Supply and Use Tables
Tool to Improve GDP Estimates and Support Policy Analysis

Training workshop

ECLAC, December 2 - 2021

ECLAC - UNSD

Supply and Use Tables within the SNA

- What are the Supply and Use Tables (SUT)

- Why SUT

- How are SUT compiled

  - Balancing SUT

The SNA accounts

- The sequence of accounts portrays the working of the economy with particular emphasis on how **income** is generated, distributed, redistributed and used for consumption or the acquisition of assets and when assets are disposed of… [plus the balance sheets]

- An alternative view of the economy focuses less on income and more on the processes of **production** and **consumption**

  ✓ Where do products come from and how are they used?

- The answer to this question can be found in the "Goods and Services Accounts" (also part of the SNA Central Framework)

The SNA accounts [flows] – and the main aggregates

Production accounts	• Value added / Gross domestic product
The generation of income account	• Operating surplus • Mixed income
The allocation of primary income account	• National income
The secondary distribution of income account	• Disposable income
The use of income accounts	• Saving
The capital account	• Net lending (+) / net borrowing (–)
The financial account	• Net lending (+) / net borrowing (–)

The Goods and Services Account (*Production and Consumption*)

Starting from the macroeconomic productoin identity, we have:

$$PDP = Cons + Gov + Inv + Exp - Imp$$

From the "Production Accounts" we know: $GDP = Output - Interm.Cons.$

Therefore, the identity becomes (the Gs and Ss accounts)

$$Output - Interm.Cons. = Cons + Gov + Inv + Exp - Imp$$

GDP (Production)	**=**	GDP (Expenditure)

Reorganizing the M and IC we get (the most basic identity of the SNA)

$$Output + Imp = Interm.Cons. + Cons + Gov + Inv + Exp$$

Supply	**=**	Use

The Goods and Services Account

➤ The *amount* of a product available (e.g., 100) for use within the economy must have been supplied either by domestic production (e.g., 80) or by imports (e.g., 20)

➤ The same *amount* of the product (e.g., 100) entering an economy in an accounting period must be used for intermediate consumption (e.g., 15), final consumption (e.g., 45), capital formation (e.g., 5) (including changes in inventories) or exports (e.g., 35)

$$\underbrace{Prod}_{80} + \underbrace{Imp}_{20} = \underbrace{Interm.\,Cons.}_{15} + \underbrace{Cons}_{42} + \underbrace{Gov}_{3} + \underbrace{Inv}_{5} + \underbrace{Exp}_{35}$$

This is called: product balance, product flow, commodity balance, commodity flow

...this identity must hold at both product and aggregate levels

The Goods and Services Account

Based on this principle: if the **production** process is recorded with an **industry** breakdown (m), both the output and intermediate consumption will be detailed at this industry level

$$Outp(1) \quad + Outp(2) \quad + Outp(3) \quad + \dots + Outp(m) \quad + Imp \ =$$
$$Int.Cons(1) \ + Int.Cons(2) + Int.Cons(3) + \dots + Int.Cons(m) \ + Cons + Gov + Inv + Exp$$

Now, if in addition to industries, the data is recorded with a **product** breakdown (n) for all the components, the identity can be expressed with a matrix notation:

Output Matrix	*Imports*	*Intermediate Consumption Matrix*	*Final Use Vectors*

The Supply and Use Tables

The most detailed version of the goods and services accounts can be expressed as an SUT

| Output Matrix | + | Imports | = | Intermediate Consumption Matrix | + | HH Final Consumption | + | Gov. Final Consumpt. | + | Capital Formation | + | Exports |
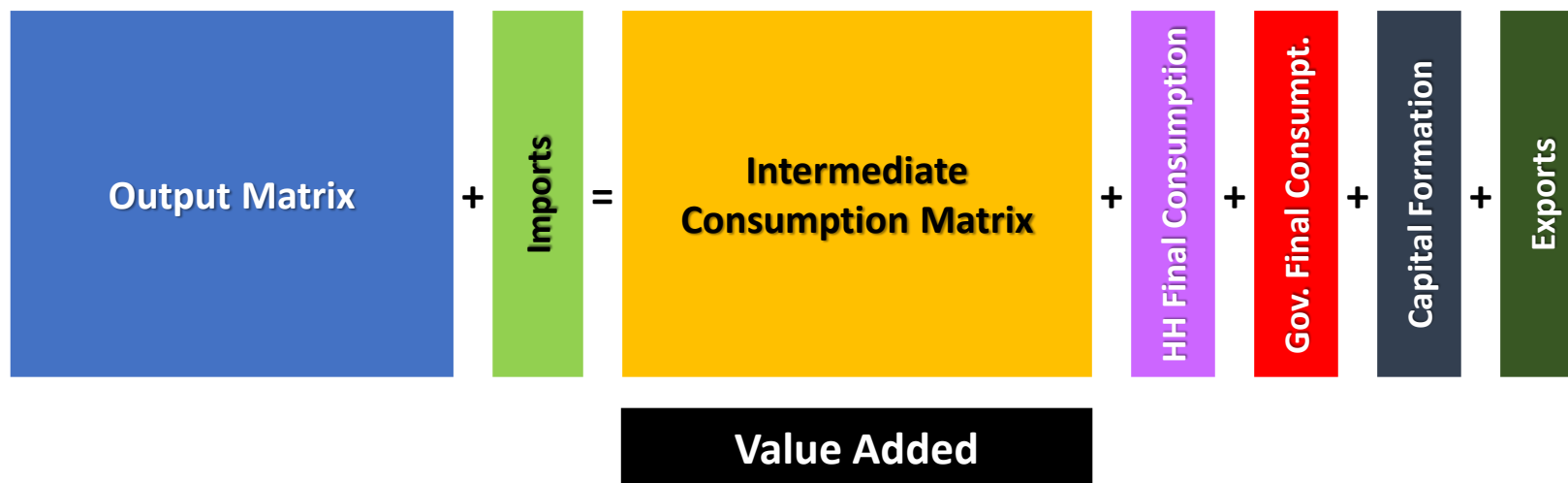
Value Added

Given the SUT structure, it is possible to directly derive the industries **value added** (VA=total output – total IC), which are generally computed underneath the IC matrix

Moreover, it is possible to compile the *detailed components of the VA* (The generation of income account) within the SUT framework

The valuation of the SUT components

So far, the product balances have been described in terms of "amounts", however the SUT components are expressed in values, therefore it is essential to understand how these components are valued to ensure meaningful balances:

> The **use** side of the SUT is usually valued at **purchaser's prices** (pp), while

> The **output** is valued at **basic prices** (almost always bp < pp)

¿what is the difference?

⇒ It is necessary to **add** *trade and transport margins, and taxes on products* and **subtract** the *subsidies on products* on the supply side, so that both sides are expressed at pp and thus become directly comparable (it is also possible to balance SUTs at basic prices – by deducting the valuation layers from the use)

⇒ The export and import valuations require special considerations

Los Cuadros de Oferta y Utilización (Precios Comprador)

Output + Trade Margins + Transport Margins + Taxes (Products) − Subsidies (Products) + CIF/FOB adjustment + Imports = Intermediate Consumption + HH Final Consumption + Gov. Final Consumption + Capital Formation + Exports

Value Added

Valuation layers (Vectors)

Offsetting the transport and insurance services (CIF) from Imports
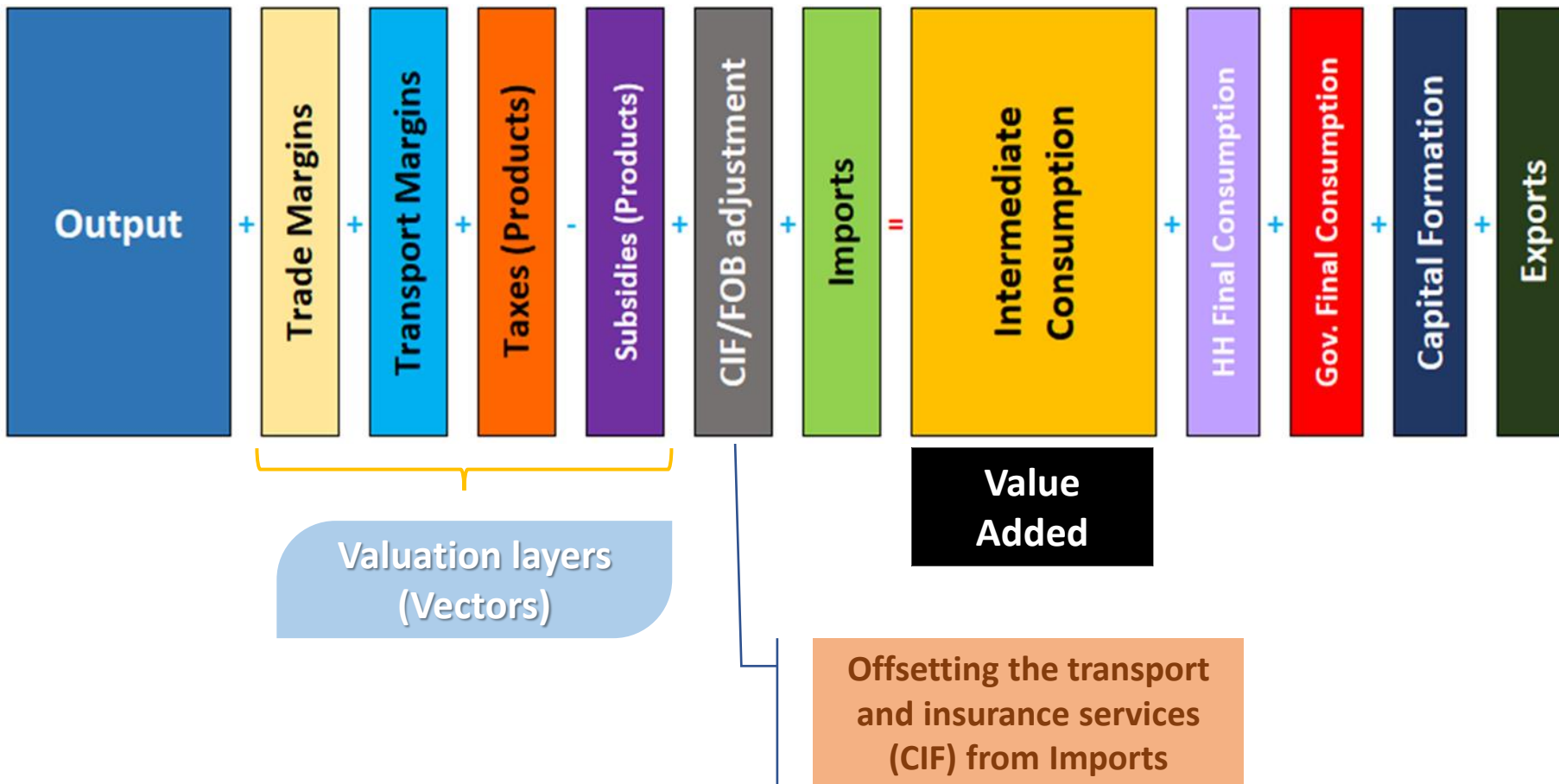
Supply and Use Tables (Purchaser's Prices) - Example — ECLAC

Products (by CPC sections)	Valuation: Trade and transport margins	Valuation: Taxes on products	Valuation: Subsidies on products	Output: Agriculture, forestry and fishing	Output: Manufacturing and other industry	Output: Construction	Output: Trade, transport, accommodation and food	Output: Information and communication	Output: Finance and insurance	Output: Real estate activities	Output: Business services	Output: Education, human health and social work	Output: Other services	Output: Public administration	Imports: CIF/FOB adjustments on imports	Imports: Gs&Ss	IC: Agriculture, forestry and fishing	IC: Manufacturing and other industry	IC: Construction	IC: Trade, transport, accommodation and food	IC: Information and communication	IC: Finance and insurance	IC: Real estate activities	IC: Business services	IC: Education, human health and social work	IC: Other services	IC: Public administration	Exports	FCE	GCF
Agriculture, forestry and fishery products	2	5	(3)	90	0	0	0	0	0	0	0	0	0	0	0	34	3	74	0	3	1	2	1	2	3	0	2	7	27	3
Ores and minerals; electricity, gas and water	2	5	0	0	194	0	0	0	0	0	0	0	0	0	0	57	3	191	1	6	3	2	1	2	5	0	4	7	36	(2)
Manufacturing	70	92	(5)	2	1700	11	23	17	0	0	9	0	0	0	0	272	33	699	78	44	16	16	18	19	45	5	39	421	583	175
Construction	0	17	0	0	7	234	3	2	0	0	0	0	0	0	0	0	1	10	5	3	1	1	1	1	11	0	7	6	2	214
Trade, accommodation, food & beverages; transport services	(74)	5	0	0	6	1	238	0	0	0	0	0	0	0	(6)	47	3	64	3	25	4	4	2	4	4	0	5	57	42	0
Finance and Insurance	0	0	0	0	0	0	0	0	144	0	0	0	0	0	(4)	12	1	37	7	17	1	3	6	7	7	1	16	2	48	0
Real estate services; and rental and leasing services	0	0	0	0	0	0	4	0	0	184	0	0	0	0	0	0	1	15	1	8	2	5	2	4	8	1	9	1	112	22
Business and production services	0	11	0	0	1	0	3	84	0	0	177	0	0	0	0	4	2	73	18	15	10	19	17	20	22	9	25	9	40	1
Community and social services	0	0	0	0	0	0	0	0	0	0	0	278	0	0	0	0	0	1	0	0	0	0	0	1	27	0	8	2	238	0
Other services	0	4	0	0	0	0	2	0	0	5	2	0	82	0	0	0	1	1	0	1	1	1	0	1	2	0	2	0	85	0
Public administration	0	0	0	0	0	0	0	0	0	0	0	0	0	161	0	0	0	0	0	0	0	0	0	0	1	0	1	0	159	0
CIF/FOB adjustment on imports	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	(10)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct purchases abroad by residents	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	0	0	35	0
Domestic purchases by non-residents	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	(32)	0
Total	0	139	(8)	92	1910	246	273	103	144	188	188	278	82	161	0	451	47	1165	112	122	38	52	47	61	135	16	118	545	1376	413

Compiling SUTs

Pros

- It's one of the key SNA accounts
- Provide additional analytical capabilities
- Ensure consistency between several SNA aggregates
- Are a GDP compilation tool – Including some satellite accounts
- **Facilitate/Enable the implementation** of some of the new recommendations

Cons

- High (er) requirements of data sources and details
- Multiple classifications
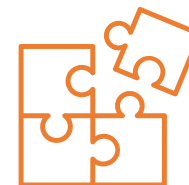- Labor intensive balancing processes

# Usefulnes of the SUT

Compilation tool

Analytical tool

Source for other statistics

Compilation tool

- Compiling supply and use tables requires exploiting all available data and information from the economy

- Integrated framework for checking consistency

  - GDP is compiled using various survey and administrative data sources. Efficient analysis and comparison of primary sources to achieve consistency.

  - Inconsistencies are dealt with at a detail level and using different levels of data reliability.

- Completeness of national accounts

  - Adequate framework to make estimates to fill data gaps, e.g., non-observed economy, and product breakdown.

- Enables a detailed and consistent deflation process
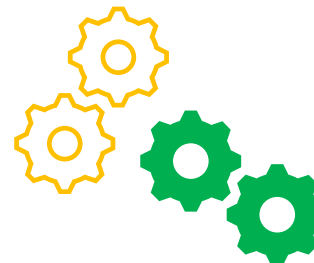
Compilation tool

➢ In general (simplified) terms, SUTs are compiled following 3 stages:

- **Data collection**: various data sources, detail information, interagency collaboration, advance planning is required

- **Data population (Preliminary estimates)**: classification harmonization, formatting, valuation, validation, initial contrasting, filling in data gaps

- **Balancing**: process to achieve consistency (including additional data gap filling)

Workshop's objetive

This process can be performed at both current and constant prices (either simultaneous or consecutively – effects on deflators)

Analytical tool (examples)

- Detailed production function structures

- International trade contribution to the domestic economy

- Detail on the HH consumption

- Industrial trends/composition changes

- Detail on the investment components

- Relevance of taxes on products

- Detailed structures, composition and contribution of deflators

Source for other statistics

- SUT are the basis for deriving Input-Output tables

  - ✓ Multipliers

- Trade in Value Added

- Extended SUTs

- Productivity estimates taking account of labor, capital, and intermediate inputs

- Satellite accounts

- Weight structures

- Physical SUTs

Potential benefits of using the tool

- Free, practical, and flexible

- Reduced time used in the final reconciliation stage

- Allows consistent procedures over time

- Allows for filling data gaps

- Permits a detailed detection of the main discrepancies (facilitates prioritization)

- Makes certain subjective aspects of the process objective

- Performs the balancing process transparently

- Facilitates training on SUT and SUT balancing

"In spite of the best endeavours of statisticians, national accounts contain statistical discrepancies, residual errors, unidentified items and other balancing entries, evidence of the difficulties arising from the fact that the **information available** is in some degree <u>incomplete</u>, <u>inconsistent</u> and <u>unreliable</u>. These difficulties are not peculiar to economics: they have long been recognised in the physical sciences, and methods of combining and adjusting measurements have been devised. Thus, about a hundred years ago, Merriman {1884; 8th edn, 1911, p. 1) wrote: 'The absolutely true values of the observed quantities cannot in general be found, but instead must be accepted and used values, derived from the combination and adjustment of the measurements, which are the most probable, and hence the best.'"

Richard Stone

(Nobel Memorial Prize in Economic Sciences, 1984)

Thank you!