Factors of Economic Development

A force multiplier:

\[
\text{Innovation} = \text{Labor} + \text{Capital} + \text{Land}
\]

Priority 1:

- Eliminate cap & sunset on Job Dev. Inv. Grant

Priority 2:

- Expand funding to EDPNC & establish closing fund to help compete for high-impact projects

Priority 3:

- Fund & activate NCDOC Site Infrastructure Dev. Fund

NCEDA Priorities

Best approach: mixed portfolio strategy using traditional factors and innovation!

- Acs & Audretsch, 1987
- Acs, Audretsch, & Feldman, 1994
- Antonelli, 2003
- Armanios, Lanahan, & Yu, 2017
- Arrow, 1962
- Bartik, 1990
- Baumol, 2010
- Baumol, 1968
- Baumol, Litan, & Schramm, 2009
- Davis, Haltiwanger, & Schuh, 1996
- Edmiston, 2007
- Edmiston, 2004
- Krugman, 1995
- Plosila, 2004
- Rebelo, 1991
- Romer, 1990
- Romer, 1986
- Schumpeter, 1942
- Veblen, 1899

What is Innovation?

- **Innovation**: something new that adds value; or, the creation & adoption of new products, services, and business models to add value

- Innovation comes primarily (but not solely) from:
  - **science** (systematic knowledge)
  - **technology** (practical/creative application of knowledge)

- Between one-third to one-half of **economic growth** in U.S. is attributed to innovation (Source: U.S. Department of Commerce 2012)

- Innovation has big (5x) **multiplier effect** (across sectors & skill levels)
  - Due to **higher wages & higher growth**, primarily from **traded sectors**
  - e.g., If Inmar adds a Data Scientist job in Winston-Salem → more jobs for waiters, landscapers, store clerks, painters, etc., but not vice-versa
High-tech wages are twice as high as all-industries wages
High-tech wages are increasing faster than all-industries wages

Innovation occurs most efficiently and effectively in a vibrant, healthy innovation ecosystem
What’s an Innovation Ecosystem?

Traditional Factors

Ultimate Goal

Industrial Sites Infrastructure

Environment & Infrastructure Recruitment & Retention Industry Mix

Innovation Ideas/Innovation

Innovation Organizations

Economic Well-Being & Quality of Life

Research & Development

• Funding
• Policies
• Facilities & Equipment
• Researchers
• Culture & Goals of Research & Development Organizations

Commercialization

• Funding
• Policies
• Facilities & Equipment
• Industry Training
• Culture & Goals of Commercialization Organizations

Education & Workforce

• Funding
• Policies
• Facilities & Equipment
• Researchers
• Culture & Goals of Education/Training Organizations

Environment & Infrastructure

Industrial Sites Infrastructure

Recruitment & Retention Industry Mix

Which Factors Matter Most for Economic Prosperity?

Which factors have largest impact on three economic well-being variables:

• Per capita GDP
• Per capita personal income
• Average annual pay

Using SAS Visual Statistics, we found three factors statistically significant for predicting changes in economic well-being variables across all U.S. states:

• Proportion of workers in high-tech industries
• Proportion of workers in science & engineering occupations
• Proportion of population with post-secondary educational attainment

Available at: www.nccommerce.com/sti

2017 Index to be released later this month
What’s an Innovation Ecosystem?

Traditional Factors

- Funding
- Policies
- Facilities & Equipment
- Industry-University Nexus
- Culture & Goals of Commercialization Organizations

Research & Development
- Funding
- Policies
- Restaurants
- Evaluation & Results of Research & Development Organizations

Commercialization
- Funding
- Policies
- Industry-University Nexus
- Cultivate & Improve of Commercialization Organizations

Education & Workforce
- Funding
- Policies
- Facilities & Equipment
- Researchers
- Culture & Goals of Research & Development Organizations

Economic Well-Being & Quality of Life

Industry Mix
- Employment in High-Tech Employment Establishments as a Percentage of Total Employment, All U.S. States, 2012

- High-tech employment is a minority of all employment
- NC ranks below U.S. average in high-tech employment
- Need to increase high-tech employment in NC.

U.S. Average = 12.1%
NC Rank = 22

Recruitment & Retention

- High-tech employment very concentrated in N.C.
- Only three N.C. counties above U.S. average in high-tech employment
- Need to deepen existing pockets and broaden innovation capacities across state

U.S. Average = 12.1%
### Innovation-Based is from Different from (but complimentary to) Traditional Economic Development

<table>
<thead>
<tr>
<th>Areas of Difference</th>
<th>Traditional Economic Development</th>
<th>Innovation-Based Economic Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor/Workforce Needs</td>
<td>Skilled and/or highly-skilled labor (traditionally unskilled)</td>
<td>Highly-skilled labor</td>
</tr>
<tr>
<td>Capital (Machinery/Equipment &amp; Financial Needs)</td>
<td>Big business, venture capital, expansion capital</td>
<td>Small business, venture capital, seed/early-stage capital</td>
</tr>
<tr>
<td>Land/Resources Needs</td>
<td>Real estate, infrastructure, energy, utilities</td>
<td>Research parks, free or co-working space, accelerators &amp; incubators</td>
</tr>
<tr>
<td>Costs of Doing Business</td>
<td>Tax breaks (costs in future)</td>
<td>Grants (costs today)</td>
</tr>
<tr>
<td>Gains of Doing Business</td>
<td>New companies &amp; jobs (now)</td>
<td>New companies &amp; higher-productivity jobs (over time)</td>
</tr>
<tr>
<td>Shortfalls of Doing Business</td>
<td>Success is costly</td>
<td>Small firms lose big firms!</td>
</tr>
<tr>
<td>Primary Activities</td>
<td>Recruiting, retaining, expanding</td>
<td>Mentoring, connecting, championing</td>
</tr>
<tr>
<td>Strengths</td>
<td>&quot;Smokestack chasing&quot;</td>
<td>&quot;Gazelles,&quot; &quot;Unicorns&quot;</td>
</tr>
<tr>
<td>Weaknesses</td>
<td>&quot;Big-visor&quot; or &quot;Pishing winners&quot;</td>
<td></td>
</tr>
</tbody>
</table>

### Examples of Innovative ED Activities in NC

<table>
<thead>
<tr>
<th>Sector/Industry</th>
<th>Mountain</th>
<th>Piedmont</th>
<th>Coast</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotech</td>
<td>eBots!</td>
<td>BeBot</td>
<td>eBot</td>
</tr>
<tr>
<td>Materials/Engineering</td>
<td>v3i Design, Inc.</td>
<td>3TECH</td>
<td>3TECH, Inc.</td>
</tr>
<tr>
<td>Energy/Green</td>
<td>b3 Energy</td>
<td>eBots!</td>
<td>eBots!</td>
</tr>
<tr>
<td>Tech</td>
<td>v3i Design, Inc.</td>
<td>3TECH</td>
<td>3TECH, Inc.</td>
</tr>
<tr>
<td>Agriculture/Food</td>
<td>x2 Venture</td>
<td>eBots!</td>
<td>eBots!</td>
</tr>
<tr>
<td>E-ship &amp; Innovation</td>
<td>Accelerators &amp; Incubators</td>
<td>eBots!</td>
<td>eBots!</td>
</tr>
<tr>
<td>Support Organizations</td>
<td>NC State Small Business Program</td>
<td>NC Green Business Fund</td>
<td>NC Green Business Fund</td>
</tr>
<tr>
<td>Universities</td>
<td>Community Innovation Fund</td>
<td>NC Biotech Center Grant and Loan Programs</td>
<td>NC Biotech Center Grant and Loan Programs</td>
</tr>
<tr>
<td>Statewide Funds (Examples)</td>
<td>NC Green Business Fund</td>
<td>NC Green Business Fund</td>
<td>NC Green Business Fund</td>
</tr>
</tbody>
</table>

### References