

## Input-Output Analysis Terms Defined

### Direct Economic Effects

Direct effects are the changes in local business activity occurring as a direct consequence of the project or policy.

### Indirect Effects

Indirect effects result from changes in sales for suppliers to the directly-affected businesses, including trade and services at the retail, wholesale, and producer levels.

### Induced Effects

Induced effects are further shifts in spending on food, clothing, shelter, and other consumer goods and services caused by a change in personal income of local workers employed by the directly and indirectly affected businesses.

### Final Demand

Economic impact analysis generally estimates the regional economic impacts of final demand changes. Final demand is the term used for sales to final consumers (households or governments); or purchases of goods and services for final consumption. Visitor spending is one type of final demand.

## Understanding Input-Output Analysis

We often use Input-Output Analysis, but many of our clients are unaware of the value of this tool. The following discussion provides information for our clients to consider for future projects.

### What is Input-Output Analysis?

Input-Output (I-O) analysis is an economic tool used to measure impacts of an existing, proposed, or anticipated business operation, decision, or event on the economy. I-O analysis is useful in communicating the benefits of a project or a policy. It is often used for public relations purposes and to help guide economic development policy. For example, a municipal government could use I-O analysis to measure how many jobs would be created, how much personal income would be generated, or the tax revenues that could be anticipated from building an industrial plant or a sports complex. I-O can also be used to measure the benefits to a community of a new hardware store, the benefits to the state of a natural gas industry, or the effects on a country of a change in fiscal policy.

The analysis is based on a model of the inter-industry transactions within a community, a region, a state, or a country. The I-O model is a matrix that tracks the dollar flows between the industries within a specified economic region of interest. The model can measure how many times a dollar is re-spent in, or "ripples" through a community (or a larger economic region) before it leaks out.

Generally, a new project creates an increase in demand for goods and services. If there is an increase in demand for a particular commodity, producers or sellers react to meet the increased demand; this is the direct

effect. As these producers increase their output, there will also be an increase in demand on their suppliers and so on down the supply chain; this is the indirect effect. As a result of the direct and indirect impacts, the level of household income throughout the economy will increase as a result of increased employment, and a proportion of this increased income will be re-spent on other goods and services; this is the induced effect. The indirect and induced effects are collectively called multiplier effects, since these effects make the overall economic impacts larger than direct effects alone.

The I-O model yields multipliers that are used to calculate the total direct, indirect, and induced effects on jobs, income, and output generated per dollar of spending on various types of goods and services in the study area.

### What do you need to know?

There are several important factors you need to consider in an I-O analysis:

What are your project objectives? Do you want to show the number of jobs that will be created in the economy and the effects of increased household spending? Do you want to show the potential increase in personal income in the community? Do you want to

see I-O Analysis, next page

## NEXT ISSUE

The next issue will feature Community Impact Models: What are they, how do they differ from Input-Output models, and how can they be of use to your community?

  
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## I-O Analysis, continued

measure the amount of taxes that could accrue to the state and local government? It is helpful to know the questions that need to be answered.

What is the impact location? What is the geographic location of the initial economic activity? The study area might be a city, a county, a region, a state, or a country. You can expect higher multiplier effects in larger and more diversified economies. Most software programs for I-O analysis are limited to the county level as the smallest area of analysis due to data limitations at the community level.

### Leakage

If you think of an economy as something like a money-powered perpetual motion machine, I-O Analysis is the method used to determine how much power is generated by the input of "fuel" in the form of money. The more times the money travels around the system, the more activity is generated. The term Leakage is used to describe the processes whereby money "leaks" out of the system, by being spent outside the state or the community. (For example, by ordering products from an out-of-state vendor rather than buying locally.)

Which are the local expenditures? Some of the expenditures may be imports or may take place outside of the study area. To study the effects on the local economy, you need to consider only the local expenditures; the rest are considered leakages. More leakages equals smaller multipliers. What are the dollar amounts of the final demand changes? How much money would the new project bring in? The higher the expenditures, the higher the multiplier effects. However, if resources are merely shifted from an existing use to serve needs created by the new project, and the project does not bring in additional outside resources, then there are likely to be no net multiplier effects.

What is the activity time frame? What is the time span during which the impact takes place?

Construction activities will have different impacts than operations and need to be evaluated separately.

What model/software to use? Input-output models

calibrated for specific counties or aggregations of counties are commercially available for any part of the U.S. from MIG, Inc. (Impact Analysis for Planning, IMPLAN model), and the U.S. Bureau of Economic Analysis (RIMS- Regional Input/Output Multiplier System). Tables of typical multipliers for state and local levels are also available in print from the U.S. Chamber of Commerce.

While these considerations are among the more important ones, there are a number of other issues that need to be factored into the analysis. A regional economist would be able to provide insights about the process, about the local economy, and about the meaning of the results; and avoid the "garbage in, garbage out" effect.

*For more information about I-O analysis, please call Northern Economics.*

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