Social Security Disability and the Affordable Care Act

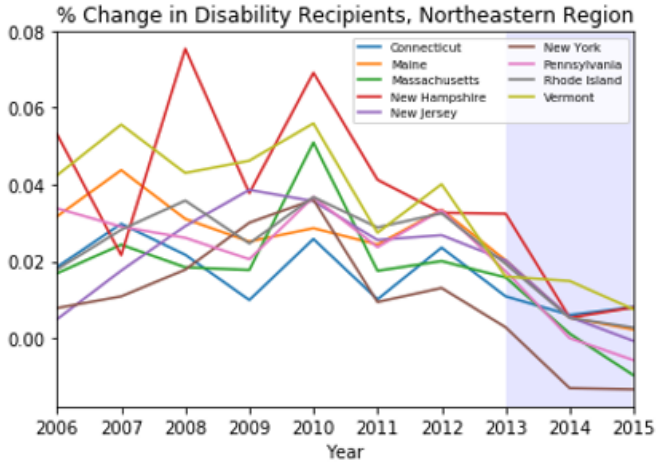
Problem

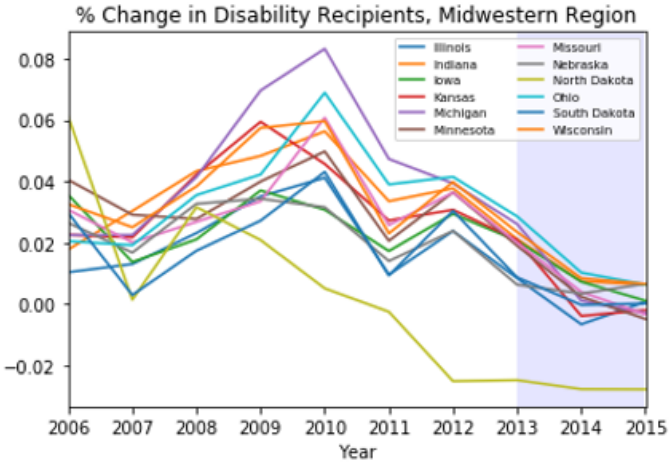
- The Patient Protection and Affordable Care Act (ACA) was enacted in 2010 and went fully into effect in 2014
  - Intended to improve access and affordability of health insurance
- Prior to the ACA, one vector for individuals to obtain health insurance regardless of pre-existing conditions was to qualify for Social Security disability
  - After one year on Supplemental Security Income (SSI) you are eligible for Medicaid
  - After two years on Social Security Disability Insurance (SSDI) you are eligible for Medicaid
- With the ACA in place, this incentive to go on disability may be reduced, as the ACA marketplaces and Medicaid expansion improve access, regardless of pre-existing conditions
- On the other hand, with the ACA in place, you have access to health insurance outside a job, which may in some cases incentivize use of the program
- CBO, in congressional testimony prior to the ACA, said “the Affordable Care Act is likely to influence application rates for the DI [disability insurance] program, but whether it will result in more or fewer beneficiaries is difficult to predict”
- This project is an attempt to determine the possible effects of the ACA on disability enrollments using early ACA enrollment data recently made available.

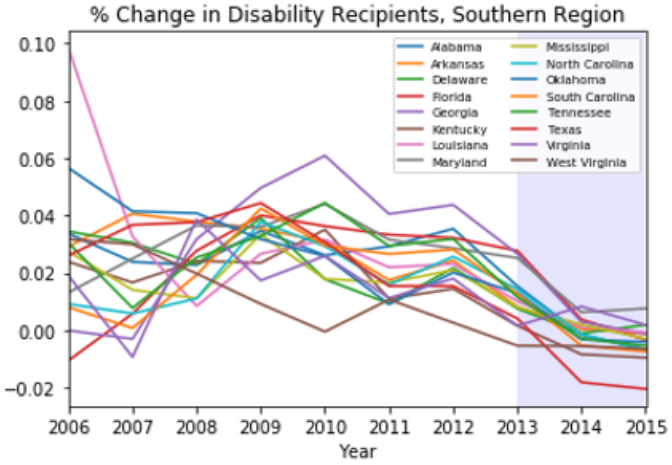
Data

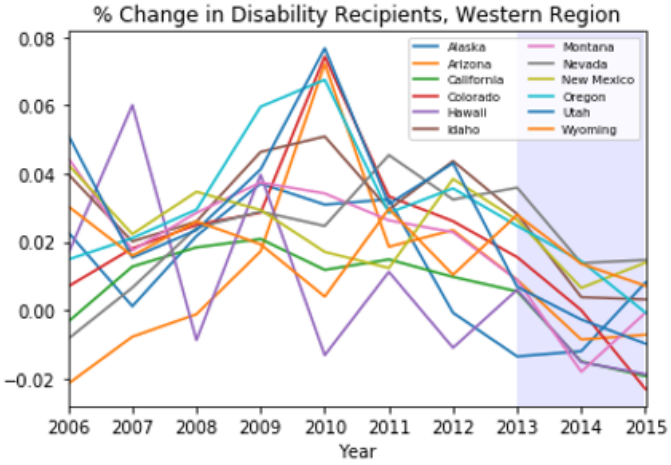
- ACA Enrollment data: Annual (final) Enrollment Reports published by the US Department of Health and Human Services.
- Economic Data (GDP, Personal Income, Employment, Compensation, Wages): The US Department of Commerce, Bureau of Economic Analysis to obtain series by State and Nationally
- Demographic Data (Age of Population, Poverty Rates) and necessary reference data (State/Region mapping and State Name/State Code): US Census Bureau.
- Data on the Medicaid Expansion: Kaiser Family Foundation website.
- Data was obtained on a yearly, State-by-State and national level and constructed into a longitudinal panel

Visualizations









Models

- PanelOLS (from linearmodels) fixed effects model
  - Used forward stepwise selection with the f-statistic as the scoring function
  - One-period lagged Employment to Population ratio was the only regressor chosen
  - R-squared of only .22
  - No additional variables in my dataset improved the model
  - Wald tests for structural break – no unique structural break in the time series
- One year of data available on ACA utilization
  - Two additional regressors: ACA Marketplace enrollment and Medicaid Expansion
  - Added to the model with lagged EPOP ratio
  - Used fixed effects estimated by PanelOLS as the group intercepts
  - Additional Linear Model estimated without ACA Marketplace Enrollment and Medicaid Expansion
  - Non-linear (Kernel Ridge Regression) model included for pedagogical reasons (hyperparameter tuning)
  - Test train sets created from 50 datapoints available for the year
  - Predictive power of all models was minimal

Conclusion

- No conclusion could be reached regarding the question of interest
- Dataset did not have enough significant independent variables to control for economic and demographic changes at the State level
- Dataset was constructed column by column from multiple data sources – not a well known, readily available data set
  - For purposes of this sort of project, an excess of data wrangling is not advisable – you can find yourself with a lot of work done but not the right pieces of information to develop useful models
- As an exercise in data wrangling in pandas and learning various parts of the linearmodels, statsmodels and sklearn apis, it was a useful experience