Trump Country

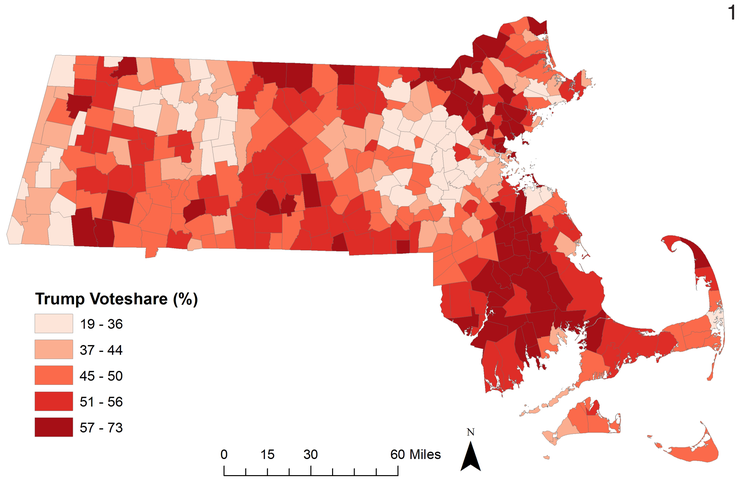
Examining support for Donald Trump in the 2016 Presidential Primary and indicators of Economic Distress in Massachusetts

Introduction

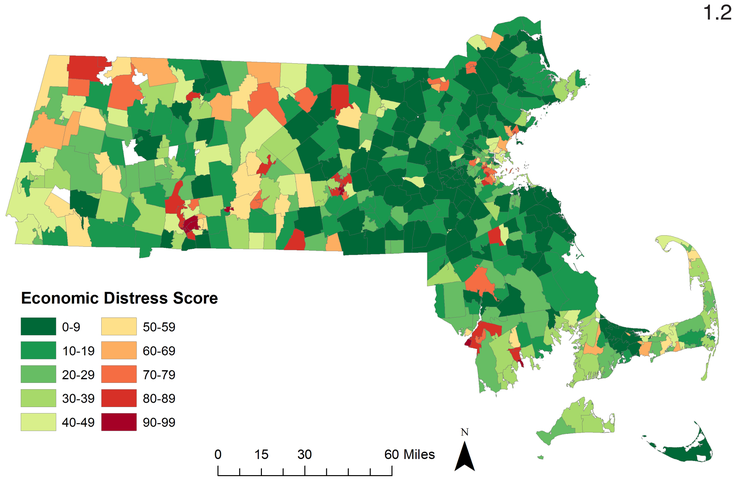
Donald Trump's run for the presidency in 2016 has overturned the political world. He has broken nearly every unwritten rule in national politics and developed a passionately strong following across the country. Political analysts and pundits have tried to explain his success by examining a number of different potential underlying factors, including dissatisfaction with the economy. The unemployment rate is down to around 5% nationally for the first time since 2008, but many Americans feel left behind by the recovery. It is possible Trump has been able to tap into the frustrations of these voters.

In February 2016, the Economic Innovation Group published a "Distressed Communities Index" for every zip code in the country. It assigned a "distress score" to each zip code on a scale of 0-99 based on a confluence of 7 equally weighted indicators. These include the percentage of the population without a high school degree, housing vacancy rate, the percentage of the population who are nonworking adults, the poverty rate, the median income ratio, the percent change in employment, and the percent change in business establishments. This project sought to explore the relationship between the Trump's success in the Massachusetts Presidential Primary and levels of economic distress in each town in the commonwealth. Map 1.1 shows the percentage of the vote won by Trump in every Massachusetts town and Map 1.2 shows an average economic distress score for each town.

1.1

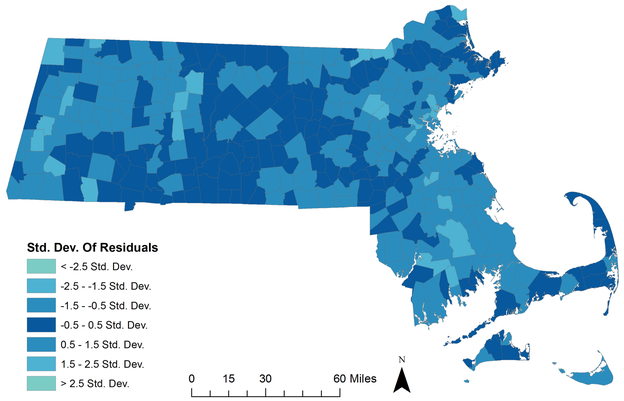


1.2

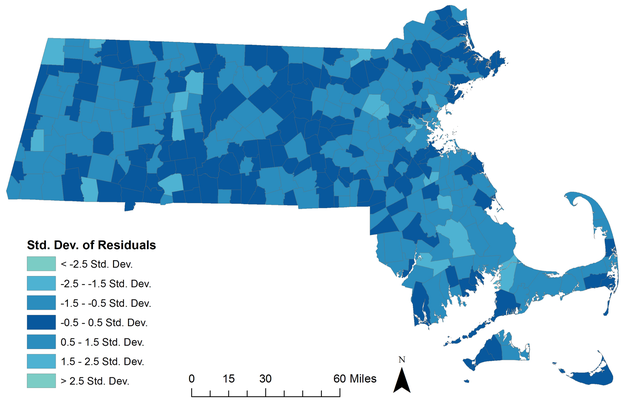


Source: the Economic Innovation Group's 2016 Distressed Communites Index

Predicting Trump Vote by Distress Score 2.1



Predicting Trump Vote by Proportion of Population without a High School Diploma 2.2



Methodology

The election data was gathered from the office of the Massachusetts Secretary of State, which compiles and controls voting results for every election in the state, and joined to a shapefile of Massachusetts towns produced by MassGIS.

The Distressed Communities Index data provided by EIG used each zip code in the state as its unique identifier. In order to get that data to communicate with the election results, I summarized and averaged the data by town. This meant that the economic data for towns with multiple zip codes would be the product of averaging the indicators for each of those zip codes.

Once each data source was organized by the same geographic reference, Massachusetts towns, I joined the two sets of data together in one attribute table and shapefile. I then used the Ordinary Least Squares tool to regress the percentage of the total votes cast Trump acquired in each Massachusetts town with the average Distress score for that town and map the distribution of the residuals (Map 2.1). I used the same tool again to regress Trump's voteshare per town with the average proportion of that town's population without a high school degree. Map 2.2 shows a distribution of the residuals from that regression.

Finally, I used Local Moran's Index to test for spatial autocorrelation in both Trump's voteshare (Map 3.1) and the residuals of the regression between Trump's voteshare and the average distress scores for each Massachusetts town (Map 3.2).

All maps were made using ArcGIS and projected in the Massachusetts State Plane Coordinate System.

Results

The results from both regression models were revealing. The first, whose residual distribution is displayed in Map 2.1, tested the relationship between Trump's voteshare and average distress score by town. The resulting adjusted r-squared value was .104, meaning about 10% of the variance in Trump's voteshare could be explained by variance in the average economic distress score of a town. The beta-coefficient for the regression line was .418, meaning every unit increase in the distress score predicted a roughly .4% increase in support for Trump. These results were statistically significant and had a p-value of 0. The map of the residual distribution shows a lot of dark blue, meaning the level of support for Trump in many Massachusetts towns was within 0.5 standard deviations from the model created by the regression.

Map 2.2 is a representation of the residual distribution from a regression of support for Donald Trump and the proportion of the population without a high school diploma. I chose to isolate this indicator after running a regression that included all 7 independent variables. The proportion of the population without a high school degree had by far highest beta-coefficient of all 7 indicators, meaning it had the greatest influence on levels of support for Trump. The regression in Map 2.2 had an adjusted r-squared value of .199, meaning nearly 20% of the variance in support for Donald Trump could be explained by the proportion of a town's population that did not graduate from high school. It was statistically significant with a p-value of 0 and beta-coefficient of .402, meaning that every percentage-point increase in the proportion of people without a high school degree would produce an expected .402 increase in support for Trump.

Limitations and Conclusion

Both the original map (1.1) of Trump's voteshare in each Massachusetts town as well as the map of a distribution of residuals from a regression of that voteshare and towns' distress scores (2.1) on the surface look to have some clustering, particularly in the western and southeastern regions of the state. In order to track this clustering, I found the local Moran's Index for both maps, which produced new maps showing outliers in clustering.

Map 3.1 shows significant outliers in a few areas. One such high-high cluster is located in southeastern Massachusetts, where there were very high levels of support for Trump. A cluster of low levels of support surrounded by other low levels is located in the area directly west of Boston. These outliers cannot be explained by data that I explored in this project.

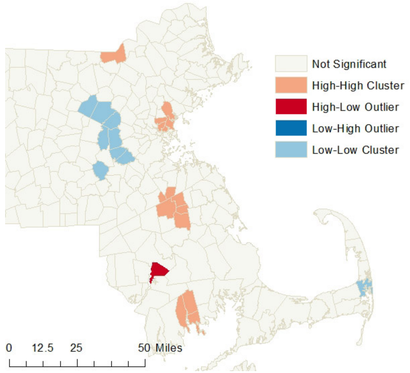
Map 3.2 shows outliers from the residuals produced by the regression shown in Map 2.2. Significantly, there are large residuals located around other large residuals in areas where Trump's support was the strongest, the corridor directly South of Boston that is deep red in Map 1.1 This high level of support, based on the degree of autocorrelation displayed in Map 3.2, cannot be attributed to economic distress.

The data explored in my project showed a statistically significant relationship between areas of economic distress and support for Donald Trump in the Massachusetts Republican Primary. Towns that with higher levels of economically distress were likely to have higher levels of support for Trump as well. Yet, key areas of very high support could not be explained by the economic distress data. Further research into these areas should include an exploration of racial and ethnic diversity as well as the levels of immigrant populations.

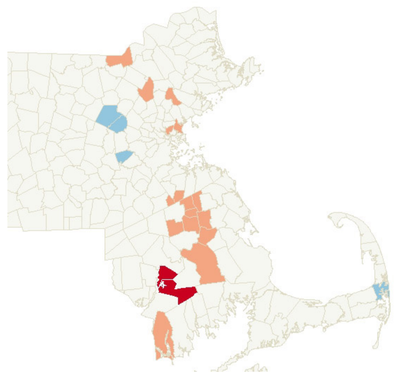
Although the seven economic indicators used to generate the distress score could explain some portion of Trump's support in Massachusetts, they do not tell the entire story.

Spatial Outliers: Areas of Significant Clustering

Trump Voteshare 3.1



Trump Voteshare and Distress Score Residuals 3.2



Tufts

Kyle Allen | GIS101 | May 2016

Projection: Massachusetts State Plane Coordinate System
Sources: ESRI, MassGIS, the Massachussetts Secretary of State, The Economic Innovation Group's 2016 Distressed Communities Index.