

# Issues with Structural Comparisons of the Indian Economy Using Input-Output Tables

Written by: Rajesh Chadha, M. R. Saluja, Ganesh Sivamani

## Abstract

*Many studies have been done on the evolution of the economic structure of the Indian economy, by making use of Input-Output Tables and Supply Use Tables. Any analysis of this kind can only be effectively done if the sources for the data and the methodology of construction of the tables are the same. Due to the base year for the National Accounts Statistics being revised approximately every five years, large variations can be noted in certain sectors. This is not due to structural changes in the economy, but rather due to the changes in data collection, such as adding new areas of production to a sector. This change will need to be considered when making any comparisons with datasets constructed using another base year. This paper highlights some of the large differences in datasets due to the base year change, as well as other data collection issues.*

## Introduction

The structure of the Indian economy may be compared using the Input-Output (I-O) Transactions Tables (released up till 2007-08), and the more recently-released Supply and Use Tables, published by the Ministry of Statistics and Programme Implementation (MoSPI). This data can also be compared with the National Account Statistics (NAS) as well as the Annual Survey of Industries (ASI) data. When comparing data over years, it is important to note any abnormal differences in the data, understand what may be the causes of these differences, and know what can be done to correct these issues.

## Effects of Change of Base Year of National Accounts

The base year for NAS changes approximately every five years. The most recent series is 2011-12, and the two previous series were 2004-05, and 1999-20. Changes in the series typically results in changes to the outputs of various sectors, due to the addition of new areas of production to a particular sector.

In the data series with base 2011-12, the concepts under the manufacturing sectors have changed from registered and unregistered to organised and unorganised manufacturing respectively. The source of the data for the organised manufacturing sector has changed from ASI to the Ministry of Corporate Affairs' MCA-21. This has led to large differences in the values of output and GVA for various manufacturing sectors.

For the comparison of the structures of SUTs and IOTs, the following data is taken from three sources: 2015/16 SUTs, 2012/13 SUTs, and 2007/08 IOT. The IOT was constructed using the 2004-05 base year, while the SUTs were constructed using the 2011-12 base year. Changes in the areas of production in various sectors can be seen in cases as highlighted below.

### Problems with the Data

Another cause of differences in the structures of the SUTs and IOTs is due to the problems in the data itself. This includes issues with the data collection, classification, processing, etc.

### Comparison of Intermediate Uses

The intermediate use represents the movement of commodities between various sectors of the economy.

The following table compares the intermediate use data of some supplying and consuming sectors (in ₹ crore).

Supplying Sector	Consuming Sector	2015/16 SUT	2012/13 SUT	2007/08 IOT
Fertiliser	Construction	7,302	81,564	409
Fertiliser	Manufacture of Other Chemicals (which includes fertilisers)	0	0	20,094 (14,778)
Fertiliser	Manufacture of Petroleum Products	0	0	4,933
Leather and products	Leather and products	16,711	1,714	9,280
Other Chemicals and Chemical Products	Crude Petroleum	26,000	19,369	875
Other Chemicals and Chemical Products	Manufacture of textiles + cotton ginning	13,083	2,120	1,666
Inorganic Chemicals	Drugs and Medicines	7,221	13,373	1,271

Use of Iron and Steel Foundries (₹ crores) in:

Sector	2015/16 SUT	2012/13 SUT	2007/08 IOT
Crude Petroleum	8,428	21,001	0
Manufacture of Transport	21,629	1,30,606	3,845
Construction*	2,49,780	2,82,023	35,962
Manufacture of Basic Iron and Steel + Casting of iron and steel	63,304	1,410	9,122
Manufacture of fabricated metal products, except machinery and equipment	21,106	3,605	3,318

\*According to NAS, the input of Iron and Steel to Construction is ₹6,80,249 crores, while in 2015/16 SUT the same input is ₹2,87,558 crores.

### Comparison of Outputs

The following two tables show the outputs of various sectors and compares the values between the three data sets and the Annual Survey of Industries (ASI) 2015/16 where there are problems.

Outputs (₹ crores) of various sectors:

Sector	2015/16 SUT	2012/13 SUT	2007/08 IOT	2015/16 ASI
Fertiliser	11,250	84,130	49,211	1,24,352
Bauxite	4,096	1,200	707	-
Limestone	18,221	7,203	2,454	-
Processed fruits & Processed Vegetables	12,923	33,561	-	-
Electronic equipment including TV	38,181	84,719	31,773	-
Repair & Maintenance of Motor Vehicle	1,32,947	12,980	-	-
Communication equipment	23,470	4,021	33,872	-

Iron and Steel Foundries is not a sector in the ASI.

Sector	2015/16 SUT	2012/13 SUT	2007/08 IOT	2015/16 ASI
Iron, steel and ferro alloys	69,605	1,94,153	2,23,794	5,17,997
Iron and steel casting & forging	1,93,907	55,548	55,364	81,818
Iron and Steel Foundries	3,06,019	3,77,414	82,562	-
Total	5,69,531	6,27,115	3,61,720	5,99,815

## Comparison of Final Consumption

The following two tables compares the final consumption of private households and the gross fixed capital formation of various sectors.

Private Final Consumption Expenditure (PFCE) (₹ crores):

Sector	2015/16 SUT	2012/13 SUT	2007/08 IOT
Ships and Boats	7,488	0	0
Electronic equipment including TV	10,776	0	9,184
Miscellaneous metal products	0	0	8,640
Non-metallic mineral products	5,208	1,249	6,519
Processed poultry meat & poultry meat products	29,859	42,393	-
Processed other meat & meat products	1,296	5,576	-
Water Transport	4,429	0	6,463
Tea and Coffee Processed	3,288	734	-

Government Fixed Capital Formation (GFCF) (₹ crores):

Sector	2015/16 SUT	2012/13 SUT	2007/08 IOT
Plastic Products	16,297	28,057	9,540
Carpet weaving	4,732	1,284	3,596
Electrical appliances	47,803	10,828	3,587
Machine tools	34,639	83,592	23,519
Electronic equipment including TV	47,889	79,956	14,818

## Comparing SUTs with NAS

While constructing the IOT for 2015/16, the relevant data from NAS 2015/16 may also be considered. Various sectors have substantially different outputs when comparing the SUT 2015/16 to the same year's NAS. Given the same base year is used for both datasets, the variance likely comes from data processing or classification issues. Examples are given below, comparing the PFCE and Outputs of some sectors between SUT 2015/16 and NAS 2015/16.

PFCE Comparison with NAS (₹ crores):

Sector	SUT 2015/16	NAS 2015/16	Ratio of SUT / NAS
Fish	1,67,282	1,37,428	1.22
Fruits	2,53,590	3,50,043	0.72
Vegetables	2,85,645	3,08,637	0.93
Alcoholic Beverages	71,349	53,513	1.33
Non-alcoholic Beverages	26,586	38,504	0.69
Hotels and restaurants	2,40,777	1,63,937	1.47
Health	2,23,888	3,49,659	0.64
Transport services	4,35,821	6,05,561	0.72

Output Comparison with NAS (₹ crores):

Sector	SUT 2015/16	NAS 2015/16	Ratio of SUT / NAS
Water supply	1,10,071	65,134	1.69
Trade	21,47,473	17,49,721	1.23

Comparing NAS with Indian Bureau of Mines Data

The data on the production of minerals released by the Indian Minerals Yearbook and the National Account Statistics has also been compared. The Indian Bureau of Mines (IBM) releases data on the production of minerals on an annual basis in the Indian Minerals Yearbook. For the year 2015/16, the production values of the following key minerals do not match between the IBM and NAS data. The variance in values likely arises from the issues in the processing of data.

Comparison between NAS and IBM Minerals Yearbook (₹ crores) for output of minerals:

Mineral	IBM Yearbook 2015/16	NAS 2015/16	Ratio of IBM / NAS
Coal	88,382	1,11,949	0.79
Lignite	7,499	0	N/A
Iron ore	22,321	47,763	0.47
Manganese ore	855	2,677	0.32
Bauxite	1,544	4,835	0.32
Copper ore	655	2,051	0.32
Gold	321	1,007	0.32
Limestone	6,867	21,165	0.32
Minor minerals	53,994	84,925	0.64

### Conclusion

This paper compared the structure of the Indian economy through the use of the Input-Output Table for the year 2007-08 and the Supply Use Tables for the years 2012-13 and 2015-16. The comparisons highlighted the issues with the change in base year and data processing. National Account Statistics, Annual Survey of Industries, and the Indian Bureau of Mines data were also used for comparison purposes. This paper highlighted a few such sectors with a high magnitude of differences in values, and when analysing the structural changes of the economy, one would need to consider the change of base year. The Central Statistics Office (CSO), an agency under MoSPI, gives a comparable series of estimates of the national accounts from 1950-51 onwards, but the series for the latest base year – 2011-12 – is not yet available.