

Appendix B. IMPLAN Model Description

The following description of the IMPLAN model is based on the description provided by the Minnesota Implan Group (MIG) (Lindall, S.A., and Olson, D.C., undated).

Input-output accounting describes commodity flows from producers to intermediate and final consumers. The total purchases of commodities, services, employment compensation, value added, and imports are equal to the value of the commodities produced.

Purchases for final use (final demand) drive the model. Industries produce goods and services for final demand and purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakages from the region (imports and value added) stop the cycle.

These indirect and induced effects (the effects of household spending) can be mathematically derived. The derivation is called the Leontief inverse. The resulting set of multipliers describe the change of output for each and every regional industry caused by a one dollar change in final demand for any given industry.

Creating regional input-output models requires a tremendous amount of data. The costs of surveying industries within each region to derive a list of commodity purchases (production functions) are prohibitive. IMPLAN was developed as a cost-effective means to develop regional input-output models. The IMPLAN accounts closely follow the accounting conventions used in the "Input-Output Study of the U.S. Economy" by the Bureau of Economic Analysis (1980) and the rectangular format recommended by the United Nations.

The IMPLAN system was designed to serve three functions: 1) data retrieval, 2) data reduction and model development, and 3) impact analysis. Comprehensive and detailed coverage of the entire U.S. by county, and the ability to incorporate user-supplied data at each stage of the model building process, provides a high degree of flexibility both in terms of geographic coverage and model formulation.

The IMPLAN databases, created by MIG, Inc., consist of two major parts: 1) a national-level technology matrix and 2) estimates of sector activity for final demand, final payments, industry output, and employment for each county in the U.S. along with state and national totals.

There are two components to the IMPLAN system, the software and the databases. The databases provide all information to create regional IMPLAN models. County level databases (Butte, Colusa, Glenn, and Tehama Counties) for the Sacramento River socioeconomic study were used in the IMPLAN modeling analyses. Each of these four databases contains county level specific information for all 528 industrial sectors in the IMPLAN model.

The IMPLAN software performs the calculations and provides an interface for the user to make final demand changes. For the Sacramento River socioeconomic study, changes in final expenditures were entered into IMPLAN for each of the primary economic sectors that would be affected: agriculture, recreation, and restoration. IMPLAN then estimates the ripple effects of these changes in expenditures on each county's economic sectors through the use of economic multipliers.

REFERENCE

Lindall, S.A. and Olson, D.C. Undated. The IMPLAN input-output system. MIG, Inc. Sillwater, MN.