

**INTERNATIONAL WORKSHOP ON
SUPPLY AND USE TABLES
BEIJING, CHINA
11-13 SEPTEMBER, 2018**

Dr. Sudeepta Ghosh
National Accounts Division, CSO
INDIA

Supply and Use Tables

- Ideal framework for compiling GDP at current prices.
- Important tool for integrating framework of the national accounts.
- SUT provides the ideal concept for balancing supply and demand.
- The supply use equation for any given product in an economy can be expressed as:

$$\begin{array}{|c|} \hline \text{Output+} \\ \text{Imports} \\ \hline \end{array} = \begin{array}{|c|} \hline \text{Intermediate Consumption+} \\ \text{Final Consumption+ Gross} \\ \text{Capital Formation (including} \\ \text{changes in inventories)+} \\ \text{Exports} \\ \hline \end{array}$$

Supply and Use Tables-History in India

- SUT for the year 2006-07 was prepared under an ADB project, *“Adopting the Supply and Use Framework Towards 1993 System of National Accounts Compliance in Selected Developing Member Countries”*, in 2008.
- Subsequently SUT was compiled for the year 2009-2010. But with the change in the base year the focus shifted and the same was not published.
- Used for checking the internal consistency of statistical data on flows of goods and services.
- The most important macroeconomic aggregates such as
 - GDP
 - Components of value added
 - Imports
 - Final consumption
 - Capital formation
 - Exportscan be obtained within this framework and are mutually consistent.

Highlights of the new base-2011-12

- India revised its base to 2011-12 based on the SNA-2008 in 2015 to the extent data was available.
- Valuation of GVA etc. at basic prices and GDP at market prices.
- Estimates prepared at different institutional sectors.
- Distinction between GG and public corporations.
- Unincorporated enterprises belonging to households, which have complete sets of accounts, treated as quasi corporations.
- The head office has been allocated to the non-financial corporations sector unless all or most of its subsidiaries are financial corporations, in which case it is treated as a financial auxiliary in the financial corporations sector.

Some of the other highlights of the new base

- Expenditure on R&D has now become part of capital formation.
- FISIM calculation using reference rate
- Non-financial assets have been classified as 'dwellings, other buildings and structures', 'machinery and equipment', 'cultivated biological resources' and 'intellectual property products'.
- Harmonization between SNA and BPM in respect of the external sector transactions has been achieved since RBI has adopted BPM6 in its compilation.

Classification used

- NIC 2008 which is a derivative of ISIC 4.
- NPCSS & NPCMS product classifications based on CPC 2.
- COFOG, COICOP for government and private consumption.
- Production method for supply side and expenditure method for demand side, income approach for non market output.
- SOA up to finance accounts for the total economy and by institutions- GG, HH and financial & non financial corporations.

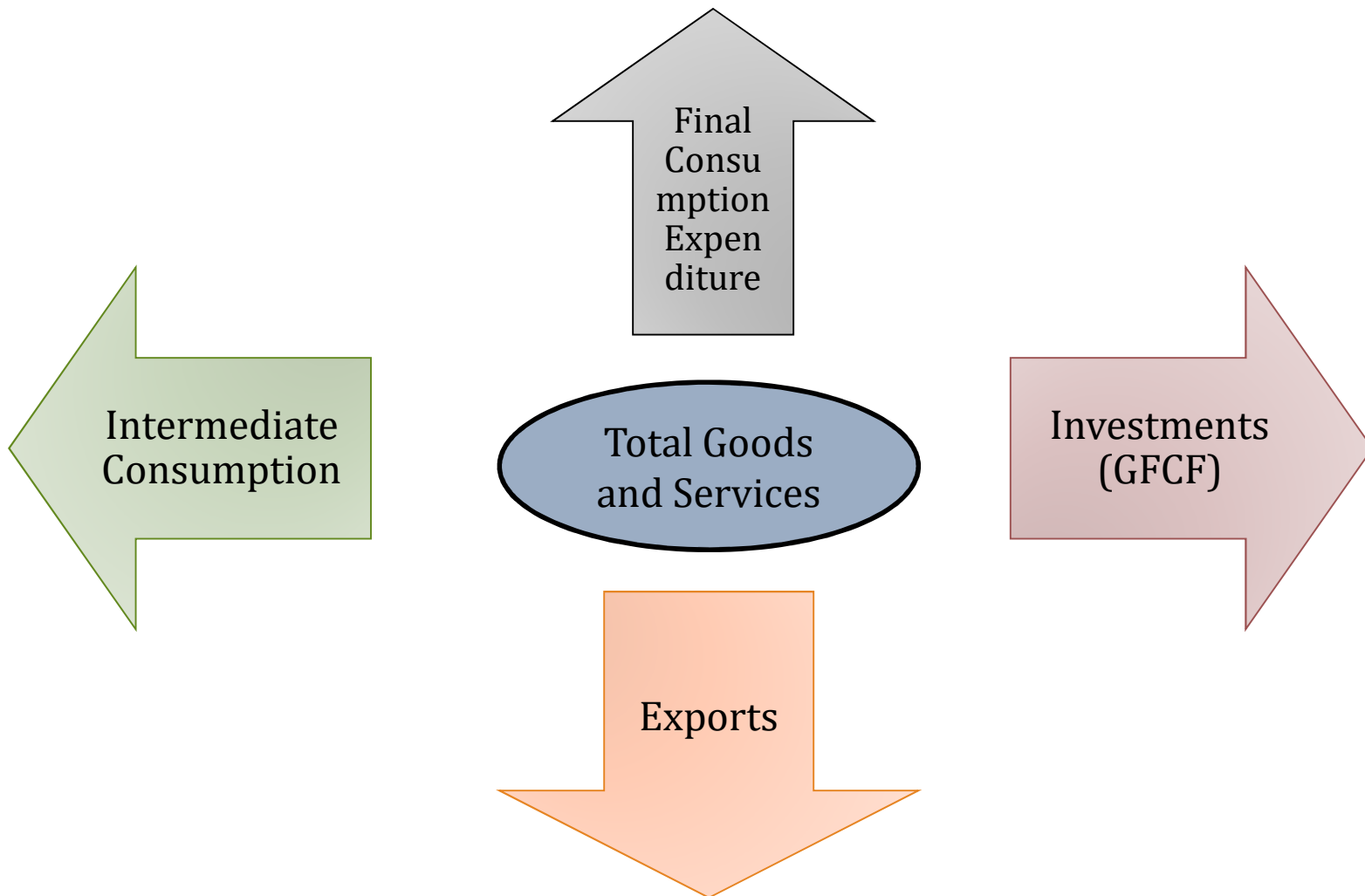
Supply

- Source of goods and services available within the domestic territory / boundary originate from either:
 - (i) Domestic Production
 - (ii) Imports



Uses

How are the available goods and services used?



Framework of SUT



First Published SUT (So far no SUT has been converted to IO Tables)

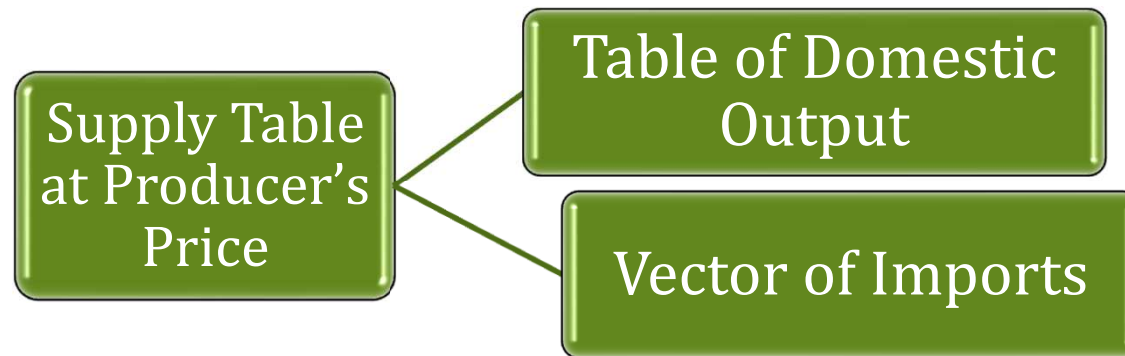
Commodity X Industry Matrix (Concordance with International Classification ISIC-4, CPC-2, ITCHS etc.)

SUT of India (2011-12 and 2012-13)

140 Commodities and 66 Industries

Structure of commodities have been decided keeping in view the requirement of the National Accounts Statistics and the data availability

Supply Table



- Economy divided into different industrial sectors.
- Aggregate by product, agriculture output was estimated using production and ex-farm gate price data and the construction by commodity flow method. For other sectors, the supply and use aggregates were generated by aggregating the estimates of different institutional sectors
- Basic Data sources: Budget Documents, Annual Financial Statements of Corporations, Special studies and Surveys.
- As a starting point, the national income industry aggregates were used as the control totals

Supply table cont...

- The import of goods and services are obtained from Directorate General of Commercial Intelligence and Statistics (DGCIS) and Central Bank by ITCHS concordance to SUT codes.
- A ratio is applied on the import of services components of water, air and insurance from the data obtained from the Central Banks BP statistics (CIF/FOB adjustments on imports).

Supply tables-continued...

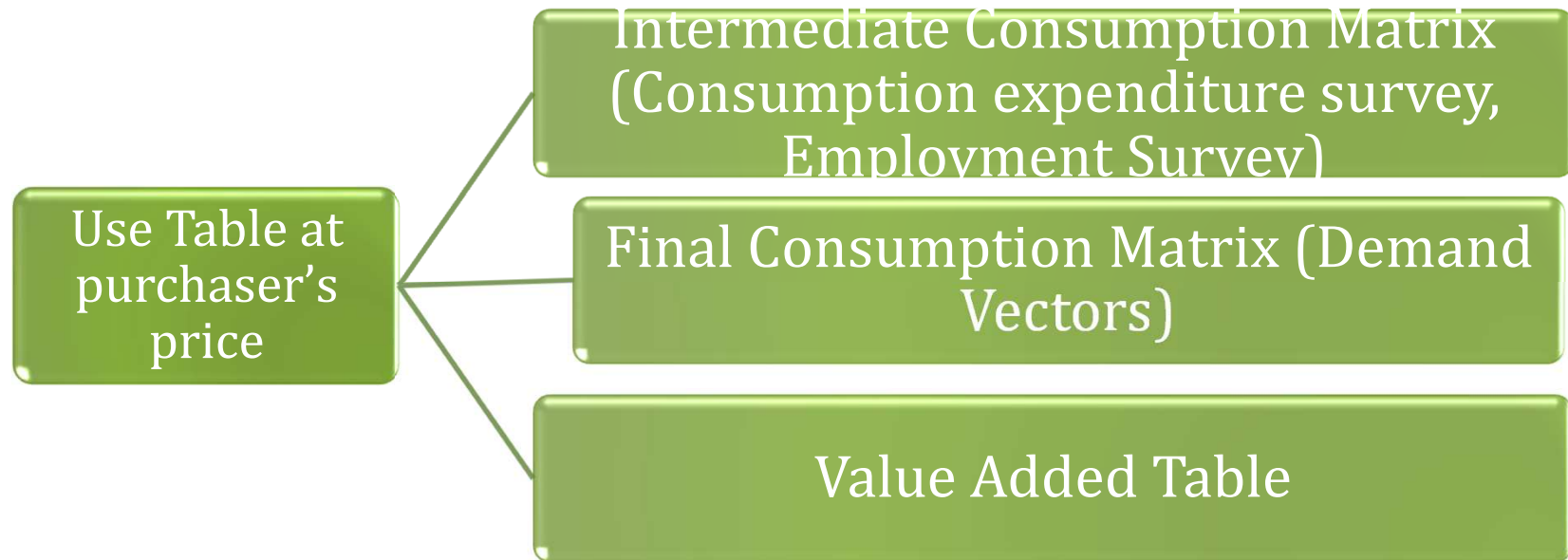
Valuation Tables

- The next principal table are the valuation tables.
- The valuation tables comprise information on Taxes less subsidies on products (Budget documents of National and Sub National governments) Trade margins and Transport margins (based on an old survey and auxiliary data).
- This valuation table allow the transformation of Total Supply at producer prices into Total Supply at purchaser's prices

Specimen of Supply Table

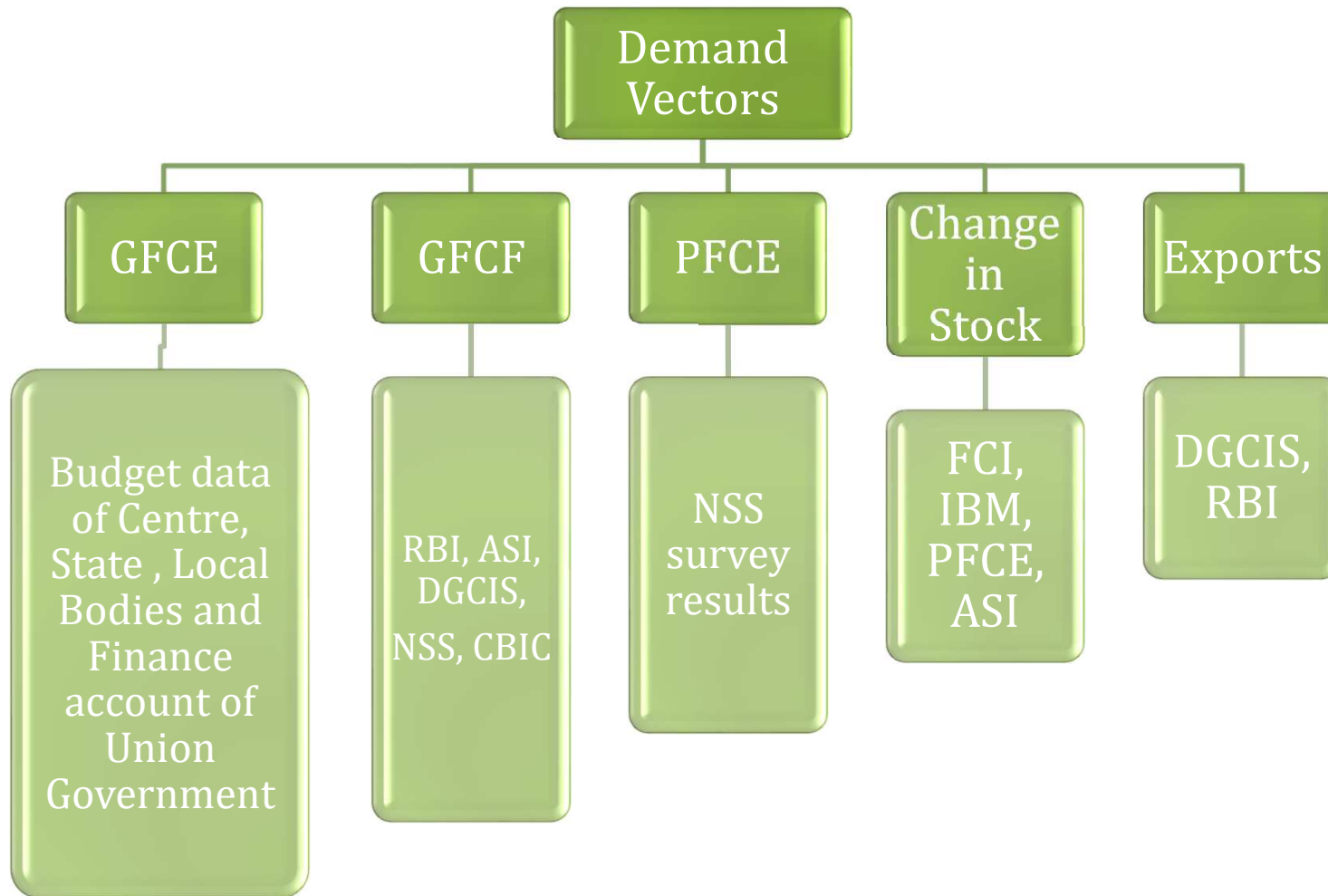
Industry Product → ↓	Industry	Imports	Net Indirect Taxes	Trade Transport margins	Supply at Purchaser's Price
Product 1					
Total Output					

Use Table





- If Total Supply = Total Use then the 2 sides should balance

Demand Vectors



Specimen of USE table

 Industry	Final Consumption expenditure	GFCF	Change in Stock	Exports	Total Use at purchaser price
					
Products					
INPUT					
OUTPUT					
GVA					
COE					
Operating surplus					
Taxes on production					

Broad View of Commodity Structure

S. No.	SUT Codes	Product Specification
1	(1-29)	Products of agriculture
2	(30-40)	Oil & Gas, Mining
3	(41-55)	Food Products of Manufacturing industry
4	(56-112)	Other Products of Manufacturing Industry
5	(113)	Construction work
6	(114-116)	Energy and water
7	(117-125)	Trade, hotel, transport and Communication
8	(126-134)	Financial, real estate, business services
9	(135/138-140)	Other services including Public Administration
10	(136-137)	Education and Health

Broad View of industry Structure

S.No.	SUT Codes	Industry Specification
1	(1-4)	Agriculture & Allied
2	(5-10)	Mining
3	(11-40)	Manufacturing Industry
4	(41)	Construction
5	(42-44)	Electricity, Gas and Water supply
6	(45-53)	Trade, hotel, transport and communication
7	(54-63)	Finance, real estate, business activities
8	(64-66)	Other service activities

Input Data Sources: Agriculture, Mining & Mfg

Sector	Input Data sources
Agriculture	<ul style="list-style-type: none">• Cost of Cultivation Studies (CCS) by DES• Budget documents for Irrigation charges• AIDIS• Land Use Statistics
Livestock	<ul style="list-style-type: none">• M/o Agriculture
Forestry	<ul style="list-style-type: none">• State Forests departments, State Government Forests Corporations• Annual Reports
Fishing	<ul style="list-style-type: none">• State Government
Mining	<ul style="list-style-type: none">• Annual reports of the companies listed in Indian Mineral Year Book• Annual Reports of various NDEs and Private corporate• IOTT Ratios
Manufacturing	<ul style="list-style-type: none">• Annual Surveys of Industries• Annual accounts for PC, DE, NDE• NSS results

Input Data Sources: Construction, EGWR and Services

Sector	Input Data sources
Construction	<ul style="list-style-type: none">• CBRI study reports• IOTT• Agriculture and Forestry sector
Electricity, Gas, Water Supply	<ul style="list-style-type: none">• Annual reports of the NDE Companies- State and Centre• Departmental Enterprises of Central and State Governments• Private companies• Budget documents• NSS Reports
Transport (railway, land, water, air)	<ul style="list-style-type: none">• Annual reports of Railway Budget Documents• DMRC Reports, Konkan Railways and Kolkata Metro reports• State road transport corporation• NSS reports and Budget documents• Annual accounts of Shipping Corporations and airlines companies
Communication, storage & warehousing, hotels & restaurants, trade, real estate, renting & business services, education & health	<ul style="list-style-type: none">• Budget Documents• Annual reports of state and centre• NSS survey• IOTT

Input Data Sources: Insurance, Public Administration and Defence

Sector	Input Data sources
Financial and Insurance services	<ul style="list-style-type: none">• Reports of various financial institutions• NSS reports
Public Administration and Defence	<ul style="list-style-type: none">• Budget Documents of M/o Defence

Balancing

- The balancing of SUTs is fundamental in the compilation of SUTs.
- Since SUTs are constructed with data derived from many sources each of which has its own sample and reliability margins, definitions and peculiarities, the basic identities of the SUTs are not met when the tables are first put together.
- GDP estimates from the 3 approaches are likely to be different.
- The ideal scenario implies that the full set of SUTs is balanced simultaneously at basic prices and at purchasers' prices as well as in current prices and in volume terms.
- Requires availability of micro level data, resources and computer systems.

Balancing... cont

- Balancing of the SUTs refers to the iterative process of reconciling differences between the different parts of the SUTs.
- For balancing, no general theory is available.
- Automated balancing techniques can be used only after, all the significant imbalances have been resolved manually.
- Balancing is reconciling the differences between the methods and between output of each product and its use.

Balancing Process-India

- In an ideal situation, one should be able to track each item from its production to use and hence there shouldn't be any mismatch. However, that is not practically feasible. so we have the differences.
- The following items are estimated using the commodity flow approach and hence it becomes easy to balance:
 - i. PFCE.
 - ii. GFCF by assets for all capital assets products
 - iii. Basic materials used in construction
 - iv. Products like crude, mineral ores that are used totally in the concerned industry.
- For the household consumption products the product flow in the Use Table was examined vis a vis, the work sheets for PFCE; and necessary corrections made in the relevant product flow.

Balancing Process-India

- The initial divergence between supply and use for 86 of the 140 products was within 20%, and for the remaining products, it was more than 20%.
- The observed differences in the supply and use were resolved by taking a second look at the final uses or the intermediate consumption.
- In some cases, coding discrepancies in the export/import items were detected.
- For certain products, auxiliary information such as IO ratios from the latest IOTT or the TTM were found to be inappropriate.
- Necessary adjustments were made to reconcile the SU figures.

Balancing Process-India

- Manual- general approach was to balance manually till the difference reduced to 3%.
- Automatic (RAS- automatic row-column prorated adjustments)- is used when the difference reduced to less than 3%.

Some of the limitations of the exercise

- PFCE- no adjustment is made for privately held stocks as well as wastage due to transportation.
- Seed feed wastage adjustments are made while estimating the value of output of agriculture sector.
- Data on product wise sales tax is not available and so a proxy of output of the product was used to allocate the same.
- Subsidies across products were distributed on the basis of domestic output.
- The data relating to TTM are dated. Hence, the differences between product wise CPI and WPI were used as a proxy.

Comparative Results: SUT vs. Published NA

Comparison of SUT and Published NA Levels: Production Approach (Rs Crores)			
INDUSTRY	SUT	Published NA-2017	% Difference
GDP	8796971	8736329	0.7

- When the SUT was compared with NAS-2011-12, it was found that there was 0.7% difference in the overall GDP.
- Some differences were observed in electricity sector because the water used to produce electricity was not accounted for on the supply side.
- In the case of real estate and business services, the estimated output was low though the service taxes collected were very high.
- Thus, SUT helped in improving the quality of the National Accounts Estimates.

Challenges and Strategy Implemented

Issues/Challenges	Resolutions/Action taken
Large dependency on the Informal sector. Indicator to move it forward	Using current indicators as derived from the organised sector such as services taxes
Time Lag in annual data	
How to incorporate revision policy of National Accounts. Frequent data revisions.	Similar strategy needs to be built for SUTs

Conclusion and Way Forward

- SUT is not integrated with the National accounts at present.
- It is proposed to compile annual SUTs but given the time lag in data availability the same is still a challenge.
- Indicator based SUT's moving forward the control totals can be one option.
- SUT Constant price estimation has not been attempted till date.
- The balance SUT provides a coherent overview of industry data relationships, products, and sectors. It provides consistent results of the three GDP compilation approaches and is a basis for compiling IOTs.



THANK YOU