REGIONAL CENTER-SPECIFIC ISSUES

8 CFR § 204.6 (m) (i) (ii) (iv) and (v) can best be addressed in a comprehensive economic model and analysis of the impact of the investment vehicles that are encompassed by the business plan and strategy of the Regional Center.

There are several major commercial economic models in use that may be encountered as well as individualized economic models produced by individual economists for a specific Regional Center's business plan and strategy.

REGIONAL CENTER-SPECIFIC ISSUES

RIMS II

In the 1970's, the Bureau of Economic Analysis (BEA) developed a method for estimating regional I-O multipliers known as RIMS (Regional Industrial Multiplier System), which was based on the work of Garnick and Drake. /1/

In the 1980's, BEA completed an enhancement of RIMS, known as RIMS II (Regional Input-Output Modeling System), and published a handbook for RIMS II users. /2/

In 1992, BEA published a second edition of the handbook in which the multipliers were based on more recent data and improved methodology.

In 1997, BEA published a handbook that provides more detail on the use of the multipliers and the data sources and methods for estimating them.

REGIONAL CENTER-SPECIFIC ISSUES

RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the industrial distribution of inputs purchased and outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table to show a region's industrial structure and trading patterns. /3/

Using RIMS II for impact analysis has several advantages. RIMS II multipliers can be estimated for any region composed of one or more counties and for any industry, or group of industries, in the national I-O table. The accessibility of the main data sources for RIMS II keeps the cost of estimating regional multipliers relatively low. Empirical tests show that estimates based on relatively expensive surveys and RIMS II-based estimates are similar in magnitude. /4/

REGIONAL CENTER-SPECIFIC ISSUES

RIMS II Footnotes:

1. See Daniel H. Garnick, "Differential Regional Multiplier Models," Journal of Regional Science 10 (February 1970): 35-47; and Ronald L. Drake, "A Short-Cut to Estimates of Regional Input-Output Multipliers," International Regional Science Review 1 (Fall 1976): 1-17.

2. See U.S. Department of Commerce, Bureau of Economic Analysis, Regional Input-Output Modeling System (RIMS II): Estimation, Evaluation, and Application of a Disaggregated Regional Impact Model (Washington, DC: U.S. Government Printing Office, 1981). Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; order no. PB-82-168-865; price $26.

3. See U.S. Department of Commerce, Bureau of Economic Analysis, The Detailed Input-Output Structure of the U.S. Economy, Volume II (Washington, DC: U.S. Government Printing Office, November 1994); and U.S. Department of Commerce, Bureau of Economic Analysis, State Personal Income, 1929-93 (Washington, DC: U.S. Government Printing Office, June 1995).

4. See U.S. Department of Commerce, Regional Input-Output Modeling System (RIMS II), chapter 5. Also see Sharon M. Brucker, Steven E. Hastings, and William R. Latham III, "The Variation of Estimated Impacts from Five Regional Input-Output Models," International Regional Science Review 13 (1990): 119-39.

REGIONAL CENTER-SPECIFIC ISSUES

IMPLAN

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

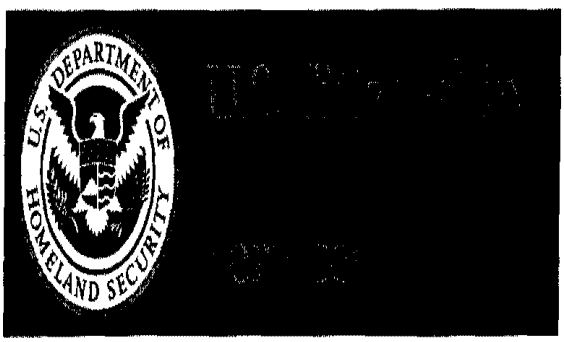
Purchases for final use (final demand) drive the model. Industries produce goods and services for final demand and purchase goods and services from other producers. These other producers, in turn, purchase goods and services. This buying of goods and services (indirect purchases) continues until leakages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

From: http://www.implan.com/library/documents/implan_io_system_description.pdf

REGIONAL CENTER-SPECIFIC ISSUES

These indirect and induced effects (the effects of household spending) can be mathematically derived. The derivation is called the Leontief inverse. The resulting sets 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 require 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.



REGIONAL CENTER-SPECIFIC ISSUES

The IMPLAN sytem was designed to serve three functions: 1) data retrieval, 2) data reduction and model development, and 3) impact analysis. Comprehensive and detailed data 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 database, created by MIG, Inc., consists of two major parts: 1) a national-level technology matrix and 2) estimates of sectorial activity for final demand, final payments, industry output and employment for each county in the U.S. along with state and national totals. New databases are developed annually by MIG, Inc.

REGIONAL CENTER-SPECIFIC ISSUES

IMPLAN easily allows the user to do the following:

- Develop his/her own multiplier tables;
- Develop a complete set of SAM (Social Accounting Matrix) accounts;
- Change any component of the system, production functions, trade flows, or database;
- Generate type I, II, or any true SAM multiplier internalizing household, government, and/or investment activities
- Create custom impact analysis by entering final demand changes;
- Obtain any report in the system to examine the model's assumptions and calculations.

There are two components to the IMPLAN system, the software and Databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides an interface for the user to make final demand changes.

REGIONAL CENTER-SPECIFIC ISSUES

REMI

What are the available configurations for the REMI model?

Policy Insight® is customized by region and by the number of industry sectors. REMI can design a single-region model that represents a single county, a group of counties (up to and including a state and additional counties), or even multiple states and additional counties. REMI can also design a multi-region model that can comprise counties or groups of counties. National models as well as sub-county models are also available.

How is REMI different from other I-O Models?

The primary advantage REMI Policy Insight® has over I-O models is that it is a dynamic model, which means that it allows for year-by-year analysis, while I-O models are static and do not have time series data. In addition, REMI makes use of Computable General Equilibrium (CGE) techniques, econometric estimations using time series panel data, and the New Economic Geography theory, which takes into account agglomeration effects due to the benefits of access to broader labor and commodity markets.

REGIONAL CENTER-SPECIFIC ISSUES

REMI Policy Insight is a structural economic forecasting and policy analysis model. It integrates input-output, computable general equilibrium, econometric, and economic geography methodologies. The model is dynamic, with forecasts and simulations generated on an annual basis and behavioral responses to wage,
price, and other economic factors.

The REMI model consists of thousands of simultaneous equations with a structure that is relatively straightforward. The exact number of equations used varies depending on the extent of industry, demographic, demand, and other detail in the specific model being used. The overall structure of the model can be summarized in five major blocks: (1) Output, (2) Labor and Capital Demand, (3) Population and Labor Supply, (4) Wages, Prices, and Costs, and (5) Market Shares. The blocks and their key interactions are shown in Figures 1 and 2.

REMI Model Linkages

(Excluding Economic Geography Linkages)

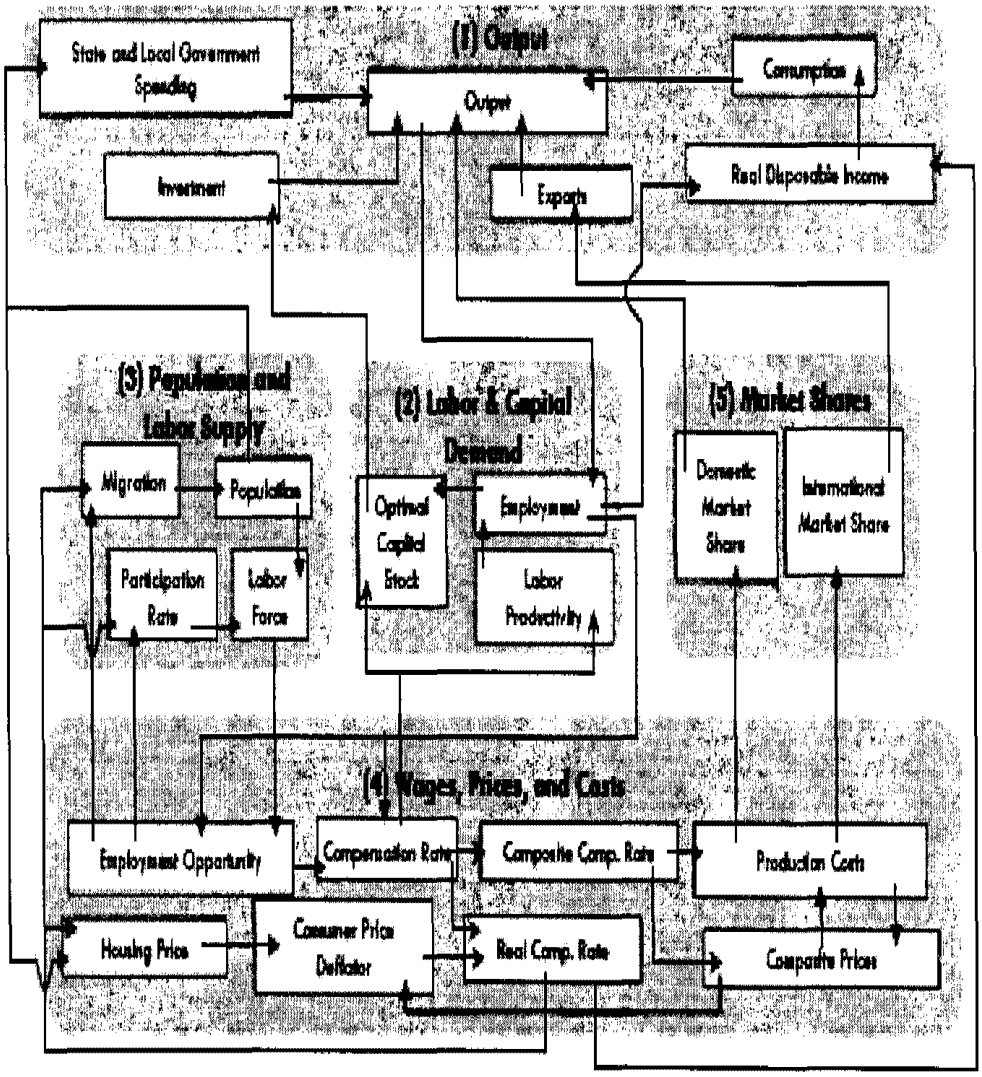


Figure 1: REMI Model Linkages

Economic Geography Linkages

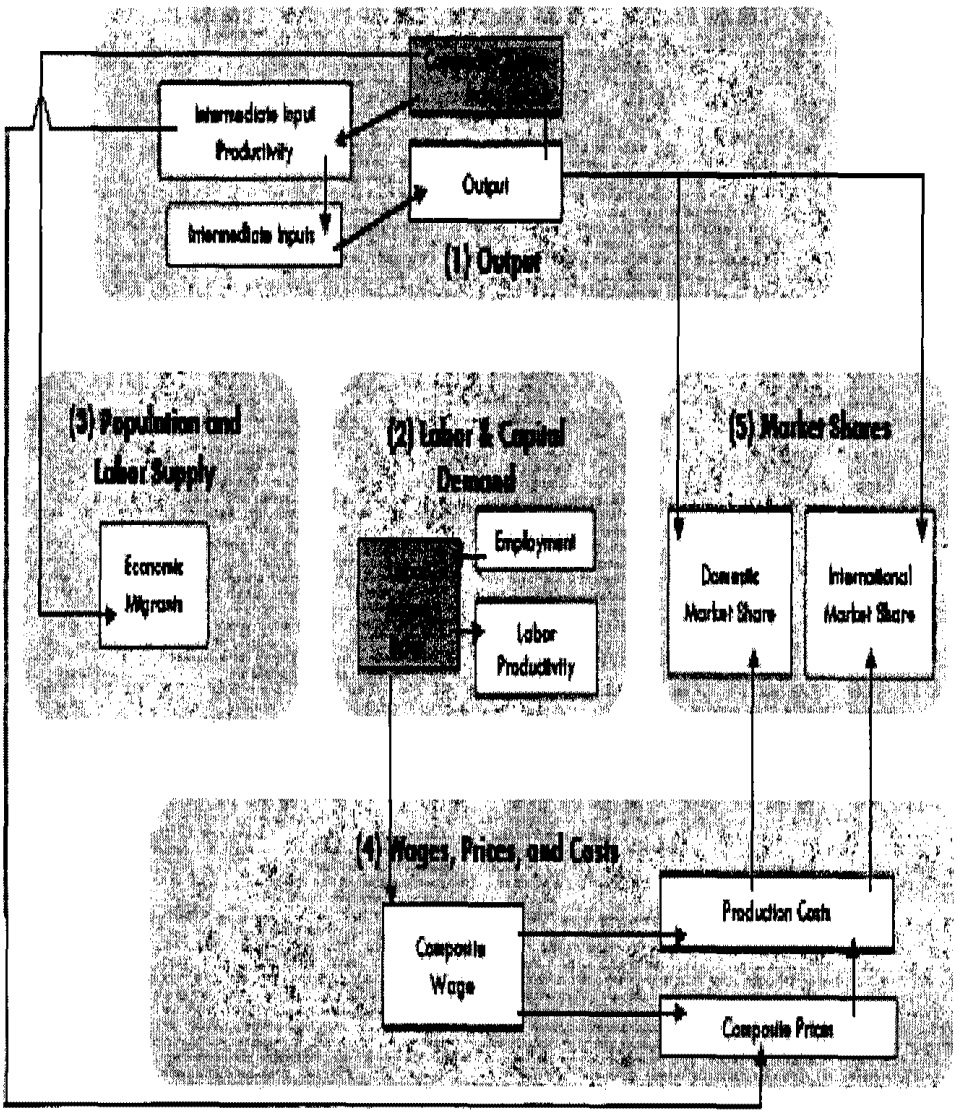
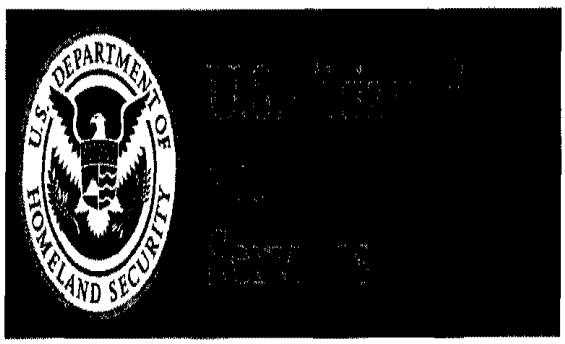


Figure 2: Economic Geography Linkages

REGIONAL CENTER-SPECIFIC ISSUES

REDYN

The REDYN model is a fundamental re-envisioning of economic theory applied to estimating multi-regional, dynamic effects. It reflects advances in New Economic Geography, especially gravity theory (regional attraction) and trade flow (regional imports/exports), based on a new distance impedance database from Oak Ridge National Laboratories that enables calculating trade flow by commodity by road, rail, water, air, and proxy transport. The breakthrough in design is the commodity production linkage between the trade flow process and an entity-based data structure for the economy. Entities include industries, workers, governments, investors, etc., and commodities are the goods they use and make.



REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

Multipliers: represent a quantitative expression of the extent to which some initial, "exogenous" force or change is expected to generate additional effects through interdependencies associated with some assumed and/or empirically established, "endogenous" linkage system.

Multipliers are predicated upon a domino theory of economic change. They translate the consequences of change in one variable upon others, taking account of sometimes complicated and roundabout linkages. ***Multipliers are aptly called estimators of the 'ripple' effect".***

From: http://faculty.washington.edu/krumme/207/inputoutput.html

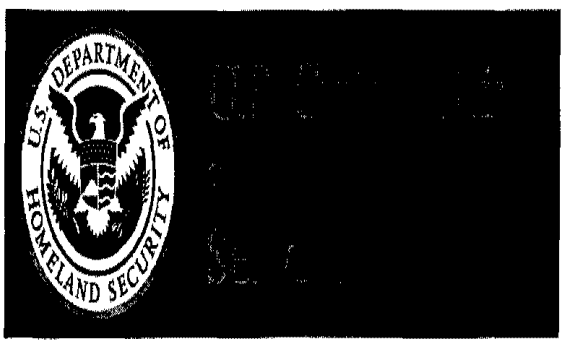
REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

In more 'technical terms', they are numerical coefficients which relate a change in (a component of aggregate) demand (or employment) to a consequent change in total income (or total employment). Thus, a *"regional employment multiplier"*, for example, relates a change in a region's export (*"exogenous"*) employment to the resulting total employment change. In Input-Output analysis, there are many different multipliers. One multiplier is the ratio of the direct, indirect and induced effects to the direct (i.e. the initial) change itself.

Specific examples:
Job multiplier is the number of jobs per million dollars in direct sales.

Income multiplier is the ratio of income per dollar of direct sales. Income includes employee compensation, proprietor, and other property income.



REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

Multiplier: is a numerical coefficient which relates the change of a component of aggregate demand (such as the export demand for a region's products) to a consequent change in income [or employment] (in this case: regional income or [employment]).

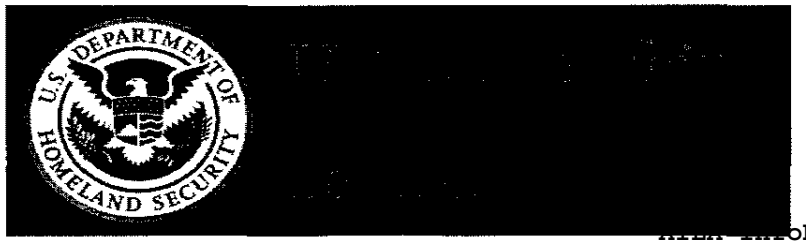
In the case of the regional employment multiplier we relate the change of employment in the region's export sectors to the consequent changes in employment in those ("non-basic") sectors which are facing a change in household demand as a (direct and indirect) result of changes in employment and income in the export sectors.

REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

Leontief inverse matrix (& coefficients):

As applied to *regional* interindustry or inputput-output analysis, the values in this matrix (= Leontief coefficients) represent the total direct and indirect (and, possibly "induced") requirements of any industry j (typically in columns) supplied by other industries (i) within the region in order for industry j to be able to deliver $1 worth of output to final demand.

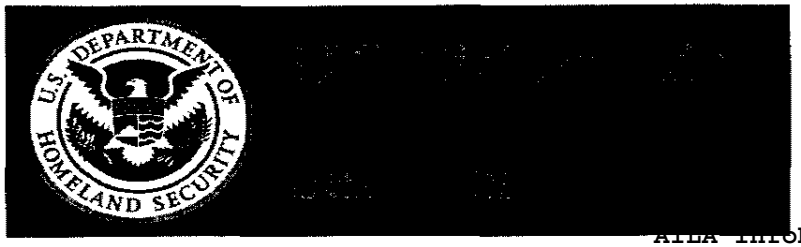


REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

Technical coefficient:

In input-output analysis, identifies the percentage or portion of the total inputs of a sector required to be purchased from another sector irrespective of the geographic origin of this purchase. Technical (input) coefficients represent direct backward linkages of an industry to other industries and constitute the "recipe" for production of that industry. See also regional coefficient.



REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

Regional coefficient (as different from the "technical" coefficient):

In regional input-output analysis, this coefficient identifies that part of the technical coefficient which is associated with purchases from firms located within the region. See "technical coefficient"

REGIONAL CENTER-SPECIFIC ISSUES

Multipliers

The simple economic base (employment) multiplier is presented in three different forms, respectively emphasizing different components and roles of the multiplier

Total Employment (T) = Basic Employment (B) + Non-basic Employment (N)

Multiplier Effect (ME) = Non-basic Employment generated (by Basic employment)
OR:
Basic employment multiplied by Non-basic employment per basic employee
OR:
Basic Employment x Multiplier minus Basic Employment
OR:
Basic Employment x (Multiplier - 1) ***[most common application you'll see]***