The Post-Recession Resilience of Legacy Regions

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Motivation

- **What**: We model the the relationship between the pre-recession characteristics and post-recession *outcomes* of U.S. metropolitan economies. We apply this model to subsets of the universe—into several "clusters" of MSAs—to identify the heterogeneity in economic resilience across metro areas in the years following the Great Recession.
- **How**: OLS Regression (comparative statics)
- **So What?**: The impact of the recession differed across the various types of metropolitan economies. We want to see what differentiates the performance of "legacy regions" from the performance of other MSAs.

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Legacy Regions

- The *existing* conceptualization of "Legacy Cities" — places where a complex mixture of assets and challenges provide a unique variety of opportunities and hurdles toward urban revitalization

In a previous paper, we:

- Used statistical technique to divide the 354 MSA into homogeneous groups
- Measured a majority of variables at the geographic level of the metropolitan area; legacy cities $\rightarrow$ legacy *regions*

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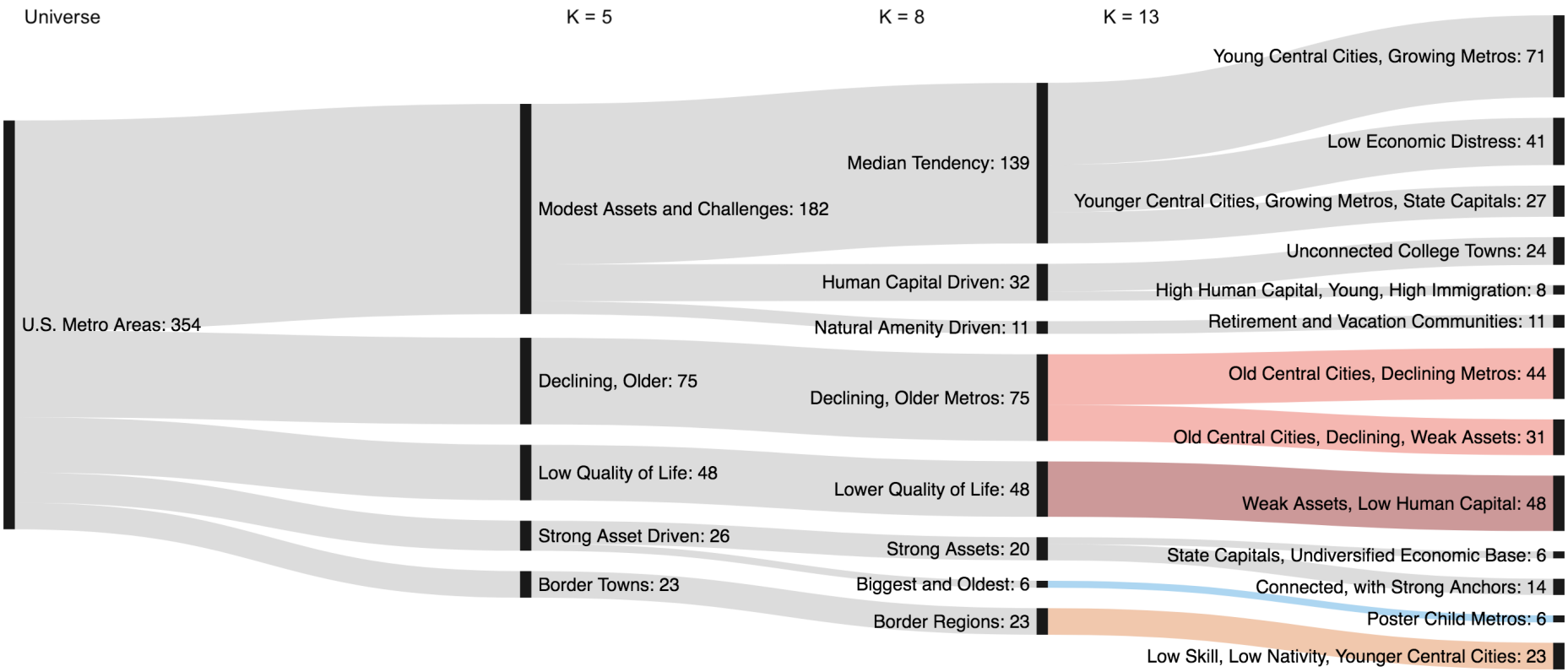
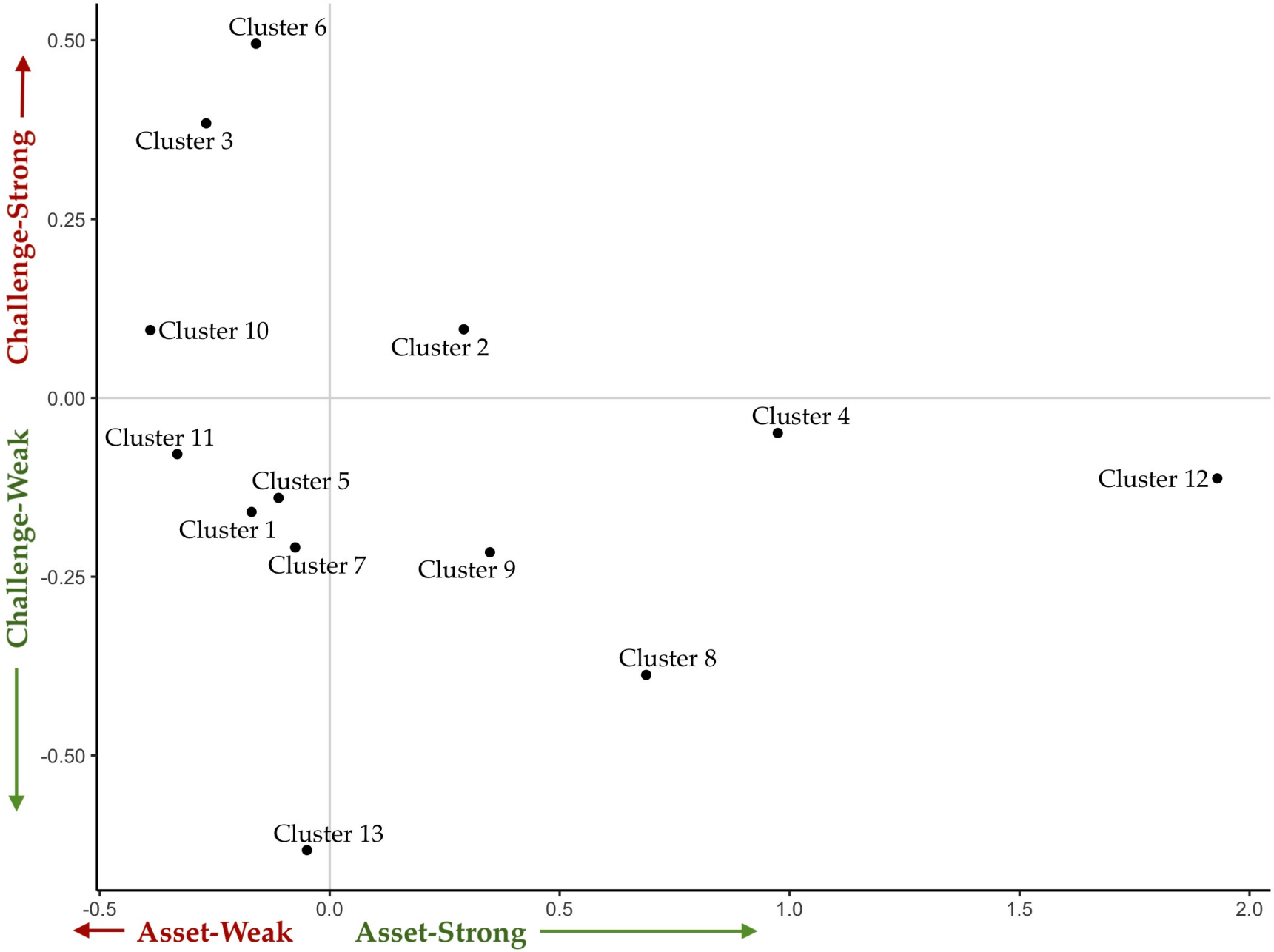
Cluster Tree




Cluster 6
Cluster 3
Cluster 10
Cluster 2
Cluster 4
Cluster 11
Cluster 5
Cluster 12
Cluster 1
Cluster 7
Cluster 9
Cluster 8
Cluster 13
0.50
0.25
0.00
-0.25
-0.50
-0.5
0.0
0.5
1.0
1.5
2.0
Challenge-Strong
Challenge-Weak
Asset-Weak
Asset-Strong

Legacy Regions

So What?

- Popularly branded constructs can become rhetorical tools but are not necessarily public policies; our analysis took some of the "fuzziness" out of the legacy city construct.
- Dividing the universe of 354 MSAs into 13 coherent clusters helps researchers understand meaningful differences between different types of metropolitan economies.
- However, further analysis is required if we are to identify meaningful differences in economic performance.
- We are interested in measuring the degree to which different clusters of MSAs are resilient in the aftermath of a major economic shock

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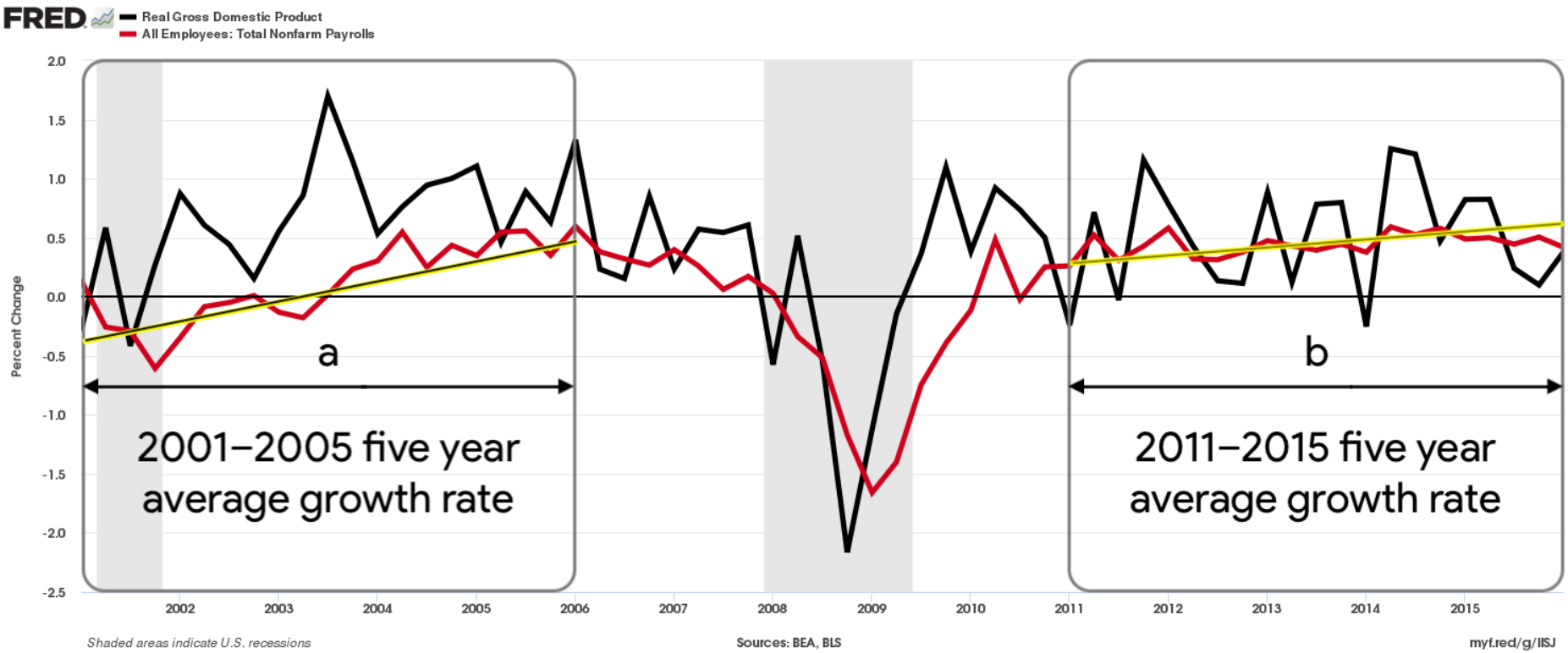
Resilience

Metropolitan Economies in the Aftermath of the Great Recession=

- **Resilience**: the ability of a metropolitan economy to recover successfully from shocks that throw it off its growth path
- Economies can be thrown off their growth paths through cyclical or secular change. Resilience is an indicator that change was not structural.
- Research interest motivated by observing the aftermath of 2007-09 recession. We care about the relationship between pre-recession industry structure and post-recession resilience.

Outcome Variable



Revised outcome variable $= b_i - a_i$ (for MSA i)

Model

Hypotheses

Hypotheses:

- MSAs with heavier reliance on the auto manufacturing, home construction, and financial services industries were associated with less economic resilience
- MSAs with a more diversified economic base were associated with greater economic resilience

- **Universe**: 354 metropolitan areas, subset 13 clusters
- **Analytical Groupings**: True Legacy Regions, Asset-Deficient Legacy Regions, Non-Legacy Regions

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Model

Specification

$$GMP_{it} = \beta_0 + \beta_1 R_{i,t=2005} + \beta_2 P_{i,t=2005} + \beta_3 C_{i,t \leq 2005} + \epsilon_{it}$$

$$EMP_{it} = \beta_0 + \beta_1 R_{i,t=2005} + \beta_2 P_{i,t=2005} + \beta_3 C_{i,t \leq 2005} + \epsilon_{it}$$

- R: Vector of variables associated with triggering the **recession**
- P: Variables associated with the **portfolio** of the economic base
- C: Geographic, demographic, institutional, and structural characteristics **controlled** for in the model
- Both models identical except for outcome variable: employment or gross metropolitan product

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The Event

- Previous paper used ordered logistic regression; not possible with subsets due to loss of statistical power
- Comparative statics approach: new *continuous* outcome variable generated by comparing long-term growth paths of metropolitan economies before and after the recession.

Omits three potentially distorting time frames:

- Housing bubble of 2006-07
- Recession of 2008-09
- Slow recovery year in 2010

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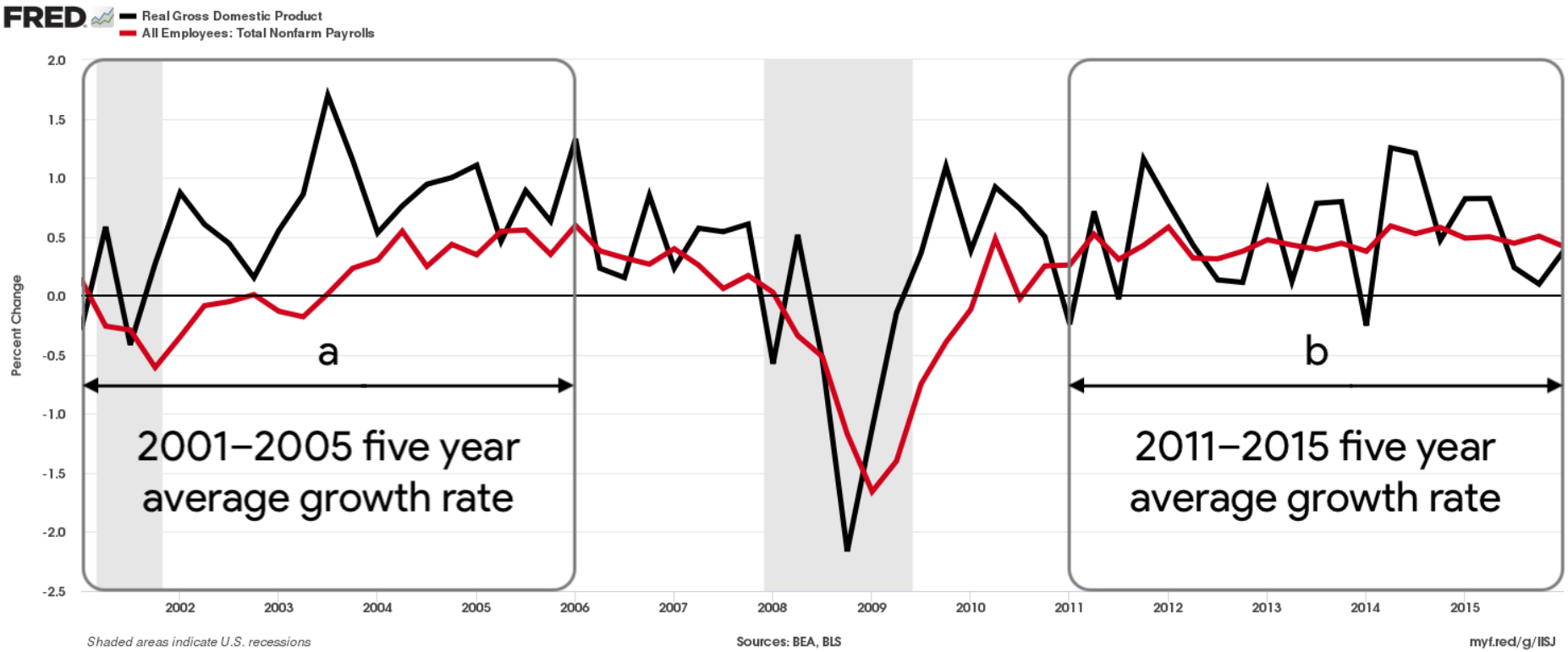
Outcome Variable



Revised outcome variable $= b_i - a_i$ (for MSA i)

Empirical Approach

- Model cannot reliably be applied to clusters with $n < 30$
- Cluster analysis produced groups of relatively homogeneous MSAs, *some* variation is need in order to apply the model (especially for dummy variables).
- We only pay attention to three subsets:
  - Cluster 2 ("true" legacy regions)
  - Cluster 6 (asset-deficient legacy regions)
  - The rest[1] of all U.S. metro areas (non-legacy regions)

[1] Omits the 6 MSAs that make up Cluster 12

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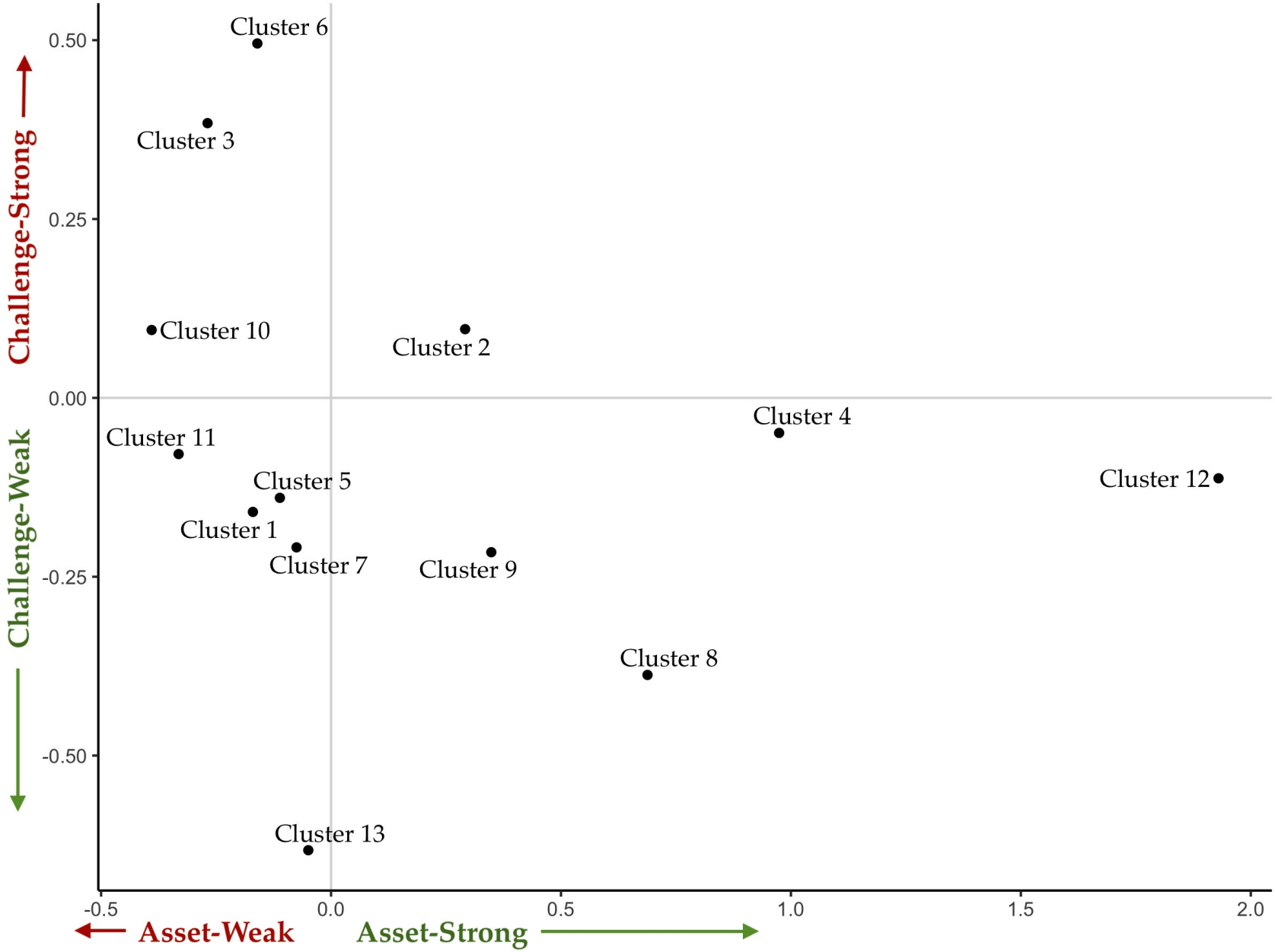
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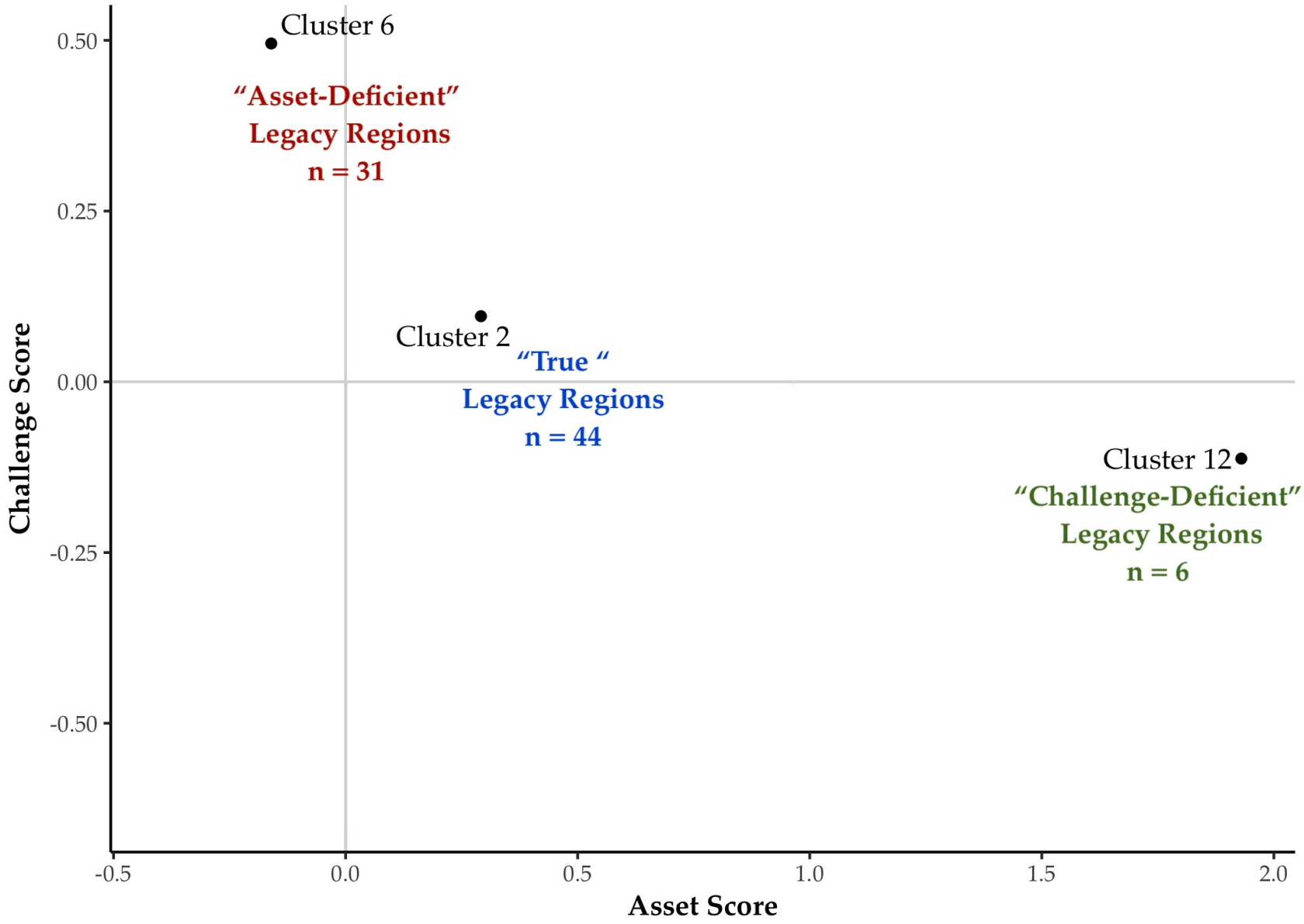
-0.50
-0.5
0.0
0.5
1.0
1.5
2.0
Challenge-Strong
Challenge-Weak
Asset-Weak
Asset-Strong

Clusters in the Model



Data

- Outcome variables (GMP, EMP) from Moodys Analytics
- Industry employment data from Upjohn Institute's Whole Data set
- Control variables from Census/ACS, IPUMS NHGIS, NOAA, BEA, FAA, FDIC, IPEDS, others

$$LQ_i = \frac{e_i \div e}{E_i \div E}$$

- If an industry's LQ ≥ 1.8, it is considered to be in the MSA's base

Data

Key Varibles

Type	Variable
Pre-Recession Reliance	Auto Sector LQ Home Construction LQ Home Construction Emp. Growth Bank HQs
Pre-Recession Concentration	Four Industry Concentration Ratio **or** Base Dominance
Controls	MSA Age Right to Work

Findings

Employment

	Legacy (1)	Legacy, Weak (2)	Non-Legacy (3)	All MSAs (4)
Auto Sector LQ	0.34***	-0.10	0.13***	0.12***
	(0.09)	(0.12)	(0.02)	(0.02)
Home Construction LQ	0.61	-1.92	-0.11	-0.10
	(0.87)	(1.83)	(0.22)	(0.20)
Home Construction Emp. Growth	-0.54	1.72	-2.26***	-2.17***
	(1.04)	(1.68)	(0.41)	(0.37)
Bank HQs	-0.003	-0.04	-0.002	-0.002
	(0.01)	(0.07)	(0.01)	(0.005)
Four Industry Concentration Ratio	-5.83*	-3.45	-2.16**	-2.58***
	(3.28)	(4.44)	(0.97)	(0.87)
MSA Age	0.03	0.06	0.07***	0.04**
	(0.04)	(0.06)	(0.02)	(0.02)
Right to Work	-0.63	-0.02	0.23	0.29**
	(0.53)	(0.89)	(0.16)	(0.13)
Observations	44	31	271	354
Note:	*p<0.1; **p<0.05; ***p<0.01			

Findings

Gross Metropolitan Product

	Legacy (1)	Legacy, Weak (2)	Non-Legacy (3)	All MSAs (4)
Auto Sector LQ	0.35**	-0.23	0.19***	0.17***
	(0.17)	(0.19)	(0.05)	(0.05)
Home Construction LQ	1.61	-0.18	-0.74	-0.62
	(1.65)	(2.93)	(0.47)	(0.42)
Home Construction Emp. Growth	-1.24	2.64	-2.04**	-2.39***
	(1.96)	(2.68)	(0.88)	(0.77)
Bank HQs	-0.002	-0.18	-0.0001	-0.004
	(0.02)	(0.12)	(0.01)	(0.01)
Base Dominance	-2.29	-4.54	2.14	0.89
	(5.96)	(5.91)	(1.58)	(1.40)
MSA Age	0.05	0.11	0.18***	0.11***
	(0.09)	(0.10)	(0.05)	(0.04)
Right to Work	-0.45	-3.89**	-0.33	-0.38
	(1.02)	(1.43)	(0.34)	(0.28)
Observations	44	31	271	354
Note:	*p<0.1; **p<0.05; ***p<0.01			

Conclusion

- The stimulus worked in the 'true' legacy regions. Saved auto industry throughout the country, but not in 'asset-deficient' legacy regions. Finance industry not a factor.
- Higher "bubble' of home construction employment had a strong negative association with resilience *except* in legacy regions (both).
- Right to work: might be biased by homogeneity of cluster subsets, but potential reasoning theoretically makes sense.

Meta Points:

- Inductive description of a "universe" (e.g., metro areas in the U.S.) should be paired with empirical deductive analysis in order to be useful.
- Distinction between MSAs (i.e., clustering) provides clarity in accounting for heterogeneity in the associations between pre-recession characteristics and post-recession outcomes

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Thank you!

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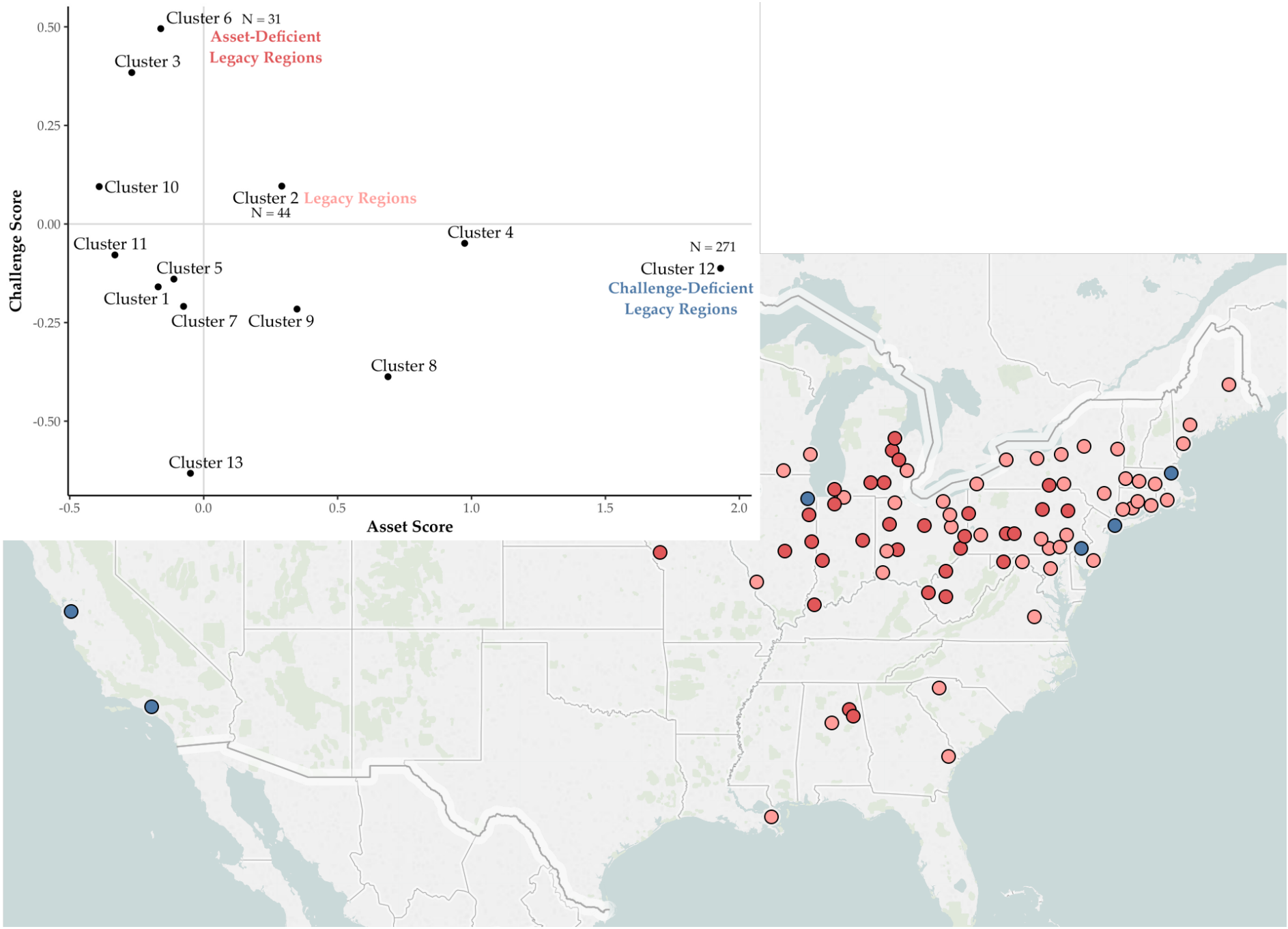
Cluster 6 N = 31
Asset-Deficient
Legacy Regions
Cluster 3
Cluster 10
Cluster 2 Legacy Regions
N = 44
Cluster 4
N = 271
Cluster 12
Challenge-Deficient
Legacy Regions
Cluster 11
Cluster 5
Cluster 1
Cluster 7
Cluster 9
Cluster 8
Cluster 13
Challenge Score
Asset Score
0.50
0.25
0.00
-0.25
-0.50
-0.5
0.0
0.5
1.0
1.5
2.0