

Analyzing the Relationship Between Unemployment Rates and Voter Turnout in U.S. Presidential Elections (2012-2020)



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Research Question

What is the relationship between unemployment rates and voter turnout in U.S. presidential elections from 2012 to 2020? This project investigates the effect of economic hardship on political participation in the 2012, 2016, and 2020 national elections. Economic hardship may affect voters in different ways. On one hand, it may incentivize citizens to vote for candidates with economic policies that target unemployment. Economic hardship may also interfere with a potential voter’s ability to be politically active, as they may not have the means to access polling locations in their area.

To analyze these questions, we relied on county-level presidential election data in 2012, 2016, and 2020, as well as county-level unemployment rate data and voting age population data from 2012-2020. Our alternative hypothesis states that there will be a relationship between the unemployment rate and the voter turnout rate.

Data

We estimated two linear regressions, one examining the relationship between changes in the unemployment rate and voter turnout rate from 2016 to 2020, and another examining the same relationship from 2012 to 2016, both at the county level. We identified the change in the voter turnout rate between the 2012 and 2016 presidential elections and the 2016 and 2020 presidential elections as the dependent variable. The change in the unemployment rate between those elections is the independent variable.

To calculate the change in voter turnout, we used a proxy measurement. We calucaluated the voting age population by summing the total amount of people above 18 per county. Then, we subtracted the total votes in 2020/2016 divided by the voting age population in 2020/2016 from the total votes in 2016/2012 divided by the voting age population in 2016/2012. The figure below describes these calcutions.

Voter Turnout Formulas

$$\Delta \text{Voter Turnout (2016 - 2020)} = \frac{\text{Total Vote 2020}}{\text{VAP 2020}} - \frac{\text{Total Vote 2016}}{\text{VAP 2016}}$$

$$\Delta \text{Voter Turnout (2012 - 2016)} = \frac{\text{Total Vote 2016}}{\text{VAP 2016}} - \frac{\text{Total Vote 2012}}{\text{VAP 2012}}$$

Regression Results

Regression Model Results:

$\Delta \text{Voter Turnout Rate} \sim \Delta \text{Unemployment Rate}$

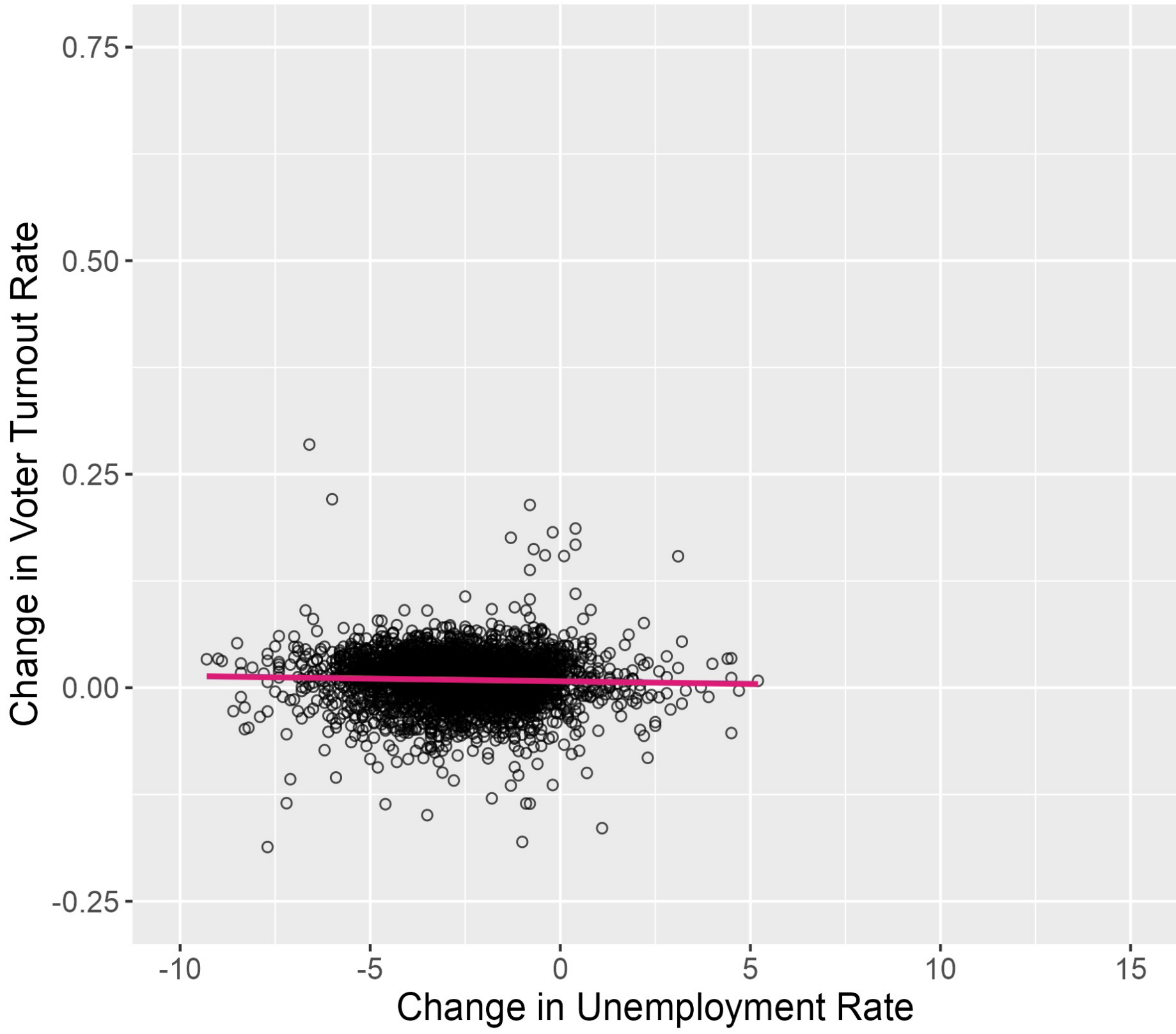
Election Periods	Estimate Coefficient	Pr(> t)	95% CI
2012-2016	-0.000625	0.0447 *	(-0.00123, -0.0000147)
2016-2020	0.00234	1.35e-09 ***	(0.00159, 0.00309)

* p < 0.05, ** p < 0.01, *** p < 0.001

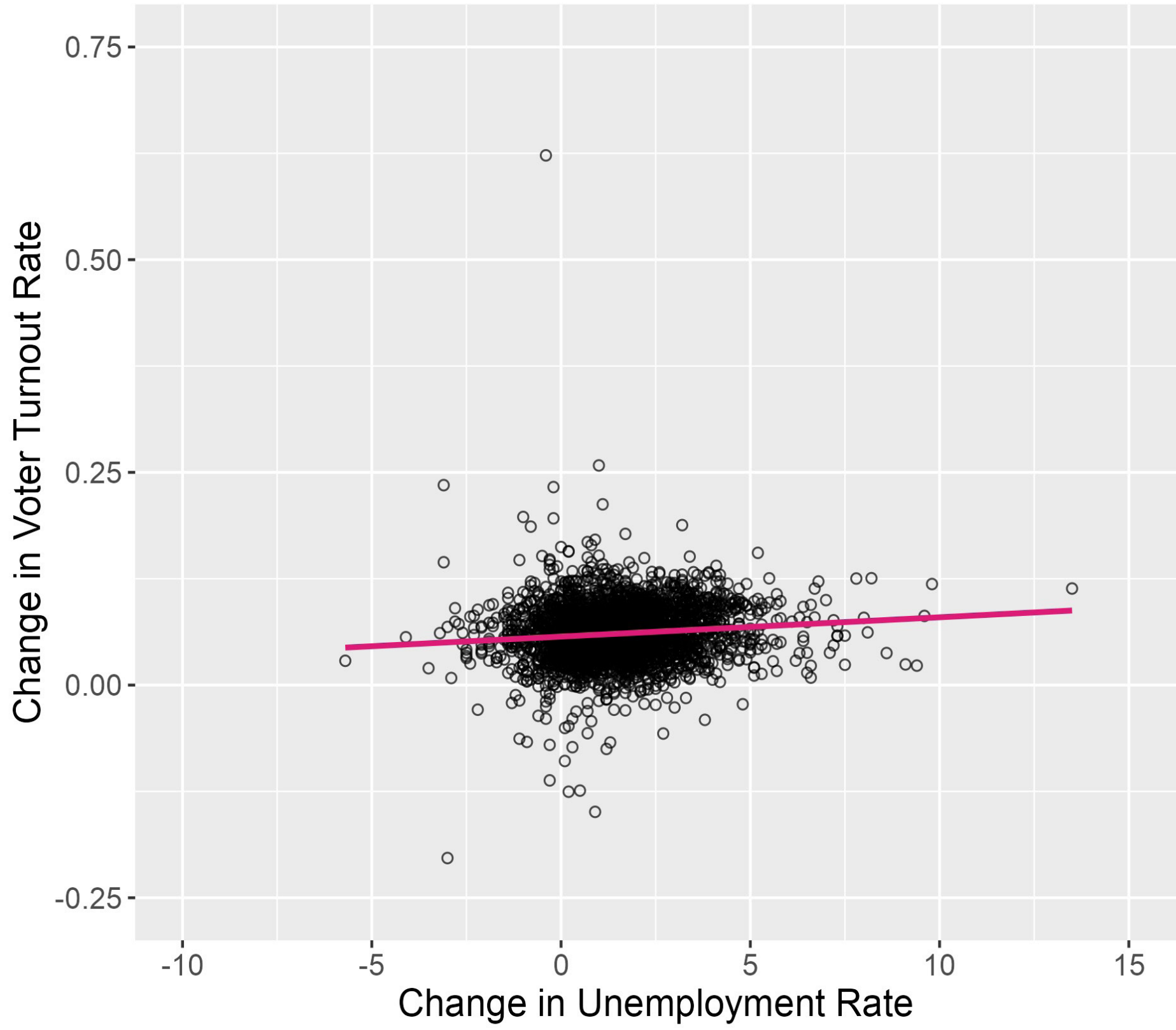
The model below illustrates a slightly negative relationship between the change in unemployment rate and the change in voter turnout rate between the 2012 and 2016 presidential elections. By each point one-unit increase in the change in unemployment rate, the change in voter turnout rate is expected to decrease by 0.0625 percentage points.

In the confidence interval test, the 95% confidence interval is (-0.00123, -0.0000147), meaning that there is a 95% chance that the above confidence interval contains the true value of the negative impact of change in the unemployment rate on the change in voter turnout rate. The confidence interval doesn't include 0 and the p-value (0.0447) is below 0.05, meaning that we can reject the null hypothesis claiming there is no relationship between the two variables. Although there is a statistically significant relationship between the change in the unemployment rate and the change in the voter turnout rate, their coefficient is small, and the p-value is only 0.0003 below the standard significant level required to reject the null hypothesis. We can only conclude that the change in the unemployment rate may have a small negative relationship with the change in the voter turnout rate.

Relationship between Change in Unemployment Rate and Change in Voter Turnout Rate by County (2012-2016)

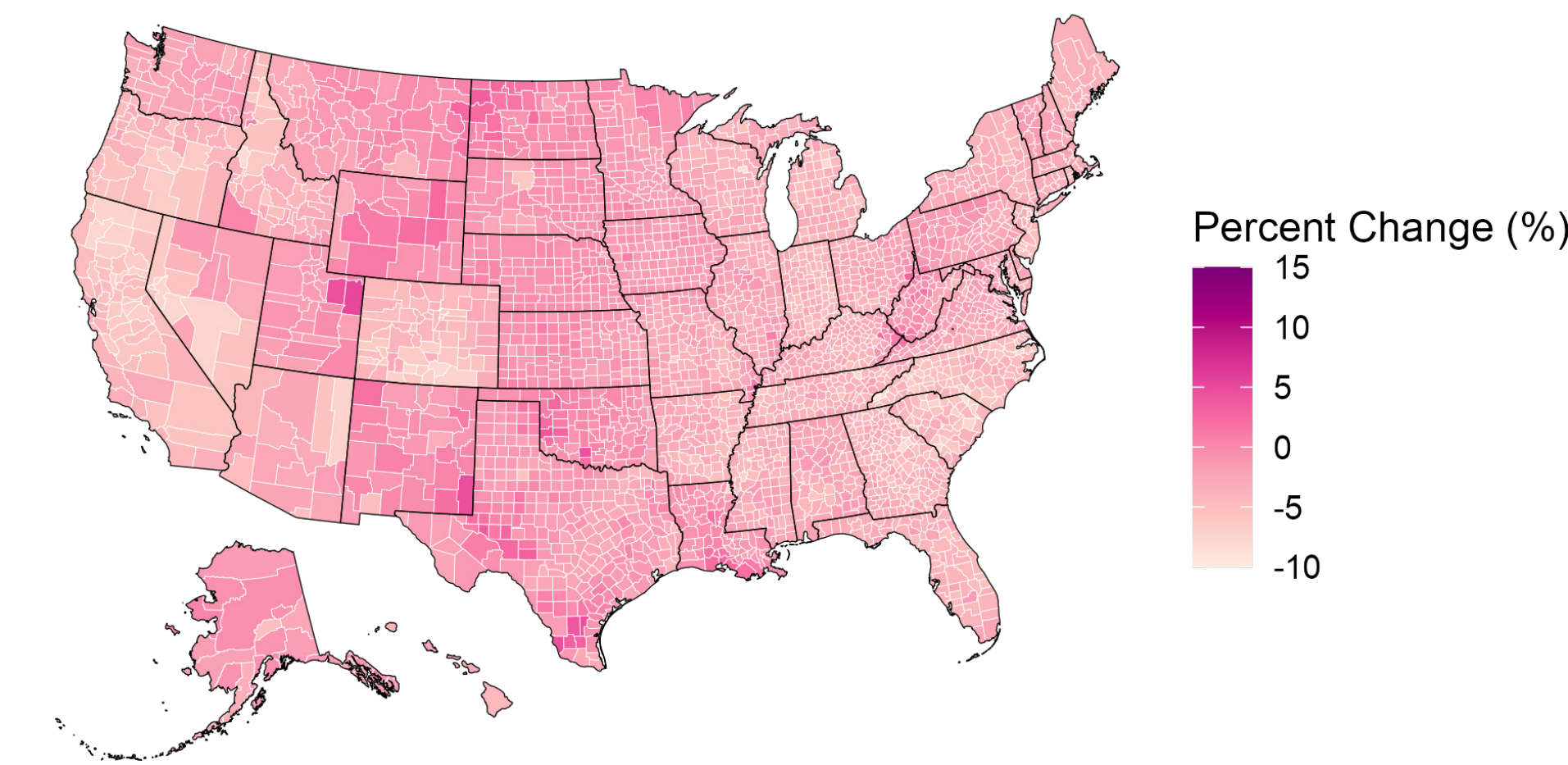


Relationship between Change in Unemployment Rate and Change in Voter Turnout Rate by County (2016-2020)



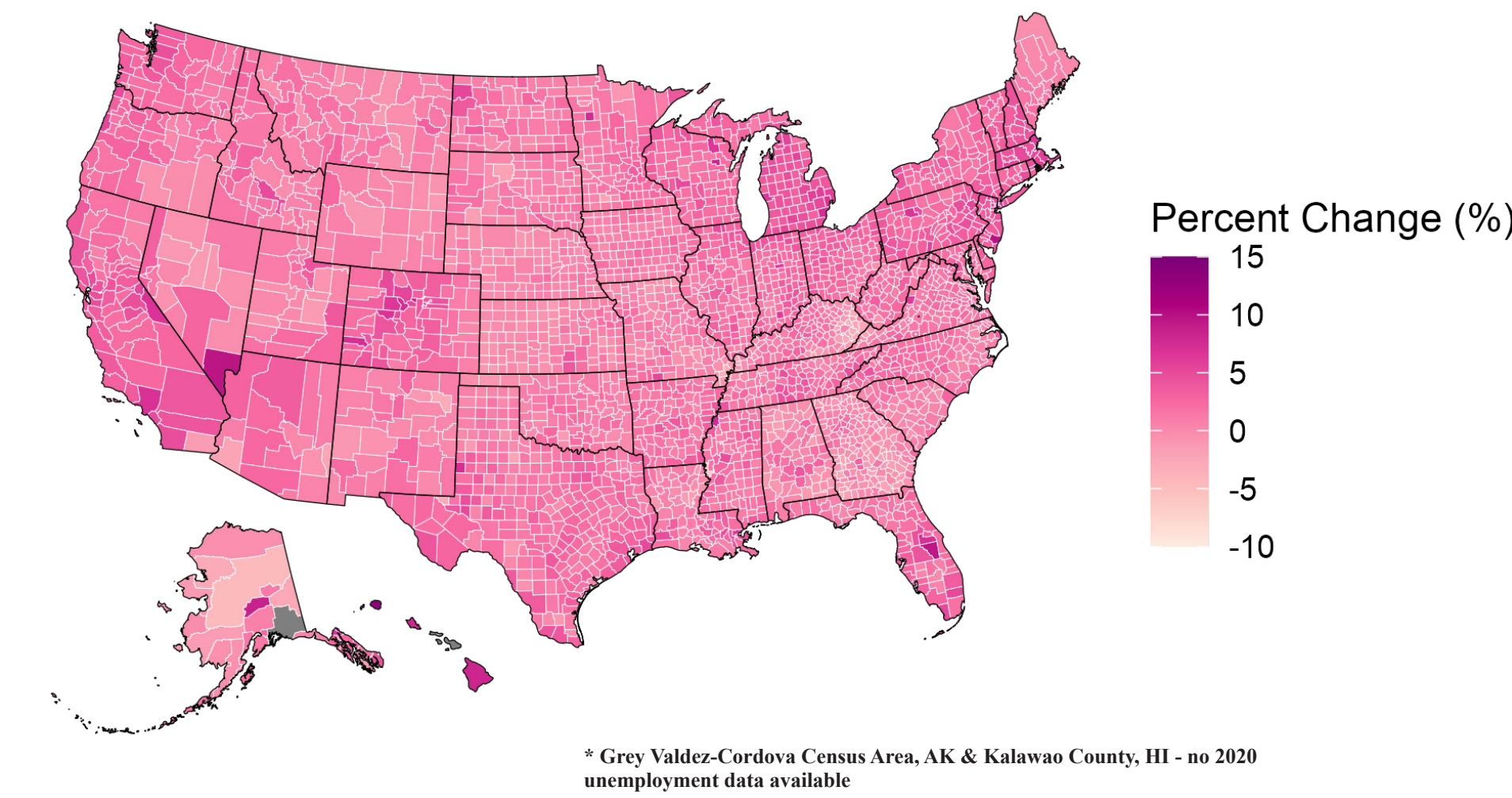
Unemployment Rate

Change in Unemployment Rate Per County (2012-2016)



The average change in the unemployment rate from 2012-2016 is -2.6%, meaning that more Americans became employed from 2012-2016.

Change in Unemployment Rate Per County (2016-2020)



The average change in the unemployment rate from 2016-2020 is 1.52%, meaning that more Americans became unemployed from 2016-2020.

Conclusion

Overall, we find statistically significant but small relationships between changes in the unemployment rate and voter turnout rate in the 2012-2016 and 2016-2020 election periods. The 2012-2016 period showed a slight negative relationship, and the 2016-2020 period had a small positive relationship.

However, given the very small coefficient sizes, we cannot conclusively determine that the unemployment rate is a major explanatory factor behind changes in voter turnout over these election cycles. While the relationships are statistically significant, the unemployment rate changes account for a small portion of the variation in voter turnout changes. There are likely other sociopolitical and economic factors that play a more substantial role. More research incorporating additional independent variables would be needed to understand what may be driving changes in voter participation over recent elections.