Module 3: Compilation of Supply Table

Ana Francesca Rosales

Consultant (Research Analyst), ADB

Regional Course on Supply and Use Table

20-24 January 2020

Chiba, Japan

Outline

- Structure of the Supply Table
- Domestic output
  - Primary statistics and data sources
  - Primary and secondary products, ancillary, redefinitions
  - Classifications
  - Compilation issues
- Imports of goods and services
  - Valuation of imports – CIF and FOB valuation
- Valuation Matrices (Module 5)

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Main references

- System of National Accounts 2008
- UN Handbook on Supply, Use and Input-Output Tables with Extensions and Applications, 2018
- Eurostat Handbook on Supply, Use and Input-Output Tables
- UN Financial Production, Flows and Stocks in the System of National Accounts
- Impact of Globalization on National Accounts

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Structure of the Supply Table

- Shows the supply of goods and services by type of product and by type of industry distinguishing between the supply by domestic industries and imports of goods and services
- Consists of:
    1. Domestic output
    2. Imports valued at CIF prices
    3. Valuation adjustments – Trade and Transport Margin, Taxes less Subsidies on Products, Direct purchases of residents abroad, Direct purchases of nonresidents in the domestic economy

Supply Table												
Products \ Industries	Domestic Production					Imports of Goods and Services	CIF/FOB Adjustment on Imports	Total Imports	Total Supply and Use at Basic Prices	Trade and Transport Margins	Taxes Less Subsidies on Products	Total Supply at Purchasers' Prices
	Industry 1	Industry 2	Industry 3	Industry 4	Total							
	I					II				III		
Goods 1	80	70	–	–	150	20	–	20	170	20	15	205
Goods 2	60	30	10	0	100	10	–	10	110	10	10	130
Services 1	–	–	100	25	125	15	–15	–	125	–30	12	107
Services 2	5	5	15	50	75	–	–	–	75	–	8	83
CIF/FOB Adjustment on Imports	–	–	–	–	–	–15	15	–	–	–	–	–
Direct Purchases of Residents Abroad	–	–	–	–	–	5	–	5	–	–	–	5
Total	145	105	125	75	450	35	–15	20	480	0	45	525

1. Domestic output

- Rows: products
  - Primary products
  - Secondary products
    - Subsidiary products
    - By-products
    - Joint products
- Columns: activities

		Industries						**Total domestic output**
		Agriculture	Mfg	Construction	Trade, transport and comm	Finance and bus. services	Other services	
Products	Agriculture	■						
	Manufacturing		■					
	Construction			■				
	Trade				■			
	Transport				■			
	Communication				■			
	Finance and bus. svc					■		
	Other services						■	
	Total							

■ Principal product

Secondary product

Source: UN Handbook, 2018

1. Domestic output

- Size of secondary outputs
  - Level of aggregation
  - Enterprise vs. establishment survey
- Work with much detail as possible, subject to
  - availability of data
  - user needs
  - level of detail used in the National Accounts
  - Representative of the economy
- What is the dimension of your SUT?

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

1. Domestic output

- Principal activity
- Secondary activity
- Ancillary activity
- Redefinitions - Factoring out the amount of secondary products produced as well as the inputs used in that production and reassigning both to the industry for which the product is classified as primary (Miller and Blair, 2009)

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

1. Domestic output

- Classification of economic activities:
  - International reference: ISIC Rev. 4
  - National and regional classifications: NACE Rev. 2, NAICS, ANZSIC
- Classification of products:
  - International reference: CPC Ver. 2.1
  - National and regional classifications: CPA
- Build correspondence table (many source code to unique CPC code)

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

1. Domestic output

- Tax records are becoming more reliable sources of sales/output/revenue
- Enterprise surveys supply information on the main structural characteristics of different economic activities
- Production surveys allow estimation of total production by type of product
- Admin data (e.g., sector report, company accounts)

		Industries			**Total domestic output**
		Agriculture	Industry	Services	
Product	Agriculture				
	Industry				
	Services				
	Total				

Production type surveys

Data on total sales or output by type of product

Tax records
Provide information on total sales/output/revenue

Enterprise/establishment surveys
Collect data on total sales by enterprises or establishments plus a range of other information, preferably with product breakdown:

- Sales by type of product
- Changes in inventories by asset type, by opening and closing)
- Own account production by type of product
- Other taxes and subsidies on products
- Trade activity by type (wholesale or retail)
- Of total sales, sales of export by type of product

2. Imports

- Main data sources:
  - Goods: customs data, international merchandise trade statistics
  - Services: balance of payments and specialized statistics on international trade in services (e.g., business surveys)
- IMTS 2010 vs. 2008 SNA and BPM 6: IMTS 2010 valuates imports at CIF, while 2008 SNA and BPM 6 valuates imports at FOB – an extra row on CIF/FOB adjustment of imports is added to reconcile the different valuations
- Good sent abroad for processing with no change of economic ownership should be excluded from NA and BOP
- Merchanting margin (reflected as negative export upon purchase and positive export upon sale) should not include holding gains and losses

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

2. Imports

- Extra row on direct purchases abroad by residents
  - Expenditure of resident business traveler is treated as import of service (Supply Table) and IC of the industry which the traveler belong (Use Table)
  - Expenditure of resident travelers on personal trips is treated as import of service (Supply Table) and Household final consumption expenditure (Use Table)

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

2. Imports

Products	Total IC	HFCE	Exports	Total final demand	Total Imports	CIF/FOB adjustment	Total Supply
Agriculture, forestry, and fishing	10,662,513	3,310,626	5,033,235	20,194,024	634,607	0	20,194,024
Mining and quarrying	3,457,758	0	6,288,405	9,734,986	421,281	0	9,734,986
Food, beverages and tobacco	5,353,192	14,509,161	5,676,088	25,830,371	1,573,293	0	25,830,371
…	54,261,143	44,368,917	2,943,769	143,560,803	20,454,611	978,636	143,560,803
Private HH with employed persons	0	538,178	0	538,178	0	0	538,178
Direct purchases	101,738	**-1,097,831**	1,786,270	790,177	**790,177**		790,177
CIF-FOB adj	0	0	0	0	-978,636	978,636	0
Total IC	**73,836,344**	**61,629,051**	**21,727,767**	**200,648,539**	**22,516,333**	**0**	**200,648,539**

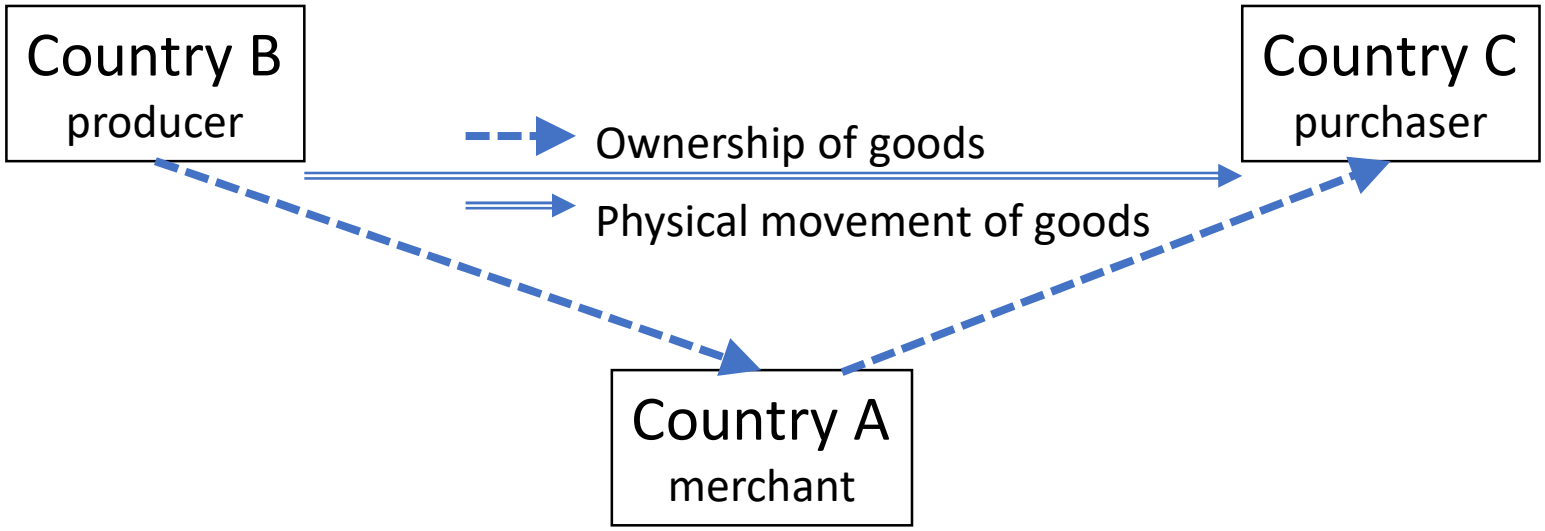
ADB

Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Merchanting

Merchanting is a process where a commodity in Country B is purchased by Country A for sale in Country C. The goods legally change ownership but do not physically enter the economy where the owner (Country A) is resident.



Source: Impact of Globalization on National Accounts

Example: Merchanting in the Supply table

- Butter: - 200 export from Country B + 400 export to Country C = 200 margin earned from merchanting
- Computer eqpt: -500 export from Country B + 900 export to Country C= 400 margin earned from merchanting

SUPPLY	Agri	Food and beverage	Office mach and computer	Wholesale trade	Total domestic supply	Imports	Trade Margin	Taxes less Subsidies	Total Supply
Cereal									
Food and beverage							200		200
Office mach and computer							400		400
Wholesale trade service		200	400		600		-600		0
Total									

Source: Impact of Globalization on National Accounts

Example: Merchanting in the Use Table

USE	Agri	Food and beverage	Office mach and computer	Wholesale trade	Total	HFCE	NPISH	Govt	GFCF	CII	EX	Total
Agriculture												
Food and beverage											200	200
Office machinery and computer											400	400
Wholesale trade												
…												
Total											600	600

Source: Impact of Globalization on National Accounts

Change from 1993 SNA to 2008 SNA: Merchanting in Hong Kong

- Export of goods under the new principle will go down by $20 billion, imports of goods will go down by $69 billion in 2008 – no longer imputing value of goods
- Total imports of services under the new principle may rise by US$27 billion in 2008, while export of services may decrease by $27 billion – import of services reflects processing fee, export of service reflects new treatment of merchanting

Table 6.4.1 Impact of implementation of the 2008 SNA and BPM6 on goods for processing and merchanting

$ billions

External trade of Hong Kong in2008	*Under BPM5*	*Outward processing*	*Merchanting*	*Offshore trade with outward processing*	*Under BPM6*	*Percentage change*
Exports of goods	365	-57	19	18	345	-5%
Imports of goods	388	-77		8	319	-18%
Balance of trade in goods	*-23*				*27*	
Exports of services	92		-19	-3	69	-25%
Imports of services	47	20		7	74	+58%
Balance of trade in services	*45*				*-5*	
Balance of trade in goods and services	*22*				*22*	

Figures may not add to totals due to rounding.

Source: Impact of globalization on national accounts

CIF/FOB Adjustment

- BOP/SNA: Imports at FOB vs. IMTS 2010: Imports at CIF
- An extra row on CIF/FOB adjustment of imports is added to reconcile the different valuations
- Insurance and freight paid to non-resident carriers is added as import of service
- In the freight and insurance services product rows, negative entries are posted in the c.i.f./f.o.b. adjustment column equal to the insurance and freight components in the imports

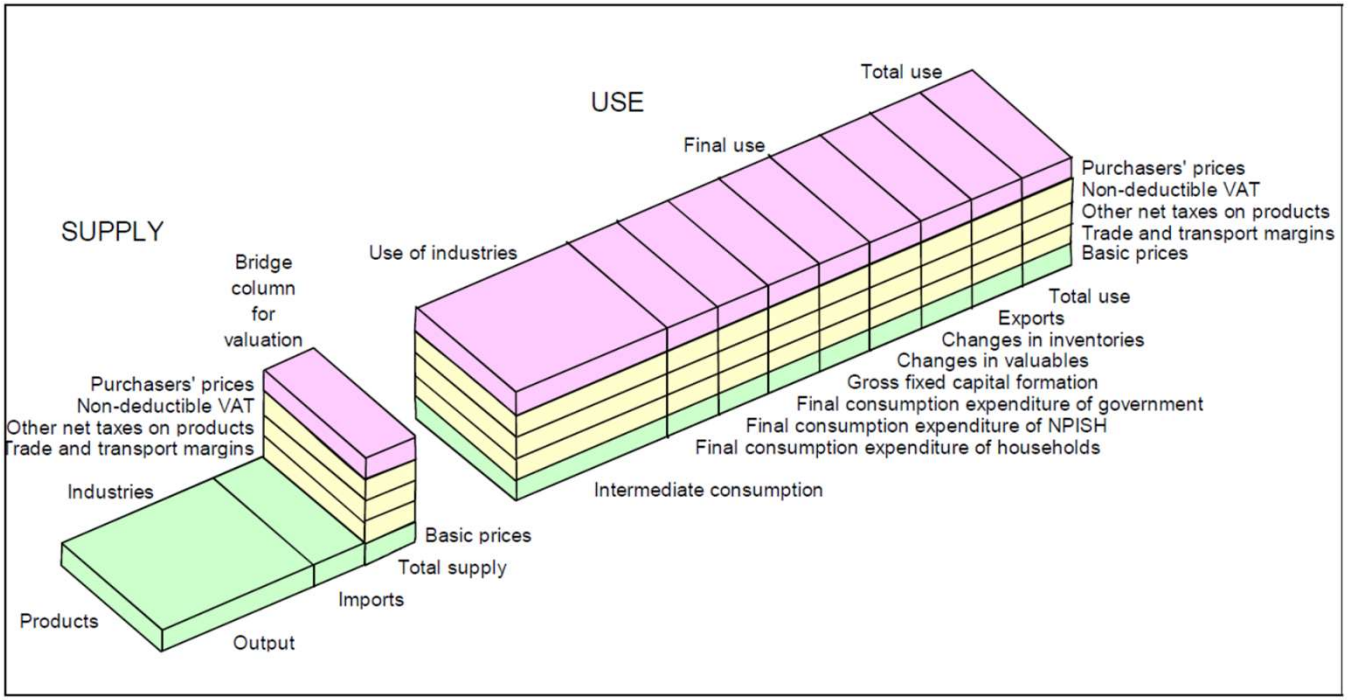
ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

3. Valuation Matrices

- Fundamental step in SUT compilation as it bridges different valuation concepts of the product flows



ADB

UNITED NATIONS siap
Statistical Institute for Asia and the Pacific

United Nations
Statistics Division

Example: CIF/FOB adjustment

- FOB (free on board) is the price of goods + transportation cost until the border of the exporting country
- CIF (cost, insurance, freight) is the price of goods + transportation cost until the border of the importing country
- For neighboring countries (i.e., land border): CIF = FOB
- Insurance & freight paid to non-residents is included in the import of services

Example: CIF/FOB Adjustment

- Central Bank may make a global adjustment for BoP purposes
- Use data which are available from customs and other documents for laying down different ratios
- Carry out special survey of importers on transport and other costs
- Use (historical) ratios – adjust trade in goods by a fixed percentage for transportation cost and insurance (but transportation costs depends on the goods and not on the transportation activity)

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Example: CIF/FOB Adjustment

	Goods	Services	Total Domestic output	Imports	Total Supply	CIF /FOB adjustment	Total supply at basic prices
Goods				**C** Includes I&F of residents and non-residents 1000	1000		
Services							
I&F		**A** I&F on imports by residents 20	20	**B** I&F on imports by non-residents 80	100		
Others		30	30	120	150		
Total		50	50	200	250		
CIF/FOB adjustment							
Total							

Example: CIF/FOB Adjustment

	Goods	Services	Total Domestic output	Imports	Total Supply	CIF/FOB adjustment	Total supply at basic prices
Goods				**C** Includes I&F of residents and non-residents 1000	1000		**H** Includes I&F of residents and non-residents 1000
Services		**A** I&F on imports by residents		**B** I&F on imports by non-residents			
I&F		20	20	80	100	**F** **-100**	**I** Excludes I&F
Others		30	30	120	150		150
Total		50	50	200	250	**-100**	150
CIF/FOB adjustment				**D** **-100**		**G** 100	
Total				**E** Imports of goods at FOB Imports of services including I&F 1100			

Example: CIF/FOB Adjustment

- E.g., global adjustment of 6% (98% on transport, 2% on insurance)
- CIF/FOB adjustment is entered as negative imports in the transport and insurance services rows
- Total of the CIF/FOB adjustment column is zero

	Imports	CIF/FOB adjustment
Cereals		
Food and beverage products		
Office		
Office mach.		
Trade		
Transport services	6.76	-6.76
Insurance service	0.14	-0.14
CIF/FOB adjustment	-6.9	+6.9
Total		0

Example: Output of FISIM

$$FISIM = FISIM_L + FISIM_D = \left(\frac{r_L - rr}{100.0}\right) Y_L + \left(\frac{rr - r_D}{100.0}\right) Y_D$$

where

$FISIM_L$ = FISIM on loans made by financial institutions

$FISIM_D$ = FISIM on deposits held by financial institutions

r_L = lending rate (market rate)

r_D = deposit rates (market rate)

rr = reference rate (economic rate of return, IBOR)

Y_L = average stock of loans

Y_D, = average stock of deposits

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Reference rate used in the estimation of FISIM

- Simple average

$$rr_s = 0.5\left(\frac{r_L}{Y_L} + \frac{r_D}{Y_D}\right) \times 100$$

- Weighted average

$$rr_s = \left(\frac{w_L r_L}{Y_L} + \frac{w_D r_D}{Y_D}\right) \times 100$$

- Exogenous rates of maturities with different terms (weighted by the stock of loans and deposits in each maturity)
- Interbank rate
- Central Bank lending rate
- Government bonds
- Money market rate
- Exports of FISIM – reference rate used to calculate output of domestically-produced FISIM
- Imports of FISIM – reference rate used to calculate output of domestically-produced FISIM of the supplying country

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Reference rate used in the estimation of FISIM

- Reference rate based on a single observable exogenous rate for a specific instrument, such as interbank lending rates
- Reference rate based on weighted average of observable exogenous rates of maturities with different terms (weighted by the stock of loans and deposits in each maturity)
- Weighted average of the endogenous interest rates on loans and deposits

Negative FISIM

- Period of volatile movements in reference rates and when liquidity markets begin to dysfunction
- Subsidized rate
- Review underlying reference rate for the period
- There should not be negative FISIM

FISIM allocation

- Allocation to resident institutional units – use of FISIM to be classified as intermediate or final consumption
- Validate if country data on export of services includes FISIM

FISIM estimation and allocation example

- Estimate average stock on loans, average stock on deposits, average interest rate on loans, and average interest rate on deposits
- Estimate FISIM on loans and FISIM on deposits
- Compute average stock by broad industry group
- Allocate FISIM by broad industry group
  - Allocate by institution
  - Allocate by activity (use stock of loans by activity from Central Bank, interest payment from business survey, GVA, GO)

See sample illustration (worksheet)

ADB

UNITED NATIONS SIAP Statistical Institute for Asia and the Pacific

United Nations Statistics Division

Thank you!