

Lessons for New Regional Economic Development; Strategy Frameworks and Measurement Systems

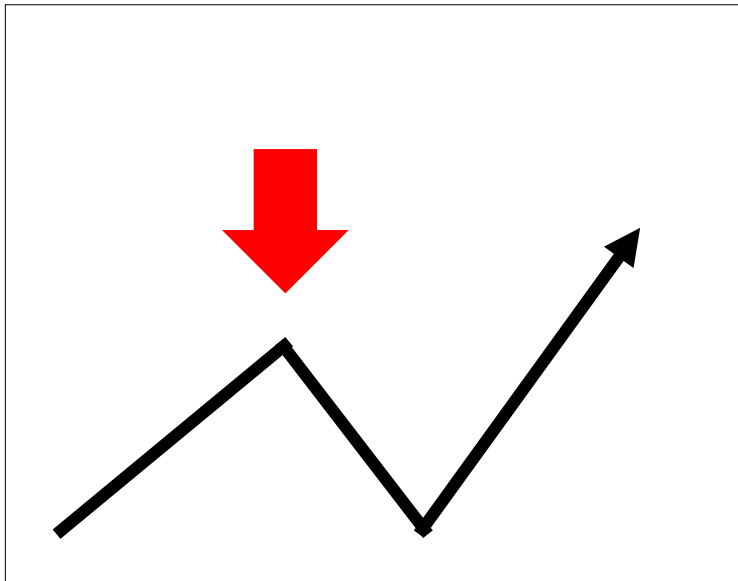
Timothy F. Slaper
Indiana Business Research Center
Indiana University

Contributors to the Regional Economic Development Project

- Economic Research Service – Arts & Design and Innovation
- Indiana University – Regional Risk and Resilience Measures
- Ohio State University
- Pennsylvania State University – Recovery, Rewiring and Resilience
- University of California San Diego – Income Mobility

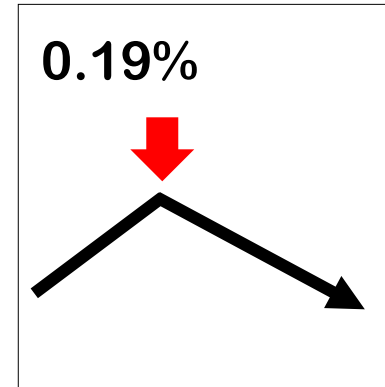
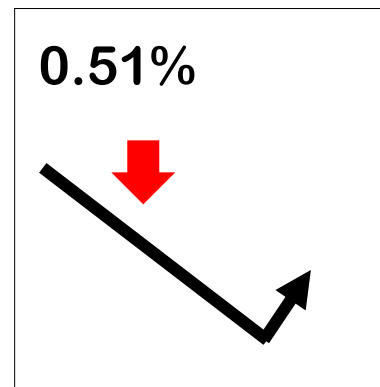
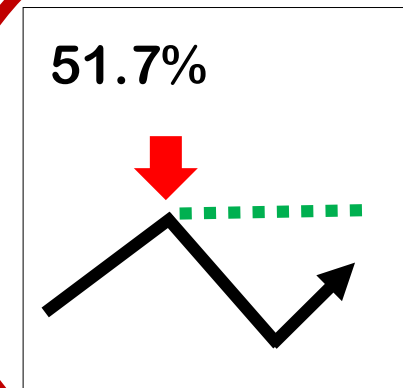
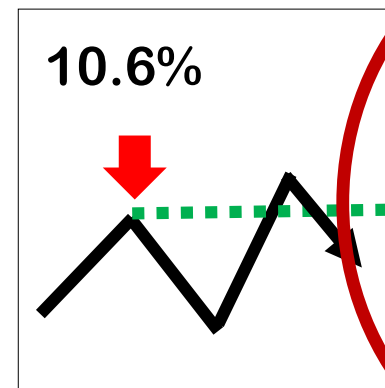
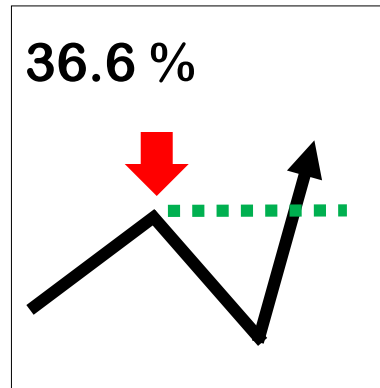
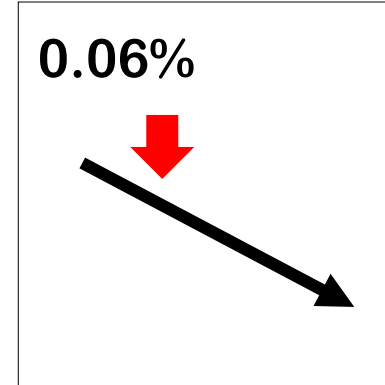
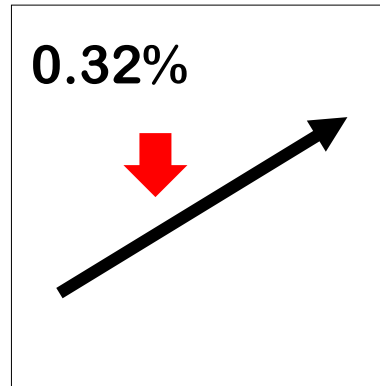
Longer-term response to the Great Recession (global financial crisis), U.S. counties

U.S. in the Aggregate (3,139 counties)



Data source: US Department of Labor Statistics,
Quarterly Census of Employment and Wages, Jan 2000
– June 2017

Analysis: **Stephan J. Goetz** and **Yicheol Han**
Dept. of AESE, NERCRD
Penn State University



Key Topic – Resilience and Rewiring

- PSU examined the economy as a Complex Adaptive System, treating *industries as “actors” influencing one another over time, and in the process changing their behaviors and future interactions*
- Developed alternative empirical potential measures of CAS suitable for statistical analysis as well as new measures that may influence resilience (or economic growth) that have not been used previously

Updated Resilience Results

- PSU updated (from Han and Goetz, 2015), longer-term economic resilience measure, through June 2017
- The network-based centrality measures tend to perform well in the resilience equations
- **Other Research:** augment the original location quotient measure to account for spatial concentration of related industries and spatial spillovers

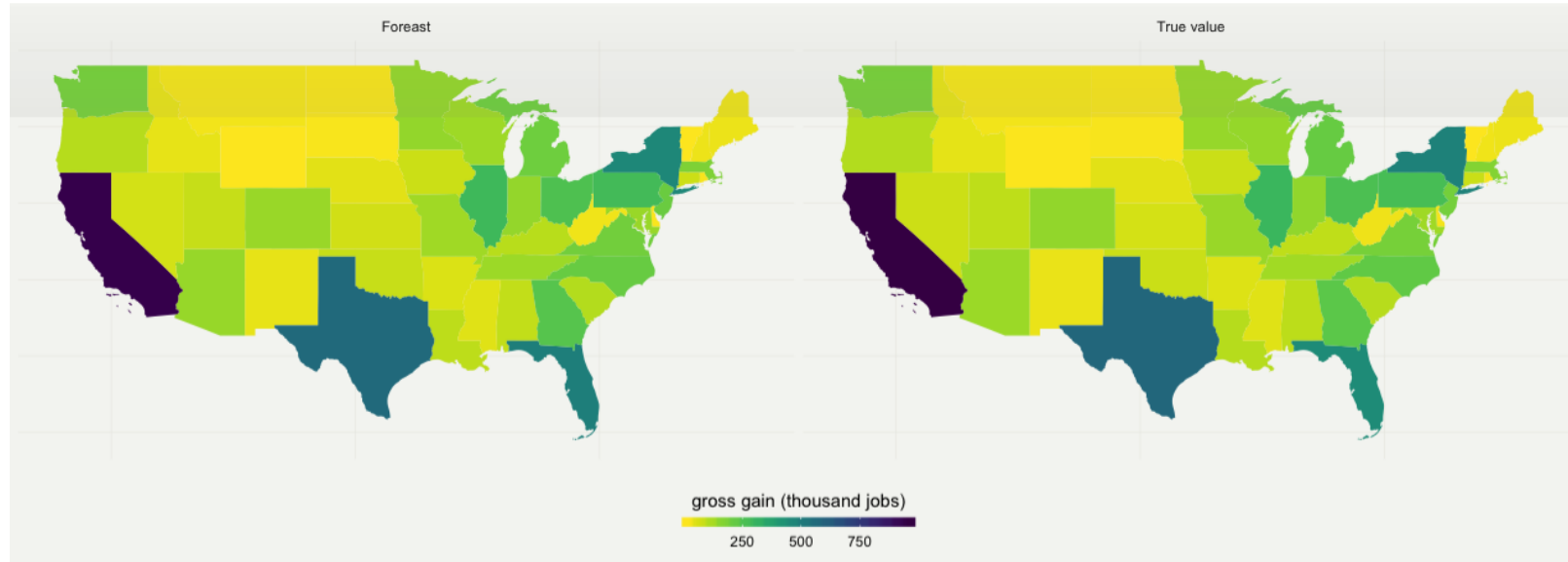


Updated Resilience Results

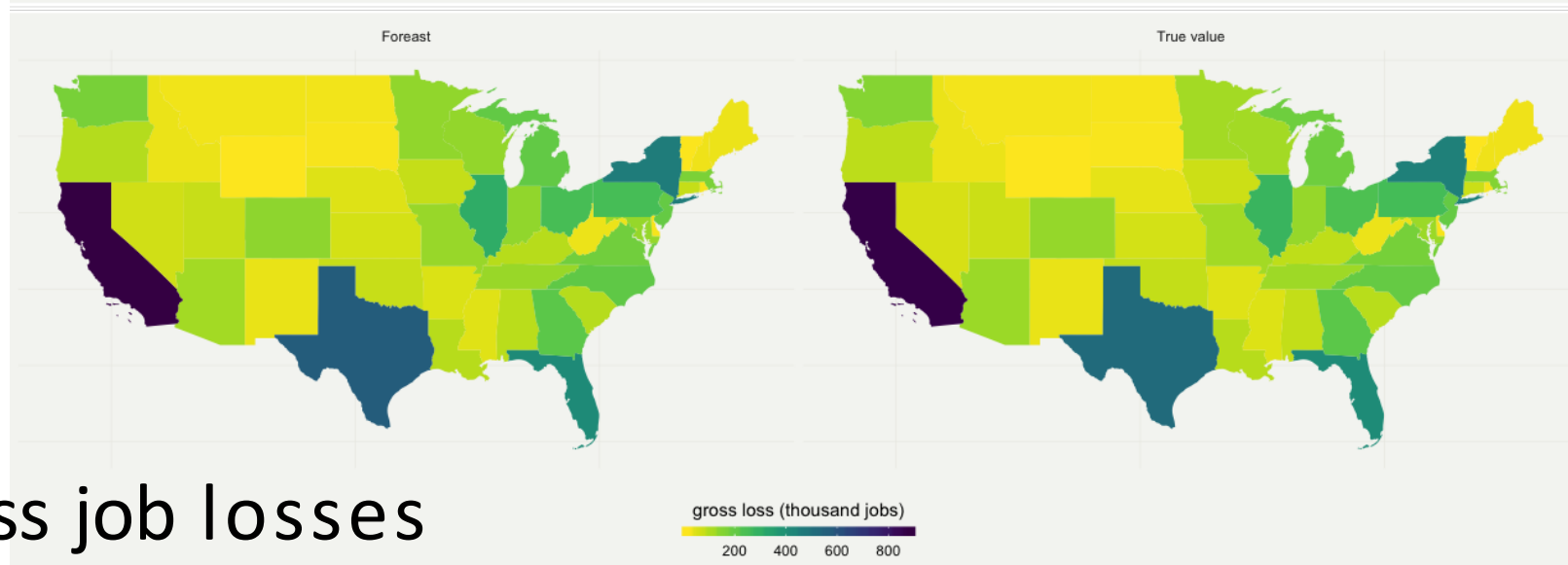
- **Other PSU research:** Compared rewiring across countries using new measures
- These include, at the county-level:
 - Economic centrality
 - Latent innovation
 - Employment reorganization
 - Voluntary organizations
 - Mobility centrality
 - Employment transition and labor mobility over time
 - Industry colocation and agglomeration
- **Other PSU research:** Explore the ability of using **Google Trends** (GT) data to predict economic variables at the state and defined market area (DMA) level in the U.S.
- The main contribution is to use the method of time series least angle regression (TS-LARS) to implement variable selection
 - The economic variables to be forecast are *gross job gains* and *gross job losses* at the state level and *unemployment rate* at the DMA level

Compare forecast and true values

Gross job gains



Gross job losses



What's Art Got to Do with It? Insights from Big Data on the linkage between Local Arts and Innovation

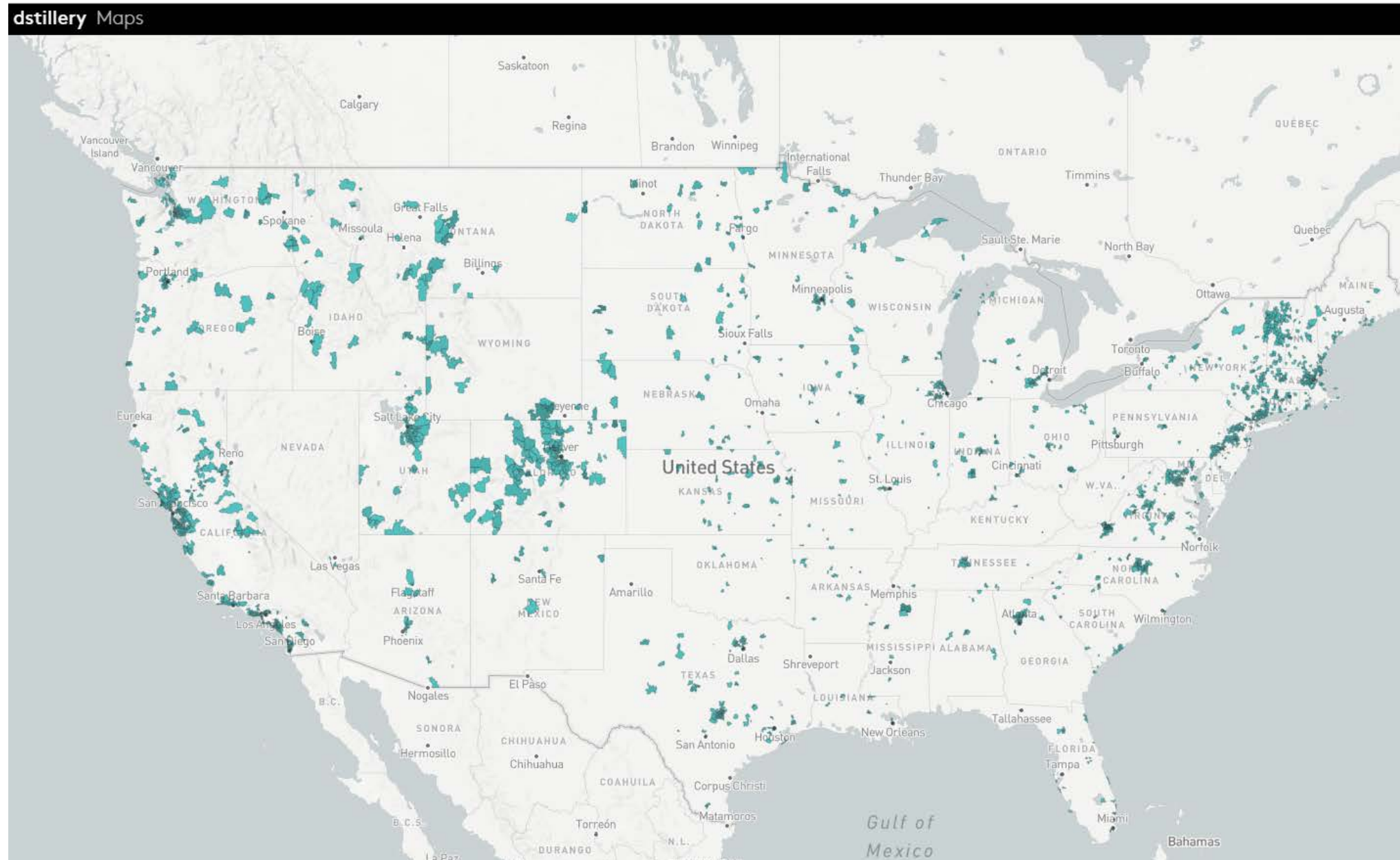
- Measures of Artistic Imagination at the Local Level Pose Significant Challenge
- The American Time Use Survey and the Survey of American Participation in the Arts (NEA) both provide relevant metrics, but too sparse to derive reliable local area estimates
- Proxies for local area “artistic milieu” provided by artist employment share and performing arts organizations in rural counties
- But no confirmation that these proxies are associated with greater artistic imagination of resident population

•Until Now

Are Individuals' Artistic Lives Partially Captured by **Internet Activity?**

- List of websites likely to be visited by individuals pursuing arts avocations provided by Dstillery llc
- Hits on those websites tracked and compiled to identify an Arts Avocation audience
- At zipcode level, the propensity that local residents click on arts avocation sites
- The spatial distribution of artistic imagination of the general public looks like:

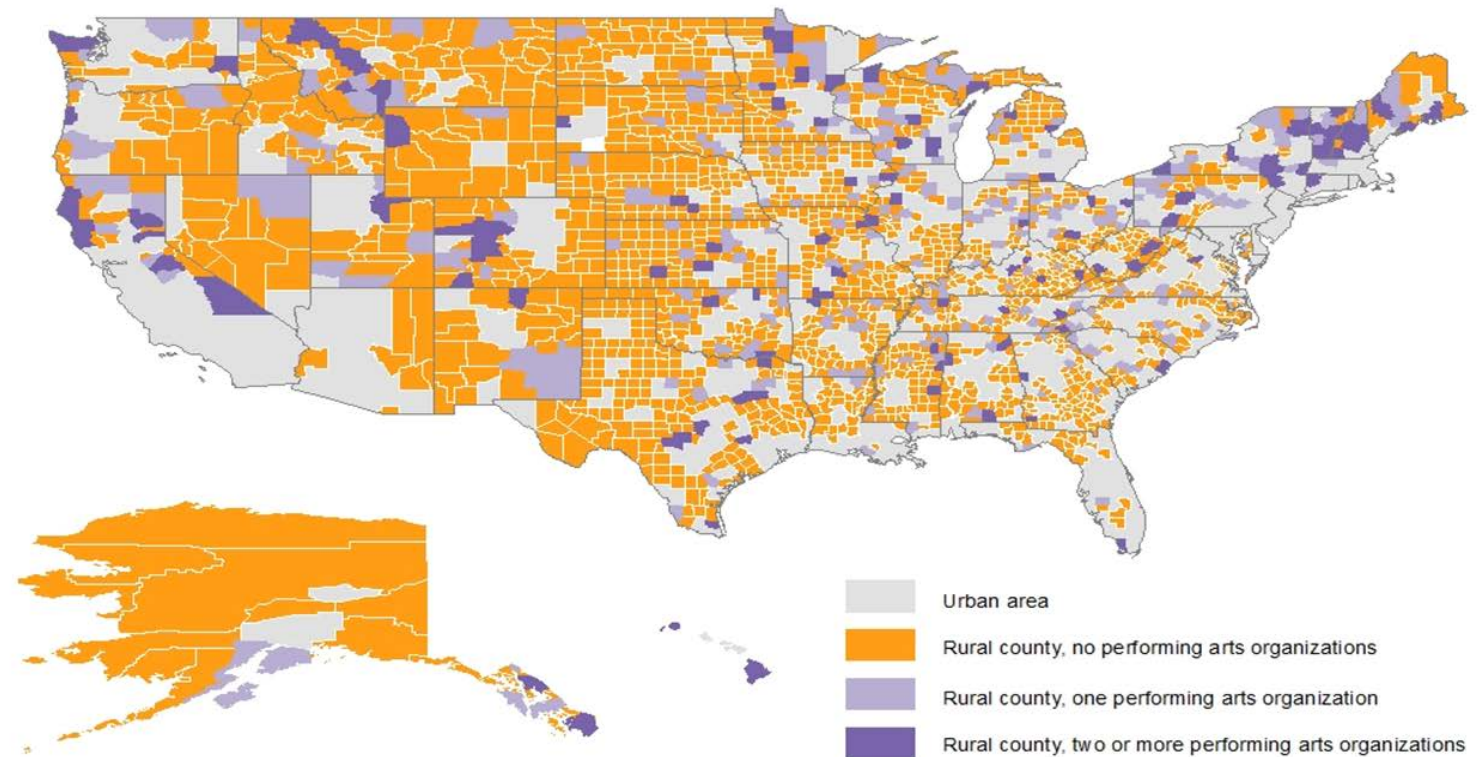
Arts avocation website density by ZIP codes 1.4 times greater than national average



Substituting *artsindex* for performing arts proxy

- Findings from “Design, Innovation, and Rural Creative Places”
- Independent impact of performing arts organizations on design controlling for:
 - Natural amenities
 - Housing costs
 - Educational attainment (25-44 w/ BA+)
 - Presence of 4-year college

Performing Arts Organizations in U.S. Rural Counties: 2014



Ordered Logistic Regression

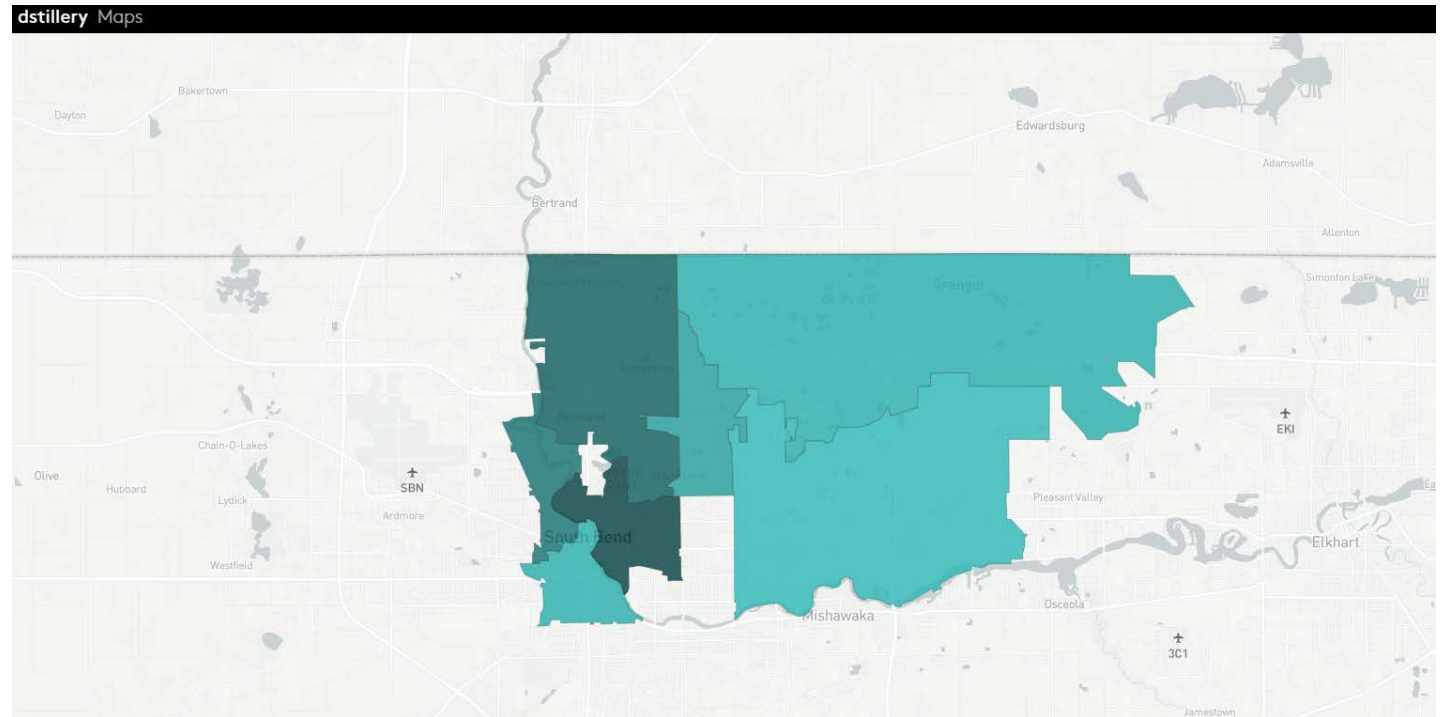
Dependent Variable = 3 Design-Integrated; = 2 Design Last Finish; = 1 No Systematic Design

Variable	Estimate	P-value	Odds Ratio
Intercept DesInt	-16.508	0.7644	
Intercept LastFin	-13.604	0.8049	
Establishment Size	0.0147	<.0001	1.016
Population Density	0.0402	0.0016	1.067
4-Year College	0.1361	<.0001	1.213
College Grads 25-44 %	2.8079	<.0001	24.357
Median Contract Rent	-0.00081	<.0001	0.999
Natural Amenity Scale	0.0403	<.0001	1.053
Performing Arts Organization Dummy	0.3331	<.0001	1.487
N	2,187		
Percent Concordant	71.1		

Variable	Estimate	P-value	Odds Ratio
Intercept DesInt	-18.491	0.8356	
Intercept LastFin	-15.58	0.8612	
Establishment Size	0.0152	<.0001	1.015
Population Density	0.0717	<.0001	1.074
4-Year College	0.0184	0.5646	1.019
College Grads 25-44 %	1.8258	<.0001	6.208
Median Contract Rent	0.00148	<.0001	1.001
Natural Amenity Scale	0.0194	0.0019	1.02
Arts Index	0.2507	0.0017	1.285
N	2,187		
Percent Concordant	72.1		

Other Application of the distillery data:

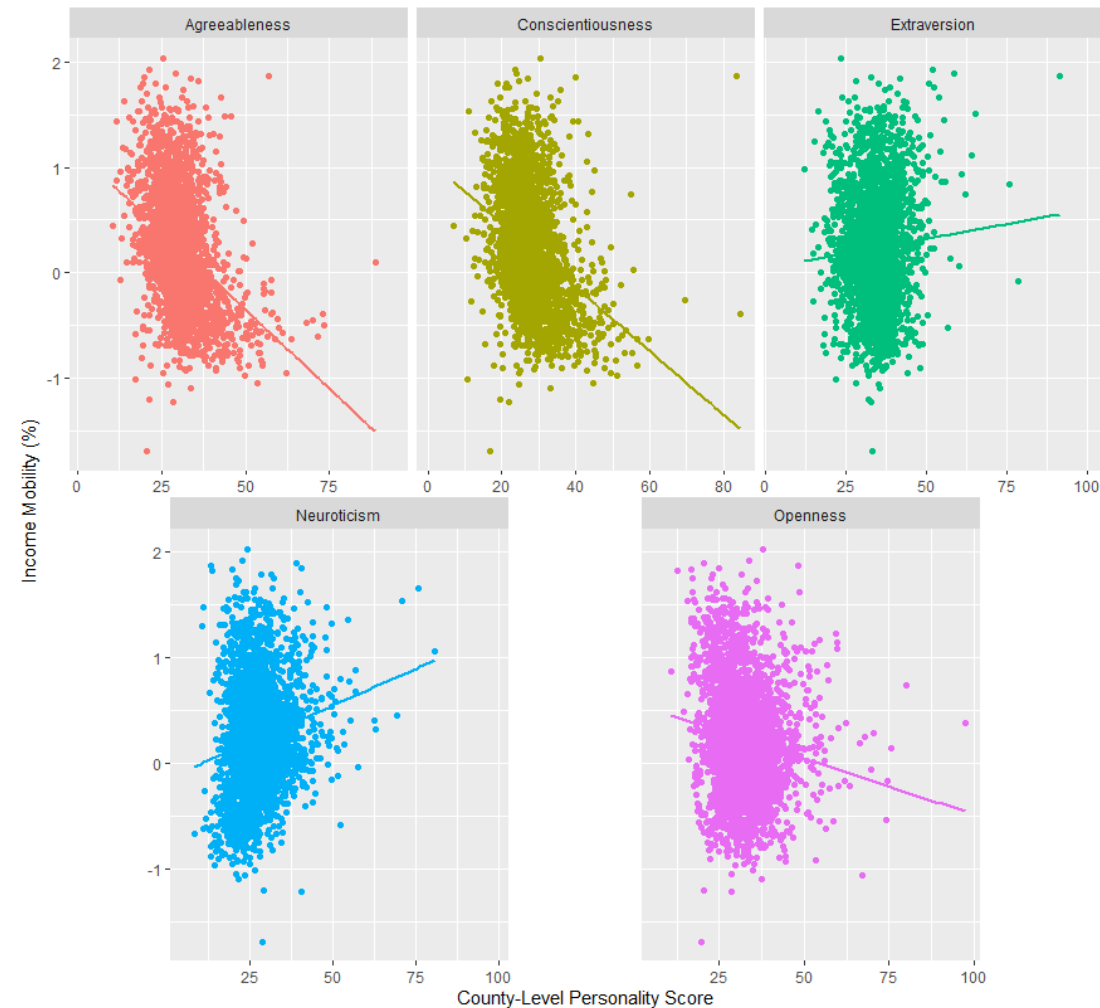
- 1099/gig economy
- Entrepreneurship
- Temporary and seasonal workers
- Logistical activity



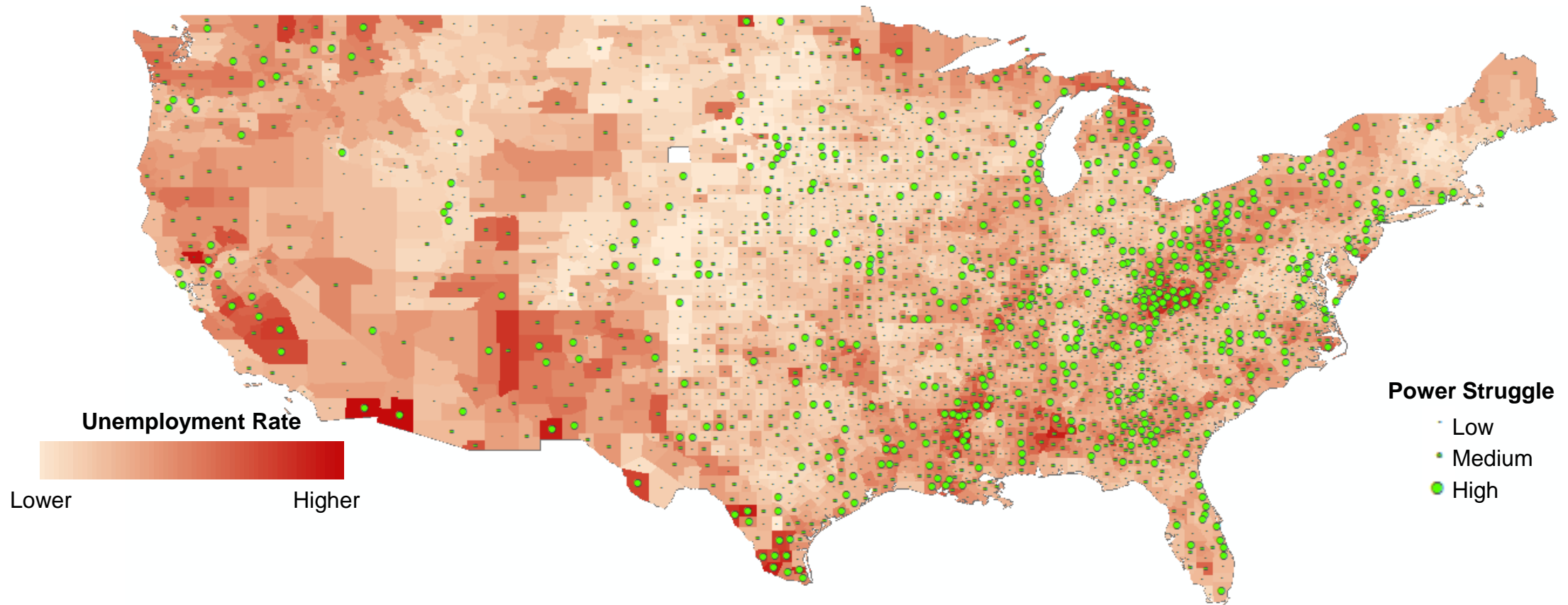
UCSD: Four Preliminary Findings – income mobility

- Counties with higher scores for **gender equality** were more likely to have **better economic outcomes**, including higher individual incomes, lower unemployment rates, and higher income mobility.
- More **extroverted counties** were more likely to have better economic outcomes, whereas counties with more psychosocially agreeable atmospheres tended to **exhibit worse** outcomes.
- Counties with a more **acute sense of power struggles** in America, such as those whose populations are more apt to acknowledge inter-class conflicts, tend to **exhibit worse economic** outcomes.
- Counties with more **belief in science**, as measured by sixteen survey questions on its benefits and opportunities, exhibited **significantly higher levels** of individual incomes and significantly lower rates of unemployment.

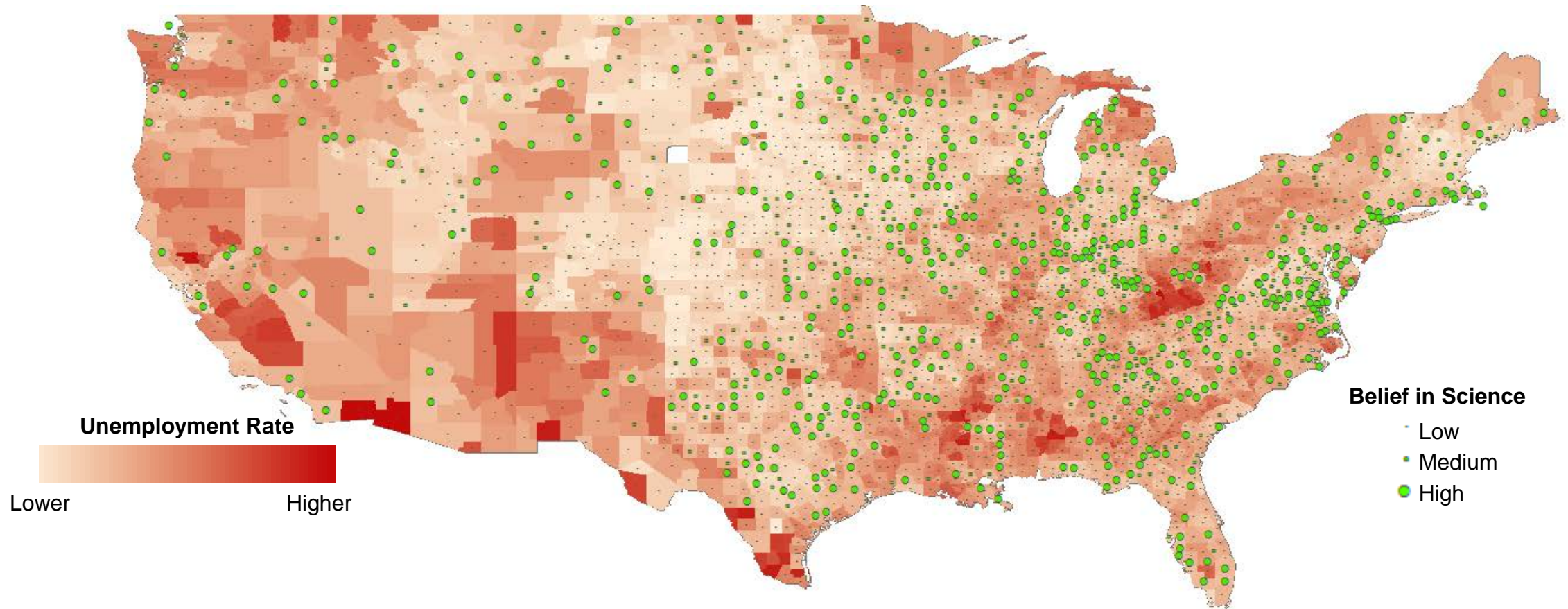
More **extroverted counties** were more likely to have **better economic outcomes**, whereas counties with more *psychosocially agreeable* atmospheres tended to *exhibit worse outcomes*.



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Regional Risk and Resiliency – R3

- Long literature in regional development on the trade off of industry diversity versus “return” measures, as in this case, employment
- Long literature on how to best measure industry diversity
- Specialization => stronger employment growth
- Diversity => greater ability to weather shocks and downturns
- Consider the balanced stock portfolio in contrast to concentration in a couple high-flying stocks
- Would applying a portfolio approach to regional economic development strategy offer any special insights?
- Diversity ≠ Diversification
 - One is a condition/characteristic, the other a strategy

Key Concepts

- Systematic Risk – cannot be diversified away
 - Moves with the market, i.e., how a region moves with the national economy
- Specific Risk – can be diversified away
 - The degree to which region does not move with the nation
- Beta – measure of volatility or amplitude relative to the market
 - 1 : follows market perfectly
 - > 1 : greater amplitude – greater swings – relative to the market
 - < 1 : lesser amplitude – less pronounced economic swings – relative to market
 - Negative: counter cyclical, like the Dollar Store doing well after the GFC

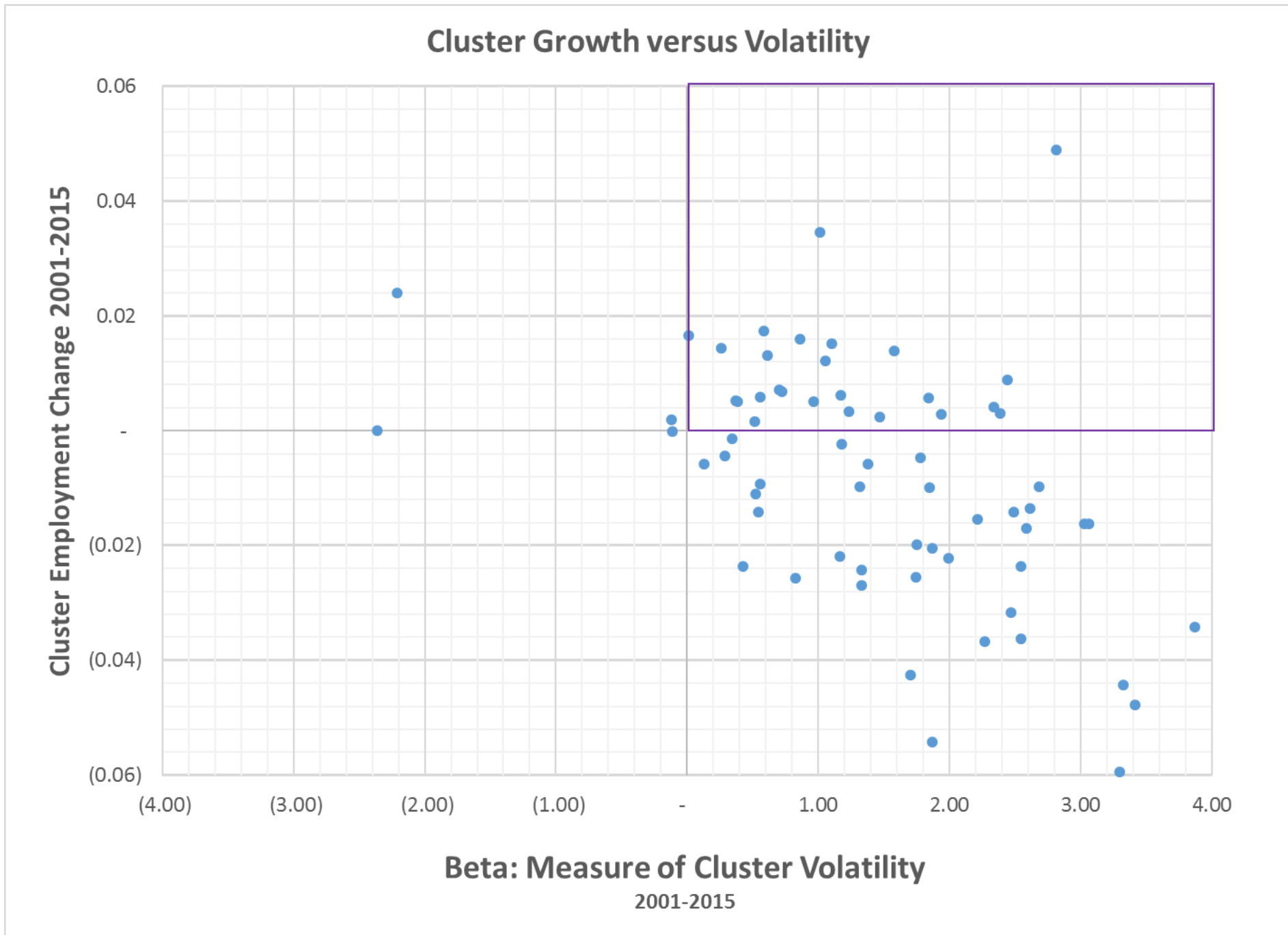
How does this describe industries and regions/counties?

Greatest Amplitude

|

Lowest Amplitude

Cluster Code	Cluster Name	SpRisk	BETA	Pval	Cluster Employ Trend	Cluster Code	Cluster Name	SpRisk	BETA	Pval	Cluster Employ Trend
44	Trailers, Motor Homes, and Appliances	0.72	5.34	0.06	(0.01)	13	Education and Knowledge Creation	0.93	(2.21)	0.37	0.33
31	Metal Mining	0.60	4.17	0.02	0.06	304	Government	0.98	(0.12)	0.64	0.01
4	Automotive	0.28	3.87	0.00	(0.03)	113	Local Education and Training	0.99	(0.11)	0.76	(0.01)
33	Music and Sound Recording	0.94	3.41	0.43	(0.05)	103	Local Health Services	1.00	0.01	0.94	0.19
51	Wood Products	0.21	3.33	0.00	(0.04)	5	Biopharmaceuticals	1.00	0.13	0.86	(0.02)



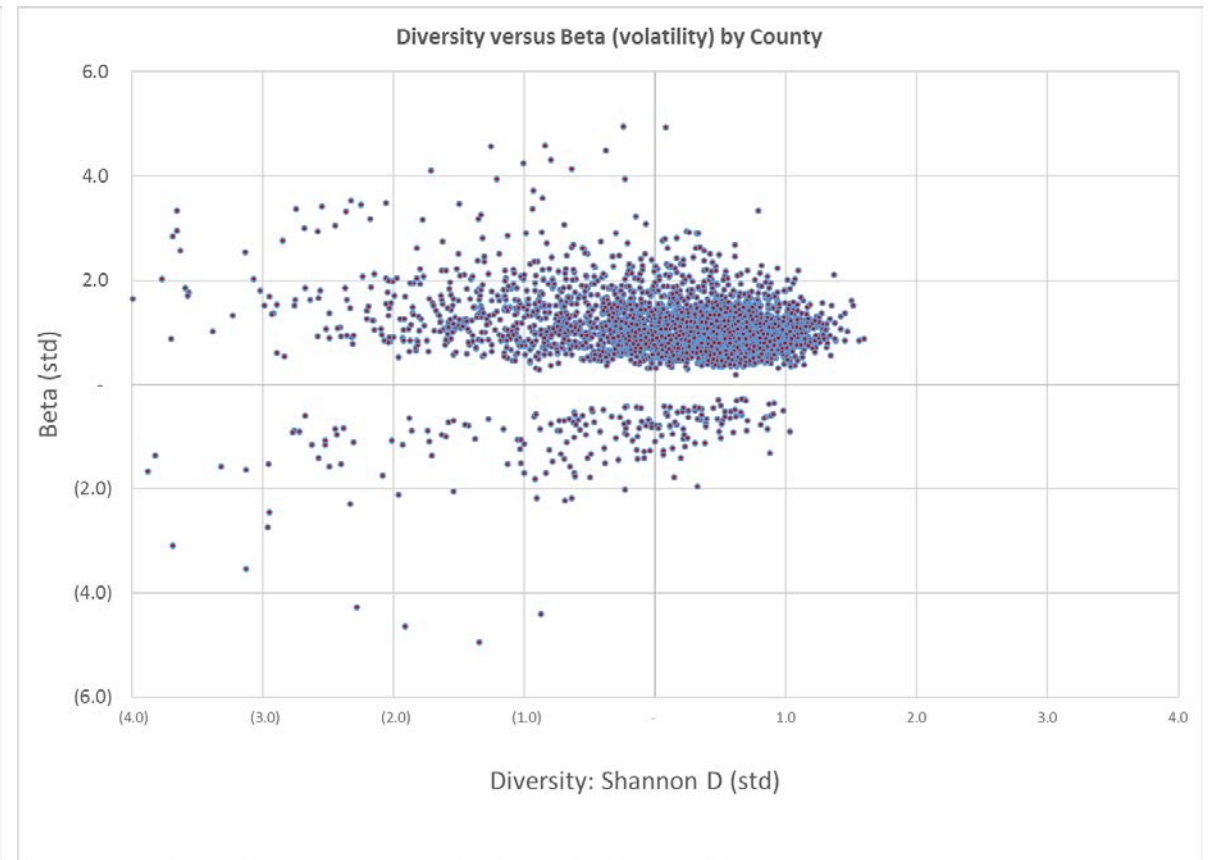
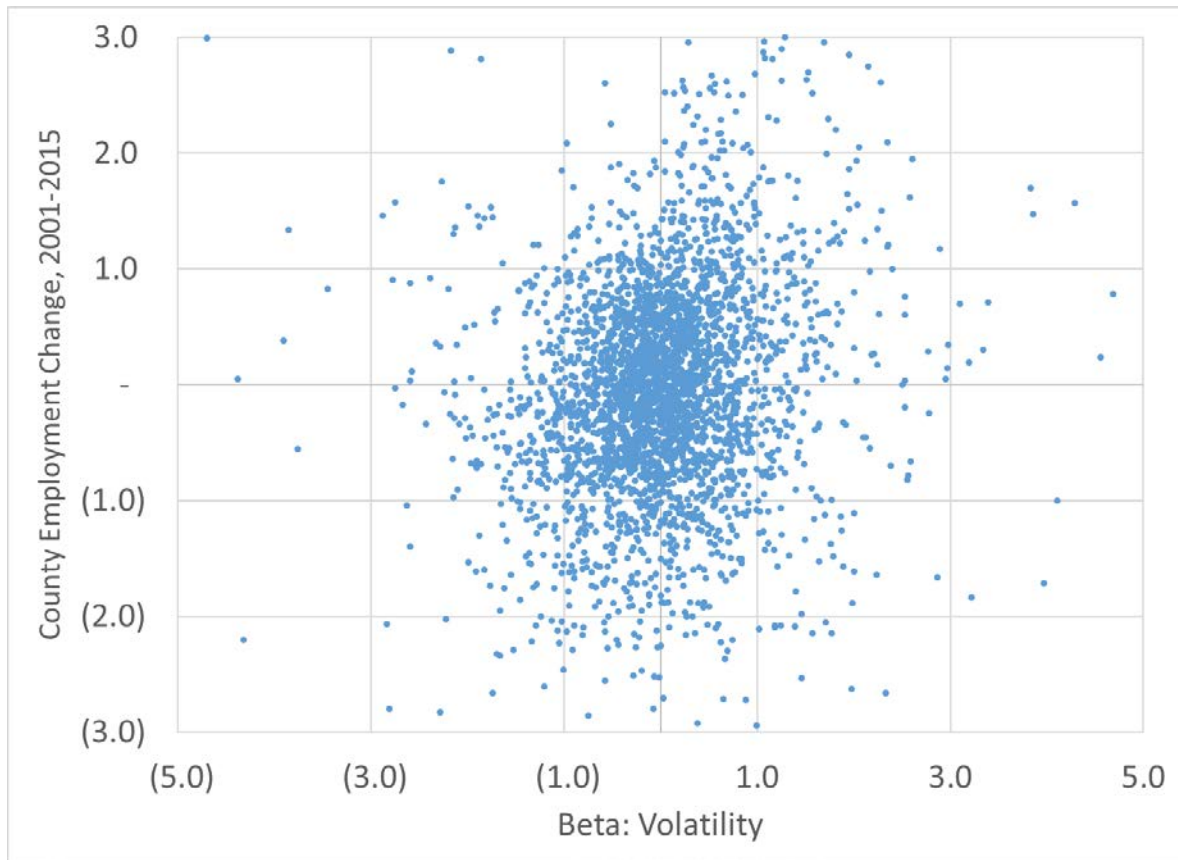
Greatest Amplitude

| Lowest Amplitude

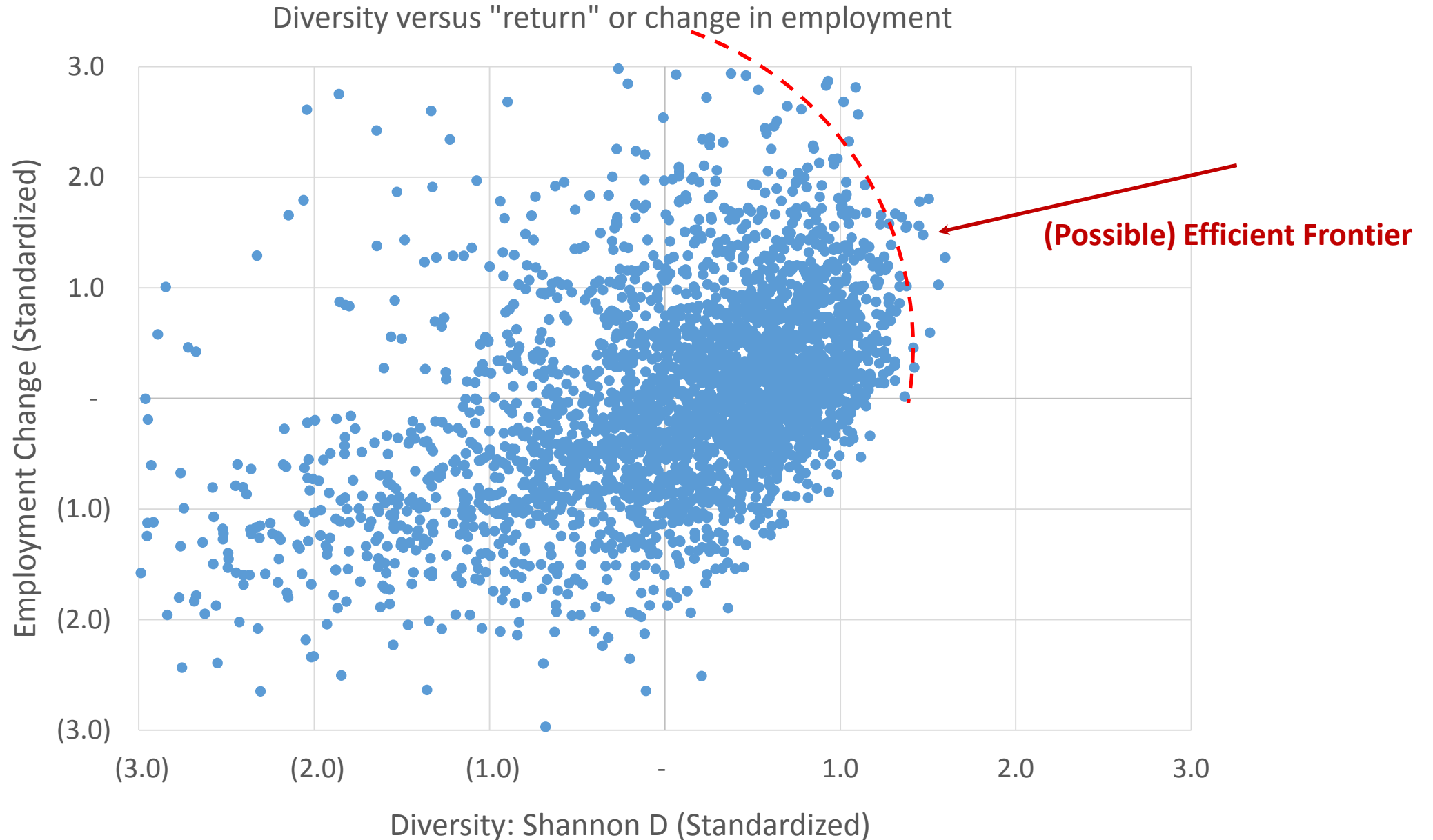
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IN	Elkhart	18039	0.60	2.99
IN	LaGrange	18087	0.63	2.75
IN	Whitley	18183	0.72	2.12
IN	Noble	18113	0.58	1.95
IN	Fountain	18045	0.48	1.91
IN	Howard	18067	0.60	1.91
IN	Scott	18143	0.70	1.90
IN	Bartholomew	18005	0.70	1.86
IN	Jay	18075	0.46	1.75

stabb	countyname	beafips	sys_risk	beta_county
IN	Martin	18101	0.15	(0.92)
IN	Switzerland	18155	0.09	(0.52)
IN	Sullivan	18153	0.00	(0.03)
IN	Harrison	18061	0.01	0.13
IN	Pike	18125	0.01	0.15
IN	Greene	18055	0.01	0.18
IN	Monroe	18105	0.08	0.18
IN	Owen	18119	0.01	0.20
IN	Madison	18095	0.05	0.24

Discernable Patterns Regionally?



If there is a trade off between growth and industry diversity...
then we have possible diversification paths to reduce risk/vulnerability



Historic Performance Is No Guarantee of Future Results

- Many industries are in secular decline
- A diversification strategy to reduce the vulnerability to shocks must be carefully considered
- Account for regional differences in industry performance
 - Auto industry gained employment in Alabama and So. Carolina
- To dampen national economic swings, it is great having a military base or national laboratory...until...
 - And the trick is getting one
- The benefit of the portfolio approach and beta to other volatility measures, such as the standard deviation, is that an industries or company's beta provides information for a diversification strategy