



Statistical Analysis of Social Mobility Across United States Counties

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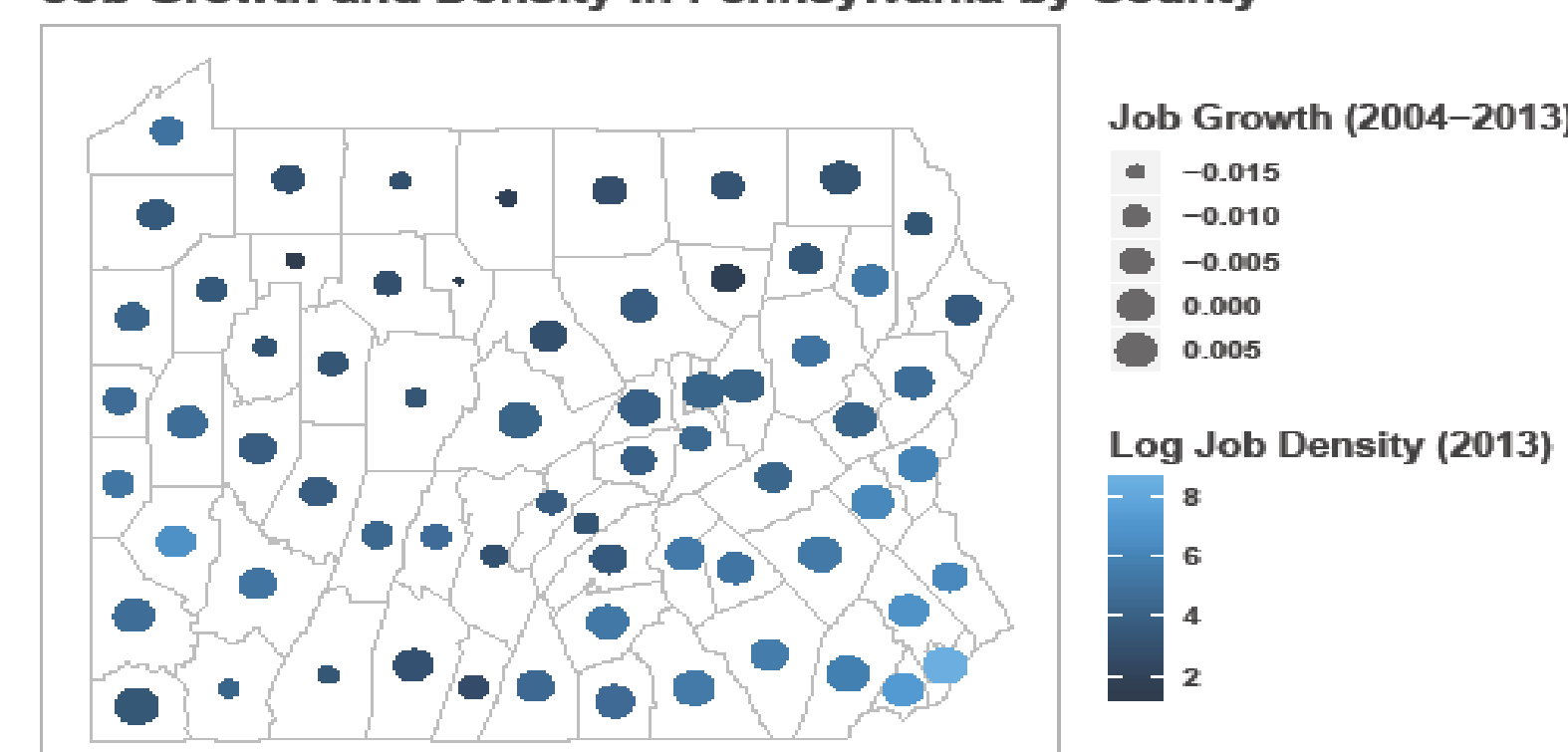


Background

Our dataset comes from Opportunity Insights, a Harvard University research center that studies economic opportunity in the United States. As part of a recent research project, "The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility," the center studied what variables are correlated with social mobility across the United States. The dataset we are using, "Neighborhood Characteristics by County," contains various covariates the researchers studied to see what might be associated with social mobility. The dataset includes various economic and social information on U.S. counties, such as job growth, math test scores, and racial demographics.

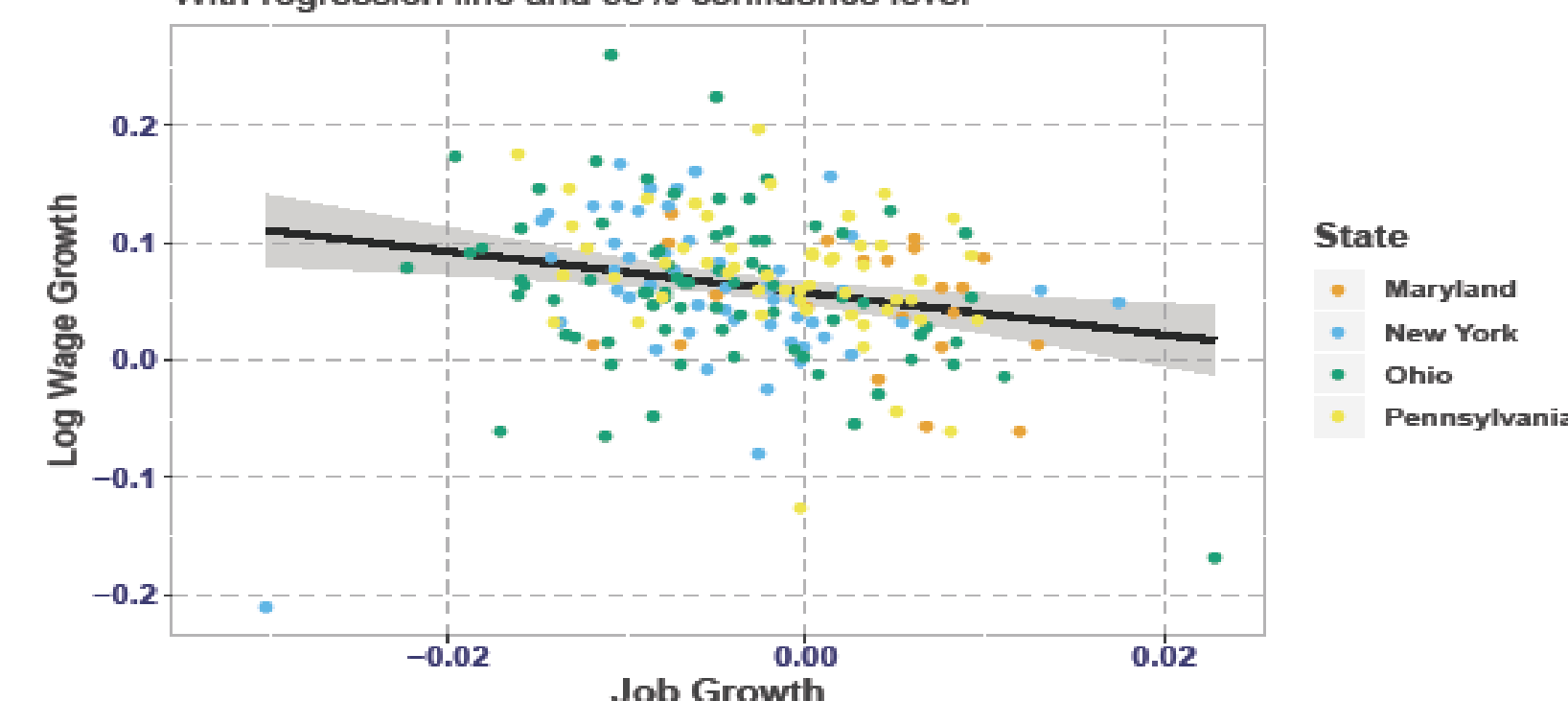
Jobs and Wages

Job Growth and Density in Pennsylvania by County



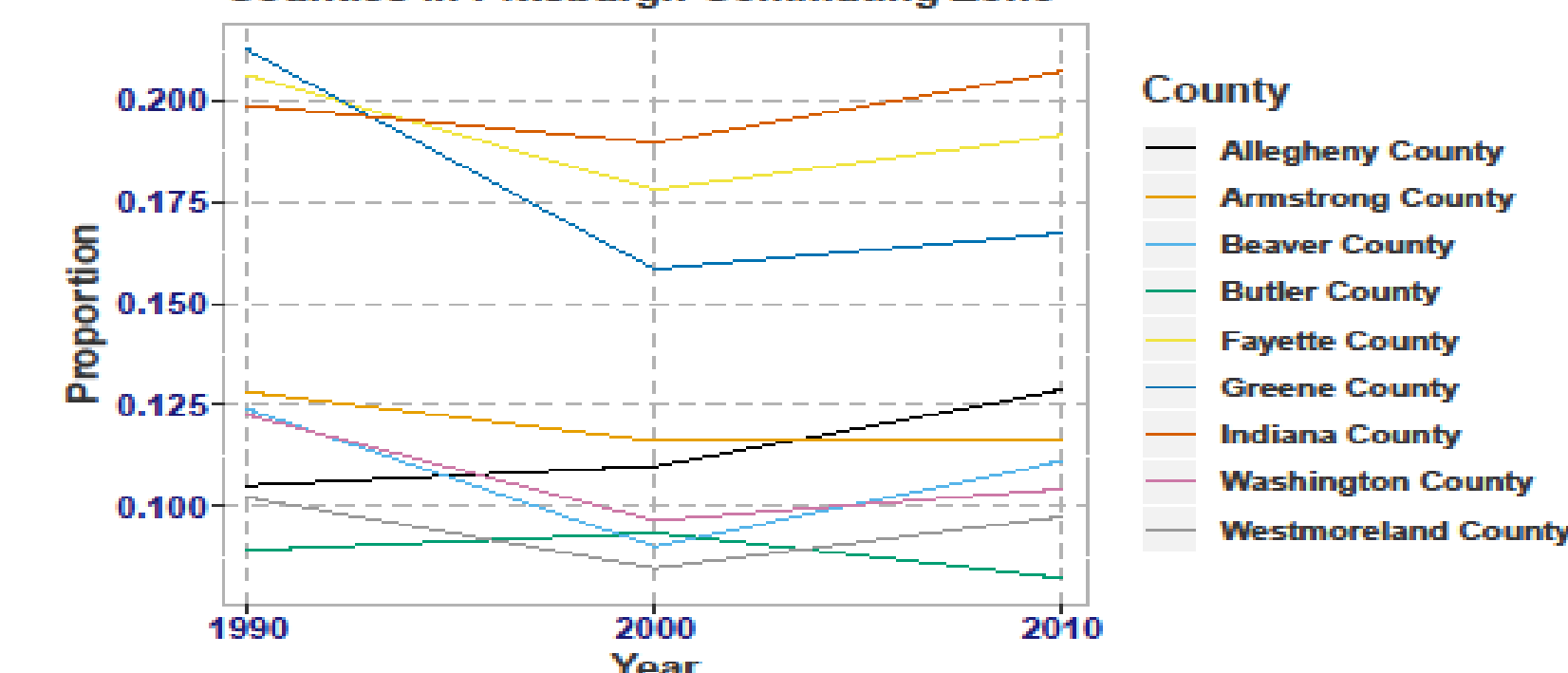
- The map shows which counties in Pennsylvania have gained and lost jobs between 2004 and 2013.
- It also shows job density, the number of jobs per square mile, transformed logarithmically.
- Some counties in central PA have lost jobs, but maintain a high number of jobs per square mile.

Wage vs Job Growth in Pennsylvania and Neighboring States
With regression line and 95% confidence level



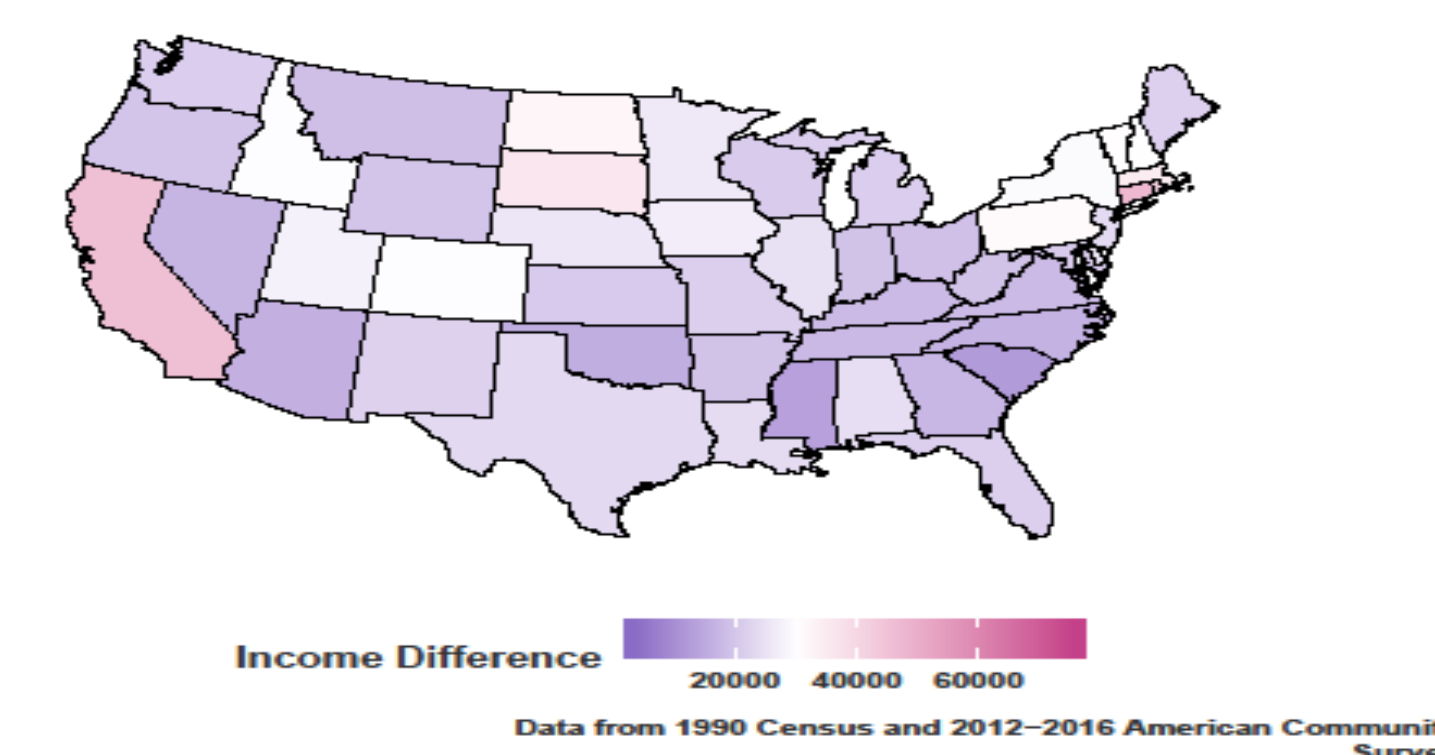
- The graph shows job growth and the log of wage growth for counties in Pennsylvania and bordering states.
- There appears to be a small negative relationship between the two variables.
- There are no noticeable differences between the states.

Proportion of Individuals Below Poverty Line
Counties in Pittsburgh Commuting Zone



- The graph shows the proportion of individuals who were below the poverty line in selected counties in Western Pennsylvania over time.
- The great recession might explain the increased poverty rates in some counties in 2010.
- It appears that there is a gap between three counties with high poverty rates and the rest of the counties that has persisted, but somewhat narrowed, since 1990.

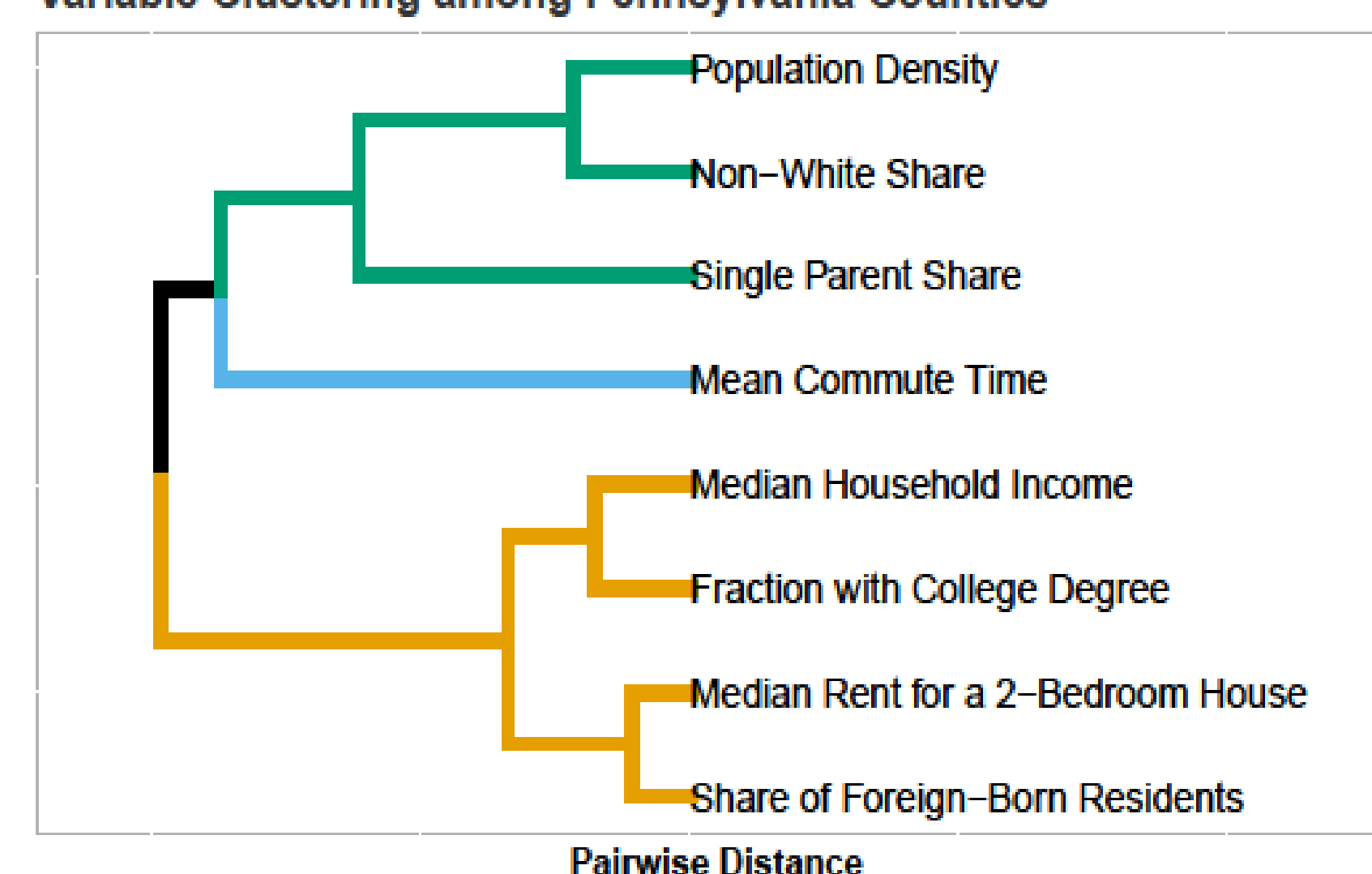
Spatial Distribution of Median Household Income By State
Difference in Median Household Income from 1990 to 2016



- This map shows how median household income has changed between 1990 and 2016.
- In states shown in pink, income has increased more than in states shown in purple. Most states fall below \$30,000 in difference.

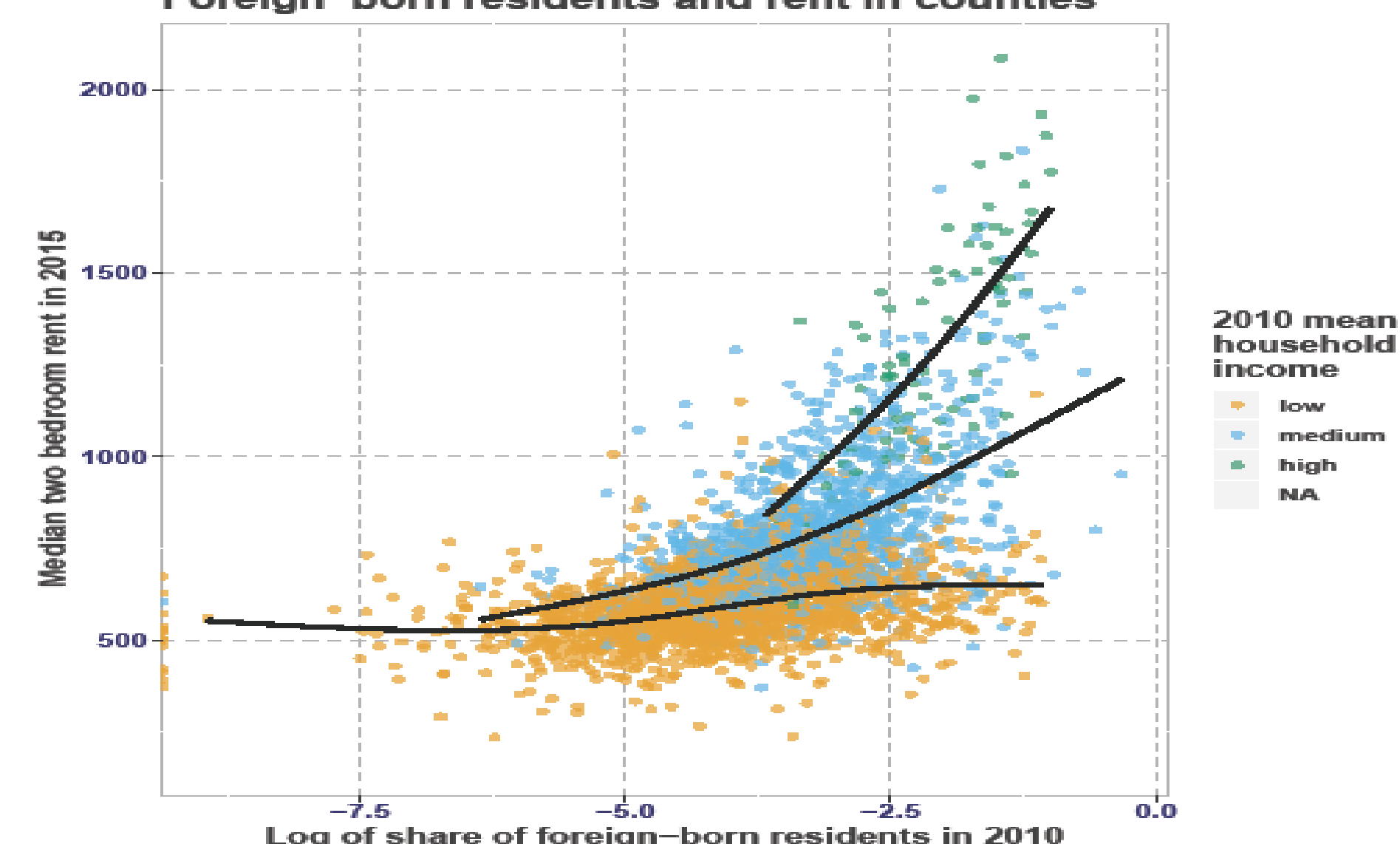
Demographics

Variable Clustering among Pennsylvania Counties



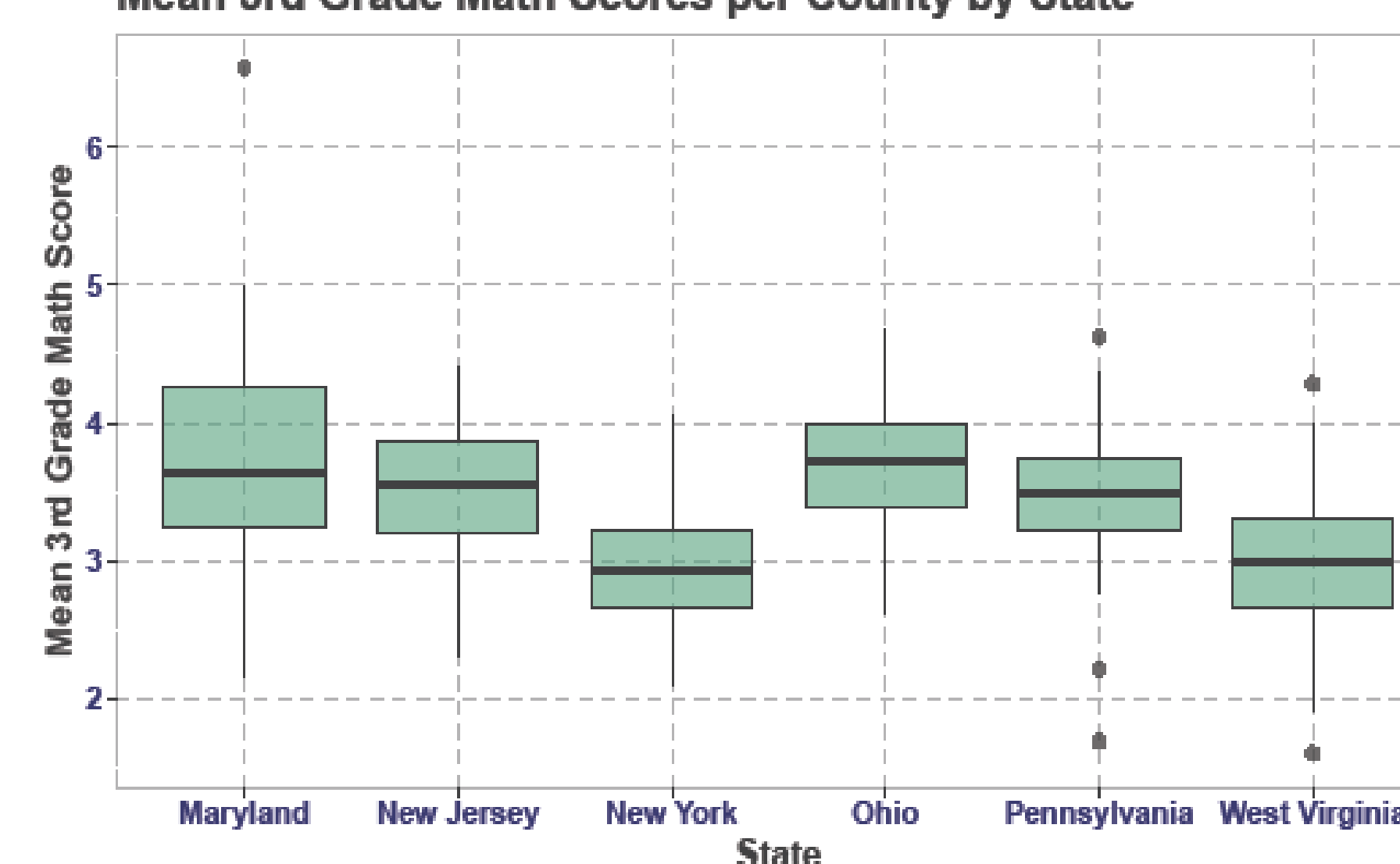
- Made using hierarchical clustering of variables with one minus absolute correlation as a similarity measure.
- Race ties closely to population density, which is also grouped with single parenthood.
- Rent is most similar to the proportion of foreign-born residents.

Foreign-born residents and rent in counties



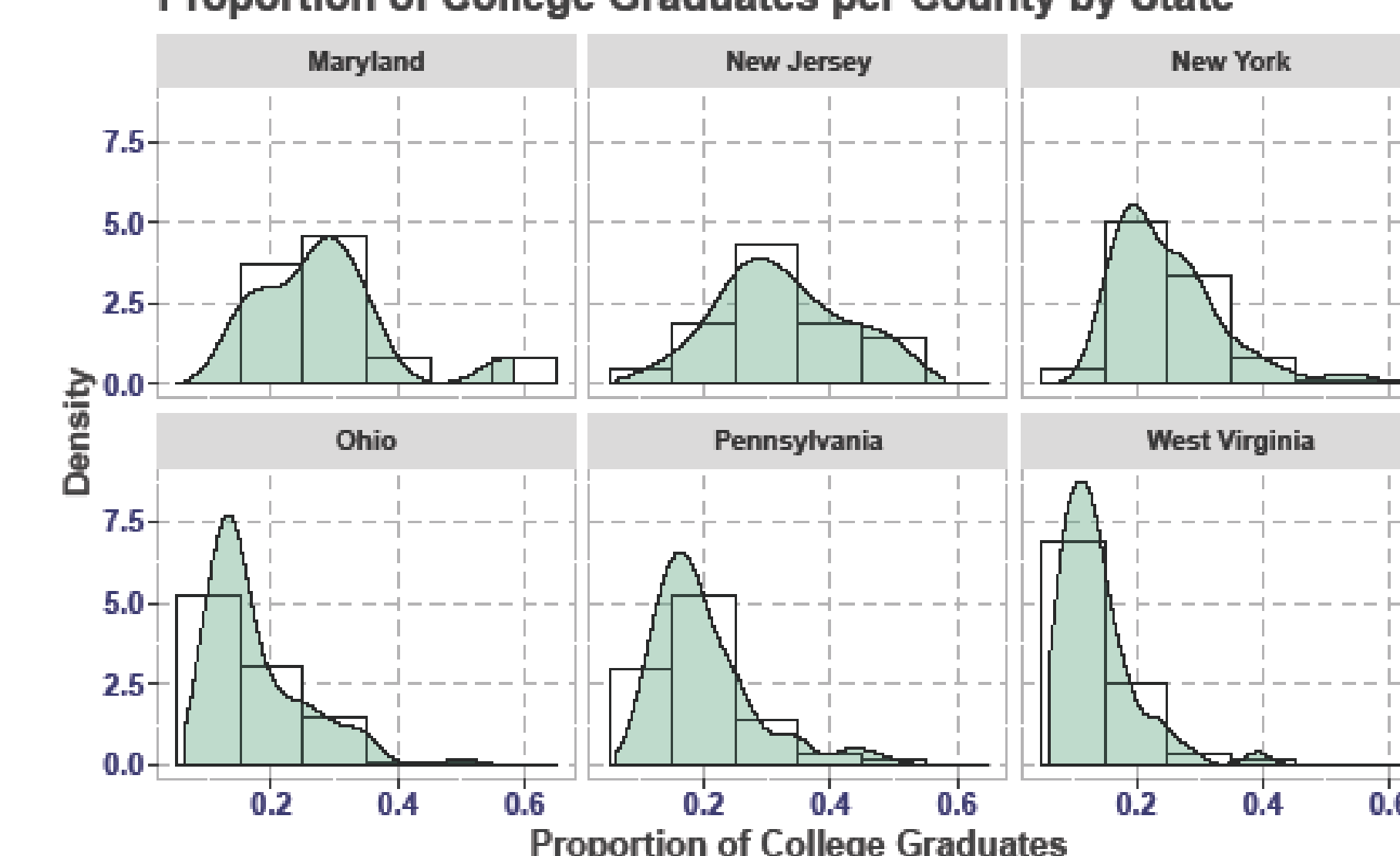
- The graph shows the relationship between the log proportion of foreign-born residents in 2010 versus the median gross two bedroom rent in 2015 for each country.
- We can see a general positive trend between these two variables, indicating that higher rent is correlated with higher proportion of foreign-born residents.
- The points are colored by the 2010 mean household income and we can see that the points are clustered by this variable. Moreover, the trend between rent and foreign-born share seems to differ for different classes of household income.

Mean 3rd Grade Math Scores per County by State



- The graph shows the distribution of average math test scores in counties in various states.
- Students in counties in New York and West Virginia seem to have lower math test scores.
- A county in Maryland is a very high outlier.

Proportion of College Graduates per County by State



- The map shows the distribution of the proportion of college graduates in counties in selected states near Pennsylvania.
- Counties in West Virginia seem to have a low proportion of college graduates, following a right-skewed distribution.
- Counties in New Jersey seem to have more variation in the proportion of college graduates.