, though category wise of the items, common weightage to each item irrespective of income groups which is far away from reality. What is acceptable as the logical weightage, does not stand so in a typical Indian condition. Different income groups in India have unequal percentage of their income in consumption expenditure on the same item. In the revised series of CPI with the base year 2012 = 10 in place of 2010-11 = 100 earlier prepared by the govt., the weightage of the sub-components within the new CPI basket is based on the Consumer Expenditure Survey (CES) of 2011-12 against old basket individual weightage based on CES of 2004-05.

Revised series has reflected the fallen consumer expenditure on food articles and rise in non-food articles like clothing, bedding, foot ware etc. Inclusion of number of food items are also decreased to 437 from 448 earlier, Suchmanipulation has brought CPI still farther from reality.

Weightages to some important primary articles are given as under in CPI (2012=00)

Item	Rural	Urban	Combined
1. Cereals and products	12.35	6.59	6.67
2. Milk and Products	7.72	5.33	6.62
3. Oil and fat	4.21	2.81	3.56
4. Fruits	2.88	2.90	2.38
5. Vegetables	7.46	4.41	6.04
6. Pulses and Products	2.95	1.73	2.38
7. Sugar	1.70	0.97	1.36
8. Spices	3.11	1.79	2.50
9. Prepared meals, Snacks & Sweets	5.56	5.84	5.55
10. Food & Beverages	54.18	36.29	45.86
11. Clothing & Foot ware	5.57	7.36	6.53
12. Fuel & Lights	5.58	7.94	6.84
13. Household goods & Services	3.75	3.87	3.80
14. Health	6.83	4.81	5.89
15. Transport & Communication	7.60	9.73	8.59
16. Education	3.40	5.63	4.46
17. Personal Care	4.25	3.47	5.09
18. Miscellaneous	27.26	29.53	25.32
Aggregate	100.00	100.00	100.00



Above cited data table points out to the fact that consumers in rural and urban areas give different weightage to the same commodity at the same time. It will be quite logical to guess that such difference is due to difference in income level as well as consumption habits of the consumers in both areas. Change in income level as the growth impact moves the weightage on commodity consumption ups or down. For example, the consumers in rural area with lower income in the hands give higher weightage to food and beverages, but the higher income group of urban areas give far lower weightage to the same article. They give higher weightage to non-food articles like clothing, foot wares, housing, fuels and light, transportation and entertainments, health care etc. Similarly, rural area consumes coming in closer touch with the urban effects now a days, go on changing their weightage orders.

But, in spite of such differences, CSO uses only 'combined' weightage i.e. 'common for all' weightages in preparing CPI inflation statistics. Therefore they stand far away from real facts.

Conclusion :

This research work is concluded with the following observations.

1. Different Price Index methods have been found failure in reflecting real inflation condition in economy in India at present.
2. Out of three types of price indices being brought under use for measuring the inflation viz. Wholesale Price Index (WPI), Consumer's Price Index (CPI) and Producer's Price Index (PPI), none of them is found full proof. Each type of price index is suffering from its own limitations.
3. CPI in India is used as the popular and handy statistical tool of measure of retail inflation by govt. and all other concerned. But it is too weak price index to become a reliable tool. It is observed that there is no consistency between CPI and actual retail inflation.
4. PPI which takes only the price change of inputs of the production, can be used by industrial countries like USA only. It is good for nothing in Indian economic environment.
5. Basic loophole of present CPI is that it gives the weightage to the commodities included in CPI construction only category wise. Weightage according to the income level group of the consumer is not taken into account. This is the basic cause of inconsistency between CPI and actual inflation.

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