

FORWARD TO THE PAST: THE CURRENT STATE OF REGIONAL ECONOMIC IMPACT AND POLICY MODELING IN THE U.S. (AND BEYOND)



Nicolas O. Rockler, Ph.D.
Kavet, Rockler & Associates, LLC

Telephone: 617-395-8021

Website: www.kavetrockler.com

E-Mail: nrockler@kavetrockler.com

- **This paper offers a review of regional economic impact modeling and estimation in the U.S. since the 1960's.**
- **The tools in use back then are largely the same tools as we use today, some unchanged.**
- **The problems encountered back then were:**
 - **Limited computing power**
 - **High cost (and difficulty) of regional data acquisition**

In 1960, Walter Isard's Methods of Regional Analysis gave a listing of the fundamental tools:

- 1. Population Projection**
- 2. Migration Estimation**
- 3. Regional Income Estimation and Social Accounting**
- 4. Interregional Flow Analysis and Balance of payments Statements**
- 5. Regional Cycle and Multiplier Analysis**
- 6. Interregional and Regional Input-Output Techniques**
- 7. Interregional Linear Programming**
- 8. Gravity, Potential, Spatial Interaction Models**

Two Well-Known Regional Input-Output Models

- **The 1960 Philadelphia Model (Industry by Industry)**
- **The 1963-2007 Washington State Model (8 tables total since first produced)**

For Empirical Regional Input-Output Modeling, the Barriers Were High

In 1960, with the single-region Philadelphia table in hand, it seemed an empirical interregional model would soon follow. It never did.

Data acquisition and computing were known significant barriers at the time. The tables listed on the previous slide are two among only a handful of empirical regional models

We Needed a New Approach: Less Industrial Detail, Little Formal Structure, BUT With Market-Response Capabilities

Regional timeseries econometric models as in Klein (1969) and Klein and Glickman (1977) were the major response in regional modeling for impact estimation and analysis.

The models were smaller (20 sectors), computing less of a problem and data for timeseries modeling, although largely estimated, were becoming available.

Application of Models for Impact Studies

- **Among the first (1950's) were water resource planning studies.**
 - **The U.S. Army Corps of Engineers (USACE)-The federal agency responsible for domestic civil engineering services related to water resources (ports, navigation, and flood control on coastal and inland waterways.)**

Application of Models for Impact Studies ^{cont.}

- Long-range development studies. Projections for population characteristics, employment, and output and/or product measures.
- **Regional development studies**
 - Projections were needed for population, housing, employment
- **Airport**
 - Local demand, spatial interaction, market size by industry.
- **River basin regions**
 - Similar needs to USACE

Early Benefit-Cost Studies Highlighted A Need to Consider Externalities

- **In the 1960's-1970's, resource contamination, waterway and port congestion impacts were recognized as being significant, but there was no direct means of measurement. Non-market impacts required proxy-value estimates.**
- **Leontief and Isard offered alternative approaches to incorporate pollution production and control into an input-output framework. Later, Coupé constructed a two-region, ten sector interregional model for two regions in the Netherlands (but emissions "production" technology was constant.) Most important, the model was linked to air-mass movement. (Is there an updated version?)**

With externality measurement and welfare concerns comes a need to measure price effects

Control strategies, i.e., taxation, quotas (cap and trade), technology adoption all have price effects

Price effects may have different distributional impacts.

After Regional I/O and Timeseries Econometric Model

1980-Treyz, Friedlaender, and Stevens
Hybrid Regional Model—Now known
as the REMI Model: I/O core for
estimating secondary and tertiary
output (and linked) effects, partial
equilibrium for market impact for
labor, capital, price-levels.

REMI includes population dynamics, limited income distribution "overlay", and regional trade flows (based on impedance estimates and gravity.) Annual estimates extending approximately 50 years.

- Users cannot alter technologies in the I/O portion. The input-output models are still 100% nonsurvey, derived from national benchmark tables, the latest of which is 2007.**
- Externality-related feedbacks not endogenous.**
- Some fuel substitution possible.**

IMPLAN now offers user configured, nonsurvey multiregional I/O that can accommodate new subsectors, allowing for survey-based input requirements for sectors of interest, and

Cambridge Econometrics' E3 Model offers new capabilities to deal with issues of technology change, fiscal impact, and emissions control strategies. It has not yet adapted for U.S. regions, but has been implemented for EU and a new version for India's 27 states is in the works.

So, The Tools Are a Little Different, and...

- **In the 1960's and 1970's, we faced significant barriers to transforming theoretical input-output models for impact analysis:**
 - **Need for greater computing power**
 - **Need for regional data (not just synthetic income and product accounts) that depict technological differences over space.**

The Barriers are Getting Lower.

- **Computing power is not a hindrance**
- **Lower cost means of conducting surveys are now available, along with automated data collection and processing capabilities...(Web-based tools)**

Are Our Models Stuck in the 1970s?

**Our regional I/O models are stuck in the 1970's.
Nonsurvey regional models dominate the field.**

We don't know how inadequate they are as we lack benchmarks (except for WA State) but we also seem to be unwilling to improve them (at least, not very quickly.)

Our clients are happy with large multipliers, so why change?