

United Nations Statistical Division and National Bureau of Statistics International Workshop on Supply and Use Tables

Beijing, China
11-13 September 2018

This Handout contains various key notes and diagrams for best practice(s) in compiling Supply and Use Tables (SUTs) and Input-Output Tables (IOTs) which will be referred to at different points in the Workshop (as appropriate).

These are in line with the UN *Handbook on Supply, Use and Input-Output Tables with Extensions and Applications*.

Compiled by Sanjiv Mahajan

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Examples of the main recommendations, principles and guidelines provided in the UN Handbook

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The Box below provides a list of the main recommendations, principles and guidelines relevant for the compilation of SUTs, IOTs, PSUTs (and EE-IOTs) and related products presented in the UN *Handbook on Supply, Use and Input-Output Tables with Extensions and Applications*.

(A) Organizational/institutional environment

(1) The organization of the economic statistics system to follow an integrated economic statistics approach. The use of the GSBPM to organize the statistical production process would facilitate the compilation of SUTs, IOTs and related products.

(2) National Accounts should have very close links with all its suppliers, in particular, the business register, business surveys and administrative sources.

(3) The compilation of the various components of the SNA framework to be coordinated and integrated in terms of production processes, e.g. production schedules, feedback loops, coherency, etc.:

- National Accounts (including Balance of Payments and Monetary Financial Statistics, Government Finance Statistics);
- SUTs and IOTs together with PSUTs and EE-IOTs;
- Environmental-economic accounts to link in closely with the compilation of SUTs;
- Regional accounts;
- Prices; and
- Labour market statistics.

(4) The compilation of SUTs and IOTs to be done as part of the regular compilation of the National Accounts and within the “core” National Accounts”. This:

- Leads to better quality, coherency and consistency of National Accounts, Balance of Payments and related statistics; and
- Creates effective and powerful data quality and coherence feedback loops, which in turn help to address structural issues, biases and prioritize resources to targeted improvements.

(5) The final estimates of the National Accounts aggregates should be derived from the balanced SUTs framework and not the other way around. For example, the SUTs based estimates should be not constrained to pre-determined estimates or already published estimates.

(6) The compilation of SUTs and IOTs to reflect stakeholder interests by organizing regular meetings with data suppliers and users together with other regular stakeholders.

(7) Appropriate “internal” governance to ensure accountability and guidance supported with programme, project and process management, including risk management, framework reflecting:

- Schedules, timetables and customer/supplier service level agreements to be in place to ensure a regular supply of source data, briefings and evaluation reviews.
- Various standards and policies, such as revision policy, confidentiality and disclosure controls, etc.
- Staff recruitment, retention and skill development.

(8) Skill development needs to take into consideration the following types of training requirements:

- National Accounts - Technical skill focus covering National Accounts concepts, methods, processes and guidance, etc. as well as functions such as developments, compilation, coordination, balancing, analyses and dissemination.
- Systems - IT systems, programming, data management (standards and principles), data dissemination including web-site management, etc. including the role of dedicated IT professionals supporting economic statistics.
- Management - Staff management, effective leadership, communication, etc.

(9) For effective and sustainable production of SUTs and IOTs, it is important to have sufficient computing capacity in place that includes:

- Robust, reliant, structured, quick and well-documented systems.
- Database software and hardware, speed, structure, flexibility, statistical functionality, data management and links to web-dissemination.

(10) It is important that the statistical production process is well documented and kept up to date, reflecting:

- Operational, methodological, system, metadata and recording specific issues, adjustments, etc. for each quarterly/annual exercise.

(11) The compilation of SUTs and IOTs to be done taking into consideration costs and resources available as well as other criteria such as data availability, data quality and time.

(B) Compilation

(1) SUTs (and IOTs) to be compiled annually, and, if possible on a quarterly basis, following the "H-Approach" for producing SUTs/IOTs in current prices and in previous years' prices (including valuation and imports matrices). The application of the “H-Approach” allows for the volume of GVA to be estimated using a “double deflation” method as well as greater coherence linking SUTs to various other parts of the SNA framework.

(2) Produce SUTs first, then derive IOTs from the SUTs using additional information and assumptions.

(3) Compiling rectangular SUTs with more products than industries provides for:

- Greater detail, better the quality - although more detail will impact on the burden on business, systems and resources, it can improve the quality of balancing.
- Improved matching between prices and values, thereby better quality of the data in volume terms.
- Compilation (and balancing) should be undertaken at the greatest level of detail available - time, quality and resources permitting. However, due to confidentiality type criteria, the level of publication may, or will, be aggregated to a higher level.

(4) Use standard international statistical classifications (for example, ISIC, CPC, COICOP, etc.) at appropriate detailed levels to ensure international comparability. Within these classifications, greater granularity may be desired for specific economies.

(5) Use of consistent statistical unit(s) through the process from the business register and business surveys through to the SUTs.

(6) Ideally SUTs and PSUTs (EE-IOTs, as appropriate) are based on sound and complete data sources reflecting:

- Common concepts, definitions and classifications.
- Comprehensive and up-to-date statistical business register.
- Wide-range of (preferably annual) regular business surveys (including structural detail), household surveys, administrative data, prices, etc.
- Benchmarking/reconciliation - preferably, annually, reflecting rapidly changing economies (use of fixed factor or stability assumptions minimized).
- Incorporation of labour and capital information ensuring improved coherence for productivity estimates.
- Appropriate choice of index number formulae and base year.

(7) Record all the data building blocks separately, namely source data, coverage adjustments (including exhaustiveness), conceptual adjustments, quality adjustments, balancing adjustments, etc.

(8) Compile a table linking the SUTs and the institutional sector accounts:

- Goods and services.
- Production accounts by industry and by institutional sector.
- Generation of income accounts by industry and by institutional sector.
- Parts of the Use of disposable income account (such as Household final consumption expenditure) and parts of the Capital account - by industry and by institutional sector (such as gross capital formation and its components).

(9) It is preferred to use the bottom up approach in the compilation of regional SUTs which should be reconciled with National SUTs.

(10) The most frequently used methods to derive IOTs are:

- Model A (Product by Product) IOTs using the product technology assumption.
- Model D (Industry by Industry) IOTs using the fixed product sales structure assumption.
- Hybrid – Mix of technologies usually chosen to avoid having any negatives.

(11) Comprehensive documentation on operational methods and methodology including appropriate metadata and revision analysis.

(12) Keep up to date with, and contribute to, internationally evolving/agreed changes to concepts, methods and systems developments.

(C) Data strategy and requirements

(1) SUTs are data hungry and a range of timely, comprehensive, consistent and coherent data sources are needed. The data strategy should reflect a range of aspects.

(2) Data handling aspects such as:

- Data collection (for example, questionnaire design, electronic data capture, receipt of all the data a company can provide, etc.).
- Data processing, data editing, metadata and data warehousing.
- Data quality frameworks.
- Data dissemination and use of SDMX standards.

(3) Structural and data collection issues:

- Comprehensive and up-to-date statistical business register used as the sampling frame for all business surveys.
- Use of as many data sources as possible, censuses, business and household surveys, administrative data, company accounts, regulatory accounts, company websites, etc.
- An international business unit handling all aspects of multinational enterprise (MNE) groups from profiling the business structure(s) to data collection to data reconciliation and feeding coherent data through to the

various statistical domains. In addition, developing links and sharing data with other NSOs / NCBs for statistical purposes only.

- Frequency of information – monthly, quarterly, annually or five-yearly. More regular, the better reflecting rapidly changing industry structures of sales and inputs, changing patterns of household consumption, impact of globalization on trade flows, etc.
- Sufficient, appropriate and relevant, price indices matching the current price values for deflation and/or use of suitable volume only indicators where price information may be unavailable.
- Strategy for handling, and reviewing, areas where data may be missing.

(4) More generally:

- Need to minimize the burden on business.
- Need to have confidentiality and disclosure testing processes.

(D) Balancing

(1) Balanced SUTs in current prices and in volume terms leads to:

- A single estimate of GDP incorporating the components of production, income and expenditure approaches to measuring GDP;
- Volume estimates of GVA through “double deflation”; and
- Balance between supply of products and use of products and between industry inputs and industry outputs.

(2) The balancing process to encompass simultaneously:

- SUTs at basic prices and at purchasers' prices;
- SUTs in current prices and in volume terms (preferably, previous years' prices);
- SUTs links to IOTs, PSUTs and EE-IOTs (as appropriate); and
- Link with the institutional sector accounts.

(3) Balancing presents powerful integration theme:

- Goods and services, Production account, Generation of income account, parts of the Capital account and Use of disposable income account.
- Incorporation of PSUTs and EE-IOTs (as appropriate).
- Productivity estimates (labour, capital and multi-factor).

(4) Simultaneous balancing is preferred over sequential balancing. If this is not possible, an alternative is sequential balancing (first in current prices, then in volume terms) with quick and effective feedback loops.

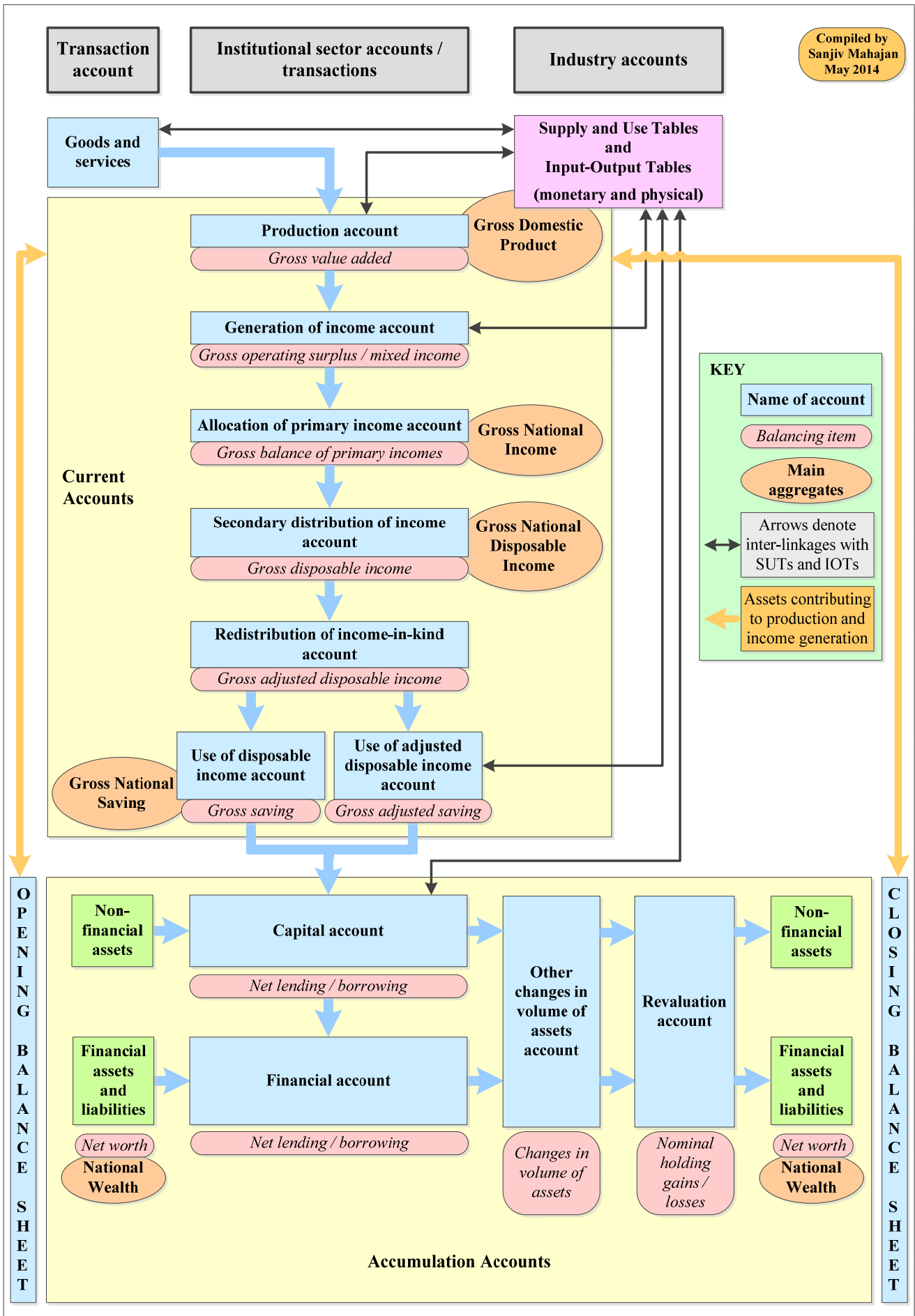
(5) The organization of the “balancing” function can be set-up in different ways across teams, however, a centralised balancing approach is preferred over the de-centralised balancing arrangement whereby the balancing of the various elements related to SUTs and IOTs (e.g. current and constant prices for a single year and for a time series, links with productivity, regional accounts, etc.) is carried out at the same time and within the same unit in order to ensure the full consistency of all SUTs-related products.

(6) The production and balancing of SUTs should enable the identification of source data incoherence. Mechanism should be developed to provide feedback to data suppliers and help prioritize areas for improvement and allocation of resources.

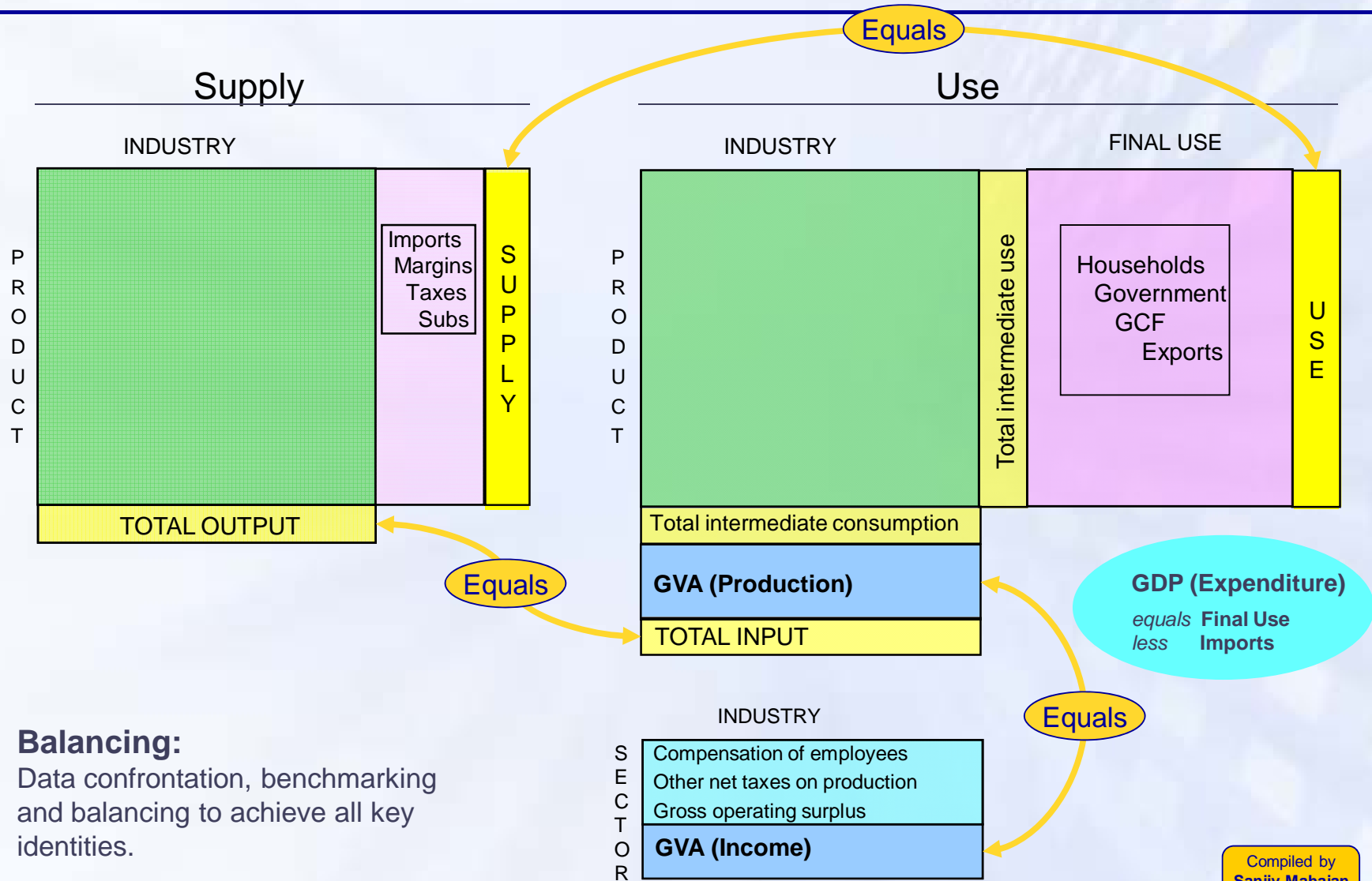
(7) Carry out annual review and evaluation of the balancing adjustments to identify and address any evolving biases.

Overview of the System of National Accounts framework and the links to Supply and Use Tables

Compiled by
Sanjiv Mahajan
May 2014



Framework for a coherent picture of the economy



Balancing:
Data confrontation, benchmarking and balancing to achieve all key identities.

Simplified Supply and Use Tables system

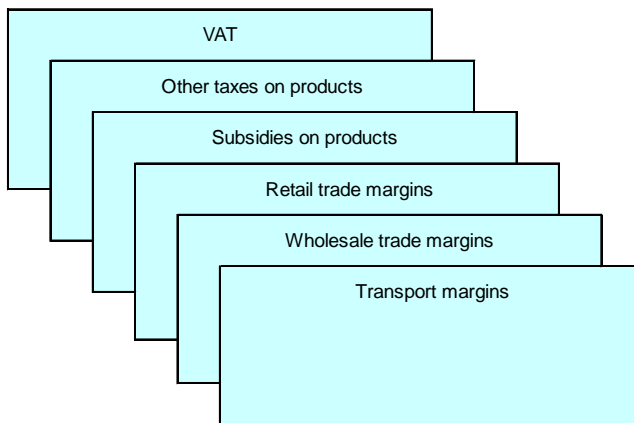
Supply Table at purchasers' prices

Domestic output at basic prices	Imports cif	Total supply at basic prices	Valuation		Total supply at purchasers' prices
			TLS	TTM	
TO at basic prices					

Use Table at purchasers' prices

Intermediate consumption at purchasers' prices	Final use at purchasers' prices	Total use at purchasers' prices
GVA at basic prices		
TO at basic prices		

Valuation matrices



Supply Table at basic prices

Domestic output at basic prices	Imports cif	Total supply at basic prices
TO at basic prices		

Use Table at basic prices

Intermediate consumption at basic prices	Final use at basic prices	Total use at basic prices
TLS	TLS	Total
GVA at basic prices		
TO at basic prices		

Supply Table of domestic output

Domestic output at basic prices	Domestic output at basic prices
TO at basic prices	

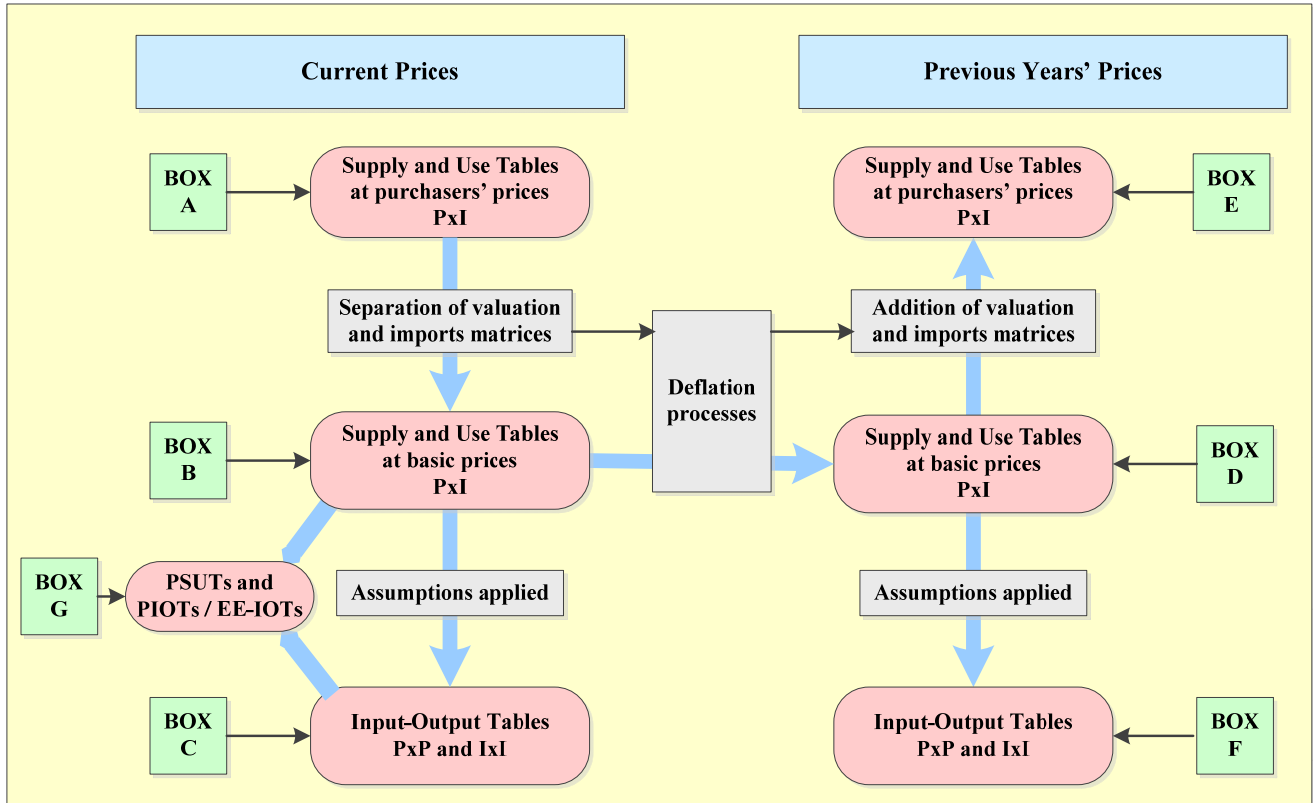
Domestic Use Table

Intermediate consumption of domestic output at basic prices	Final use of domestic output at basic prices	Total use of domestic output at basic prices
Use of imported products cif	Use of imported products cif	Total
TLS	TLS	Total
GVA at basic prices		
TO at basic prices		

Imports Use Table

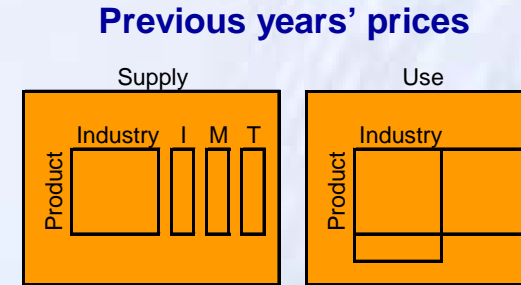
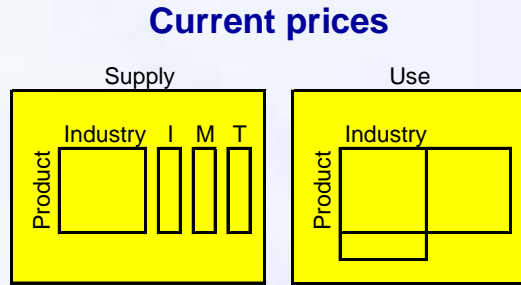
Intermediate consumption of imported products at basic prices	Final use of imported products at basic prices	Total use of imported products at basic prices
Total	Total	Total

Simplified Version of Compilation Schematic “H-Approach” (Mahajan Method)



An overview of the compilation schematic integrating Supply and Use Tables and Input-Output Tables (“H-Approach”)

Supply and Use Tables



Purchasers' prices

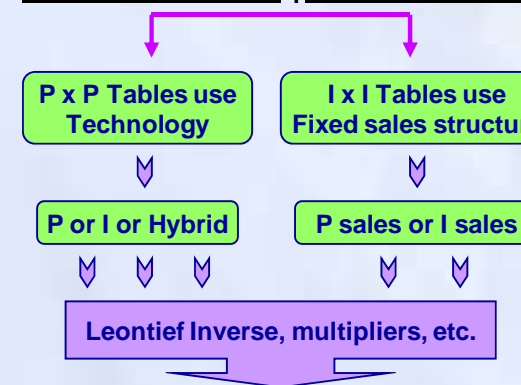
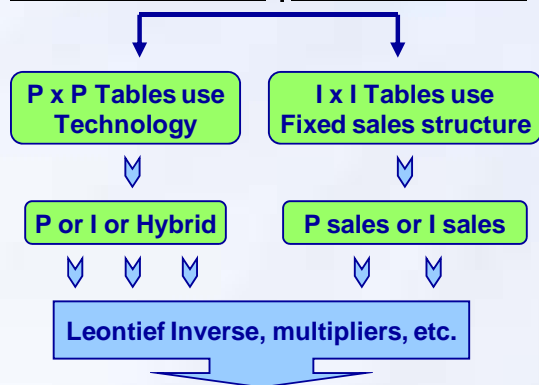
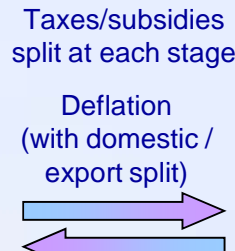
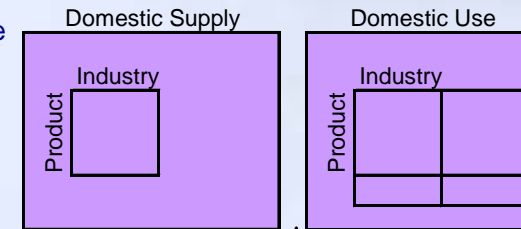
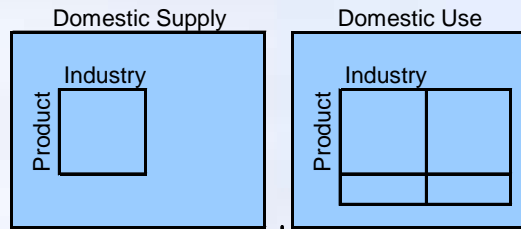
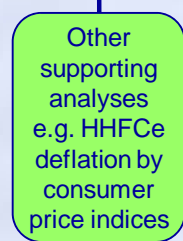
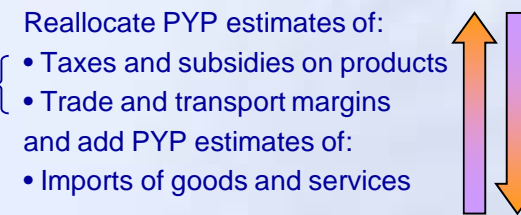
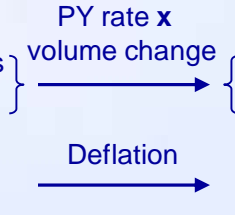
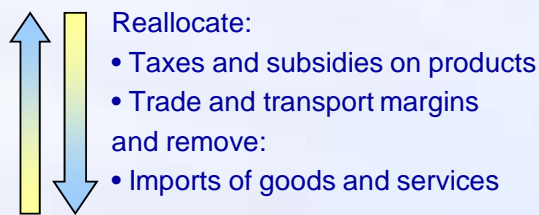
Producers' prices

Basic prices

Input-Output Tables

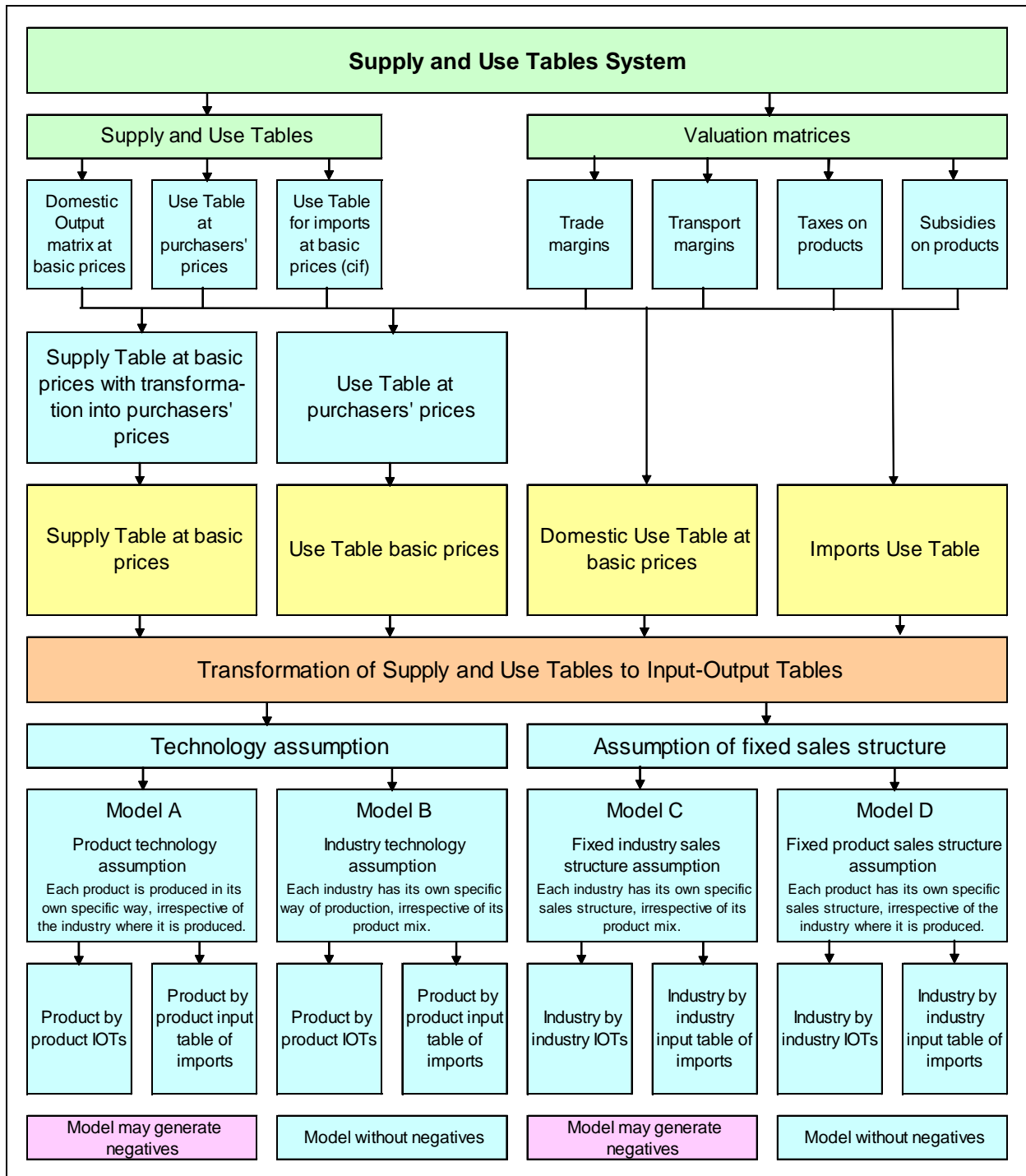
Type of tables (assumptions)

Product or industry or hybrid



Compiled by Sanjiv Mahajan June 2009

Transformation of SUTs to IOTs



Range of units – Main Units and Analytical Units

Statistical unit is key to all aspects of the statistical system

