Predicting Successful American Counties

Team 8: Ruilian Xie and Nicholas Lourme

4/29/2019

Project Goals:

- Predict the successful American Counties
- Understand what variables makes some Counties more successful
- Create a useful model for forecasting
- Get a high adj. R squared!

Design and Approach

Define "Successful" - Combine population growth with gini coefficient

- Measure desirability of an area and its inequality
- "Success" $= 0.5 norm_populationgrowth + 0.5$norm_gini

Population vs. Gini

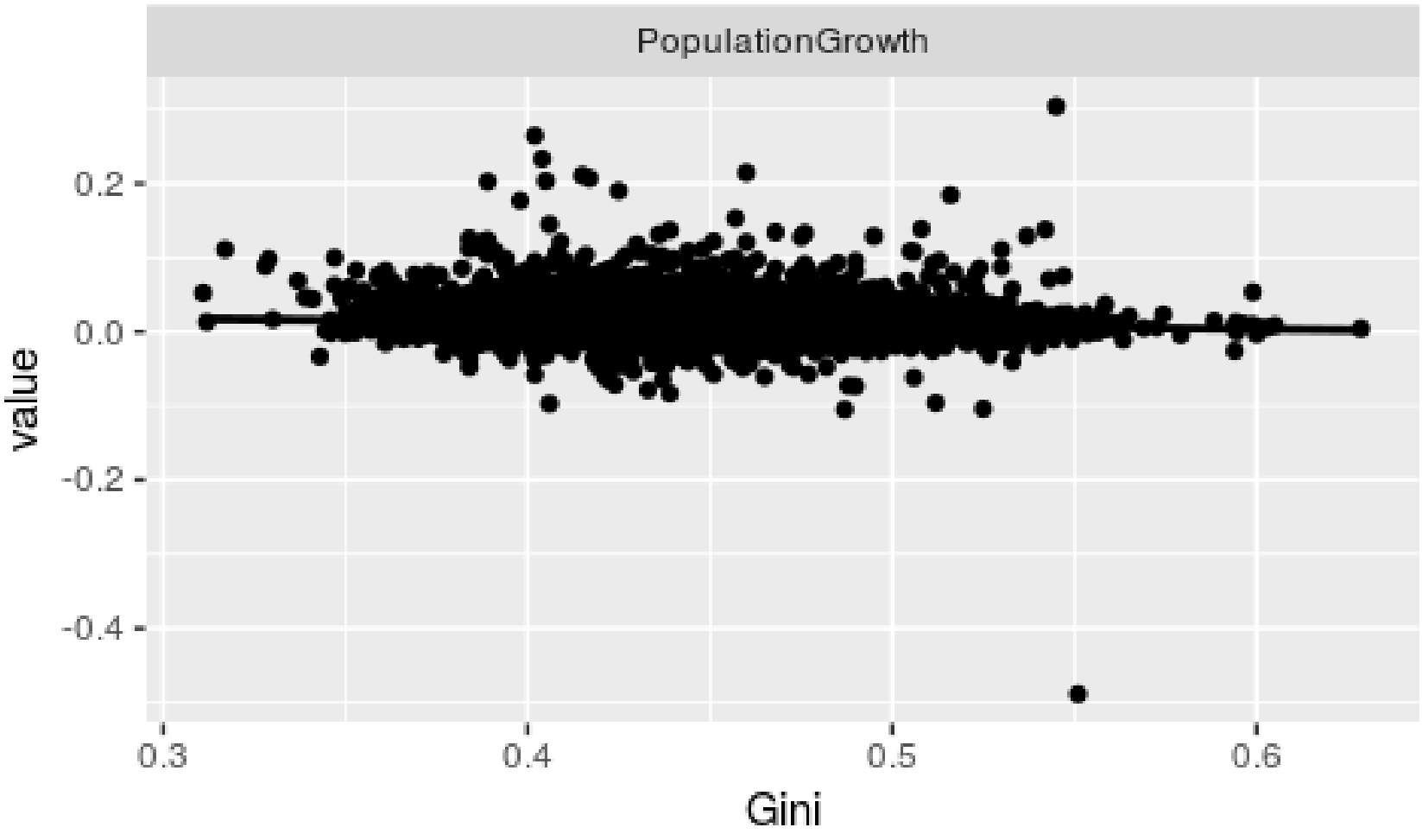


Figure 1: Population Growth

Used data from Census bureau

- Unemployment Rate
- Median Income
- Poverty Rate
- Housing Costs
- Mortgage Costs
- Bachelor Rate
- Population
- Fertility

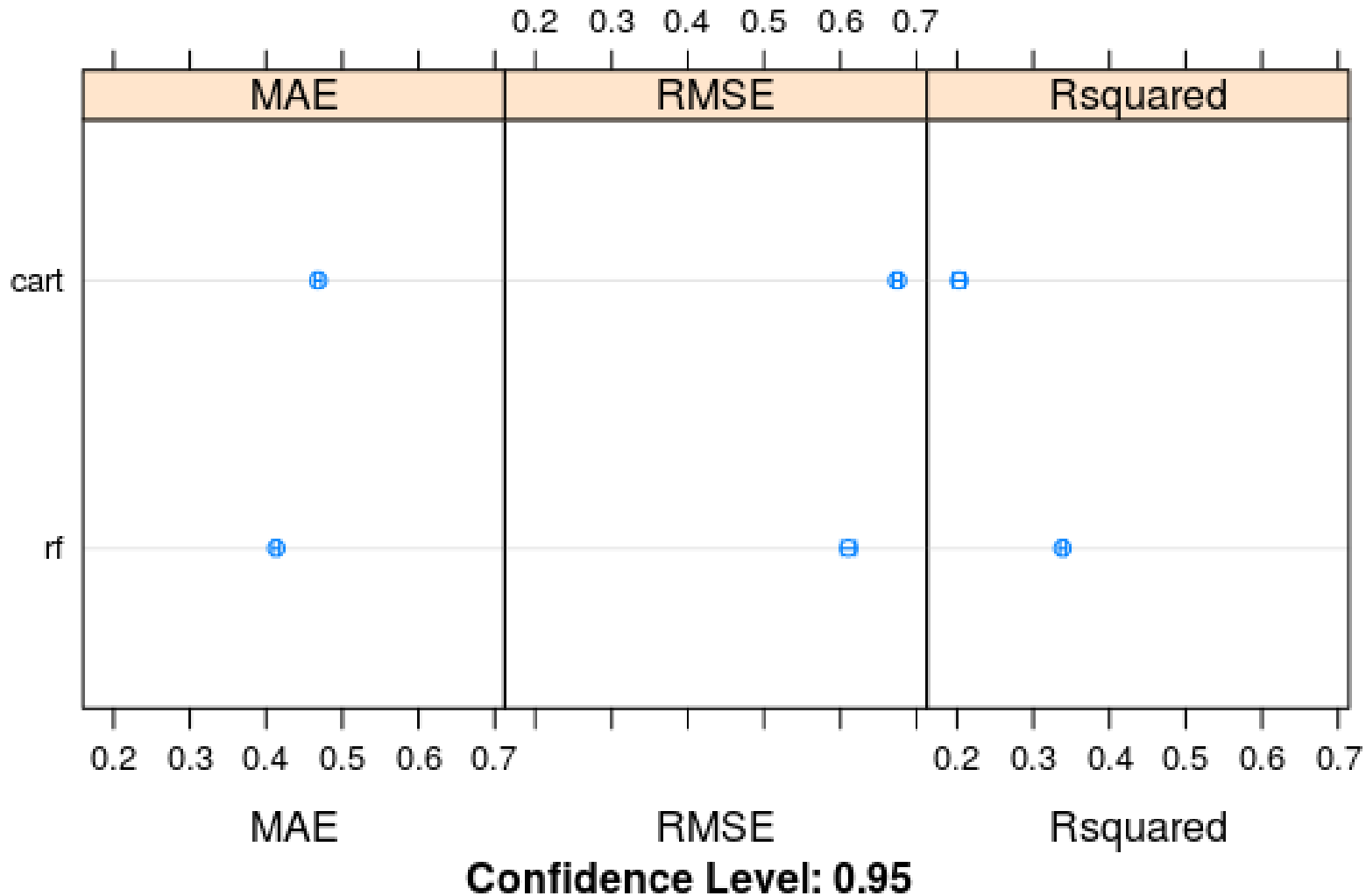
Methods

We used three main algorithms:

- Linear Regression
- Regression Tree
- Random Forest

Methods cont'd

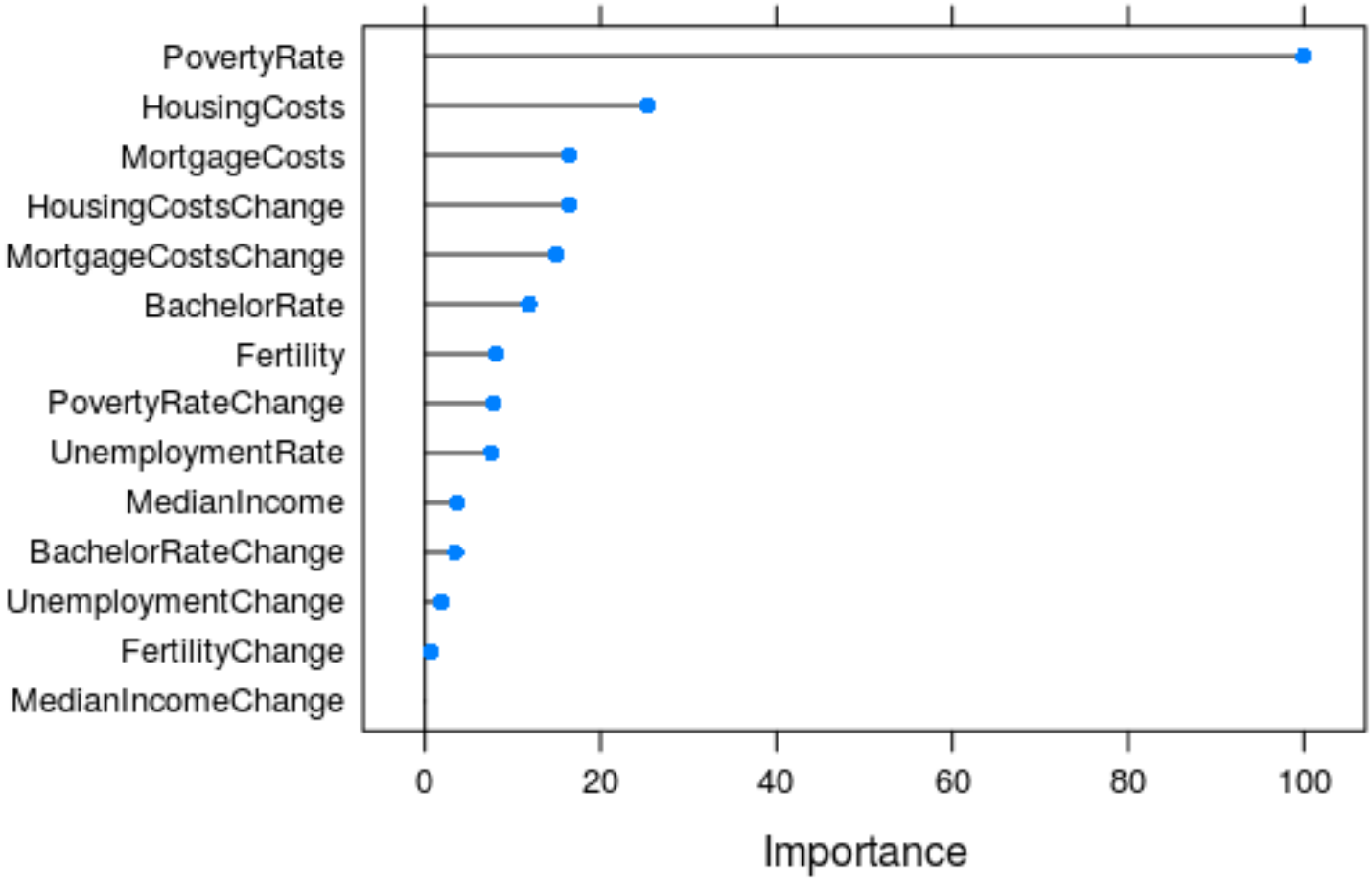
- Of the three, Random Forest performed best.
- However, it still had an adjusted R-squared of ~33.78%



*paran

Results

- The Poverty rate was (by far) the strongest predictor for "Success"
- Mortgage and Housing Costs were the two next most significant



Results Graphically

- Our predicted was not (too) far from the actual.

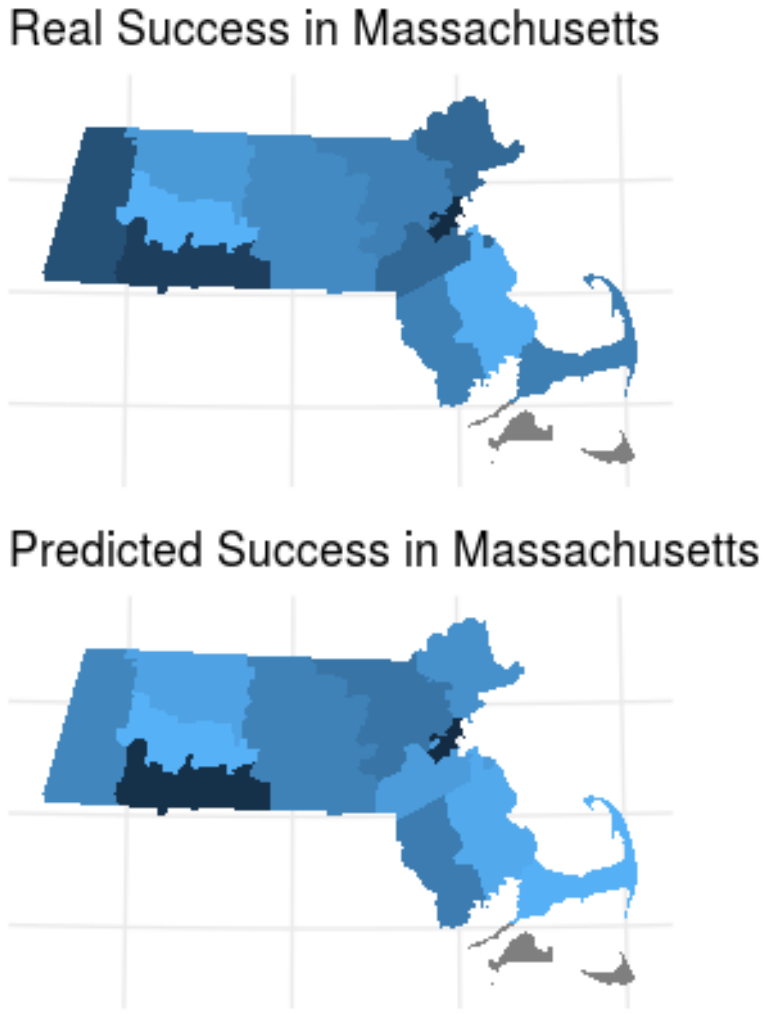


Figure 2: Massachusetts

Results cont'd

- Note that there were some missing observations, so some counties are gray

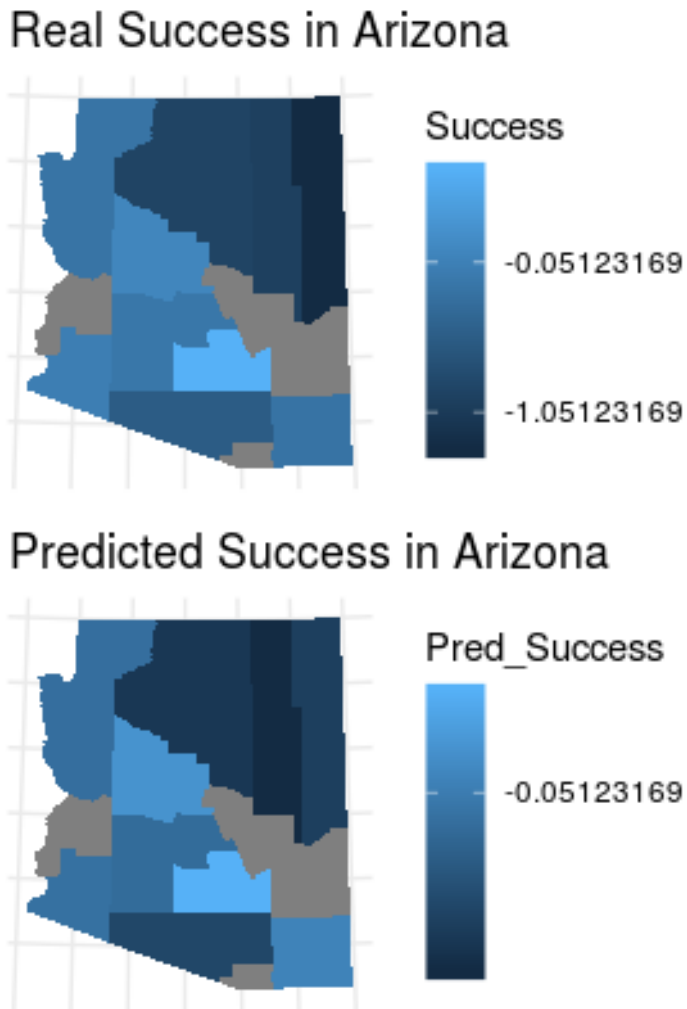


Figure 3: Arizona

Conclusions

- Our model explains very little of the deviation in our output.
- However, our finding that the Poverty Rate has an outsize effect on our output is significant.
- We can further explore other variables that could be correlated to "Success" (weather? crime?)
- We could also explore how the variables we studied interact with the Poverty rate.
- We could also forecast the variables we have and predict the "future" success of American counties.