Input-Output Table at Basic Prices in 2020

Input-Output Table at Basic Prices in 2020 was compiled as part of efforts to improve international comparability. Additionally, the Table is positioned as reference table owing to limitations in usable basic data.

(1) Basic prices

Input-Output Table at Basic Prices in 2020 (108 Sector Classification) is created based on Input-Output Table at Producers' Prices in 2020 (108 Sector Classification). In this case, the conversion to the basic prices is made according to the formula: Basic prices = producers' prices - taxes on products (including consumption tax) + current subsidies.

(2) Details of "Taxes on Products"

The Commentary on Estimation Methodology for the System of National Accounts (Annual Estimates, Benchmark year = 2015) lists the following items as taxes on products.

Table 1 Details of Taxes on Produced and Imported Products[1]

2008SNA Classification		Main Details of the System of National Accounts
Taxes levied on products	Value-added tax	Consumption tax, Local consumption tax
	Import duties	Customs duties, Crude petroleum customs duties
	Others	Gasoline tax*, Local gasoline tax*, Aviation fuel tax*, Liquefied petroleum gas tax*, Liquor tax*, Tobacco tax*, Special tobacco tax*, Prefectural tobacco tax*, Municipal tobacco tax*, Real estate acquisition tax, Japan racing association contribution*, Golf course utilization tax*, Half of Automobile tax (Environmental performance excise), Half of light motor vehicle tax (Environmental performance excise), Light oil delivery tax*

Among the "Taxes on products" in Table 1, the correspondence between those recorded under "Indirect taxes (excluding customs duties and commodity taxes on imported goods)" in the 2020 table and the basic classification is shown in Table 2 (provided by the Cabinet Office).

[1] In consideration of the consistency with the status of deliberations toward the 2020 base revision of the System of National Accounts, taxes difficult to individually match with the basic classifications in the input-output tables, such as real estate acquisition tax and motor vehicle tax (environmental excite) (see Table 2), were excluded from "taxes on products" in the basic price estimates. As a result, Table 1 differs in the above respects from the "Taxes on products" in the "Government Finance Statistics" of the "2020 System of National Accounts (Annual Estimates)" published as of June 2024.

Table 2 Details of "Taxes on Products" and Their Correspondence to Basic Classification

		Tax item	Corresponding column sector		Corresponding row sector	
Taxes levied on individually identifiable products	1	Gasoline tax and local gasoline tax	211101	Petroleum refinery products (including greases)	2111011	Gasoline
	2	Aviation fuel tax	575101	Air transport	5751012	Domestic air transport (passengers)
					5751013	Domestic air transport (freight)
					5751014	Aircraft service except air transport
	3	Liquefied petroleum gas tax	211101	Petroleum refinery products (including greases)	2111018	LPG (liquefied petroleum gas)
	4	Petroleum and coal tax	061101	Coal mining, crude petroleum and natural gas	0611011	Coal mining
					0611012	Crude petroleum
					0611013	Natural gas
			211101	Petroleum refinery products (including greases)		(Petroleum refinery products eligible for refund)
	5	Liquor tax	112101	Refined sake	1121011	Refined sake
	6	Liquor tax	112102	Malt liquors	1121021	Malt liquors
	7	Liquor tax	112103	Whiskey and brandy	1121031	Whiskey and brandy
	8	Liquor tax	112109	Miscellaneous liquors	1121099	Miscellaneous liquors
	9	Tobacco tax	114101	Tobacco	1141011	Tobacco
	10	Japan racing association contribution	674103	Stadiums and companies of bicycle, horse, motorcar and motorboat races	6741031	Stadiums and companies of bicycle, horse, motorcar and motorboat races
	11	Golf course utilization tax	674104	Sport facility service, public gardens and amusement parks	6741041	Sport facility service, public gardens and amusement parks
	12	Light oil delivery tax	211101	Petroleum refinery products (including greases)	2111014	Light oil
	13	Deposit insurance corporation contribution	531101	Financial service	5311012	Financial service (FISIM), private
	14	Specified alcohol transferor contribution	511101	Wholesale trade	5111011	Wholesale trade
Taxes levied on individually non-identifiable products		Real estate acquisition transaction tax	All sectors		All sectors	
		Half of automobile tax (Environmental performance excise)	All sectors		All sectors	
		Half of light motor vehicle tax (Environmental performance excise)	All sectors		All sectors	

On the other hand, among the "taxes on products," those included in "Customs duties and Commodity taxes on imported goods" in the 2020 Input-Output Tables are based on estimates by the Ministry of Internal Affairs and Communications. Similarly, estimated values equivalent to those used in the main compilation process of the 2020 Input-Output Tables were applied for the consumption tax.

(3) Format of Input-Output Table at Basic Prices

The Basic Price Evaluation Table format was based on the table below published in the United Nations (UN) Handbook, with appropriate modifications considering differences in how the consumption tax is expressed.[2]

Table 12.19 Demonstration of a product × product input-output table

Column Sector / Row Sector	PRODUCTS							FINAL USE								Output at basic prices
								Consumption expenditure								
	Agriculture	Manufacturing	Construction	a	Finance and business services	Other services	Total	Households	b	General government	c	Changes in valuables	Changes in inventories	Exports	Total	
Agriculture	2,492	6,065	8	248	29	34	8,877	2,042			170		-32	-2,275	-95	8,782
Manufacturing	1,708	98,765	10,754	13,040	5,768	5,893	135,928	33,525		1,749	21,736	1,929	2,737	-11,198	50,477	186,405
Construction	73	2,148	10,131	2,016	3,934	1,282	19,585	1,402			24,323		-38	0	25,687	45,272
Trade,transport and communication	248	15,900	2,258	23,514	7,586	3,183	52,690	56,185		4,575	9,951	240	363	10,746	82,060	134,750
Finance and business services	377	10,851	4,627	19,180	32,755	7,872	75,662	36,669		1,006	10,254	0	-177	4,095	51,846	127,508
Other services	6	297	51	1,174	482	1,756	3,765	13,429	5,416	53,163	113	14	1	-257	71,878	75,643
Total at basic prices	4,905	134,027	27,830	59,173	50,554	20,019	296,507	143,252	5,416	60,493	66,547	2,183	2,854	1,111	281,853	578,360
Taxes less subsidies on products	78	862	226	1,333	1,839	2,646	6,984	22,810		557	2,870	152	7	397	26,794	33,778
Total at purchasers' prices	4,983	134,889	28,056	60,506	52,393	22,665	303,491	166,062	5,416	61,050	69,417	2,335	2,861	1,508	308,647	612,138
Compensation of employees	411	25,857	10,216	38,422	28,962	40,475	144,343									
Other taxes less subsidies on production	-1,446	717	545	1,762	2,267	1,014	4,859									
Consumption of fixed capital	1,620	11,519	1,422	10,172	21,759	6,977	53,469									
Net operating surplus/Net mixed income	3,214	13,423	5,032	23,889	22,127	4,512	72,197									
Gross Value Added	3,799	51,516	17,215	74,245	75,115	52,978	274,868									
Input at basic prices	8,782	186,405	45,271	134,751	127,508	75,643	578,360									

Column Codes are:
a: Trade,transport and communication
b: Private non-profit institutions serving households
c: Gross fixed capital formation

(Source) United Nations "Handbook on Supply and Use Tables and Input-Output Tables with Extensions and Applications" chapter12

[2] The UN Handbook has already been arranged to deduct indirect taxes deductible from producers' prices. For this reason, multi-stage deductible indirect taxes, such as the consumption tax, are not included in producers' prices. This makes it difficult for Japan's consumption tax to be treated consistently with the Handbook.

(4) Procedure for creating Input-Output Table at Basic Prices

Among the "taxes on products," matrices are created for "indirect taxes (excluding consumption tax)" (split between domestic and imported products), "current subsidies," and "consumption tax" (split between domestic and imported products). Then, the matrices are subtracted from the "input-output tables valued at producers' prices" matrix to create the Input-Output Table at Basic Prices (since "current subsidies" are a negative value, they are consequently added).

[Reference 1] Overview of each matrix creation method

(1) Preparatory work

After allocating indirect taxes to the row sectors (the sectors listed on the leftmost side of the Transaction Basic Table), the values with added indirect taxes are used to allocate values to each cell in the same row sectors. Therefore, the "Input-Output Table Valued at Producers' Prices" is divided into a matrix of "domestic products" and "imported products," and the following three types of output ratios are pre-calculated.

Output ratio 1): domestic output ratio (excluding exports)

Output ratio 2): domestic output ratio (including exports)

Output ratio 3): output ratio of imported products

(2) Creating an indirect tax (excluding consumption tax) matrix

Among the "taxes on products," the "indirect taxes (excluding consumption tax)" listed in Table 2 are divided into domestic and imported products, and a matrix is created based on the following procedure:

(2)-1 Creating an indirect tax (excluding consumption tax) matrix for domestic products

1) Match the tax amount of "indirect tax (excluding consumption tax) on domestic products" to a specific column sector or row sector based on the correspondence in Table 2. Furthermore, the conversion of that tax amount from column sectors to row sectors is based on the CT ratio (valued at producers' prices), and the same applies to the conversion from row sectors to column sectors.
2) Record the "tax amount matched to each column sector" in the above 1) in "indirect tax (excluding customs duties and commodity taxes on imported goods)" for that column sector.
3) Allocate the "tax amount matched to each row sector" in the above 1) to each cell according to "Output ratio (1): domestic production ratio (excluding exports)" calculated in the preparation work.
4) For the "tax amount matched to each cell of each row sector" in the above 3), calculate the intermediate input total for each column sector, and record these calculation results in the row sector "total output (basic prices) - total inputs (basic prices)."

(2)-2 Creating Commodity taxes on imported goods (excluding consumption tax) matrix

1) Allocate the "Customs duties" and "Commodity taxes on imported goods (excluding consumption tax)" for each row sector to each cell according to "Output ratio 3): Output ratio of imported products" calculated in the preparation work.
2) For the "tax amount matched to each cell of each row sector" in the above 1), calculate the total intermediate inputs for each column sector and record the calculation results in the row sector "total outputs (basic prices) - total inputs (basic prices)."
3) Leave "Customs duties" and "Commodity taxes on imported goods (excluding consumption tax)" for each row sector as they are.

(3) Creating a subsidy matrix

In the System of National Accounts, "subsidies" are not differentiated into "subsidies on production" and "subsidies on products." The entire amount of "current subsidies" recorded in the gross value-added sectors is regarded as "subsidies on products," and a matrix is created based on the following procedure.

1) Convert the "current subsidies" for each column sector in the "Input-Output Table Valued at Producers' Prices" into the corresponding row sector. The conversion is based on the CT ratio (valued at producers' prices).
2) Allocate the current subsidies (negative values) matched to each row sector in the above 1) to each cell according to "output ratio 2): domestic output ratio (including exports)" calculated in the preparation work.
3) For the "current subsidies" matched to each cell of each row sector in the above 2), calculate the total intermediate inputs for each column sector and record the calculation results in the row sector "total outputs (basic prices) - total inputs (basic prices)."
4) Leave the "current subsidies" for each column sector as they are.

(4) Creating a consumption tax matrix

Products are separated into domestic and imported products, and a matrix is created based on the following steps. The following uses the estimates that the Ministry of Internal Affairs and Communications used to estimate consumption tax.

(4)-1 Creating a consumption tax matrix for domestic products

1) Allocate the "sales tax amount (= consumption tax paid + input tax credit)" for each row sector to each cell based on "Output ratio 1): domestic product output ratio (excluding exports)" calculated in the preparation work.
2) Convert the "Sales tax amount" for each row sector in the above 1) to the corresponding column sector, from which the "Input tax credit amount" and "Consumption tax paid" (details of "Indirect taxes (excluding customs duties and Commodity taxes on imported goods)") in that column sector are subtracted (equivalent to the investment credit amount of consumption tax). Record the results in the row sector "total outputs (basic prices) - total inputs (basic prices)."
3) Leave the consumption tax amounts for "Consumption tax paid" and "Non-household consumption expenditures" in the breakdown of "Indirect taxes (excluding customs duties and Commodity taxes on imported goods)" for each column sector as they are.

(4)-2 Creating a consumption tax matrix for imported products

1) Allocate the "Sales tax amount" in the breakdown of Commodity taxes on imported goods for each row sector to each cell based on "Output ratio 3): Output ratio of imported products" calculated in the preparation work.
2) For the tax amount allocated to each cell of each row sector in the above 1), calculate the intermediate input total for each column sector and record the calculation results in the row sector "total outputs (basic prices) - total inputs (basic prices)."
3) Leave "Consumption tax" in the breakdown of Commodity taxes on imported goods for each row sector as it is.

[Reference 2] Adjustment items in the Input-Output Table at Basic Prices

In the Input-Output Table at Basic Prices, the total of inputs does not simply equal the total of outputs.

Let the total intermediate input (valued at producers' prices) in each column sector represent A, the total intermediate input (valued at basic prices) represent A_0,

The difference represent A_1 (i.e., $A = A_0 + A_1$),

The tax (deductible subsidy) on products represent T, the value added other than T represent V,

The domestic production (valued at producers' prices) represent X, the domestic production (valued at basic prices) represent X_0,

And the difference represent X_1 (i.e., $X = X_0 + X_1$).

The identity $A + T + V = X$ holds, and we obtain $A_0 + V + (A_1 + T - X_1) = X_0$.

Therefore, the total input valued at basic prices, $A_0 + V$, usually does not equal X_0.

On the other hand, X_0 equals the total output valued at basic prices.

For this reason, $(A_1 + T - X_1)$ is shown in the Input-Output Table at Basic Prices by creating a new row sector ("Difference between total output (valued at basic prices) and total input (valued at basic prices)") as an adjustment item.

If only taxes and subsidies other than consumption tax are considered, then $T = X_1$.

If only consumption tax is considered, then $A_1 + T +$ "tax deduction amount for investment made by the relevant column sector" $= X_1$.

For this reason, in the case of taxes and subsidies other than consumption tax, only the equivalent of A_1, i.e., the difference between the total intermediate inputs valued at producers' prices and basic prices, is recorded in this adjustment item. In the case of consumption tax, the negative amount of the "tax deduction for the investment made by the relevant column sector" is recorded (in the final demand sector, this adjustment item is also calculated as 0 in the formula).