

actual operating economies achieved by the double-stack service.

A Personal Computer Model
for Determining the Economic Impacts of Ports

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Overview of the Kit

The Port Economic Impact Kit was developed by Temple, Barker & Sloane, Inc. (TBS), Recht Hausrath & Associates, and the Regional Science Research Institute (RSRI). The project was funded by the Office of Port and Intermodal Development at the Maritime Administration and by the Port of Longview, Massport, and the Georgia Ports Authority. Since the study was completed, TBS has used the Port Economic Impact Kit in Massport, Savannah, Jacksonville, Los Angeles/Long Beach, the San Francisco Bay Ports, Columbia River, Puget Sound, Hawaii, Alaska, and Minneapolis/St. Paul.

The goal of the project was to develop an effective and easy-to-use kit to assist small and medium size ports in the conduct of economic impact studies. These studies measure the economic contribution of a port to the local economy and can help a port demonstrate its positive effect on the economy. They can generate additional public support for port plans and continued operations. Depending on the objectives of the study, three types of activities can be analyzed: port industry--services associated with moving cargo through the port; local port user--the activities of shippers and receivers that make heavy use of the port; and port capital spending--new construction, expansion or rehabilitation in the port.

Types of Economic Effects

For each set of activities the economic effects can be separated into three categories: direct, indirect, and induced. the direct effects are the initial spending and employment generated by the port activity. The indirect effects are spending and employment generated in secondary industries. For example, a stevedore generates direct effects when he loads a ton of cargo; if he rents a truck or buys fuel to help him move the cargo, he creates indirect effects for the truck rental company and the fuel sales company. The induced effects come from purchases made by households, such as a longshoreman's, resulting from the wages paid by the direct and indirect industries. These effects are measured in four ways: revenues for the companies, wages paid to the employees, the number of people employed in the companies, and the taxes paid by all.

Steps Used to Determine Economic Impacts

Basically, the Port Economic Impact Kit follows a five-step approach. The first step is to calculate the direct impact of the port industry companies--these are the effects that come from actually moving cargo through the port. Second, calculate the direct effects of port users--those companies that ship or receive cargo via the port. Third, calculate the direct effects of port construction or maintenance activities. Based on the direct impacts,

the next step is to calculate the additional effects from purchases made in secondary industries. These are the indirect and induced impacts. The final step summarizes all these effects into an impact report.

The PortKit Model

The PortKit model is the microcomputer model that was developed for the Kit, and it has been designed to automate much of the work that is required for economic impact analysis.

The model runs on an IBM PC or compatible. It requires 56K of memory, and runs best on a machine with a hard disk. The model uses SuperCalc 3, which is very similar to Lotus 1-2-3 but is more programmable. The model requires a dot matrix printer or pen plotter if there is a need to prepare graphs or charts of the results.

The PortKit model incorporates the most recent national input/output table, an RSRI developed estimating procedure to adjust the national table for the port's local economy, a series of default values for each state to help calculate state and local taxes, and TBS developed parameters to translate cargo tons and port expenditures into economic effects.

Throughout its calculations, the model uses 32 economic sectors. These are roughly the 2-digit SIC codes used by the Bureau of Economic Analysis. Some very large Input/Output models have up to 500 sectors, but they also require much more detailed research to make them effective. The 32 sectors include industries like lumber and wood products, transportation, and retail sales.

To accurately calculate the economic effects of each of the sectors, the model requires four sets of inputs: inputs describing the economy of the county or city that the port is located in; inputs describing the port industry and cargo tonnage that is moved through the port; inputs describing the levels of spending planned for the port; and finally, inputs detailing the employment levels in local port user industries.

The following are sources of data used as inputs to the model:

a. County and City Inputs

These are readily available from government publications and from the Bureau of Census and the Bureau of Economic Analysis. They are used to adjust the model and the national I/O table, to reflect the characteristics of the local economy.

b. Port Industry/Cargo Inputs

The port industry and cargo inputs are estimates of the cargo tons moved through the port, the amount of bunkering done in the port, and the costs of inland transportation. These inputs are combined with the values stored in the model and from the county and city inputs to calculate the direct sales for the port industry.

c. Port Capital Spending Inputs

These inputs include an estimate of how much of the construction labor

required will come from the region and that levels of spending are for buildings, dredging, landfill, etc. These inputs are used to calculate the direct sales effects of port capital spending.

d. Local Port Users Inputs

The local port user inputs are estimates of employment in each relevant industry sector. They are used to calculate the direct sales for local port users.

Output of the PortKit Model

The output of the Port Economic Impact Kit involves a series of reports to be used by port administrators, state and local agencies and other sectors of the maritime industry in evaluating the contribution of a port to the economy of the selected geographic area. The basic report provides data on the tonnage and value of four cargo categories including container, breakbulk, liquid bulk and dry bulk; a total dollar figure on port capital spending and a total of the number of employees generated at the port and at companies that serve or use the port.

Another report indicates the direct effects--sales, employment, wages, and taxes for the three types of activities--port industry, capital spending, local port users. The report also shows the total effects which combine the direct, indirect, and induced effects, and the economic multipliers. The multipliers are the shorthand notation often used by economists to indicate the relationship between the direct impact and the indirect and induced effects. Following is an example of the format of the port economic impact report.

Port Economic Impact Report

		Port Capital Port Industry Spending Users		
Direct	- Sales (\$000)	_____	_____	_____
Impact	- Employment	_____	_____	_____
	- Income (\$000)	_____	_____	_____
	- Taxes (\$000)	_____	_____	_____
Total	- Sales (\$000)	_____	_____	_____
Impact	- Employment	_____	_____	_____
	- Income (\$000)	_____	_____	_____
	- Taxes (\$000)	_____	_____	_____
Multipliers				
	- Sales (\$000)	_____	_____	_____
	- Employment	_____	_____	_____
	- Income (\$000)	_____	_____	_____

Accuracy of the Model

As part of the development of the Port Economic Impact Kit, the PortKit model was tested against the RSRI 500-sector model for the Port of Longview, Massport, and Georgia Ports Authority. It was found that the PortKit model is generally accurate within 15 to 20 percent.