The Importance of Innovation and Entrepreneurship

- Innovation drives the economy, the innovator is the entrepreneur (Schumpeter 1911)
- Ample work on entrepreneurship’s contribution to national growth
  – But what about regional and rural growth?
The Importance of Innovation and Entrepreneurship

• Entrepreneurs are innovative users of regional assets
• What is the link between innovation and entrepreneurship in rural America?

Innovation → E’ship → Prosperity?
Innovation + E’ship → Prosperity?
Agglomeration + Luck → Prosperity???

Relevant Literature

• Schumpeter (1911) predicts entrepreneurs will lead to economic growth
• Larger firms replacing smaller, has negative effect on innovation and entrepreneurship (Schumpeter 1942)
• Entrepreneurial opportunity higher in urban areas-thicker markets, lower fixed costs (Shane 2003)
Relevant Literature

• Acs: 2 competing theories
  – Diversity; density not necessary
  – Agglomeration, specialization; density enhances innovation and e’ship

• Knowledge Spillover Theory of Entrepreneurship: e’ship provides mechanism for knowledge spillovers to grow economy (Acs and Armington 2006)
  – Focus on supply side: aligns with Schumpeter, regions, infrastructure, and knowledge

Relevant Literature

• E’ship Supply (knowledge, opportunity) and Demand (backward linkages)
  – Intensity of e’ship determined regionally (Casson 2005)
  – Which determines rate of e’ship will vary regionally

• Rural e’ship and innovation not studied as much
  – Less patents per capita than metro (Lobo and Strumsky 2006)
  – Our measure of e’ship has positive impact on factors of production in the rural US (Thompsen et al. 2006)
Framing the Question

- If we adopt the agglomeration idea
  - E’ship and innov are higher in urban areas
- E’ship supply must sit in a framework which controls for population
- Supply side factors needed for entrepreneurship to create growth
  - Market opportunities-thick markets, people
  - Financial capital-availability of financing
  - Next best occupation-opportunity cost of self-employment
  - Infrastructure, amenities-is this a nice place to be and do business?

Research Questions

- Does supply side reasoning hold in rural places?
- Is agglomeration necessary for e’ship and innovation to drive growth?
- How do e’ship and innovation relate to rural employment growth?
Measures of Entrepreneurship

• Breadth calculated as:
  nonfarm proprietors ÷ nonfarm employment
• Proprietor Value calculated as:
  nonfarm proprietor income ÷ nonfarm total income

Entrepreneurship Breadth

- < 20% (Mean)
- 20-27.5% (Mean – Mean + 1 St Dev)
- > 27.5%
Measure of Innovation

- Innovation calculated as:
  - Patents (1990) per capita
- Not a good measure of ‘innovation’

Weight number of patents for their importance?
  ie- incremental patents v. radical patents, # citations
Innovation

Hypotheses

- H1: Innovation and entrepreneurship drive rural employment growth
- H2: Combining innovation and e’ship is the best way to produce rural employment growth
Hypotheses

• H1: Innovation and Entrepreneurship drive rural employment growth
  – Is agglomeration necessary for innov and e’ship to generate growth?

Entrepreneurship and Population

Predicted fit for Breadth05 based on County Population
Entrepreneurship and Population

Predicted Fit for PropValue05 based on Pop05

Hypotheses

• H2: Combining innovation and e’ship is the best way to produce rural employment growth
  – Should rural policy focus on growing the
    • Entrepreneur
    • Innovator
    • Or both?
Patents per Capita and Population

- Patents have a positive relationship with population.

E’ship and Patents per Capita

- Interesting because E’ship Breadth is highest in rural areas.
Interaction Variables & Growth

- Breadth*Innov:
- Proprietor Value*Innov:
  - Each is normalized to one, then multiplied
- Growth measured as employment growth over 1991-2001 business cycle

Expected Results

- H1: Growth = (+) innov or (+) e’ship
- H2: E’ship/Innov interaction (+) relationship with growth
Control Variables

Agglomeration
  • Population

Human capital/Knowledge
  • Recast Creative Class, McGranahan and Wojan 2007

Natural amenities
  • Distance to National Park

Financial capital
  • Bank Deposits per Capita

Infrastructure
  • None, difficulty with 1990 measure

Empirical Model

• Hausman test detects simultaneity in model
  – 2SLS to reduce the problem
  – I.V. choice is problematic
  – Also: how to control for spatial dependency within 2SLS framework...
Spatial Dependency

• Controlled for in ‘all counties’ model
  – Queen contiguity weights matrix
  – LM error and LM lag tests significant
  – Robust LM-lag test significant for all models
    • We use spatial lag model

• No good solution for rural counties

H 1: Growth=E’ship or Innov
H2: Growth = Breadth, PatPC, Interaction

H2: Growth = PropVal, PatPC, Interaction
Conclusion

• Research Question: Do rural places with higher entrepreneurship and innovation have higher growth?
  – Positive relationship exits
    • E’ship → Growth
    • Results of interaction inconclusive
  – Results dependent upon definition of e’ship and innovation

Conclusion

• Little difference b/w all & rural counties
  – Agglomeration not necessary to create employment growth from entrepreneurship
• Human Capital is strongest (+) control variable
  – Suggests that knowledge is important, not necessarily agglomeration
Weaknesses of Analysis

• Methodological difficulties
  – Endogeneity
  – Instrumental Variables
  – Measures of Innovation
    • Not capturing what I'd hope it would