Five Ways Economic Diversity Can Help You Monitor Regional Transformation

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Project Origins: *Economic Diversity in Appalachia*

- Appalachian Regional Commission funded
- **Lead research organizations**
  - University of Illinois at Urbana-Champaign’s Regional Economics Applications Laboratory
  - Center for Regional Economic Competitiveness
- **Supporting organizations**
  - RUPRI Center for Rural Entrepreneurship
  - EntreWorks Consulting
- **Web tool and reports**
  - [http://economicdiversityinappalachia.creconline.org/](http://economicdiversityinappalachia.creconline.org/)
Illustrating the “staple trap”

- Commodity Price
  - Low
  - High

- Urgency of Need
  - High
  - Low

- Resources for Action
  - Low
  - High

- Trapped & Anxious
- Captive & Happy
Operationalizing economic diversity

• Entropy measure of diversity

\[ ENTR = \sum_{i=1}^{k} (p_i) \ln \left( \frac{1}{p_i} \right) \]

There are \( i=1 \) to \( k \) categories and \( p_i \) is the share of employment in the \( i \)th category.

• Economically diverse places have:
  
  – Employment in more categories
  
  – More evenly distributed employment across categories

*Data source: Employment by county and industry, EMSI*
Five Ways to Consider Diversity

1. *What* a Place Makes

2. *How* a Place Makes Goods & Services

3. *What Role* a Place Plays in its Region

4. Spreading or Specializing?

5. Barometer of Change
What a Place Makes – Industry Diversity

Level of industry-based employment diversity in U.S. counties, 2014

Data Source: Estimated wage and salary county employment by industry, Economic Modeling Specialists International (EMSI), 2014.

Notes: 1. 8-digit NAICS aggregation used for Entropy measure 2. Entropy measures categorized based on distance from mean value as measured by standard deviations (Z)
What a Place Makes – Industry Function Diversity

- Ag. & resource extraction
- Manufacturing
  - Capital-intensive
  - Engineering-intensive
- Corporate mgmt./admin.
- Distributive services
- FIRE
- Government
- Healthcare
- Higher Education
- Knowledge-intensive business services
- Media, entertainment, rec.
How a Place Makes – Occupation & Knowledge Cluster Diversity

• Occupations
  – 96 minor occupational groupings per BLS

• Knowledge Clusters
  – 12 occupation groups “based on similarities in the type and level of knowledge required”
    • Agricultural & life sciences
    • Arts, entertainment & spectator sports
    • Construction & specialized mechanical
    • Education, counseling & therapy
    • Engineering, architecture & natural resource science
    • Information technology & communications
    • Legal, clerical & administrative
    • Management & finance
    • Medical science & health services
    • Semi-skilled service
    • Skilled, semi-skilled labor & machine operation
    • Transportation, distribution, law enforcement & safety
What Role a Place Plays in its Region

- Most counties lose more commuters than they gain
- Commuters flow toward diversity
- Specializations in regional centers play outsized role
Spreading or Specializing?
Unrelated and Related Variety

- Some evidence that:
  - Diversity across sectors (unrelated variety) “dampens unemployment growth”
  - Diversity within sectors (related variety) “enhance[s] employment growth”

(Frenken, Van Oort, & Verburg, 2007)
Barometer of change

- Value does not necessarily indicate quality
  - High not good; Low not bad

- Significant, short-run changes in diversity tend to indicate rapid employment losses and gains
  - Diversity can represent “what’s left behind”

- Standing on diversity metrics can focus future analysis and diagnosis
Accessing economic diversity data

Latest (2014) data planned for launch to C2ER members

Use the State and County filters to explore economic diversity characteristics and find out where certain industries concentrate in the US. You can select up to 4 counties.
### Accessing economic diversity data

<table>
<thead>
<tr>
<th>Diversity Index</th>
<th>Baldwin County AL</th>
<th>Hartford County CT</th>
<th>Baker County GA</th>
<th>Adams County CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry Diversity</td>
<td>High (87th Percentile)</td>
<td>High (98th Percentile)</td>
<td>Low (5th Percentile)</td>
<td>High (97th Percentile)</td>
</tr>
<tr>
<td>Function Diversity</td>
<td>High (99th Percentile)</td>
<td>High (96th Percentile)</td>
<td>Low (6th Percentile)</td>
<td>Above Average (55th Percentile)</td>
</tr>
<tr>
<td>Occupation Diversity</td>
<td>Below Average (22nd Percentile)</td>
<td>High (83rd Percentile)</td>
<td>Below Average (18th Percentile)</td>
<td>Below Average (45th Percentile)</td>
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<tr>
<td>Knowledge Cluster Diversity</td>
<td>Low (8th Percentile)</td>
<td>Above Average (84th Percentile)</td>
<td>High (97th Percentile)</td>
<td>Above Average (77th Percentile)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Industry Function Employment</th>
<th>Baldwin County AL</th>
<th>Hartford County CT</th>
<th>Baker County GA</th>
<th>Adams County CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture &amp; Natural Resource Extraction</td>
<td>1.592</td>
<td>1.941</td>
<td>163</td>
<td>2,331</td>
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<tr>
<td>Corporate Management &amp; Administration</td>
<td>379</td>
<td>10,816</td>
<td>0</td>
<td>1,426</td>
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<tr>
<td>Distributive Services</td>
<td>3,482</td>
<td>40,558</td>
<td>18</td>
<td>31,393</td>
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<tr>
<td>Finance, Insurance &amp; Real Estate</td>
<td>3,254</td>
<td>60,056</td>
<td>35</td>
<td>5,593</td>
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<tr>
<td>Government</td>
<td>1.146</td>
<td>25,796</td>
<td>15</td>
<td>2,513</td>
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<tr>
<td>Health care</td>
<td>2,706</td>
<td>32,092</td>
<td>1</td>
<td>16,794</td>
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<tr>
<td>Higher education</td>
<td>1,468</td>
<td>14,330</td>
<td>0</td>
<td>8,541</td>
</tr>
<tr>
<td>Knowledge-Intensive Business Services</td>
<td>2,024</td>
<td>31,705</td>
<td>86</td>
<td>5,753</td>
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<tr>
<td>Capital-Intensive Manufacturing</td>
<td>2,280</td>
<td>20,723</td>
<td>2</td>
<td>8,470</td>
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<tr>
<td>Media, Entertainment &amp; Recreation</td>
<td>1,561</td>
<td>15,420</td>
<td>2</td>
<td>2,641</td>
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<tr>
<td>Engineering-Intensive Manufacturing</td>
<td>1,206</td>
<td>26,422</td>
<td>15</td>
<td>3,529</td>
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</table>

<table>
<thead>
<tr>
<th>Occupational Knowledge Cluster Employment</th>
<th>Baldwin County AL</th>
<th>Hartford County CT</th>
<th>Baker County GA</th>
<th>Adams County CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management &amp; finance</td>
<td>10,967</td>
<td>84,305</td>
<td>96</td>
<td>26,896</td>
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<tr>
<td>Legal, clerical &amp; administrative</td>
<td>11,926</td>
<td>92,589</td>
<td>95</td>
<td>29,424</td>
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<td>Information technology &amp; communications</td>
<td>1,289</td>
<td>24,799</td>
<td>23</td>
<td>5,481</td>
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<td>Transportation, distribution, law enforcement &amp; safety</td>
<td>3,304</td>
<td>24,367</td>
<td>38</td>
<td>17,018</td>
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<td>Semi-skilled service</td>
<td>20,494</td>
<td>112,731</td>
<td>66</td>
<td>40,462</td>
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<tr>
<td>Arts, entertainment &amp; spectator sports</td>
<td>269</td>
<td>2,768</td>
<td>7</td>
<td>543</td>
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<tr>
<td>Education, counseling &amp; therapy</td>
<td>3,195</td>
<td>31,973</td>
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<td>8,378</td>
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<td>Medical science &amp; health services</td>
<td>4,466</td>
<td>38,744</td>
<td>23</td>
<td>10,312</td>
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<tr>
<td>Agricultural &amp; life sciences</td>
<td>518</td>
<td>3,062</td>
<td>15</td>
<td>1,222</td>
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<tr>
<td>Engineering, architecture &amp; natural resource science</td>
<td>1,334</td>
<td>15,363</td>
<td>35</td>
<td>5,483</td>
</tr>
<tr>
<td>Skilled, semi-skilled labor &amp; machine operation</td>
<td>10,252</td>
<td>67,894</td>
<td>141</td>
<td>30,299</td>
</tr>
<tr>
<td>Construction &amp; specialized mechanical</td>
<td>4,888</td>
<td>31,967</td>
<td>28</td>
<td>18,825</td>
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</tbody>
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Identifying similar counties

<table>
<thead>
<tr>
<th>County Characteristics</th>
<th>Baldwin County AL</th>
<th>Hartford County CT</th>
<th>Baker County GA</th>
<th>Adams County CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015 Estimate</td>
<td>200,111</td>
<td>897,985</td>
<td>3,255</td>
<td>480,718</td>
</tr>
<tr>
<td>Annual Growth 2010-2015</td>
<td>2.34%</td>
<td>0.03%</td>
<td>-0.69%</td>
<td>2.06%</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015 Total</td>
<td>74,302</td>
<td>541,821</td>
<td>604</td>
<td>198,873</td>
</tr>
<tr>
<td>Annual Growth 2010-2015</td>
<td>2.31%</td>
<td>0.98%</td>
<td>-0.71%</td>
<td>4.7%</td>
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<tr>
<td>Average Earnings 2015</td>
<td>$38,122</td>
<td>$73,622</td>
<td>$40,093</td>
<td>$54,167</td>
</tr>
</tbody>
</table>

Similar Counties

- **Baldwin County AL**
  - Kootenai County ID
  - Brunswick County NC
  - Houston County AL
  - Lauderdale County AL

- **Hartford County CT**
  - Muscogee County GA
  - Polk County IA
  - Shelby County AL
  - Duval County FL

- **Baker County GA**
  - Hall County TX
  - Pulaski County IL
  - Klickitat County WA
  - Mellette County SD

- **Adams County CO**
  - Gaston County NC
  - Atlantic County NJ
  - Anderson County SC
  - Lexington County SC

Similarity determined on the basis of income, income sources, industry earnings, population, geographic area and context, and educational attainment and poverty rates.
Questions?

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