

# Chapter 1

## The Washington Input-Output Tables

The 2002 Washington State Input-Output (I-O) Study produced a 50-sector model of the state economy using the North American Industrial Classification System (NAICS) definition of industries. In addition to the industrial sectors, the model also contains six final demand categories (Washington personal consumption expenditures, Washington private investment outlays, Washington state and local government expenditures, sales by Washington sectors to the federal government, and sales by Washington sectors to elsewhere in the United States and to foreign customers). In addition to estimates of purchases from industrial sectors within the Washington economy, the table also provides estimates of payments of labor income, other value added, and purchases by Washington industries from elsewhere in the United States and from foreign countries.

The table can be downloaded through the following link:

[2002 Washington Input-Output Table](#)

For illustrative purposes, a highly aggregated version of the 2002 Washington I-O table is shown in Table 1-1 below. Except for its lack of sector details, this table is the same as the detailed table found at the online link referenced above. The table identifies three industry groupings (natural resources and utilities, manufacturing and construction, and trade and services), three final demand sectors (personal consumption, other final demand, and export), a final payment sector (total of labor earnings and other value added), and imports.

**Table 1-1**  
**Aggregate 2002 Washington Input-Output Table**

<i>(\$ Million)</i>	Resources & Utilities	Manufacturing & Construction	Trade & Services*	Personal Consumption	Other Final Demand	Exports	<b><i>Total Output</i></b>
Resources & Utilities	2838.7	3036.7	2464.4	4299.1	626.5	6311.4	19576.8
Manufacturing & Construction	1008.6	11116.4	9326.9	4817.1	33367.5	68663.6	128300.1
Trade & Services	2918.3	14213.4	48164.1	93761.2	18776.2	65607.5	243440.7
Value Added	9026.0	35698.8	140627.5	20205.9	27372.4	NA	232930.6
Labor Earnings	3840.4	30660.4	92777.6	0.0	25187.7	NA	152466.1
Imports	3785.3	64234.8	42857.7	40729.2	8417.4	NA	160024.4
<b><i>Total Input</i></b>	19576.8	128300.1	243440.7	163812.4	88560.0	140582.6	784272.6

*\*Includes all the services not covered by the other two industrial groups.*

*NA – entries here not applicable to this model*

The input-output table can be divided into three principal components, each of which consists of a set of rows and columns:

- The first component is the block of inter-industry transactions—the shaded part of Table 1-1. Estimates in this block show the flow of goods and services that are both produced and consumed among the state’s industries. Another name for these transactions is “intermediate demand,” meaning that industries purchase these inputs for the purpose of transforming them into a different product or service for subsequent sales.
- The second component contains the final demand sectors—the double-line bordered part of Table 1-1. Transactions in this block of the table represent the sales by industry to “ultimate” consumers—households, the capital goods sector (Washington investors), governments, and export markets outside the state. These final demand sectors purchase output from the producing sectors in the state economy, not for the purpose of further production or resale, but rather for final consumption or use.
- The third component of the table contains the payments to the basic factors of production—labor, capital, and land—as well as to sources of inputs located outside Washington State. The block bordered by shaded lines in Table 1-1 represents this component. This block includes value-added (payments to labor input and other estimates of value added), as well as imports from the rest of the United States and from foreign countries.

### **The Input-Output Table: A Comprehensive Description of the Washington Economy**

The Input-Output table constitutes a detailed set of accounts on all economic activities within the state; it portrays the flow of commodities and services between producing sectors and consuming sectors. The table thus provides a complete description of the state economy at a point in time -- 2002.

Each row in the table shows the production and sales of an industry to all industries within the state and to final demand. For example, in 2002, total output (sales) of Washington manufacturing and construction industries amounted to \$128.3 billion. More than 53 percent of this output, valued at \$68.7 billion, was exported; and only 29.8 percent was sold to in-state final demand. In contrast, output of trade and services industries totaled \$243.4 billion, almost double that of manufacturing and construction, but only 27.0 percent of the total output was exported, while 46.2 percent or \$112.5 billion of this output were used by in-state final demand.

Each column shows an industry’s purchases of goods and services from its own or other industries in the state, from factors of production including labor, land, capital, and tax payments to government. Total imports from other regions in the U.S. or from overseas are a part of an industry’s purchases for use in its production process. Table 1-1 shows that, in 2002, \$64.2 billion or 50 percent of total purchases by Washington manufacturing and construction industries for production use were imported. In comparison, the more “local” trade and service industries imported a relatively small amount, about 17.6 percent, of their total purchases.

The sum of a row is the total output of an industrial sector. The sum of a column is the total inputs to an industrial sector. The basic accounting rule dictates that for each industry the row total (i.e. total output or sales) equals the corresponding column total (i.e. total inputs or purchases).

## The Input-Output Tables: Measuring Changes in the State's Economic Structure Over Time

With a series of historical tables available for Washington (i.e. 1963, 1967, 1972, 1982, 1987, 1997 and 2002), changes in the structure of the economy over time can be observed. The change from the SIC to NAICS industry classification in 1997 complicates comparisons of inter-industry industrial structure over time. However, aggregate comparisons are possible. These comparisons need to be done with reference to the particular prevailing cyclical situation each historical table reflects. For example, 1987 and 1997 were relatively comparable years of economic expansions in Washington, while 1982 and 1972 were years when severe contractions took place. Table 1-2 shows the changing "openness," or shifts in imports and exports, of the Washington economy over the 1963-2002 period.

**Table 1-2**  
**Changing Importance of Washington External Trade, 1963-2002**

	% Industrial Outputs Exported (All Sectors)	% of Industrial Inputs Imported		
		All Sectors	Manufacturing	Services & Trade*
1963	28.1%	19.4%	28.0%	4.5%
1967	32.2%	25.6%	35.3%	9.3%
1972	35.6%	19.4%	31.2%	5.9%
1982	37.2%	23.9%	39.1%	8.4%
1987	36.0%	22.5%	40.2%	7.9%
1997	38.2%	22.7%	48.1%	9.8%
2002	35.9%	28.3%	53.7%	17.4%

*\*Include finance, insurance and real estate (FIRE); exclude resources, construction, transportation, communication and utilities (TCU); since 1997, include telecommunication.*

Exports as a share of total industrial output in the state during the 1963-1987 period increased from 28.1% percent to 36.0 percent, but then changed little between 1987 and 2002. Part of the reason for a low export share in 2002 might have to do with the U.S. cyclical downturn depressing the state's export markets. Since 1963, imports as a share of production inputs grew steadily for the state's services and trade industries, the share jumped to 17.4 percent in 2002. For manufacturing industries in the state, the import share of production inputs rose significantly and continuously, reaching 53.7 percent in 2002.

More detailed analyses can be conducted, at the individual industry level, on shifting patterns of exports to other regions in the U.S. and to overseas markets, or on the changes in imports from the rest of the U.S. as opposed to from foreign producers.