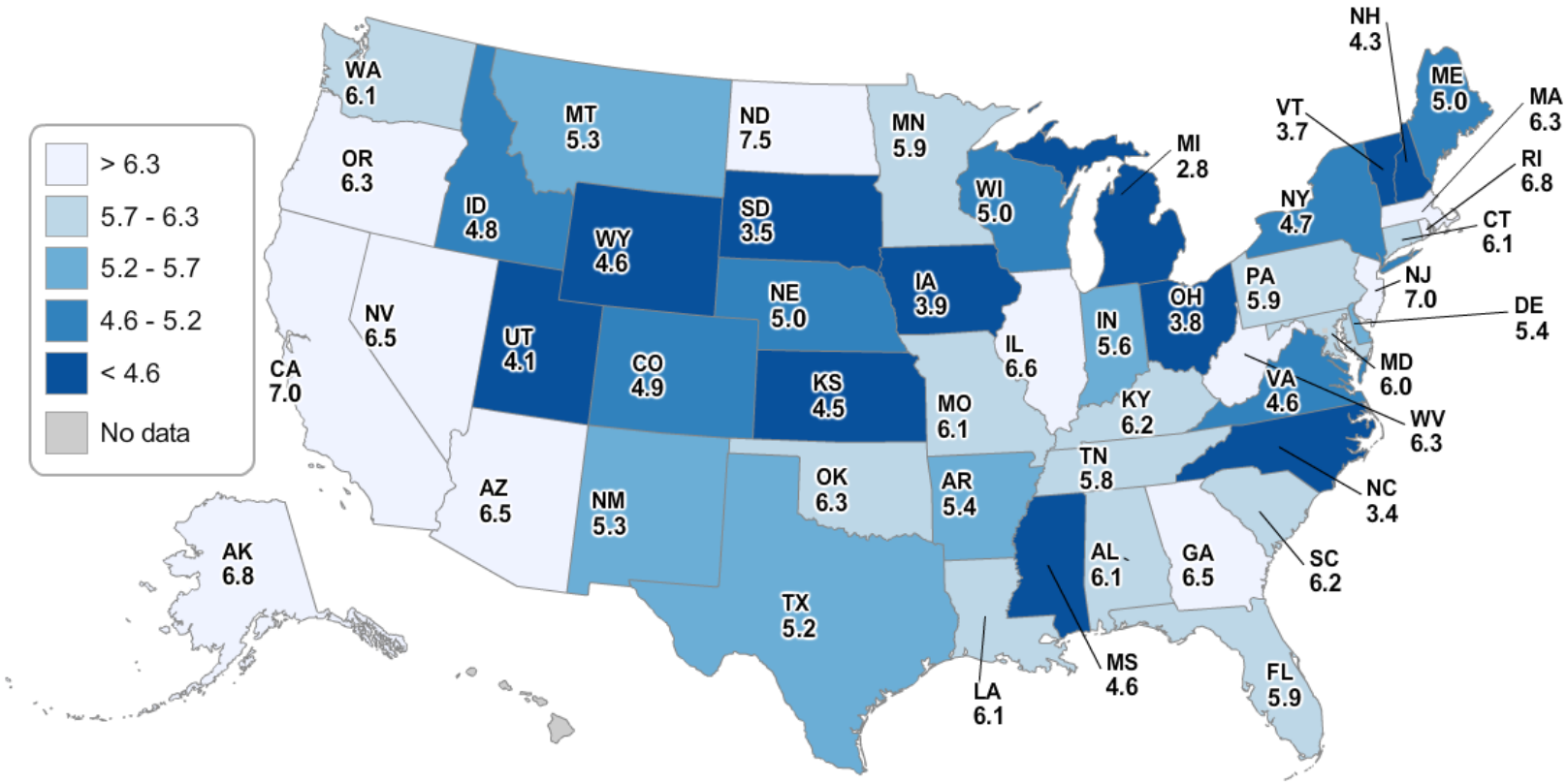
Descriptive Statics on State-level Unemployment

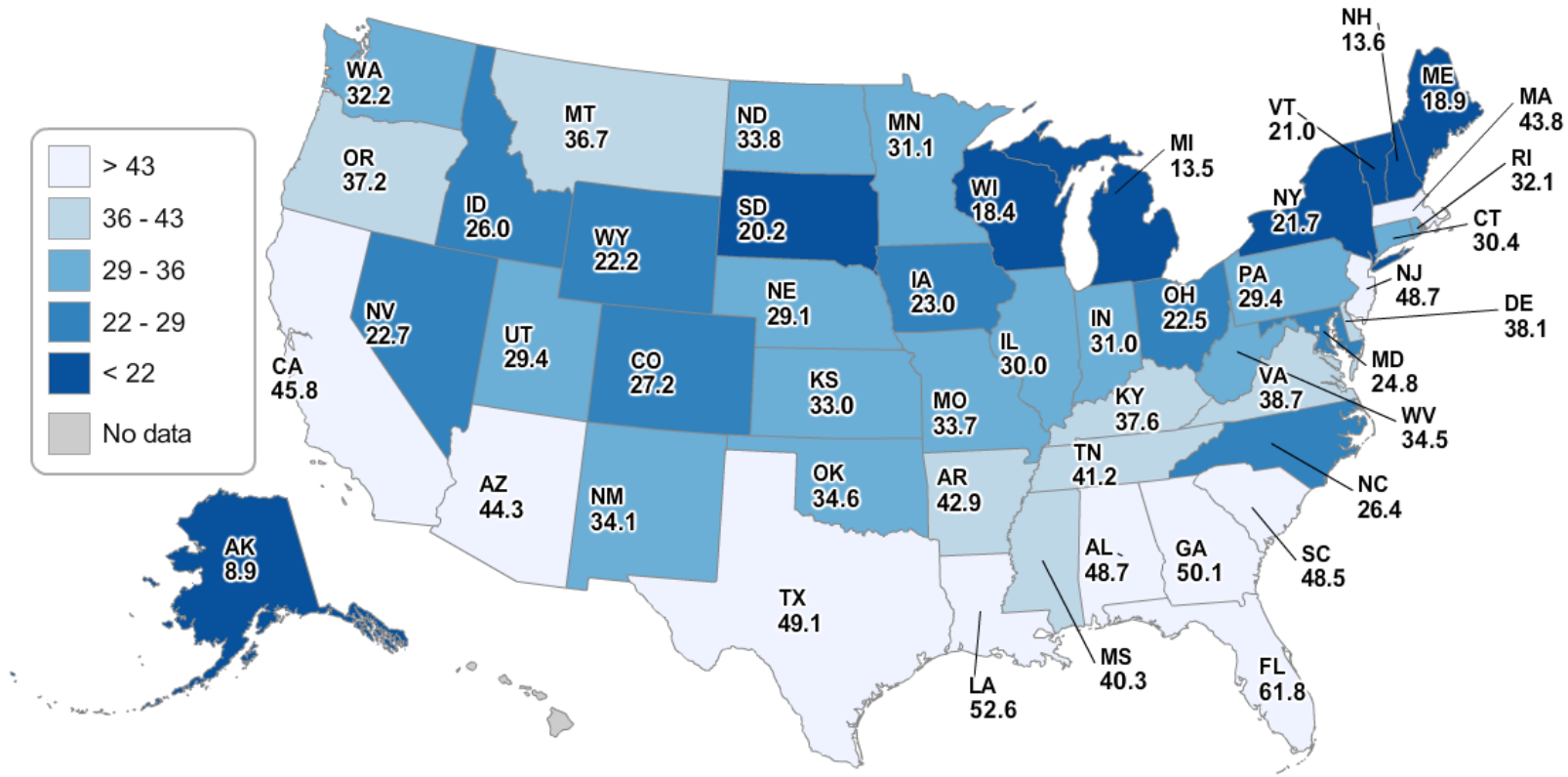
Motoaki Takahashi

Unemployment across US states



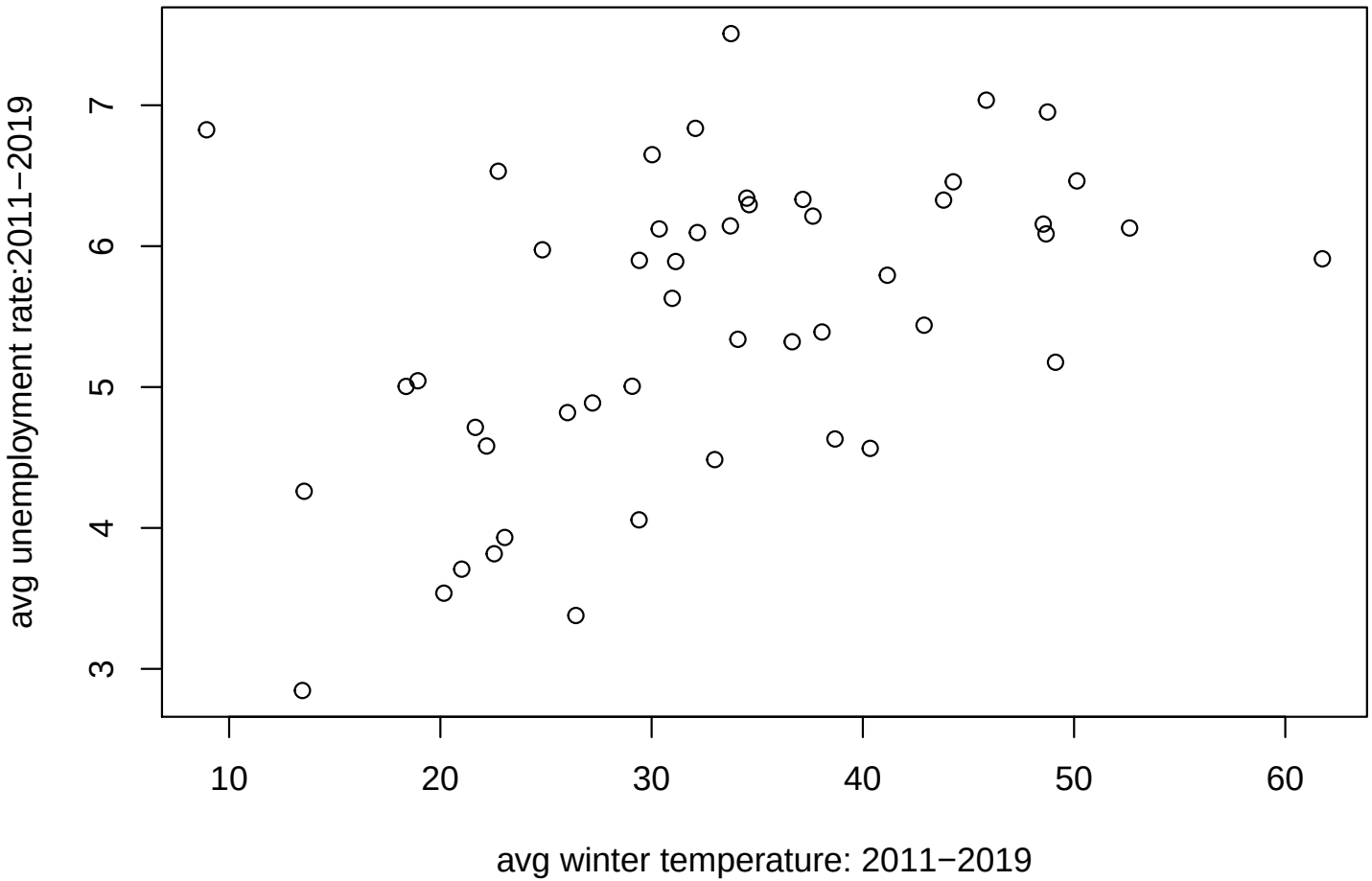
Average unemployment rates from 2011-2019.

Winter temperature across US states



Average temperature from 2011-2019, December, January and February.

Unemployment rates against winter temperature



The correlation coefficient is 0.48. Without Alaska, it would be 0.57.

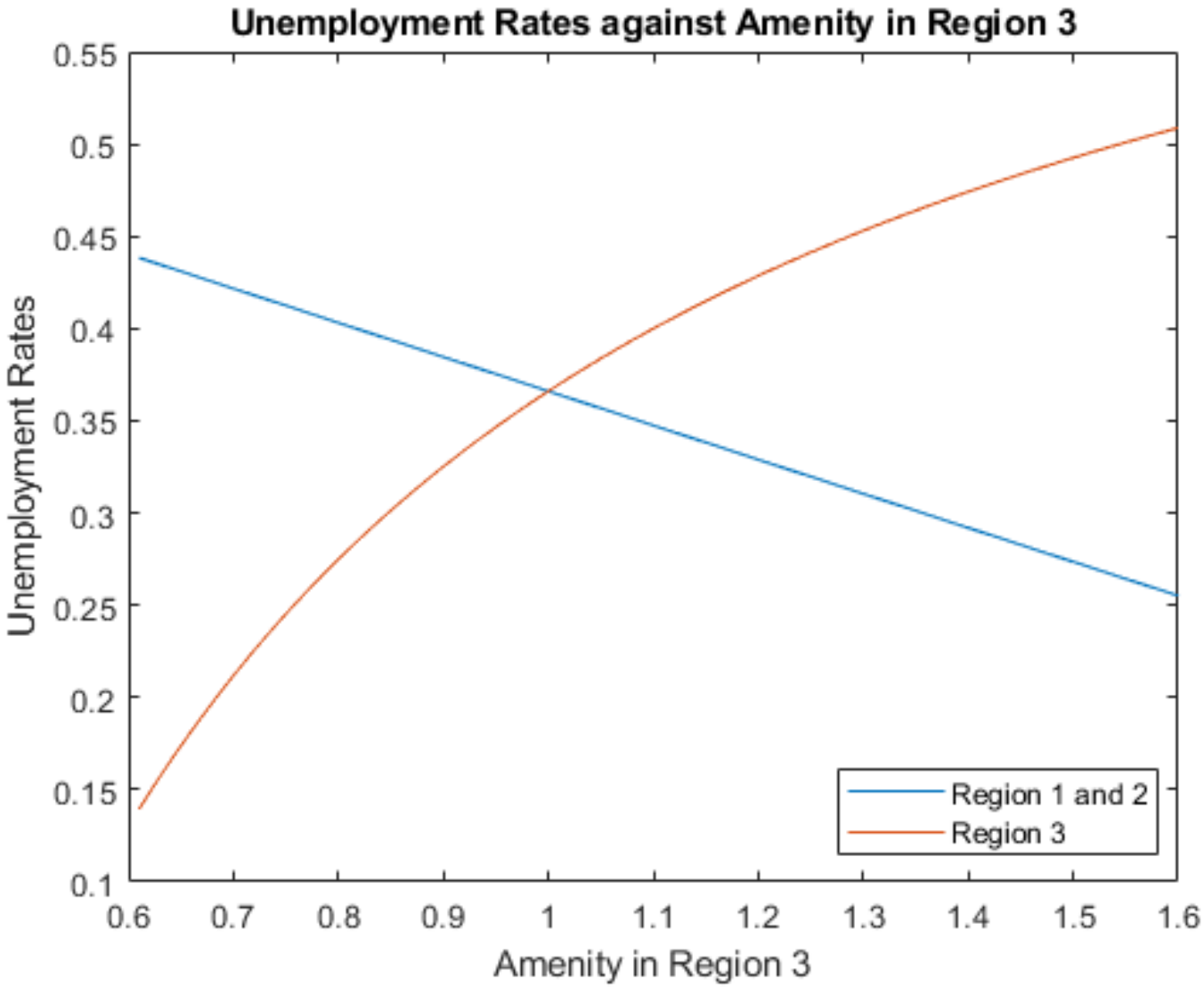
Amenity seems to matter

- A region is warm in winter, it is more likely to have high unemployment.

Two interpretations

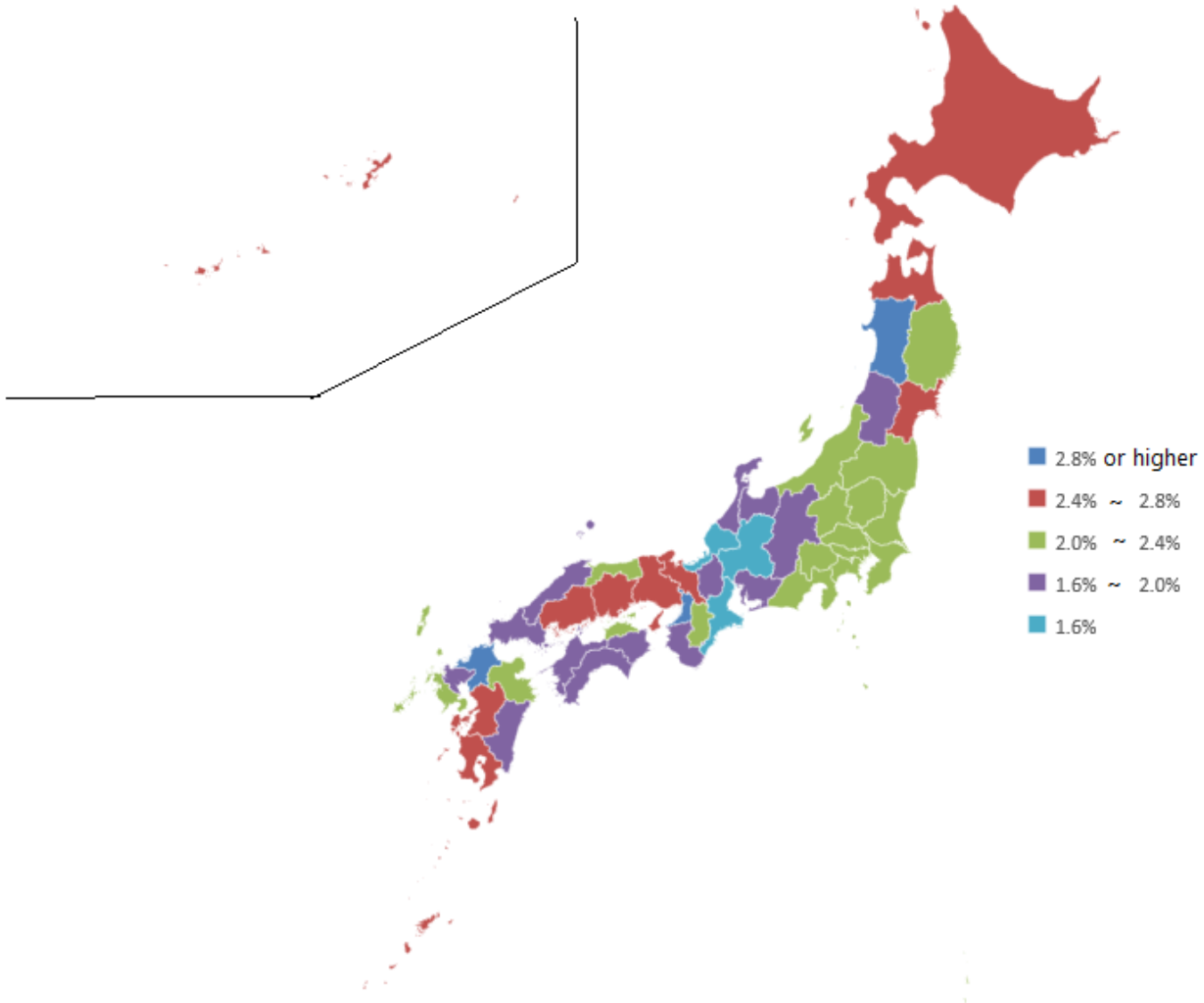
1. People go to a place with nice weather, taking a risk of high unemployment.
2. Unemployed people cannot endure cold weather.

Spatial Shapiro-Stiglitz model predicts this



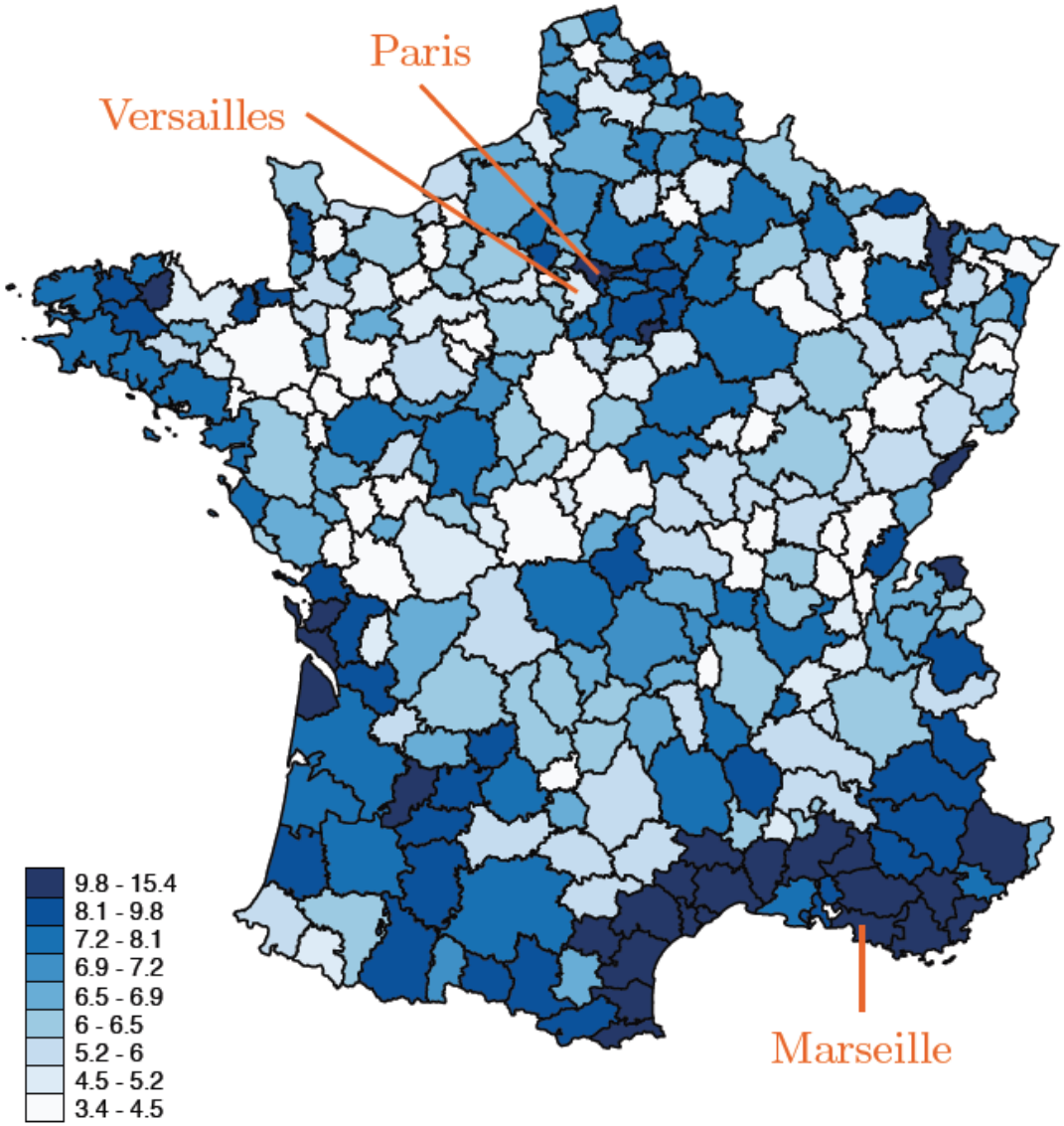
Parameters

Center-periphery pattern?: Japan



Unemployment rates in 2019 from Wikipedia.

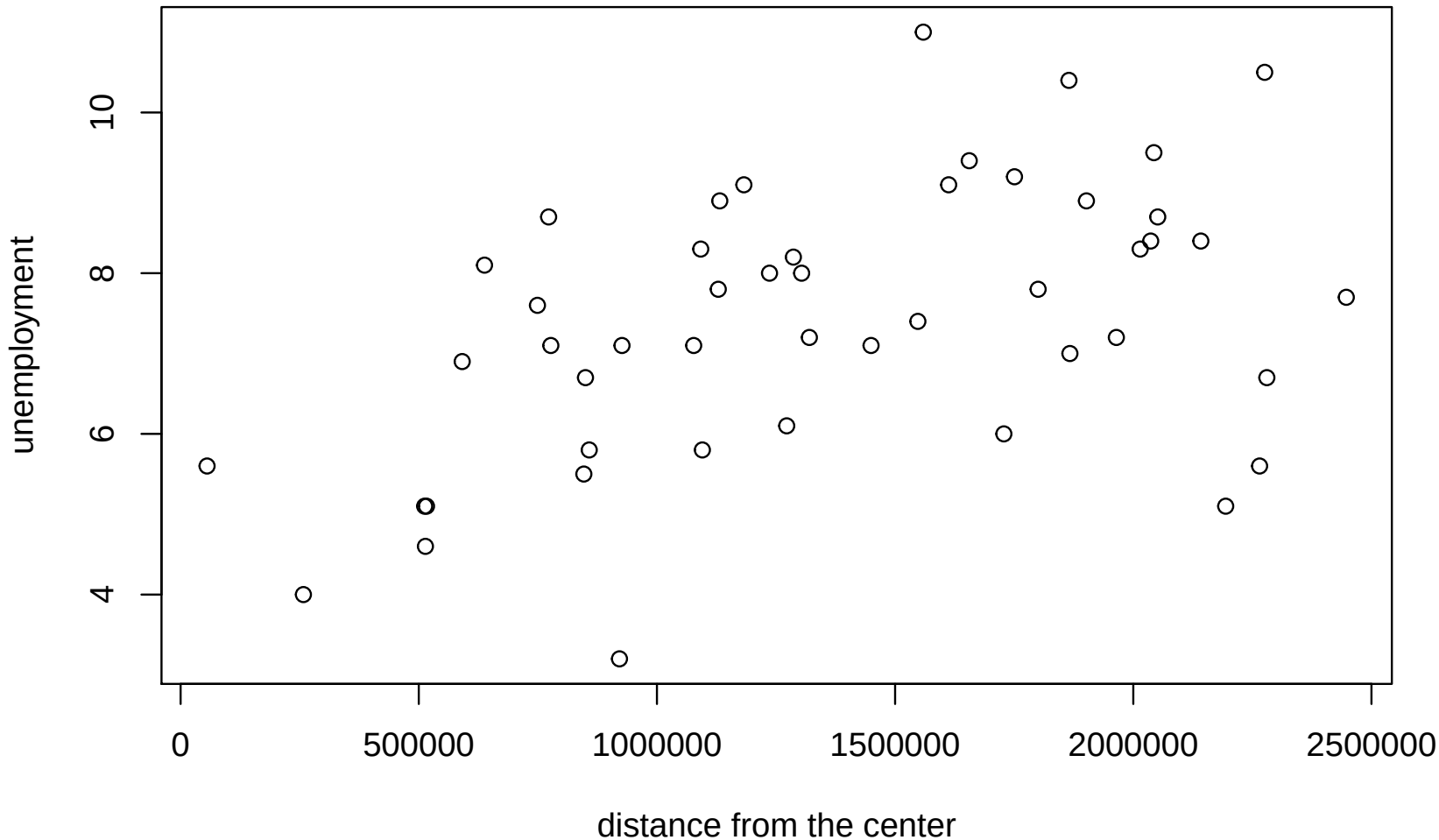
Center-periphery pattern?: France



Average unemployment rates from 1997 to 2007. Bilal (2020).

Geographic Center of the Contiguous US

Unemployment against the distances from the center

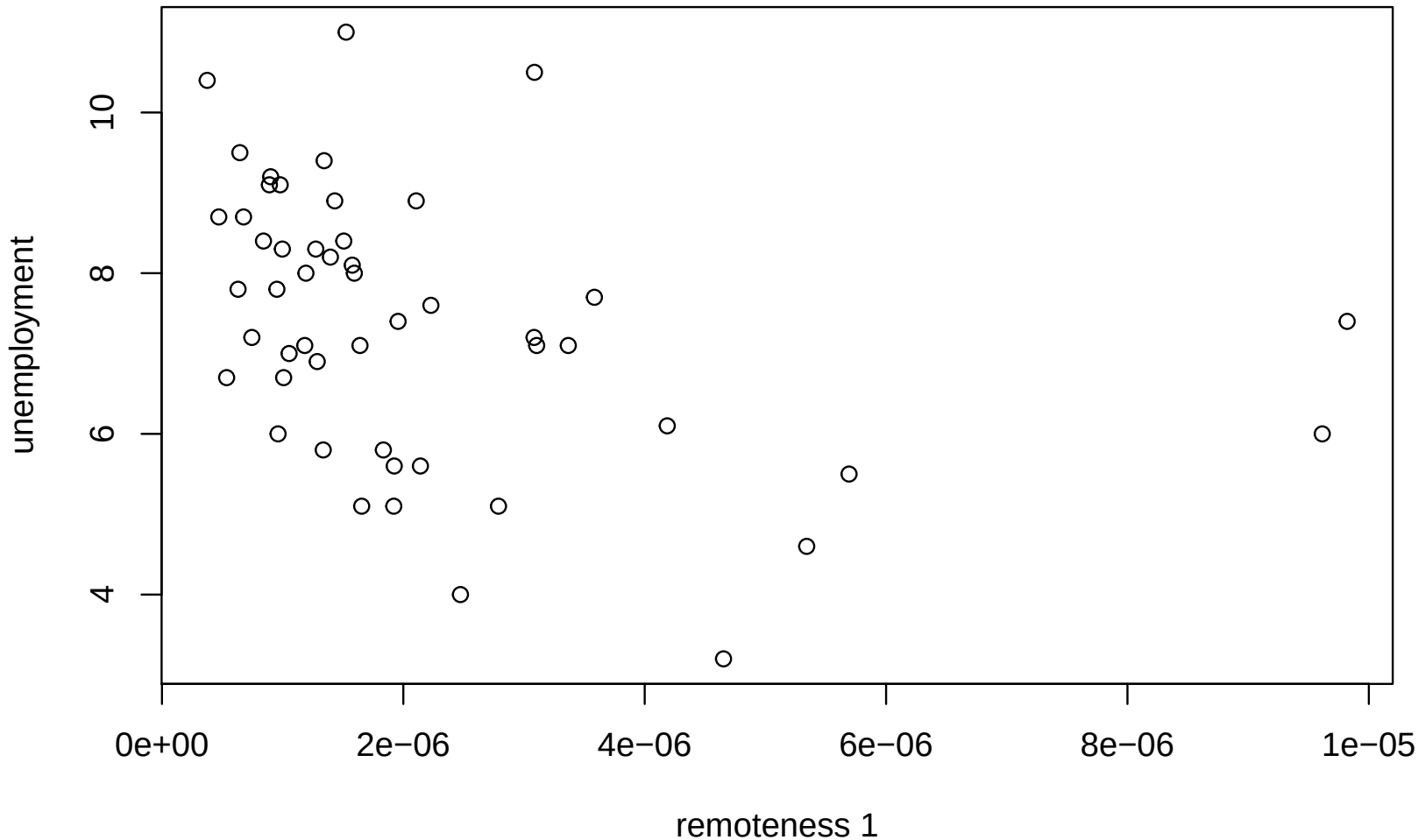


Correlation coefficient: 0.46

Remoteness 1

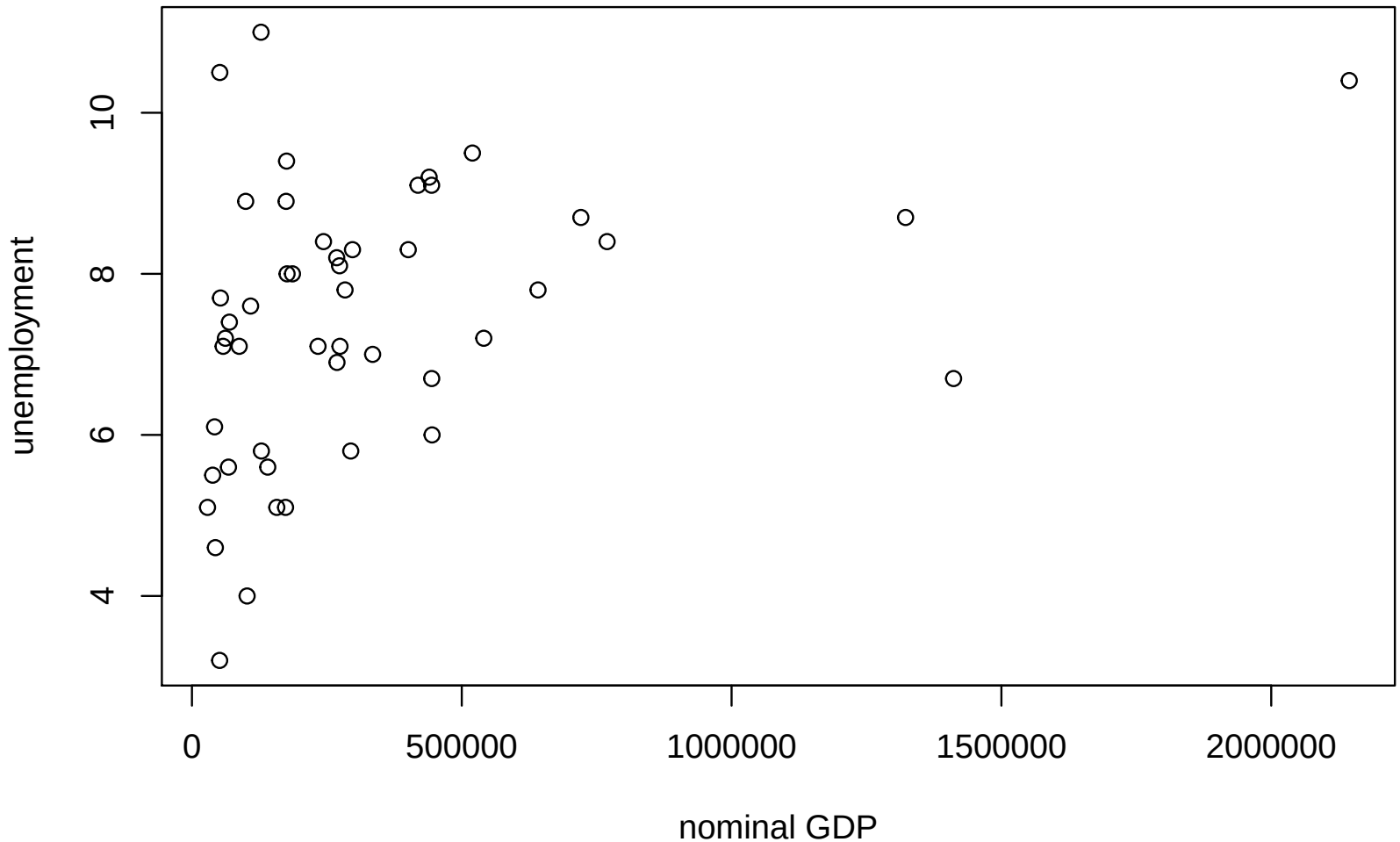
- Let's take a measure of remoteness in gravity literature.
- $$R_n^1 = \left(\sum_j t_{i,j}^{1-\sigma} Y_j \right)^{-1}$$
- $t_{i,j}$s are obtained by the Head-Ries formula.
- American Commodity Survey has many zero trade values between states.
  - I overestimate $t_{i,j}$s.
  - A huge weight on Y_n in R_n^1.

Remoteness 1



Correlation coefficient: -0.37.

Unemployment and nominal GDP



Surprisingly, the correlation coefficient is 0.36.

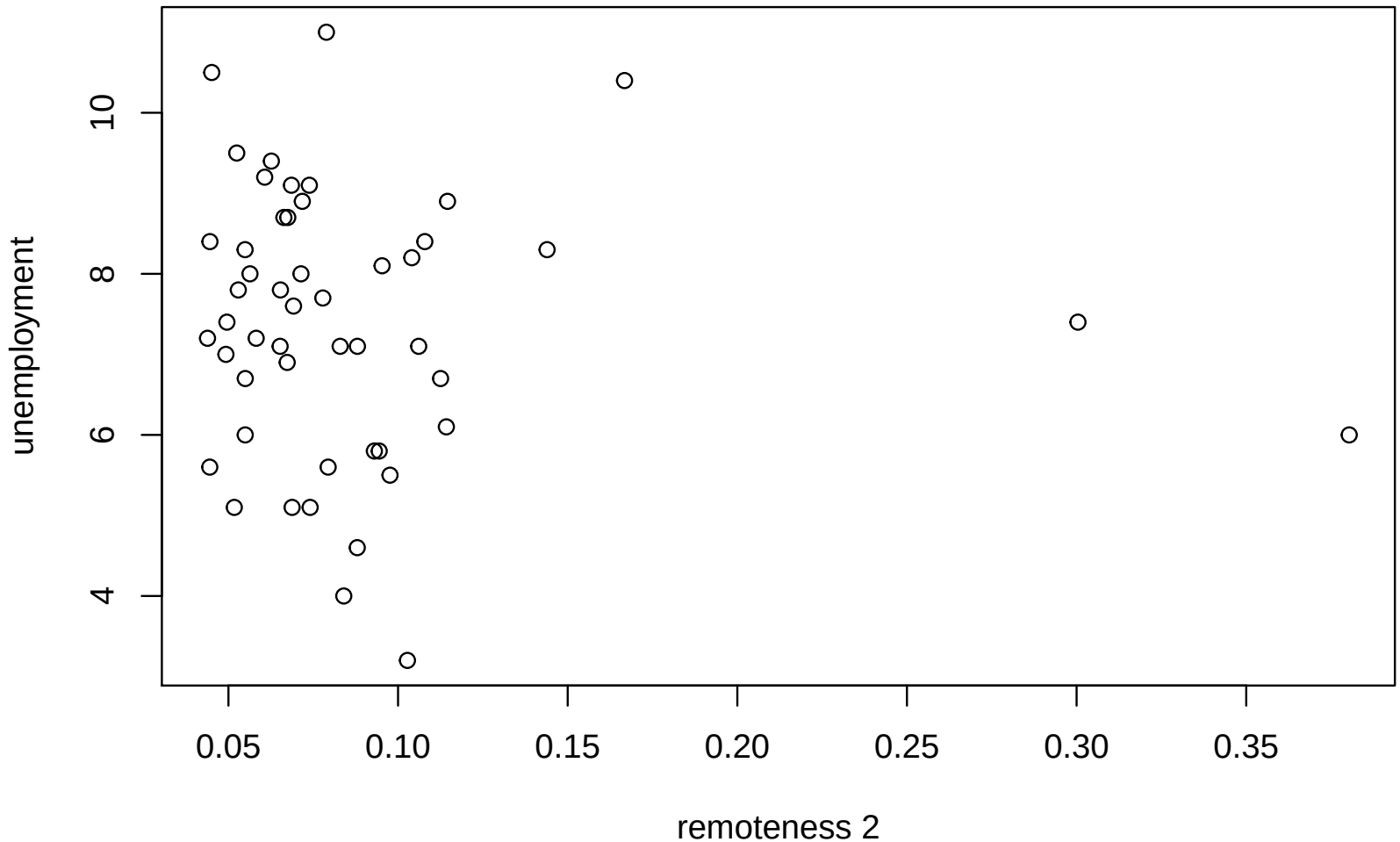
Remoteness 2

- In the remoteness 1, I may have just picked up the local GDP.
- Ignoring the home GDP and directly using the physical distances,

$$R_n^2 = \left(\sum_{j \neq n} \frac{Y_j}{\text{dist}_{n,j}} \right)^{-1}$$

- This depends on units. Y_j is in million \$. dist is in meters.

Remoteness 2



Correlation coefficient: -0.09.

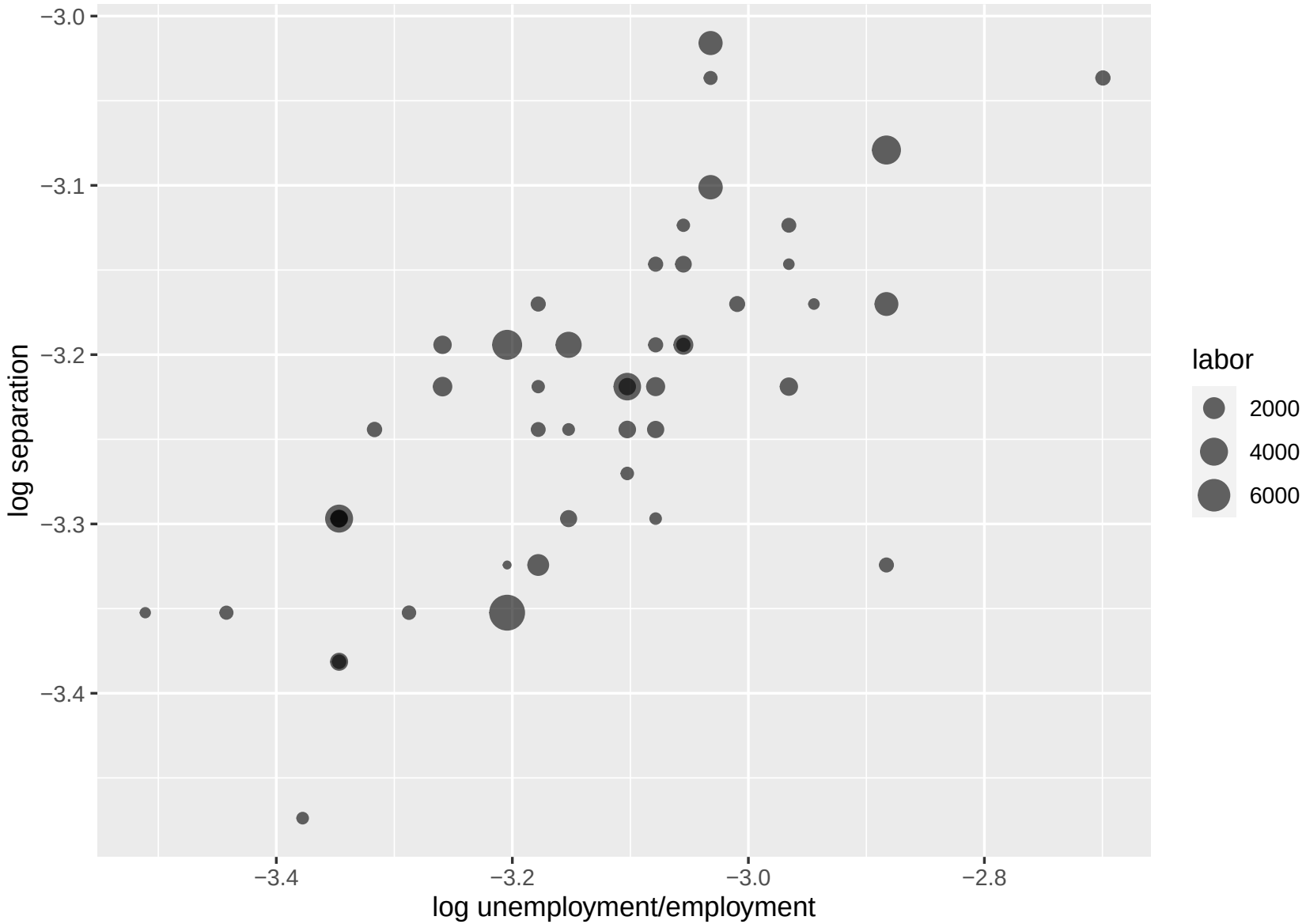
Discussion

- The distance from the geographic center is positively related to unemployment.
- Two measures of remoteness are negatively related to unemployment.
  - Trade costs are overestimated. Precise estimation of gravity equations?
  - Somehow nominal GDPs are positively related to unemployment.
  - Remoteness may have just picked up the relationship between GDPs and unemployment.

Steady State Condition

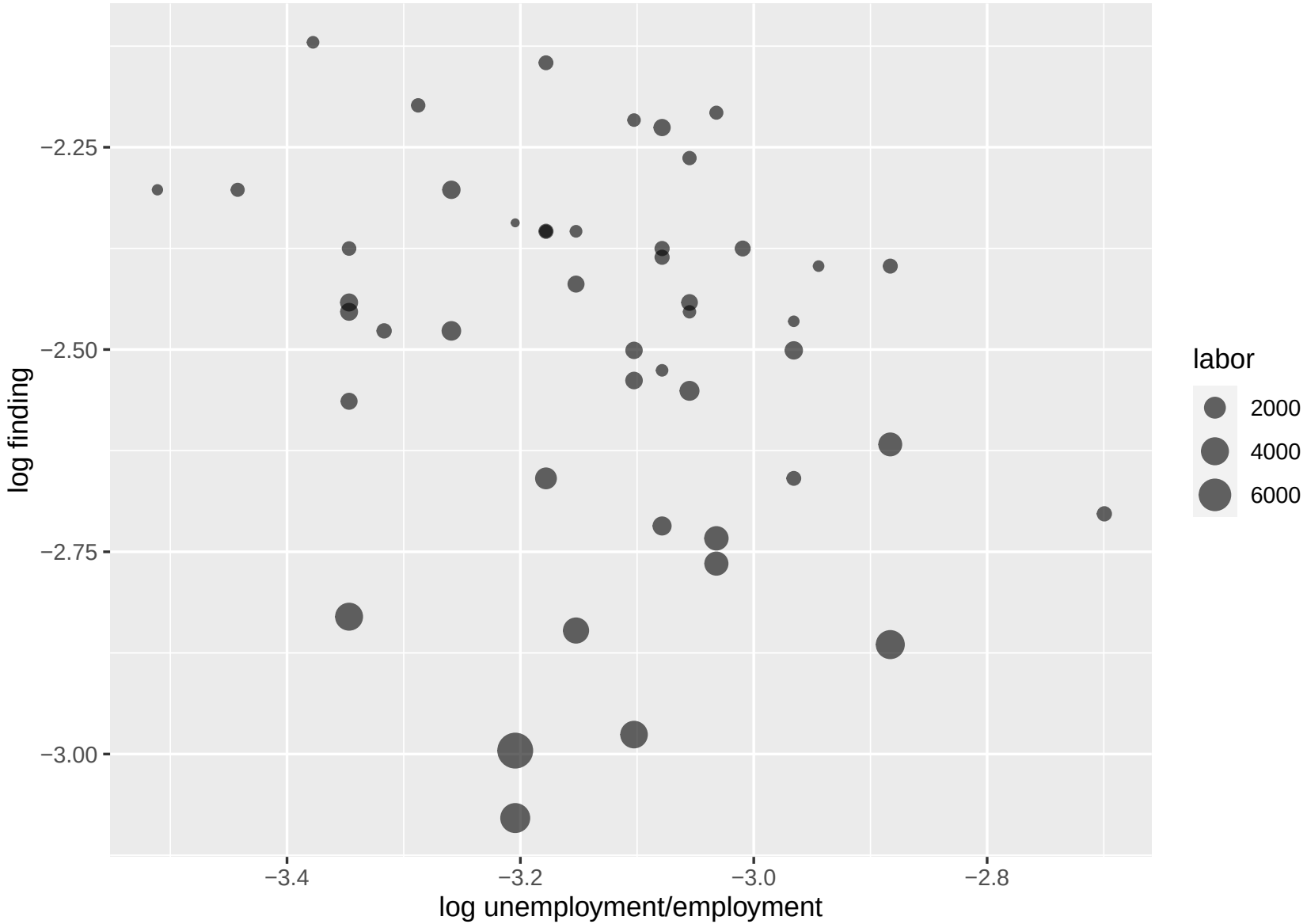
$$\log\left(\frac{u}{1-u}\right) = \log s - \log f.$$

Separation against unemployment in prefectures



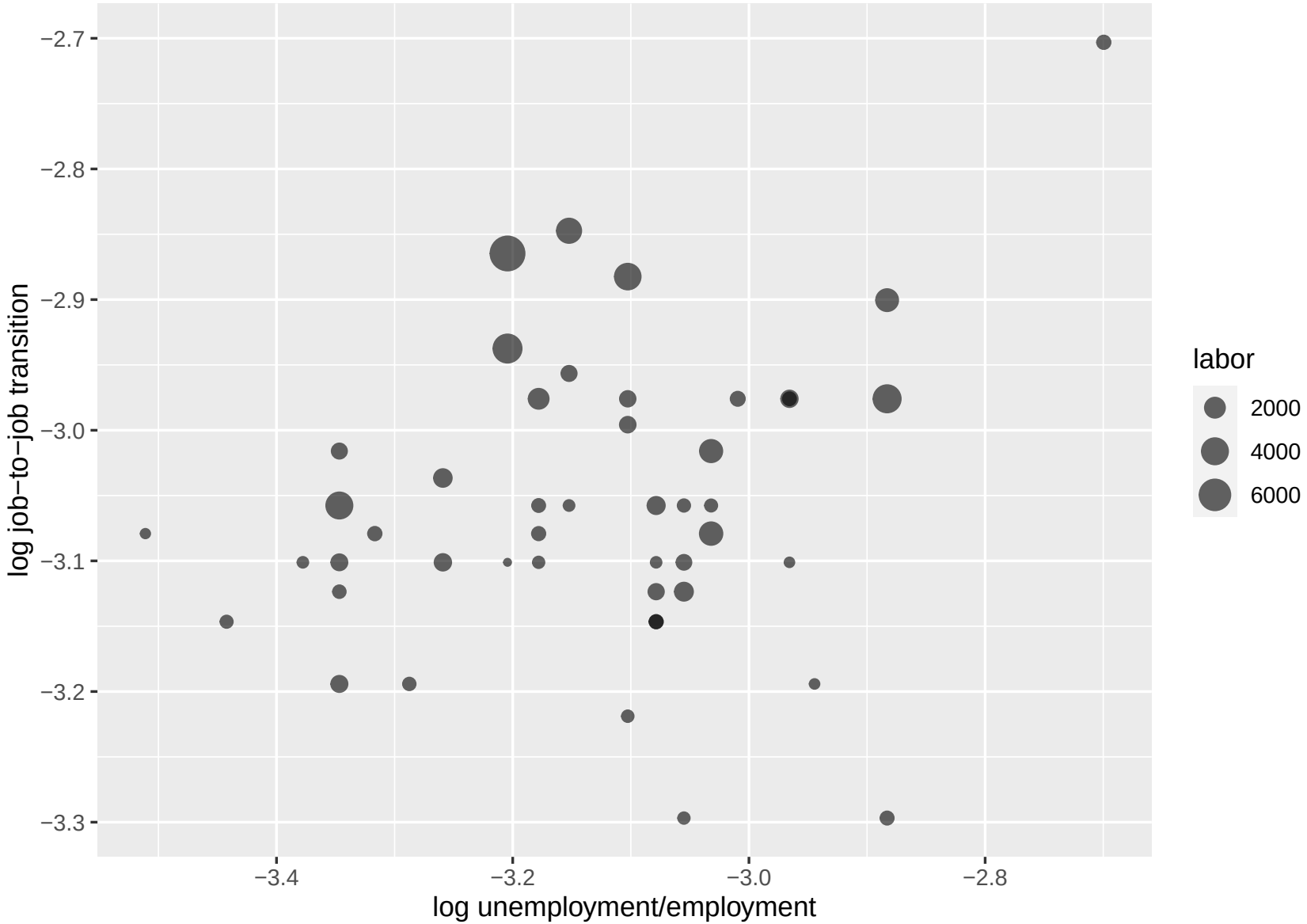
Correlation coefficient: 0.71

Finding against unemployment in prefectures



Correlation coefficient: -0.22

Job-to-job transition against unemployment in prefectures



Correlation coefficient: 0.25

Numerical Exercise: Setup

$N = 3$	number of regions
$A = 1$	amenity
$b = 0.1$	unemployment benefit
$e = 0.1$	effort
$L = 100$	total population
$q = 0.8$	detecting probability
$t_{j,j} = 1$	intra-regional trade cost
$t_{j,k} = 1.1$	inter-regional trade cost
$z = 10$	productivity
$\sigma = 4$	elasticity of substitution
$\theta = 2$	shape parameter for amenity shock

Back