Two paths of economic development – Responsive & Strategic

• Responsive
  – Helping to land leads that come a county’s way
  – Sometimes a new firm is the product of generally “selling” the county
  – Sometimes an opportunity that walks in the door & needs accommodating

• Strategic
  – Based on a discussion (& some analysis) of what kind of companies a county would like to see join the local economy
  – Sometimes based on aspiration
  – Our research falls into this category, but is limited to only those sectors that already have a presence in Chelan County
  – I.e., not “aspirational”
Perennial question of ED – how to develop a strategy of recruitment & retention

• Build on input strengths
  – Labor – quantity & quality
  – Power
  – Location
  – Taxes

• Tout quality of life
  – Natural amenities
  – Culture
  – Schools

• More formal – “cluster analysis”
Clusters – once over lightly

• Definition – the relative share of one industry in a local economy to the relative of the same industry in the U.S.

\[ \text{LQ} = \frac{\text{# of workers in industry } z \text{ in Chelan County}}{\text{all workers in Chelan County}} \times \frac{\text{all workers in Chelan County}}{\text{# of workers in industry } z \text{ in the U.S.}} \]

  – If LQ > 1.0, a cluster exists

• Assumption – if a local economy has a concentration in one or several industries, it should be exploited (built upon)

• WA CTED, now Commerce, did this for many of the counties of the state in prior decade
U.S. Bureau of Labor Statistics results for Chelan County in 2012: 18 clusters

1. Crop production: 39.44
2. Agriculture & forestry support activities
3. Primary metal manufacturing
4. Beverage & product manufacturing
5. Merchant wholesalers, non-durable goods
6. Accommodations
7. Warehousing & storage
8. Miscellaneous store retailers
9. Nonmetallic mineral product manufacturing
10. Building material & garden supply stores
11. Sports, hobby, music instrument, book stores
12. Broadcasting, except Internet
13. Motor vehicle & parts dealers
14. Ambulatory health care services
15. Furniture & home furnishings stores
16. Amusements, gambling, and recreation
17. Food & beverage stores: 1.05
18. Hospitals*
Comments to Chelan County Clusters

- Not too many – 18 out of \( xx \) sectors examined
  - Spokane – 27 out of 92 sectors
  - But typical of smaller counties

- Striking about Chelan County – the size of the location quotients (LQs)
  - 7 of 18 > 2.0
    - Two above 30.0!
  - In contrast, Spokane shows only 11% > 2.0
  - In other words, a high degree of specialization – here, mostly in agriculture & tourism
Problems with Cluster approach

• The procedure rests only on the number of workers

• Other dimensions to a local economy
  – Other inputs
    • Capital (finance)
    • Land
  – Other output measures of an economy
    • Income going to labor
    • “Gross Product” (metro, state or national)

• Does not allow for linkages between local sectors
Our project – exploit the features of input-output models

• Typically, I/O models used to answer the question of "economic impact," or generally how big a given sector is

• Its advantage – a detailed description of the interactions in an economy between:
  – All sectors
  – Consumers and businesses

• Available at the county level, so can examine the “ripple” effects of an increase of, say $1M, in sales in one particular sector throughout the local economy.
Input-output – the essentials

Essentially, a matrix that allows the output of one industry to be the input of another industry, & allows households to be buyers of all industries as well as sellers (of their labor) to all industries.

The I/O model allows us to measure how much larger the final result will be from the initial one.

Size of the final effect depends on the amount of purchases from outside the economy over all the rounds of spending.
An input-output model uses or calculates:

- **Direct effect** = economic activity either given or implied by the 1st round spending ($1M in new sales)

- **Indirect effect** = how the first round spending by tree fruit growers is augmented by purchases from other businesses

- **Induced effect** = how the income initially earned by labor in the tree fruit industry is spent and re-spent in the economy

- **Total** = Direct + Indirect + Induced effects
- **Multiplier** = \( \frac{\text{Total}}{\text{Direct}} \)
In contrast to Cluster analysis, input-output approach gives 5 measures of a sector’s effect

- **Employment** = jobs, full, part time, self-employed, or contract
- **Income** = wages, salaries, benefits
- **Output** = value of production over all stages
- **Taxes**
- **Value-added**
Method of study – imagine the Chamber or Port has a magic wand

Question: which sectors of Chelan County give the biggest “bang for the buck” of a $1M ↑ in sales. I.e., look at all sectors

Two (of the 5) outcome measures chosen:
- Jobs
- Value Added (VA)
  - Highly correlated with labor income & output
  - The measure used to compute “gross product,” whether national, state or metro

Use multipliers to rank top 20 industries ⇔ doesn’t penalize small sectors

Hypothesis: different ranking for Jobs vs Value Added
Our application of Input-output model to look at all sectors – first some culling

- I/O model description of Chelan County
  - 167 sectors with some activity, out of a possible 426
  - Of those, 150 had more than 5 in the total workforce

- Two rules – lead to 35 top sectors
  - Considered only sectors with > 5 employees
  - Sorted by those sectors with the highest combined ratio of exports to sales & value added to sales
    - Model tracks both sales out of counties & sales out-of-country
    - Strategically, want to consider sectors that export most of their product/service, since exports represent infusions into the economy
    - But want sectors that add significant value (avoid assembly & re-export scenario)
    - Created an average of two ratios – Value Added/Output & Exports/Output, then rank from highest to lowest
Value Added results of an additional $1M in sales by top 20 of the top 35 Sectors

Top 20 Sectors, by Value Added Effects

- Nursery & floriculture production
- Vegetable & melon farming
- Support activities for agriculture & forestry
- Fruit farming
- Animal production, except cattle & poultry & eggs
- Other accommodations
- Hotels & motels, including casino hotels
- All other crop farming
- Commercial logging
- Mining & quarrying stone
- Grain farming
- Packaging machinery manufacturing
- Turbine & turbine generator set units manufacturing
- Machine shops
- Farm machinery & equipment manufacturing
- Other industrial machinery manufacturing
- Other concrete product manufacturing
- Wood kitchen cabinet & countertop manufacturing
- Dairy cattle & milk production
- Wood container & pallet manufacturing
Summarizing results from Value Added criterion

• Breakdown by super-sectors
  – Agriculture: 8
  – Natural resources: 2
  – Manufacturing: 8
  – Tourism: 2

• Most sectors employ few, with 2 notable exceptions
  – Average of all sectors = 265
  – 17 sectors < Chelan County average

• Half of the 20 sectors pay more than County average
  – Usually a higher share is the case for top-ranked sectors by Value Add.
  – “Next 15” much higher
Value Added results of an additional $1M in sales by remainder of the top 35 Sectors

Top Sectors 21-35, by Value Added Effects

- All other converted paper product manufacturing
- Poultry & egg production
- Sporting & athletic goods manufacturing
- Nonferrous metal foundries
- Handtool manufacturing
- Material handling equipment manufacturing
- Plate work & fabricated structural product manufacturing
- Electronic connector manufacturing
- Other fabricated metal manufacturing
- Cattle ranching & farming
- Polystyrene foam product manufacturing
- Pharmaceutical preparation manufacturing
- Frozen food manufacturing
- Aluminum product manufacturing from purchased aluminum
Jobs results of an additional $1M in sales by top 35 sectors

Top 20 Sectors by Jobs Effects

Grain farming
Animal production, except cattle & poultry & eggs
Support activities for agriculture & forestry
Nursery & floriculture production
Vegetable & melon farming
Cattle ranching & farming
Dairy cattle & milk production
All other crop farming
Fruit farming
Other accommodations
Commercial logging
Hotels & motels, including casino hotels
Wood kitchen cabinet & countertop manufacturing
Wood container & pallet manufacturing
Machine shops
Textile bag & canvas mills
Other concrete product manufacturing
Poultry & egg production
Handtool manufacturing
Sporting & athletic goods manufacturing
Summarizing results for Jobs criterion

• Breakdown by super-sectors
  – Agriculture: 10
  – Natural Resource: 1
  – Manufacturing: 7
  – Tourism: 2

• Caveat about ag jobs – lots of part-time

• Same small size of most sectors

• 12 sectors pay < County average
Jobs results of an additional $1M in sales by top 35 sectors

Top Sectors 21-35, by Jobs Effects

<table>
<thead>
<tr>
<th>Sector</th>
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</thead>
<tbody>
<tr>
<td>Mining &amp; quarrying stone</td>
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<tr>
<td>Packaging machinery manufacturing</td>
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<td>Plate work &amp; fabricated structural product manufacturing</td>
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</tr>
</tbody>
</table>
Do “sweet spots” exist?

- Jobs
- Both
- Value Added
Yes...15 sectors are shared among top 20 for each criterion

<table>
<thead>
<tr>
<th>Top Sector only for Labor Impacts</th>
<th>Shared Top Sectors</th>
<th>Top Sector only for Value Added Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle ranching</td>
<td>Nursery &amp; floriculture production</td>
<td>Mining &amp; quarrying stone</td>
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<tr>
<td>Textile bags &amp; canvas mills</td>
<td>Vegetable farming</td>
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<tr>
<td>Handtool manufacturing</td>
<td>Fruit farming</td>
<td>units manufacturing</td>
</tr>
<tr>
<td>Sporting &amp; athletic goods</td>
<td>Animal production except cattle, poultry &amp; eggs</td>
<td>Other industrial machinery manufacturing</td>
</tr>
<tr>
<td>manufacturing</td>
<td></td>
<td></td>
</tr>
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<td>Other accommodations</td>
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<td>manufacturing</td>
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</table>
An elevated view – common super sectors between the Jobs & Value Added criteria

<table>
<thead>
<tr>
<th>Super Sector</th>
<th>Number of sectors in common</th>
<th>Number of sectors that are separate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Forestry</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Mining</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Tourism</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>
Compare to cluster results – 4 of 18 sectors are shared

- Crop production
- Agriculture & forestry support activities
- Primary metal manufacturing
- Beverage & product manufacturing
- Merchant wholesalers, non-durable goods
- Accommodations
- Warehousing & storage
- Miscellaneous store retailers
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- Sports, hobby, music instrument, book stores
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- Motor vehicle & parts dealers
- Ambulatory health care services
- Furniture & home furnishings stores
- Amusements, gambling, and recreation
- Food & beverage stores
- Hospitals*

Values:
- Crop production: 39.44
- Agriculture & forestry support activities
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Caveats

- Surprise entrants, not necessarily based on existing industries, could happen -- pharmaceuticals preparation plant

- Assumes that every sector can easily expand output by $1M
  - Easy for some sectors; not so perhaps for the very smallest

- Does not look at the demand for these products – simply assumes that every sector on the final list of 35 could experience an increase

- Some of the top sectors are largely inputs to others => would not develop a strategy around them
On balance......

- Scenario analysis; not a forecast

- I/O approach offers a comprehensive look at Chelan County economy & is based on “what is”

- Results differ from and preferred to cluster analysis

- There are actually few trade-offs between a strategy based on jobs & one based on enlarging the size of the county economy

- Perhaps some surprises about particular industries?
Thank You!

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