

# Rural Development: Some Emerging Research Possibilities at ERS

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One can count the number of seeds in  
an apple, but not the number of apples  
in a seed...



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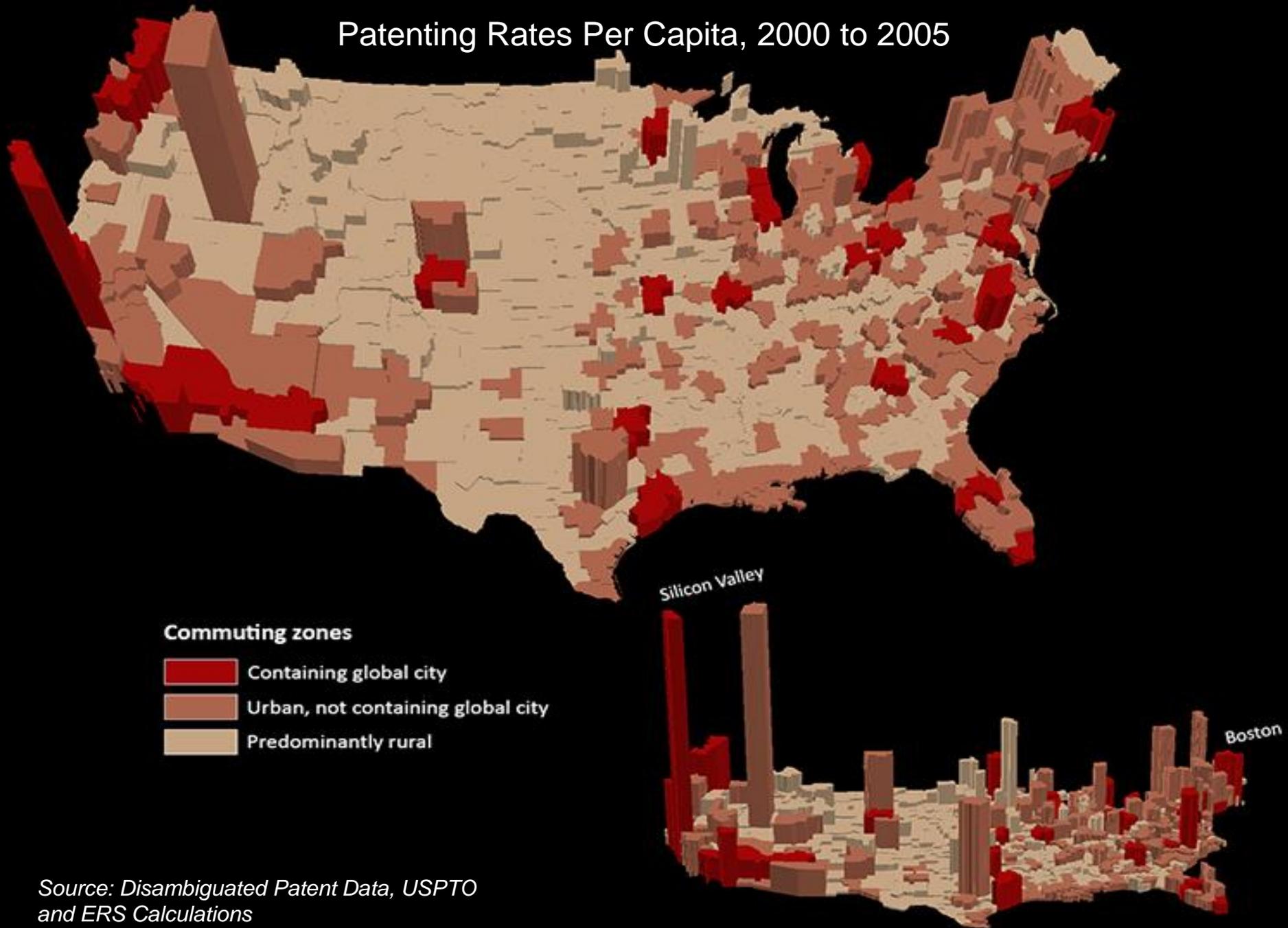
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# The Case Against “Rural Innovation” Being a Thing...

- Rural concentration of less educated individuals—less innovative capacity
- Rural concentration of lower-skilled, lower paid, more routine industries—product cycle: new ideas start in cities then filter down
- Rural patenting rates are very low—few hard statistics we have on innovation suggest a largely urban phenomenon



# Patenting Rates Per Capita, 2000 to 2005



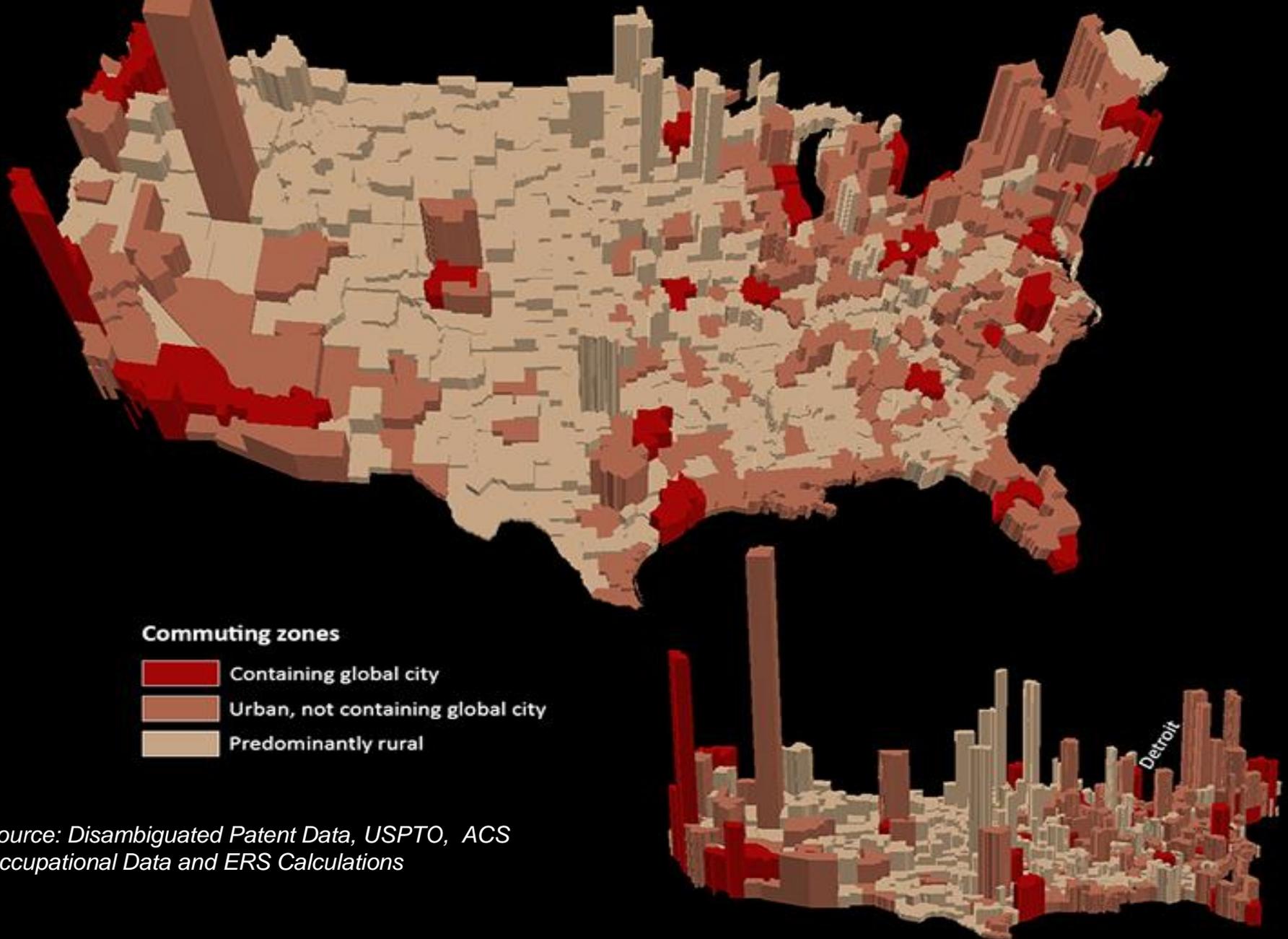
Source: Disambiguated Patent Data, USPTO and ERS Calculations

## ...Suffers from the Ecological Fallacy

- Nature of individuals are deduced from the group to which those individuals belong.
- Rural patenting productivity reduced by larger share of population outside the “innovation economy”
- What if instead we computed patenting rates on individuals who might plausibly contribute to patenting?



# Patenting Rates Per Inventive Class Member, 2000 to 2005



# What about Grassroots Innovation that Doesn't Leave a Paper Trail?

- Could we just ask firms: Are you innovative?
- Or, Have you introduced a new product or service in the last 3 years?
- The European Union has been doing this for more than 20 years, but with mixed results



# Problems with Innovation Data Generated by EU CIS

- North & Smallbone: 49% of rural mfg. firms self-reported as innovative, but expert evaluation of “innovations” only identified 24% of firms as “highly innovative.”
- 2007 Commerce Dept. Advisory Committee on Measuring Innovation in the 21st Century Economy: “Detailed innovation surveys such as the European Community’s Community Innovation Survey ... are very costly and have encountered both definitional and response rate problems.”



# Distinguishing 3 Types of Innovation

- $I$  = R&D driven, utilizing STEM human resources, leaving intellectual property trail. NSF congressionally mandated to collect these data.
- $i_S$  = substantive innovation of new products, processes or practices, few if any traditional innovation inputs, but leads to favorable market outcomes.
- $i_N$  = nominal innovation, no traditional innovation inputs and has no impact on market outcomes



# Can simple questions elicit innovation markers?

- EU CIS Survey core questions in combination with other observable characteristics
  - New or significantly improved goods, services, processes, logistics, marketing methods.
  - Are innovation investments capital constrained?
  - Acknowledge failed innovation initiatives?
  - Possess intellectual property worth protecting?
  - Does data drive decision-making?



# 2014 ERS Rural Establishment Innovation Survey

- Funded by USDA's Rural Development Mission Area
- First nationally representative self-reported innovation survey for Rural America.
- Oversampled rural establishments but allocated a quarter of the sample to urban establishments for comparison
- Sample size 11,000 for all establishments with 5 or more employees in tradable sectors



# Three Latent Classes Identified:

Class Membership Probabilities	0.2121	0.3237	0.4642
Variable	Substantive Innovators	Non-Innovators	Data Driven Nominal Innovators
Innovation Projects Abandoned and Incomplete	0.395	0.1061	0.1152
Innovation Projects Abandoned or Incomplete	0.3464	0.1373	0.1562
Surplus Funds Used for Innovation			
Not Likely	0.0239	0.497	0.2888
Probably	0.4321	0.3454	0.4946
Definitely	0.544	0.1576	0.2166
Intellectual Property Protection	0.7038	0.1434	0.1278



Source: Rural Establishment Innovation Survey Provisional Data as of 10/1/14

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# Comparing Percent Classified as Substantive Innovators Across Nonmetro and Metro Areas

	Substantive Innovators	Non-Innovators	Data Driven Nominal Innovators
<b>Nonmetro</b>	13.4	39.26	47.34
<b>Metro</b>	22.5	31.24	46.27
<b>Small Establishments</b>			
<b>Nonmetro</b>	8.59	45.81	45.6
<b>Metro</b>	17.31	37.28	45.41
<b>Medium Establishments</b>			
<b>Nonmetro</b>	20.07	26.5	53.43
<b>Metro</b>	28.94	22.55	48.51
<b>Large Establishments</b>			
<b>Nonmetro</b>	47.29	8.14	44.58
<b>Metro</b>	48.09	5.92	45.99
<b>Hi-tech Manufacturing</b>			
<b>Nonmetro</b>	38.32	18.37	43.31
<b>Metro</b>	37.4	22.33	40.27
<b>Hi-tech Services</b>			
<b>Nonmetro</b>	21.82	40.12	38.05
<b>Metro</b>	34.74	29.01	36.25



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# User Entrepreneurship

- New products brought to market that were first developed for own use.
- REIS to provide first estimate of how important user e-ship is to national and rural economy
- Move beyond data to get a much richer understanding of how extension professionals, community college faculty, other change agents can better assist these “accidental entrepreneurs”
- Collect your own anecdotes and questions to bring to NACDEP 2016 for a user entrepreneurship workshop to help us design the qualitative research phase.



It is undeniable that the exercise of a creative power,  
that a free creative activity, is the true function of  
man. It is proved to be so by man's finding in it his  
true happiness.

--Matthew Arnold 1885

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