

Input-Output Statistics

2016 Input-Output statistics are based on the System of National Accounts 2008, as well as the strict change of ownership principle according to the 6th edition of Balance of Payments and International Investment Position Manual (BPM6). Input-Output statistics contain Supply and Use Tables (SUTs) and Benchmark Input-Output Tables (IOTs).

A. Compilation Principle and Particular Treatment

1. Compilation Principle

(1) Release Periodicity

Input-Output statistics are useful tools for economic planning, policy assessment, economic forecasting and analysis.

In order to coordinate with the Industry and Service Census, the Input-Output statistics benchmark tables are compiled every 5 years (for years that end with a 1 or 6).

For annual tables, we compile the SUTs at purchaser's price and classify as 63 commodity-by-industry accounts.

(2) Valuation

In Input-Output statistics, the output is valued at producers' prices while the intermediate consumption is valued at the purchasers' prices and at producers' prices for transaction tables at those two prices respectively.

2. Particular Treatment

(1) Imports

As the imports of goods are valued at CIF, which includes the transportation and insurance costs that are provided by the domestic companies. The corresponding transportation and insurance services provided by domestic companies are treated as exports instead of deducting from imports to keep the net exports the same. Imports plus Gross Output equals total supply. After the balance between total demand and total supply is made in the purchasers' prices table and the producers' prices table, the imports can be split into each sector according to the actual consumption of the import goods and services and compiled into an Transactions Table of Import Goods and Services.

(2) Intra-sector Transactions

If the intermediate stage products can be consumed by other sectors, and they may be divided into more than one industrial sector in the future, or the value added is considerable, intermediate products such as yarn, thread, fabric for the textile industry, etc., the gross output and intermediate inputs need to be calculated separately. Otherwise, intra-sector transactions are ignored.

(3) Vertically Integrated Activities

The vertically integrated activities refers to the activities of the same enterprise to continuously produce two or more products of different sectors in the same production process, such as petrochemical industry, steel industry and textile industry.

If an intermediate product of the vertically integrated activities is competitive, its output is calculated at the market price, and its output is used as the input for the next stage of production, that is, the value of the self-supplied input is calculated at the market price.

(4)By-products

The main treatment of by-products in our country are as follows :

(i) Combine method : The by-products are listed in the same sector as the primary product, such as sugar, bagasse and molasses, etc.

(ii) Separation method : If the by-products produced by an enterprise have other independent production methods and can be produced by different enterprises, output and input of the primary and by-products of the enterprise should be calculated separately. The common costs of the primary and by-products can be shared based on their gross output, but the reasonableness of the profit and loss of the two sectors must be checked. Some adjustments can be made if needed.

(5)Processing Services

According to BPM6, imports and exports should be recorded on a strict change of ownership basis. That is, flows of goods between the country owning the goods and the country providing the processing services should not be recorded as imports and exports of goods. Instead, the fee paid to the processing unit should be recorded as the import of processing services by the country owning the goods and an export of processing services by the country providing them.

Merchanting is defined as the purchase of goods by a resident (of the compiling economy) from a non-resident combined with the subsequent resale of the same goods to another non-resident without the goods being present in the compiling economy.

The goods of merchanting are recorded as negative exports on acquisition and positive exports on disposal. The difference between sales over purchases of goods for merchanting is shown as the item “net exports of goods under merchanting.”

(6)Own-account Construction

The output of construction (including repairs, maintenance and new-build) undertaken by enterprises, individuals or government for their own use is included in construction sector, and can be classified according to its character as residential building construction, nonresidential building construction, etc. The main data sources are sample survey of Industry & Service Census and Survey of Own-Account Construction. The intermediate inputs and value added are calculated based on the input structure of the above sectors.

(7)Imputation

The imputation occurs in some non-actual transaction activities, but it has substantial utility. The above utility can be measured at market price and used as the output of the generating sector. The sectors that must be imputed in Input-Output statistics are as follows :

(i) Financial Service Activities : The output includes service income and financial intermediation services indirectly measured provided by financial institutions, widely known as FISIM. The method for estimating FISIM provided by financial institutions, is to deduct the interest payments to deposits from the interest receipts generated by loans. The FISIM should be allocated between users (lenders as well as

borrowers) treating the allocated amounts as Intermediate Consumption by enterprises, Final Consumption or Export.

(ii) Ownership of Dwelling : The output of self-owned residential services is generally based on the Survey of Family Income and Expenditure, and all of its output is distributed as private consumption expenditure.

(8)Cost of Lease

Costs of maintenance for leased goods are principally recorded as the inputs of users. Therefore, the stability of the input coefficient can be maintained. But costs of maintenance for the motor vehicles, computers and their peripheral equipments, and office machineries are recorded in the sector of owners because the leasing sectors treated them as costs.

(9)Output of Central Bank

There are three broad groups of central bank services. These are monetary policy services, financial intermediation and supervisory services. Monetary policy services represent non-market output. Financial intermediation services are treated as market production. supervisory services may be classified as market or non-market services depending on whether explicit fees are charged that are sufficient to cover the costs of providing the services. In cases where market output is not separated from non-market output, the whole of the output of the central bank should be treated as non-market and valued at the sum of costs and classified as Government Final Consumption Expenditure.

(10)Insurance

According to 2008SNA, the output of insurance, included non-life insurance, life insurance and reinsurance, are estimated as the sum of costs (including intermediate costs, labour and capital costs) plus an allowance for normal profits. In addition, the formula to calculate the output of reinsurance services is exactly analogous to those for direct insurance.

(11)Intellectual Property Products

(i) Mineral Exploration Expenses : According to 2008SNA, whether successful or not, expenditures on mineral exploration are regarded as intellectual property products and so are all treated as gross fixed capital formation.

(ii)Computer software and Databases expenditure : Producers are expected to use systems, applications and large databases for more than one year. Expenditures on computer software and databases, whether purchased externally or developed on their own, should be considered as intellectual property and included in gross fixed capital formation.

(iii) Research and Development (R&D) Expenditure : R&D, which can be used repeatedly or continuously in production for more than one year, provide an economic benefit and with the clear identification of ownership, is treated as gross fixed capital formation in 2008 SNA.

(12)Treatment of government infrastructure

Although the government infrastructure has a long service life, it is still limited, so 1993 SNA recommended that fixed capital consumption should be imputed. As the output of government service producers is estimated as the sum of costs of production, an increase in their consumption of fixed capital will increase the output and value-added, as well as government final consumption expenditure.

(13)Compilation of Social Security Funds Statistics by government departments

According to the 2008 SNA, the social insurance schemes that are imposed and controlled by government units for the provision of basic living security of the nation, and the ultimate financial responsibility, is essentially a government public service. When social security schemes are separately organized from the other activities of government units and hold their assets and liabilities separately from the latter and engage in financial transactions on their own account, they qualify as institutional units that are described as social security funds and should be classified as general government sectors. In our country, social security funds include National Health Insurance, Labor Insurance, Labor Employment Insurance, Farmers Health Insurance, Government Employees' and School Staffs' Insurance, Military Insurance, National Pension Insurance, and Civil Servant Pension etc.

B.Compilation Process

The 2016 Input-Output statistics compile commodity-by-industry (CxI) SUTs and commodity-by-commodity (CxC) IOTs.

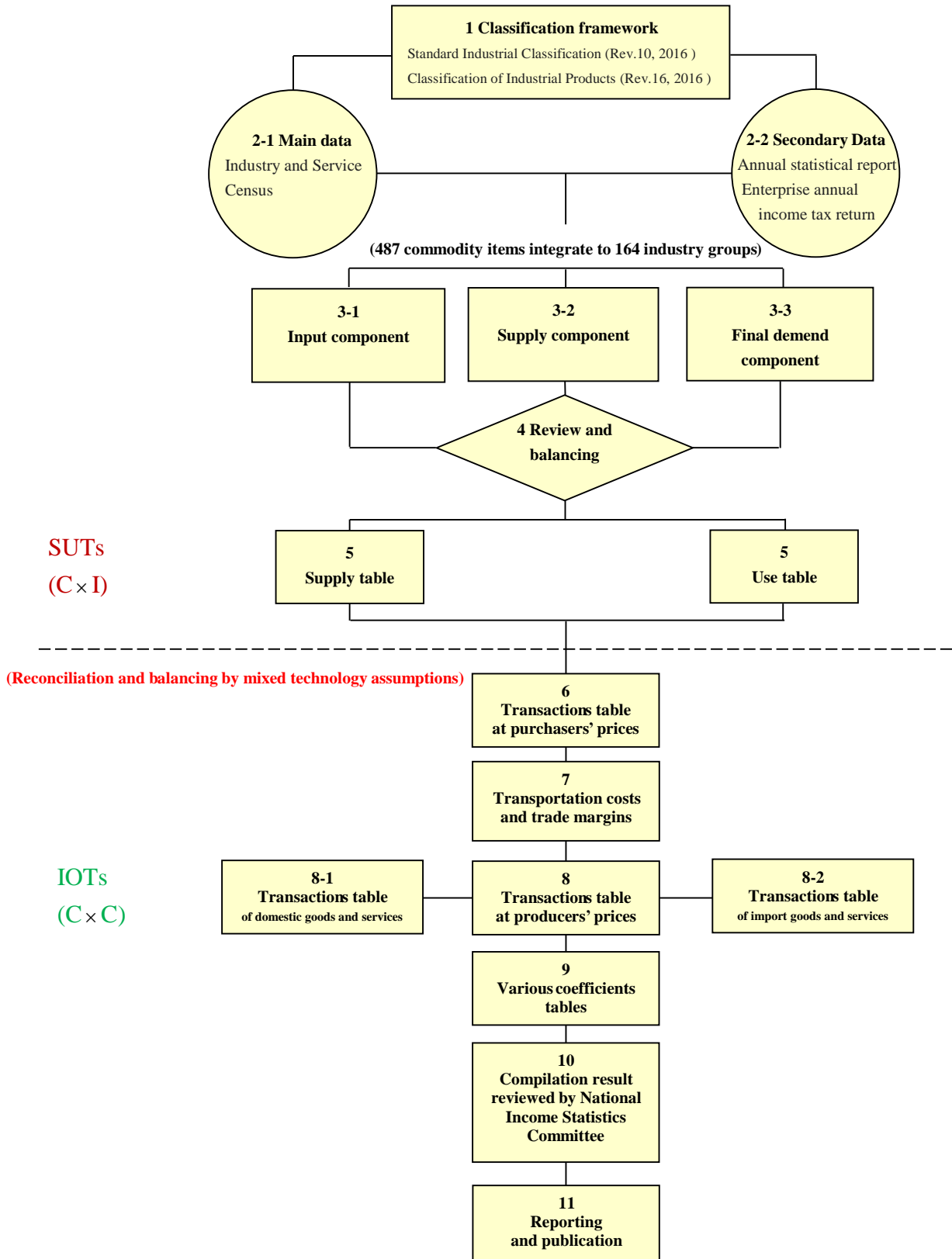
Firstly, the breakdown of economic activities is categorized according to the Standard Industrial Classification System of the Republic of China (Rev.10, 2016) and the Classification of Industrial Products (Rev.16, 2016) by the Ministry of Economic Affairs. The categories framework has 164 sectors and 487 subsectors. On the basis of valuation, these transactions tables can be valued at producers' prices and purchasers' prices.

Secondly, we collect, sort, and analyze various raw and secondary statistics. We compile CxI SUTs based on source data. Determine gross output of each commodity produced by each industrial sector, sort out the import detailed data, and estimate the net import tax, trade margins, transportation costs, VAT, etc., and then build the preliminary supply table. Compile input cost of each industrial sector, estimate final demand structure, sort out the export detailed data, and then build the preliminary use table. Review and adjust the data from supply and use sides repeatedly. Balance and accomplish the final supply table and use table at purchasers' prices.

Finally, the SUTs are converted into CxC IOTs based on mixed technology assumptions. Under the CxC framework, separate out trade margins and transportation costs of all sectors, and accomplish the transactions table at producers' prices. On the basis of commodity sources, transaction table can be further divided into "transactions table of domestic goods and services" and "transactions table of import goods and services".

After finishing the transaction tables, various coefficients tables such as input coefficients tables and impact coefficients tables for IOTs analysis are compiled.

Compilation Process of 2016 Benchmark IOTs and SUTs



C. Estimation of Industrial Sectors

Brief descriptions of the compiling methodology are summarized as follows:

No.	Sector Categories	Methods Used	Source Data
1	Agricultural Products	<ul style="list-style-type: none"> ● The output is estimated according to the quantity and value of farm products. ● The value of by-products was estimated by the ratio of primary products to by-products. ● The input is estimated according to the cost per unit area of each crops multiplying harvest area. 	1.Agricultural Statistics Yearbook 2.Forestry Statistics Yearbook 3.Fisheries Statistical Yearbook Taiwan, Kinmen and Matsu Area 4.Agricultural policy and conditions by Council of Agriculture, Executive Yuan 5.Dataset of Taiwan Joint Irrigation Association, R.O.C.
2	Livestock	<ul style="list-style-type: none"> ● The output is estimated according to the supply value of livestocks for slaughtering, exporting feeding and so on. ● The input is estimated according to the livestocks cost of supply. 	
3	Forest Products	<ul style="list-style-type: none"> ● The output includes the value of stealing the forest. Cultivated sapling and forestation is also treated as the output. 	
4	Fishery Products	-	
5	Mineral Products	<ul style="list-style-type: none"> ● Crude petroleum is valued at the sum of total production costs as it is not for selling. ● Extracted natural gas is valued at cost price and it is the main input of gas sector. ● Expenditures on mineral exploration, whether successful or not, are regarded as intellectual property products and treated as gross fixed capital formation in accordance with 2008 SNA. 	1.Industrial Production Statistics 2.Energy Statistical Annual Reports 3.Annual Statistical Report of Mineral 4.Annual Financial Report of Corporation
6	Food Products and Prepared Animal Feeds	<ul style="list-style-type: none"> ● The output includes value-added part of slaughtering. ● The output of rice are estimated separately for each stage of the production process by grinding process of paddy rice into brown rice, then grinding brown rice into polished rice and by-products. 	1.Industrial Production Statistics 2.External Trade Statistics 3.Earnings and Productivity Statistics 4.Price Statistics Monthly 5.Agricultural Statistics Yearbook 6.Taiwan Food Statistics Book 7.Energy Statistical Annual Reports 8.Business Tax Statistics 9.Annual Financial Reports of Enterprises 10.Food Industry Yaerbook 11.Textile Industry Yearbook 12.Petrochemical Industry Yearbook 13.Steel Yearbook 14.Machinery Industry Yearbook 15.Fabricated Metal Products Industry Yearbook 16.Semiconductor Industry Yearbook 17.Information Industry Yearbook
7	Beverages and Tobacco	<ul style="list-style-type: none"> ● The Tobacco & Alcohol Tax and the Tobacco Health Welfare Surcharge are included in "Net Taxes on Production and Imports". 	
8	Textiles	<ul style="list-style-type: none"> ● The majority of production is carried out by a relatively small number of large vertically integrated corporations that undertake many kinds of production. Therefore, if the vertically integrated enterprise can be partitioned into separate 	

No.	Sector Categories	Methods Used	Source Data
		<p>establishments, the output of different stages should be compiled individually.</p> <ul style="list-style-type: none"> ● Printing, dyeing and finishing of textiles is a service provision. The output of the dyeing and finishing plant is calculated based on the processing fee, if the production is outsourcing. If the factory purchases the grey cloth itself and sells it after dyeing and finishing, the treatment is to regard the product as the output of the textile sector, and deduct the output and input with the value of the germ cloth. ● For the vertically integrated enterprise whose manufacturing processes are arranged in separate establishments and the output from the earlier stage is an input of the next stage, the production value of each stage should be calculated. ● The intermediate input of the dyeing and finishing sector only includes the cost of the dyeing and finishing part, excluding the undyed raw materials (such as grey cloth) provided by the customer. However, if the textile mill sets up its own printing and dyeing equipment, it takes printing and dyeing raw materials and costs as the input, and the output of the dyeing and finishing stage is not estimated separately. 	<p>18.Communications Industry Yearbook 19.Electronic Materials Industry Yearbook 20.Flat Panel Display Industry Yearbook 21.Medical Devices Industry Yearbook 22.Electronic Components Industry Yearbook</p>
9	Wearing Apparel and Clothing Accessories	<ul style="list-style-type: none"> ● Outsourcing is a common mode in this sector. If the domestic and foreign factories are entrusted to process and sell, the sales value is treated as the output of requesters. The fee paid to the processing unit should be recorded as the output by factory providing them. ● All materials and processing fees provided by the entrusting factory are counted in intermediate inputs. 	
10	Leather, Fur and Related Products	<ul style="list-style-type: none"> ● The output of the processing services is the fee agreed for the processing. 	
11	Wood and Bamboo Products	<ul style="list-style-type: none"> ● Processing services provided by other factories on physical inputs is considered the output by the owner factory. The fee paid to the processing unit should be recorded as the output by the factory providing them. Besides, the output of wood cutting, surface treatment and bonding, which 	

No.	Sector Categories	Methods Used	Source Data
		<p>is a kind of simple processing, is measured by the processing value added.</p> <ul style="list-style-type: none"> ● Simple processing, such as wood cutting, surface treatment and bonding, that value of processed materials is not included in intermediate inputs, but only the costs of processing. 	
12	Paper and Paper Products	<ul style="list-style-type: none"> ● For vertically integrated activities, the output are estimated separately for each stage of the production process. Examples of vertical integration include producing pulp and subsequent paperboard, then as input to the next production of paper products. ● The production loss and the final products for testing are regarded as the input. 	
13	Printing and Reproduction of Recorded Media	<ul style="list-style-type: none"> ● The printing of plastic film or metal products is simple processing, and only the value-added part of processing is treated as the output. 	
14	Petroleum and Coal Products	-	
15	Chemical Materials	<ul style="list-style-type: none"> ● For vertically integrated activities, the output should include the value of intermediate products and the joint products and by-products are classified into the sector by the principal product. ● The output of the processing services is the fee agreed for the processing. ● The production loss and the final products for testing are also regarded as the input. ● The input structure of the processing services are not included the physical inputs owned by others. 	
16	Other Chemical Products	-	
17	Pharmaceuticals and Medicinal Chemical Products	-	
18	Rubber Products	-	
19	Plastic Products	-	
20	Non-metallic Mineral Products	<ul style="list-style-type: none"> ● Processing services include sandstone crushing and washing of other non-metallic mineral products. The output of sandstone crushing and washing is only measured by the processing value added if the sandstones are purchased and sold after crushing, washing, screening, 	

No.	Sector Categories	Methods Used	Source Data
		sorting and other operations. <ul style="list-style-type: none"> ● The input of sandstone crushing and washing is only calculated for various costs required, not including the value of stones. 	
21	Basic Metals	<ul style="list-style-type: none"> ● The output for the firms' own use is measured by adjusting prices to avoid overestimation. ● For vertically integrated activities, the output of previous stages of consistent production processor is also regarded as input in the latter stages. 	
22	Fabricated Metal Products	<ul style="list-style-type: none"> ● The outputs of metalworking activities such as metal cutting and surface treatment are measured by the value added part of processing . ● For vertically integrated activities, the output of previous stages is also regarded as input in the latter stages. ● The input structure of the processing services are not included the physical inputs owned by others. 	
23	Electronic Parts and Components	<ul style="list-style-type: none"> ● Processing services provided by other domestic or foreign factories on physical inputs is considered the output by the owner factory. The fee paid to the processing unit should be recorded as the output by the factory providing them. ● The value of raw materials used for processing by entrusted domestic or foreign factories and the fee paid for processing services are recorded as the requester inputs. 	
24	Computers, Electronic and Optical Products	<ul style="list-style-type: none"> ● Overseas production is a common mode in this sector. Processing services provided by other domestic or foreign factories on physical inputs is considered the output by the owner factory. The fee paid to the processing unit should be recorded as the output by the factory providing them. ● The output of maintenance and repairs are counted in other appropriate sectors such as Repair and Installation of Industrial Machinery and Equipment or Repair of Computers, Communication Equipment and Electronic Products. ● All materials, semi-products and processing fee are counted in intermediate inputs. 	
25	Electrical Equipment	<ul style="list-style-type: none"> ● The output of maintenance and repairs are counted in other appropriate sectors such as Repair and Installation 	
26	Machinery and Equipment		

No.	Sector Categories	Methods Used	Source Data
27	Motor Vehicles and Parts	of Industrial Machinery and Equipment.	
28	Other Transport Equipment and Parts		
29	Furniture		
30	Other Manufactures		
31	Electricity and Steam	<ul style="list-style-type: none"> ● The output and input include the firms' own use and the loss in the transmission process. 	<ol style="list-style-type: none"> 1. Energy Statistical Annual Reports 2. Annual Financial Reports of Enterprises
32	Gas	<ul style="list-style-type: none"> ● The gasification reduction of liquefied natural gas is regarded as simple processing, the output is measured by sales receipts minus import cost. ● The output includes the service value of liquefied petroleum gas(LPG) sub-packaging and inspection income of LPG cylinders. ● The input includes the service cost of LPG sub-packaging and the loss in the transmission process. 	
33	City Water	<ul style="list-style-type: none"> ● The output is divided into two parts: sales and loss. The former is calculated based on the average price of sales per unit, and the latter is estimated based on the average price of costs per unit. ● Transmission leakage losses are included in intermediate inputs for this sector. 	<ol style="list-style-type: none"> 1. Annual Financial Reports of Enterprises 2. Annual Financial Reports of Water Resources Agency, MOEA 3. Yearbook of Environmental Protection Statistics
34	Remediation Activities	<ul style="list-style-type: none"> ● The output and input include the collection of waste products by self-employed people. 	
35	Construction	<ul style="list-style-type: none"> ● The output includes own-account construction. 	<ol style="list-style-type: none"> 1. Survey of Own-Account Construction 2. Final Accounting Reports of Government 3. Annual Financial Reports of Enterprises
36	Wholesale Trade	<ul style="list-style-type: none"> ● The output is trade margin of the wholesale and retail estimated by the commodity-flow method. 	<ol style="list-style-type: none"> 1. Trade and Food Services Operations Surveys 2. Street Vendors Survey
37	Retail Trade		
38	Land Transportation	<ul style="list-style-type: none"> ● If the freight service is actually provide by other company, like forwarder, the freight expense is deducted from the income, and the output is calculated as the net income. ● The output of a domestic branch or agent of a foreign airline is measured by their domestic expenditures. 	<ol style="list-style-type: none"> 1. Report on Taxi Operating Condition Survey 2. Report on Tour Bus Operating Condition Survey 3. Report on the Commodity Flow and Freight Rates Survey 4. Annual Financial Report of Corporation
39	Water Transportation		
40	Air Transport		
41	Support Activities for Transportation ; Warehousing and Storage		
42	Postal and Courier Activities		
43	Accommodation	<ul style="list-style-type: none"> ● The output and input included the homestay. 	<ol style="list-style-type: none"> 1. Trade and Food Services Operations Surveys
44	Food and Beverage Service Activities	<ul style="list-style-type: none"> ● The output and input included the street vendors. 	<ol style="list-style-type: none"> 2. Street Vendors Survey 3. Accommodation Services

No.	Sector Categories	Methods Used	Source Data
			Operations Surveys 4.Homestay Statistics by Tourism Bureau of the Ministry of Communications
45	Publishing, Motion Picture, Video and Music Production and Broadcasting Activities	<ul style="list-style-type: none"> The output of advertising belong to Advertising and Market Research sector. 	1. Professional Services Investment & Operation Overview Survey 2. Computer & Information, Professional & Technical Services, Rental & Leasing Survey
46	Telecommunications	-	3. Administrative Statistics of National Communications Commission
47	Related Service of Computer and Information	<ul style="list-style-type: none"> The output includes the self-developed software and database. It is estimated on a cost-input basis. 	4. Profit-seeking Enterprise Income Tax
48	Financial Service Activities	<ul style="list-style-type: none"> The output includes service fee income and financial intermediation services indirectly measured provided by financial institutions, widely known as FISIM. The method for calculating FISIM is using the income generated by deposits deducted interest expense from deposits. Furthermore, the output of Central Bank, holding companies, asset management company and investment company are estimated by the sum of costs. 	1. Financial Statistics Monthly 2. Financial Statistics Abstract 3. The Statistics of Life Insurance Finance 4. Financial Statement for the Non-Life Insurance Industry 5. Annual Report of Taiwan Stock Exchange 6. Annual Report of Taipei Exchange 7. Annual Report of Taiwan Futures Exchange 8. Annual Report of Taiwan Securities Association
49	Insurance	<ul style="list-style-type: none"> According to 2008SNA, the output is estimated by the sum of costs adding an allowance for normal profits. According to 2008SNA, the input includes premiums ceded to reinsurers. Commissions paid to insurance agents, brokers or salesman are treated as input of insurance or compensation. 	9. Industry Statistics of Securities Investment Trust & Consulting Association of the R.O.C.
50	Commodity Contracts	<ul style="list-style-type: none"> The output includes brokerage handling fee revenue, underwriting business revenue, trust business revenue and so on. 	
51	Real Estate Activities	<ul style="list-style-type: none"> The output of Real Estate Development Activities is estimated as the sum of costs and plus the profits with reference the relevant industry. The output includes imputed rents for the plant provided by household. 	Survey of Family Income and Expenditure
52	Ownership of Dwellings	<ul style="list-style-type: none"> The output are estimated primarily from the Survey of Family Income and Expenditure. 	
53	Professional, Scientific and Technical Activities	<ul style="list-style-type: none"> The output of R&D is valued at market prices if purchased or at the sum of total production costs plus an appropriate mark-up if undertaken on own account. 	1. Government Agency Expenditure Survey 2. Professional Services Investment & Operation Overview Survey 3. Computer & Information, Professional & Technical Services,

No.	Sector Categories	Methods Used	Source Data
			Rental & Leasing Survey 4.Certified Public Accountant Firm Service Survey 5.Indicators of Science and Technology(National Science and Technology Survey)
54	Rental and Leasing Activities	-	1.Professional Services Investment & Operation Overview Survey
55	Other Support Service Activities	-	2.Computer & Information, Professional & Technical Services, Rental & Leasing Survey 3.Profit-seeking Enterprise Income Tax
56	Public Administration and Defence; Compulsory Social Security	<ul style="list-style-type: none"> ● The output is estimated as the sum of costs (including intermediate costs, labour and capital costs). ● Food allowances for military personnel are treated as compensation. 	Government Agency Expenditure Survey
57	Education	<ul style="list-style-type: none"> ● The output of public education is estimated as the sum of costs (including intermediate costs, labour and capital costs). ● The educational administrative institutions belong to the Public Administration and Defence sector. ● The teaching hospitals of the schools belong to the Medical and Health Activities sector. 	1.Government Agency Expenditure Survey 2.The Private Educational Consumption Survey 3.Education Statistics 4.The statistics of Income and Expenditure of Community colleges
58	Medical and Health Activities	<ul style="list-style-type: none"> ● The outpatient drug purchase cost is deducted from the output and the input due to Separation of Dispensing Practice from Medical Practice. 	National Health Insurance Statistics
59	Social Work Activities	<ul style="list-style-type: none"> ● The output is estimated as the sum of costs (including intermediate costs, labour and capital costs). 	
60	Arts, Entertainment and Recreation	<ul style="list-style-type: none"> ● The output of public sector is based on the expenditure of related government units, such as public library, museum, and sports facilities. 	1.The Survey of Family Income and Expenditure 2.Earnings and Productivity Statistics 3.Monthly Transportation Report 4.Survey Report on Visitors Expenditure and Trends in Taiwan
61	Services of Civil Association and Other Social Services	-	1.Civil Organizational Activities Condition Survey 2.Survey of Family Income and Expenditure
62	Activities of Households as Employers of Domestic Personnel	-	
63	Other Personal Service Activities	-	

D. Estimation of Final Consumption Expenditure

1.Private Final Consumption Expenditure

(1)Scope

Private final consumption expenditure consists of the expenditure, including expenditure whose value must be estimated indirectly, incurred by resident households/NPISHs on individual consumption goods and services, including those sold at prices that are not economically significant and including consumption goods and services acquired abroad.

(2)Treatment

Private final consumption expenditure is compiled according to private final consumption expenditures based on the national accounts. The Survey of Family Income and Expenditure is also an important data sources.

For the maintenance and expansion of the dwelling by the household, if it is a contract work, the materials consumed and labor costs are regarded as input of the construction industry. Only paint, cement and other materials purchased by households when painting or maintaining by themselves are treated as private final consumption expenditure.

The process to deal with second-hand goods purchased by households is depending on the sources of purchases.

(i)From other household. The expenditure should be excluded as the transaction is between households.

(ii)From enterprises or thrift stores. The margin of these goods should be included.

The social transfers in kind from government sector, including social security funds, are excluded from private final consumption expenditure as these are government final consumption expenditure.

2.Government Final Consumption Expenditure

(1)Scope

General government units operate as both producers and final consumers. The value of the non-market output produced by government is estimated as the sum of costs of production including intermediate consumption, compensation of employees, net taxes on production and imports and imputed consumption of fixed capital. Final consumption expenditure of government is equal to the output of general government less the value of goods and services sold to households and other producers (sales revenue) and the value of own-account gross fixed capital formation, plus the value of goods and services purchased from market producers for provision to households free or at economically insignificant prices (social benefits and assistance in kind), and the purchase of the output of the Central Bank (estimated by the sum of the costs incurred in production).

Government final consumption expenditure is one of the final demand sectors in the Input-Output Tables. It mainly includes the purchase of general office supplies, business service expenditures, defense expenses (including military engineering and durable goods), and government employee salary expenses. Since there is no primary input in (i.e. the final demand sectors), it is necessary to treat compensation, fixed capital consumption and net production and import taxes as primary inputs of government service related

sectors (such as public administration, scientific research and development, education, and social work etc.), and then purchased by government as final consumption.

(2)Treatment

Government final consumption expenditure is compiled according to government final consumption expenditures based on the national accounts, final accounting reports of government at all levels, and social protection expenditure (social benefits and assistance in kind).

3.Gross Fixed Capital Formation(GFCF)

(1)Scope

All kinds of durable property(except land) purchased or produced by various sectors, after deducting the sale of second-hand and waste durable properties, are the gross fixed capital formation(GFCF). According to the SNA regulations, the durable goods are used in production for more than one year. There are many types of durable goods, such as residential buildings, non-residential buildings, other constructions except land improvements, land improvements and plantation and orchard development, transport equipment, machinery and equipment, breeding stock, draught animals, dairy cattle and the like, and intellectual property products. The incomplete construction projects are also treated as GFCF. As for the heavy mechanical and electrical equipment that has not yet been installed, according to the recommendations of the United Nations, if ownership has not been transferred, it is recorded as inventory, otherwise it is recorded as GFCF.

(2)Treatment

Except for intellectual property, the estimates of GFCF of public enterprises are based on the Final Financial Reports of all public enterprises. The data sources of GFCF of private enterprises are more complicated. Among them, the agriculture, forestry, fishing and animal husbandry industry is estimated according to the sources from Council of Agriculture. Manufacturing, wholesale, retail and food service industries are estimated according to the sources of Factory Operation Census, Sales of Wholesale, Retail and Food Services Operations Surveys conducted by the Ministry of Economy, etc. The estimates of capital formation of government are based on the budgets and the Final Financial Reports of the governments at all levels.

4.Changes in Inventories

(1)Scope

Inventories are stocks of outputs and purchased goods not used as fixed assets at a specific time and do not include commodities stored by households, government, and non-profit institutions. The change in inventories is equal to the difference between the level of inventories at the start and end of the period.

(2)Treatment

The level of inventories at the start and end of the period should be deflated into real terms and the real changes in inventories are estimated as the difference. The nominal changes of inventories are estimated by inflating the real terms. Those estimates are based on the sources from the Ministry of Economic Affairs, including Industrial Production, Shipment and Inventory Statistics, Manufacturing Investment and Operation Overview Survey, Sales of Trade and Food Services Survey, etc., as well as the relevant price

indices and inventory turnover ratios.

5.Exports of Goods and Service

(1)Scope

The exports of goods and services include goods and services. The former is based on the goods that have been cleared and transported to foreign countries, including exports and re-exports. Re-exports refers to goods inward processing without changing country of origin, returned or resold abroad after having been imported. In addition, goods procured by nonresident transport operators in ports from resident providers are included in exports of general merchandise. And goods supplied or acquired by carriers away from the territory of residence of the operator. For example, fish and other marine products caught by ships operated by residents and sold abroad directly should be included in exports. When a customs system is used as a source of data on goods, there is a need to make adjustments to include any goods where there is a change of ownership not recorded in customs data. But there is no change of ownership of goods between a resident and a nonresident are excluded from general merchandise.

The exports of services include travel, manufacturing services on physical inputs owned by others, maintenance and repair services, transport, charges for the use of intellectual property and so on.

(2)Treatment

The goods exported through customs system will be converted from the Classification of Commodities of the Republic of China code (CCC code) to the 5-digit sector classification of the IOTs. Although the CCC code is more detailed, it still cannot be completely compared with the IOTs. It must be adjusted by referring to other information. The value of exported goods is calculated at Free On Board (F.O.B.) value.

The estimation of exports of services are primarily based on Balance of Payment compiled by Central Bank, Annual Survey Report on Visitors Expenditure and Trends in Taiwan, the expenditure in our country of foreign embassies and commercial office, the Survey of Family Income and Expenditure and so on.

E.Estimation of Supply Sector

1.Domestic Production

(1)Scope

Domestic Production represents the value of all goods and services produced by institutional units (households, enterprises, non-profit units, etc.) within a country (or an economic territory), regardless of these institutions being operated by nationals or foreigners. The economic territory of a country covers the area (including airspace) within the political boundary, and ships, aircraft and other transportation equipment owned by domestic enterprises in foreign territories.

(2)Gross Output

The 2016 Input-Output statistics compile the CxI SUTs and the CxC IOTs. The categories framework has 487 commodities sectors(groups), gross output is valued at producers' prices for goods and services.

2.Imports of Goods and Services

(1)Scope

The imports of goods and services include tangible goods and intangible services. The former is based on the tangible goods that have been cleared and transported to our country, including imports and re-imports. Re-imports include domestic goods outward processing without changing country of origin and returned from abroad. In addition, goods procured by resident transport operators from nonresident providers are included in imports. When a customs system is used as a source of data on goods, there is a need to make adjustments to include any goods where there is a change of ownership not recorded in customs data. But there is no change of ownership of goods between a resident and a nonresident are excluded from general merchandise.

The imports of services include travel, manufacturing services on physical inputs owned by others, maintenance and repair services, transport, charges for the use of intellectual property and so on .

(2)Treatment

The goods imported through customs system will be converted from CCC code to the 5-digit sector classification of the IOTs. Although the CCC code is more detailed, it still cannot be completely compared with the IOTs. It must be adjusted by referring to other information. The value of imported goods is calculated at Cost Insurance and Flight (C.I.F.) value.

The estimation of imports of services are primarily based on Balance of Payment compiled by Central Bank, the expenditure in other countries of ships, aircrafts, embassies and commercial office of our country and so on.

3. Net Import Duties

Import Duties are included Customs Duties, Commodity Tax, Tobacco and Alcohol Tax on imports, Health and Welfare Surcharge on imported Tobacco, and Harbor Construction Dues on imports. The total import duty minus the tax refund for imported raw materials for export products is the Net Import Duties.

4.Trade Margin

Many goods pass from the producer to the purchaser by means of a wholesaler or retailer. Trade margin is the difference between the selling and the buying price of the good. Thus trade margins are the output of wholesaler or retailer trades.

5.Transportation Margin

The margins of transporting commodities by rail, truck, water, air, and courier are included in the commodity rows for transportation. These margins represent the total purchases of the respective transportation cost by the industry or final user for all goods purchased.

The transportation margins are mainly extracted from the Commodity Flow and Freight Rates Survey, published by the Ministry of Transportation and Communications (MOTC), and also refer to the Revenues of Freight Traffic by Goods from Taiwan Railways Administration, MOTC, and the Industry and Service Census, 2016. The transportation margins are estimated from commodities' average freights through different kinds of transportation.

6.Value-Added Taxes (VAT)

Value-Added Tax (VAT) is a business tax on goods and services collected in stages by enterprises but

that is ultimately charged in full to the final purchasers. Producers are required to charge certain percentage rates of VAT on the goods or services they sell. Producers pay only the difference between the VAT on their sales and the VAT on their purchases for intermediate consumption or capital formation, hence the expression value added tax. For intermediate and final uses, the purchases of goods and services are calculated including non-deductible VAT only. The cases in which VAT is non-deductible are as follows:

- (1) Most of final consumption expenditure: VAT paid by households, visiting non-residents and government agencies.
- (2) Part of intermediate consumption: VAT paid by the producers exempted from the business tax and the producers applicable to non-value-added taxation. The former includes the industry of agricultural, medical services and post services; the latter includes the industry of financial services, insurance and special amusement services.
- (3) Part of gross capital formation: VAT paid by the producers exempted from the business tax and the producers applicable to non-value-added taxation.

F. Estimation of Value Added Sector

In the field of input-output statistics, value added, also called primary inputs, is the value of gross output less the value of intermediate inputs. Value added includes compensation of employees (or labor compensation), operating surplus, consumption of fixed capital, and net taxes on production and imports. A brief description of the compiling methodology is summarized as follows:

1. Compensation of Employees or Labor Compensation

In SUTs, compensation of employees is defined as the total remuneration, in cash or in kind, payable by an enterprise to an employee in return for work done by the latter during the accounting period. The remuneration for work done by own-account workers and unpaid family workers, is treated as labor compensation in IOTs and as operating surplus in SUTs. Compensation of employees has two main components:

(1) Salaries

The payment for outworkers based on the amount of work done is regarded as salaries.

(2) Benefits and Allowances

Benefits and allowances include in-kind benefit, rent, utilities allowance, education allowance, medical subsidy, insurance, missed meal money, transportation allowance, overtime, year-end or other bonus, retirement funds, severance pay, consolation payment, etc. Goods or services that employers provide to their employees in order for them to be able to carry out their work or increasing productivity of company are treated as intermediate consumption, such as the expenditure of employee's on-the-job training. However, general education and training subsidies benefit employees directly, and is considered compensation of employees (or labor compensation).

2. Operating Surplus

Operating surplus is a balancing item, which is equal to the value added minus compensation of

employees (or labor compensation), minus consumption of fixed capital, minus net taxes on production and imports. Operating Surplus includes interests, rents, transfer payments, and profits.

The remuneration for work done by own-account workers and unpaid family workers, is treated as operating surplus in SUTs but not in IOTs.

3. Consumption of Fixed Capital

Consumption of fixed capital is the decline, during the course of the accounting period, in the current value of the stock of fixed assets owned and used by a producer as a result of physical deterioration, normal obsolescence or normal accidental damage. Losses of fixed assets losses due to war or to major natural disasters that occur very infrequently, such as major earthquakes, tidal waves or exceptionally severe hurricanes, are not included under consumption of fixed capital.

4. Net Taxes on Production and Imports

Taxes on production and on imports are compulsory payments made by institutional units to government units. Net taxes on production and imports consists of commodity taxes, import duties, Value-Added taxes and other taxes less subsidies.