APPLICATION OF ECONOMIC ANALYSIS FOR TRANSPORT DECISION MAKING:
Progress & Challenges

OECD Research Roundtable on Infrastructure Planning and Assessment Tools, Boston, November 2007

Glen Weisbrod and Brian Baird Alstadt
Economic Development Research Group, Inc.
www.edrgroup.com
TOPICS

2. Model Coverage of Effects
3. Predictive Models & Tools
4. Research Implications
POLICY PROBLEMS

*Mis-Use of Research*

- Induced Growth (Return on Investment)
- Spatial Spillovers
- Magnitude of Effects

→ *Challenge: research to correctly inform decision-making*
POLICY NEEDS

- Breadth of Effects Measured
- Spatial Level of Measurement
- Modeling Tools Applied
- Accuracy/ repeatability

- Policy Levers
- Benefit Cost Appraisal
MODELING “WIDER” EFFECTS

- Cohen: wider spatial spillovers
- Graham: effects beyond standard B/C: agglomeration externalities, non-linearities
- Johansson: geographic scale and inter-urban network effects
- Sue Wing, Anderson, Lakshaman: breadth of model & endogeneity
- Vickerman: reconciling B/C appraisal and macroeconomic models
Measurement/Model Tradeoffs

- Precision/detail: *spatial zones, industrial groups, travel categories, class of “user”*
- Breadth of variation: *non-linearities, thresholds, scale economies*
- Endogeneity (Interactions): *interactions of inter-modal and inter-industry flows*
- Complexity: *simplifying assumptions vs. realism*
## Alternative Model Views (1)

<table>
<thead>
<tr>
<th>Models</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use/Transport <em>(PECAS, MEPLAN, TELUM)</em></td>
<td>Spatial zone and price detail, feedback effects</td>
<td>Economic industry detail, disjoint markets</td>
</tr>
<tr>
<td>Computable General Equilibrium <em>(CGE)</em></td>
<td>Multi-model, theoretical rigor</td>
<td>Simplify cost and response mechanisms</td>
</tr>
</tbody>
</table>
# ALTERNATIVE MODEL VIEWS (2)

<table>
<thead>
<tr>
<th>MODELS</th>
<th>POSITIVE</th>
<th>NEGATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dynamic Development</strong></td>
<td>Labor, housing, population, wage responses</td>
<td>Theory vs. realism (<em>linear, gravity functions</em>)</td>
</tr>
<tr>
<td>(<em>REMI, ASTRA</em>)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Access Models</strong></td>
<td>Market scale economies, supply chain connectivity, spatial spillover</td>
<td>Exogenous effects, not integrated into macro systems</td>
</tr>
</tbody>
</table>

→ **EXTERNALITIES SOMETIMES ARE THE OBJECTIVES**
ALT. VIEWS: BUSINESS GROUPS

Sponsored Case Studies – highlight wider issues missed by models

- Multi-modal intl. gateways
- Freight corridors
- Just-in-time logistics
- Urban services & regional distribution location & delivery
BUSINESS-LED STUDIES

- **Chicago (IL) Metropolis 2020**
  - Competitiveness of Rail Freight Yards, Regional Distribution, Global Supply Chain

- **Vancouver (BC) Gateway Council**
  - Competitiveness of Seaport, Airport & Border Facilities as Global Gateways

- **Portland (OR) Business Alliance**
  - Competitiveness as an Intermodal Center & Distribution Hub
BUSINESS CONCERNS
Productivity & Competitiveness Impacts

- **Market Access**
  - *Worker markets*
  - *Supplier markets*
  - *Customer markets*

- **Connectivity & Reliability**
  - *Airports, Marine ports, Inter-modal rail terminals, Intl. Borders, Industrial Parks*
NON-LINEAR EFFECTS: MKT SIZE

Industry Concentration by Market Size

RESEARCH IMPLICATIONS:

- Cohen: +/- spatial spillovers differ among localities
- Graham: externality impacts differ across industries and space
- Johansson: threshold and non-linear effects differ by geographic scale
- Sue Wing, Anderson, Lakshaman: role of broader productivity factors at meso scale
- Vickerman: importance of infrastructure use, CGE limitation to large projects
FUTURE PRIORITIES

- Spatial scales of economic factors
- Threshold factors (*starting basis matters*)
- Inter-modal access interactions
- Special service linkage functions
- Development dispersion forces
- Policy levers: roles of infrastructure types, transport services and context
NEEDS FOR CBA

- Consideration of multi-modal interactions
- Project objectives should be reflected in the benefit measurement
- Spatial scale of project and analysis makes a difference
- Complexity & endogeneity need to be traded off against accuracy in capturing key effects
- Reconciling macroeconomic growth against consumer surplus concepts