

Voting in the United States: How Socioeconomic Status Influenced Voter Turnout in the 2008 Presidential Election

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Abstract

The 2008 presidential election between Senators Barack Obama (D) and John McCain (R) occurred before the most severe economic recession since the great depression of the 1930s, and there is an abundance of evidence that shows economic status of voters during this period of time affected the voter turnout per state in this election. An example of this is the state GDP per capita within each individual state. The data collected in this study shows that, as state GDP per capita increases, the percent voter turnout for that state increases as well. The other variables studied included the number of students who enrolled in a degree granting institution in 2008, average state income tax, percent urban population, and state unemployment rate. However, it is not clear that these variables had significant effects on the percent voter turnout for each state in 2008.

Introduction

Voting in the United States is a very complex issue that has many factors such as state GDP, unemployment, income tax rates, percentage of the population that lives in urban areas, and education, which is represented by the total number of students enrolled in a degree granting institution. In this paper, we will attempt to test the hypothesis that states with a higher per capita GDP, education, unemployment, average tax rates, and percent urban population tend to have higher voter turnout, while those states where these variables are lower tend to have a smaller voter turnout. In analyzing this data, we will attempt to draw a conclusion about how factors like state GDP, unemployment, urban population, income tax rates and education affect voter turnout. To test our hypothesis, we will utilize data from the Federal Elections Committee and other sources, measuring voting data from individual states while also measuring these variables in those states.

During the 2008 election, Barack Obama won for the Democratic party with 52.9 of the popular vote, as recorded by the Federal Elections Committee in their transition data. John McCain, running with the Republicans, followed closely behind with 45.6 percent of the popular vote. This is important because Obama winning the election meant that the White House would change parties after the past 8 years, being led by Republican George W. Bush. This change means that our topic has importance, since it will show how the levels of our variables in 2008 led to a change in voting patterns, giving the White House to the Democrats.

By discovering how our chosen variables affect voting patterns, we can better predict the voter turnout for individual states in presidential election years. This is important because, if we can determine why some states have higher percent voter turnout numbers than other states, we will be better able to determine how to encourage more citizens to take advantage of their voting rights. The right to vote is what distinguishes American democracy from other oppressive governments around the world, so we should be trying to understand why people choose not to vote in presidential elections. This is also beneficial to the candidates in an election because they will be better able to strategize how their campaigns reach people of different economic status, and this should allow more people to take advantage of their right to vote.

Literature Review

Benenson (2016) looks into the voting patterns of the population that enrolled in university at the time of election, which is important for our research. We believed this to be an important variable because of the large number of portion of the voting age population is still enrolled in University and influenced by those other students around them. The article states, "Over 18 million people attend colleges or

universities every year, enough to influence election results and shape policy (Benenson, 2016, p.31). This goes to show how important the population of students enrolled in university at the time of elections are. If campaigners can target this market and boost voter turnout from this population in their favor, it could be enough as the article states to swing an election in their favor. We hope that our research will prove the significance of the college age population and how they play such a large part in the voter turnout of elections.

Horn (2011) argues that differences in income can play a role in whether a person takes the time to vote in an election. More specifically, he argues that “inequality associates negatively with turnout at the national elections” (Horn, 2011, p. 29). However, while income inequality appears to play a role in overall voter turnout, it does not appear that this plays a significant role in determining percent voter turnout. He states that “we can conclude that universal welfare states tend to foster voter turnout” (Horn, 2011, p. 26). This could be because, at least in theory, universal welfare closes the income inequality gap between the rich and the poor. If this is truly the case, and if income inequality does have a negative impact on percent voter turnout, then the reduction in the income gap should lead to an increase in percent voter turnout. This would in fact prove the hypothesis that a larger gap in income between the upper, middle, and lower classes does lead to suppressed voter turnout. However, in his article, he also states that “it seems that larger differences in income between the very rich and the middle decreases overall turnout, while higher difference between the middle and the very poor increases turnout” (Horn, 2011, p. 29). If this is true, then this may actually disprove the hypothesis that large gaps in income inequality lead to suppressed percent voter turnout. We would have expected percent voter turnout to decrease with an increase in the income gap between the middle and lower classes, but that is not the case.

Caporale and Poitras (2014) attempts to explain the long-term changes in voting patterns during presidential elections from 1880 to 2012. Their analysis is a time-series, while ours is a cross-sectional, but nonetheless, we feel as though their conclusions, especially their conclusions regarding unemployment, are still relevant. According to Caporale and Poitras, their coefficient for unemployment is positive, which means that as unemployment increases, so will voter turnout. They point out, “The point estimate implies that, all else equal, every additional point of unemployment increases non-South turnout by about 0.6%. This result lends support to the hypothesis that economic adversity increases turnout.”(Caporale & Poitras, 2014, 3635). This conclusion helps to reinforce our hypothesis that unemployment is positively related to voter turnout, and as such, states with higher unemployment rates will have citizens that are more motivated to vote to change their unemployment status

Our paper is unique because it will look at multiple factors including state GDP and education to determine if these variables had an effect on percent voter turnout in individual states during the 2008

presidential election. Most articles look at whether individual economic factors affect percent voter turnout, but we are interested in discovering if all of these variables together make a difference in determining percent voter turnout. In addition, we are looking at these variables at the state level, meaning that we want to see if the GDP in a particular state, or if the education level in a particular state, determine how people in that state voted in 2008. Most articles look strictly at the effects of these variables on individual person voting patterns, but in the United States, a candidate must win a majority of electoral college votes to win the presidential election, not just the popular vote which can be seen in the 2000 presidential election between Governor George W. Bush (R) and Vice President Al Gore (D).

Data

For our paper, we decided to focus on percentage of voter turnout on a state level as our dependent variable. As stated earlier, the 2008 was during a period of an extreme economic downturn and we wanted to see what factors had the most impact on the percentage of people which went to the polls to vote. Finding out the variables with the most impact on voter turnout in times like these could help candidates in the future plan their campaign in a smarter way. Rather than guess what could possibly boost turnout, they will have a more evidence based plan that can help swing an election in their favor.

Our main independent variable we decided to look into was state gross domestic product (GDP) per capita. We believed that how a state was performing economically would have a great impact on the amount of people who felt it was necessary to vote. We found this data at the Bureau of Economic Analysis.

We chose amount of people in each state currently enrolled in college as an independent variable because we felt people in college were more likely to vote when they were surrounded by others involved in politics. We thought voting would stagnate after a certain amount of years of education so we decided that enrollment in postsecondary education would be a better fit than average years of education for the population of a state. We found this data at the National Center for Education Studies.

Another factor that we thought would lead people to vote was average income tax for a state. Tax policies are some of the biggest discrepancies between parties, so we figured the average income tax level in a state would be a good choice for an independent variable. We found this data at the Tax Policy Center.

We selected unemployment rate as an independent variable because we thought states with higher unemployment rates would be more inclined to go to the polls and make a change in office. Economic factors such as unemployment rate are watched constantly by the public eye and could cause an influx of voters going to the polls. We found this data at the Bureau of Labor Statistics.

Lastly, we selected the percentage of a state’s population that lives in what is considered to be an urban area. We figured states with high levels of urban population would have easier access to polls as they are normally located in bigger cities. We found this data at the Iowa State research studies site.

| Variable | Observations | Mean | Standard Deviation | Minimum | Maximum |
|-----------------------------|--------------|-----------|--------------------|---------|-----------|
| Voter Turnout | 51 | 64.53 | 5.31 | 51.8 | 75 |
| College Enrollment | 51 | 374,260.3 | 440,782.2 | 30,717 | 2,652,241 |
| Unemployment Rate | 51 | 5.30 | 1.26 | 3 | 8.4 |
| State GDP Per Capita | 51 | 38,172.75 | 14,159.43 | 24,403 | 126,407 |
| Average Income Tax | 51 | 3.63 | 2.05 | 0 | 7 |
| Percent of Urban Population | 51 | 74.11 | 14.88 | 38.7 | 100 |

Above is a summary of all of the descriptive statistics for our dependent and independent variable(s). As seen for each variable we had 51 observations, which includes Washington D.C. and all 50 states.

We see for voter turnout that on average 65.53% of each state showed up to vote in the 2008 election with a standard deviation of 5.31. Voter turnout had a minimum turnout of 51.8% which was in Hawaii, and there was a maximum of 75% turnout coming from Minnesota.

It was found that on average, states had 374,260.3 people enrolled in post-secondary education in 2008 with a standard deviation of 440,782.2 which is fairly large. There was a minimum amount of people enrolled in Arkansas with 30,717 people and a maximum amount of people enrolled in California at 2,652,241.

In the United States in 2008, the average unemployment rate for a state was 5.3% with a standard deviation of 1.26. At the point this data was gathered, the unemployment rate was still fairly low as it got up near 10% on average during times of the recession. We found a minimum unemployment rate of 3% in South Dakota and a maximum unemployment rate of 8.4% in Michigan.

For our primary independent variable, State GDP Per Capita, we saw a state average of 38,172.75 with a standard deviation of 14,159.43. The state with the lowest GDP per capita was Mississippi with a

GDP of 24,403 and the state with the highest GDP per capita was Washington D.C. with a GDP of 126,407.

We found that the average state income tax across the United States in 2008 was 3.63% with a standard deviation of 2.05. There were many states that tied for the minimum income tax at 0% as not all states have a state income tax in effect. Oregon was the state with the maximum average income tax at 7%.

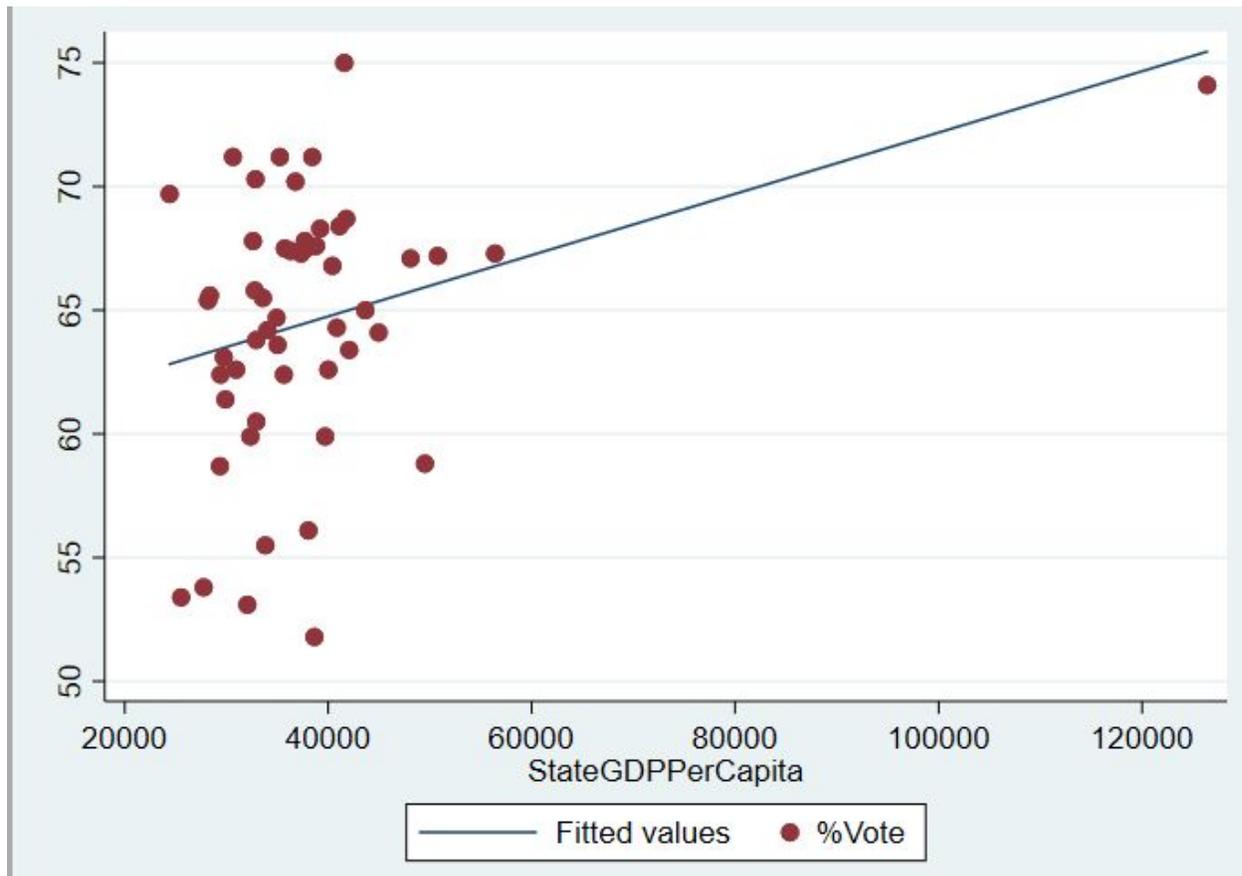
Lastly, our data showed us that on average a state had 74.11% of their population living in an urban area with a standard deviation of 14.88. We see that Maine has the lowest percentage of urban living with only 38.7% of their population living in an urban area while Washington D.C. has the highest percentage with 100% of their population living in an urban area in 2008.

Gauss-Markov Assumptions

Our data passes the first assumption in the Gauss-Markov model, which is that it is linear in parameters. To simplify, our independent variables and our dependent variable are linearly related. For the second assumption, the random sampling assumption, our data passes as well, since it is data taken from the total population of a state. For the third assumption, the no perfect collinearity assumption, our data passes, since neither of the independent variables in the multiple regression are linearly related to one another. This is proven in our chart listed below that provides the correlation coefficient for all of the variables in terms of each other. We can see that none of our variables have a correlation coefficient higher than 0.5, with only two occasions of variables having a correlation coefficient greater than 0.4. Having these variables with correlations above 0.4 is not alarming at all and does not show us that we will need to search for new variables in an effort to avoid collinearity.

| | Vote | ColEnr | UnRate | StGDP | IncTax | Urb |
|--------|-------|--------|--------|-------|--------|------|
| Vote | 1.00 | | | | | |
| ColEnr | -0.14 | 1.00 | | | | |
| UnRate | 0.12 | 0.33 | 1.00 | | | |
| StGDP | 0.33 | 0.02 | 0.15 | 1.00 | | |
| IncTax | 0.18 | 0.04 | 0.00 | 0.16 | 1.00 | |
| Urb | -0.08 | 0.41 | 0.24 | 0.46 | -0.04 | 1.00 |

For the fourth assumption of zero conditional mean, our data falls in line, since the mean value of our residuals equals zero. Upon viewing the scatter plot below, it can be seen that the regression shows a positive correlation between %Vote and StateGDPPerCapita, but the actual data points show differently, with an extremely slight positive correlation, with the exception of one large outlier on the far right end of the plot.



Lastly, for the fifth and final assumption, the assumption of homoskedasticity, our regression model passes, since the variance of our residuals, which is represented as Root MSE in our STATA output for the multiple regression, is a constant.

Results

Simple Linear Regression:

$$Voter\ Turnout = \beta_0 + \beta_1 StGDP$$

$$Vote = 59.80 + 0.0001StGDP$$

Unrestricted Multiple Linear Regression :

$$Voter\ Turnout = \beta_0 + \beta_1 StGDP + \beta_2 ColEnr + \beta_3 Urb + \beta_4 IncTax + \beta_5 Urb$$

$$\text{Vote} = 61.61 + 0.0002\text{StGDP} - (1.12 * 10^6)\text{ColEnr} - 0.097\text{Urb} + 0.282\text{IncTax} + 0.672\text{UnRate}$$

Restricted Multiple Regression:

$$\text{Voter Turnout} = \beta_0 + \beta_1\text{StGDP} + \beta_2\text{IncTax} + \beta_3\text{UnRate}$$

$$\text{Vote} = 57.23 + 0.0001\text{StGDP} + 0.353\text{IncTax} + 0.335\text{UnRate}$$

| | Simple | Multiple 1 (Unrestricted) | Multiple 2 (Restricted) |
|-------------|--------|------------------------------|-------------------------|
| Coefficient | 59.80 | 61.61 | 57.23 |
| StGDP | 0.0001 | 0.0002 | 0.0001 |
| ColEnr | | $-1.12 * 10^{-6}$ | |
| %Urb | | -0.097 | |
| IncTax | | 0.282 | 0.353 |
| UnRate | | 0.672 | 0.335 |
| R-squared | 0.1090 | 0.2133 | 0.1328 |

We decided to use State GDP Per Capita as our primary simple linear regression because it was the most statistically significant of all of our variables. Upon running the regression, we found the results gave us a coefficient of 59.80. This means that if we were to find a state that had a value of 0 for their GDP per capita *ceteris paribus*, we could expect voter turnout to be 59.80%. For the variable GDP per capita itself, we saw a coefficient of 0.0001, which tells us that a \$1 increase of state GDP per capita will lead to 0.0001 increase in the percentage of voter turnout. This simple regression gave us a R-squared value of 0.1090, meaning around 10.9% of voter turnout was explained by state GDP per capita. This is not a very large R-squared, but it is good for a one variable model.

For our unrestricted multiple linear regression model, we regressed all of the variables we were interested in against our dependent variable, voter turnout. For this model, we found the equation had a coefficient of 61.61 meaning that holding all the independent variables constant at 0, we could expect to see voter turnout equal to 61.61%. It is interesting to see that the y-intercept increased by nearly 2% compared to the simple linear regression model. Along with the y-intercept, we also saw a very slight increase in the coefficient for state GDP per capita. Although the increase seems small, going from 0.0001 to 0.0002, it is still double the previous coefficient. This tells us that holding all other variables constant,

we will see a 0.0002% increase in voter turnout for every additional dollar added to a state's GDP per capita. For the variable college enrollment, as expected, we saw an extremely small coefficient. We believed we would see such a small coefficient such as the one we received, $-1.12 * 10^{-6}$ because of the high values associated with the variable. This shows us that for every extra person enrolled in college in a state, it will cause a decrease in voter turnout by .00000112%. We also to our surprise found there to be a negative relationship between voter turnout and the percentage of urban population in a state. Examining the regression equation, we found a coefficient of -0.097 for the urban population variable. This proves that in this model, we can expect to see voter turnout decrease by 0.097% for every addition percent of the population of a state that lives in an urban area. For both economic variables, average income tax rate and state unemployment rates, we saw a positive relationship between their coefficients and voter turnout as we expected. For income tax, we received a coefficient of 0.282 from the regression meaning that every percentage point the average income tax rate in a state increases, voter turnout will increase by .282%. Lastly, looking at unemployment rate, the regression provided us a coefficient of 0.672. This means that for every percentage point that the unemployment rate increases, we will see voter turnout increase by 0.672%.

For the restricted multiple linear regression model, we decided to focus on the economic factors involved in the model. Keeping voter turnout as our dependent variable, we did a regression with state GDP per capita, average income tax, and unemployment rate as the independent variables. Once the regression was complete, we found that there was a coefficient or y-intercept of 57.23. This shows us that if all the variables were equal to 0, the voter turnout would be 57.23%. This was the lowest coefficient of any of the models by approximately 2%. We found the coefficient for state GDP per capita to be equal to what it was for the simple regression model at 0.0001. This tells us that an increase by \$1 in state GDP per capita would lead to a 0.0001% increase in voter turnout. Next, we saw a slight increase in the coefficient for average income tax compared to the unrestricted multiple regression model. The coefficient for this variable came out to be 0.353 which shows that an increase by 1% in a state's average income tax would lead to an increase in voter turnout by 0.352%. Finally, to our surprise, we found a significant decrease in the coefficient for the unemployment rate than we found in the unrestricted model. In the restricted model, the unemployment rate variable had a coefficient of 0.335 which means an increase in the unemployment rate by one percentage point would lead to an increase in voter turnout by 0.335%.

T-Test Inferences

| Dependent Variable: % Voter Turnout | | | |
|-------------------------------------|---------------------|--|---------------------|
| Independent Variables | Simple Regression | Unrestricted Model | Restricted |
| StGDP | 0.0001** (0.000) | 0.0002** (0.000) | 0.0001** (0.000) |
| UnRate | | 0.672 (0.597) | 0.335 (0.577) |
| IncTax | | 0.282 (0.353) | 0.353 (0.356) |
| %URB | | -0.097 (0.061) | |
| ColEnr | | -1.12*10 ⁻⁶ (1.88*10 ⁻⁶) | |
| Intercept | 59.8*** (2.1) | 61.6*** (4.71) | 57.2*** (3.61) |
| R-Squared | 0.11 | 0.2133 | 0.1328 |
| No. of Observations | 51 | 51 | 51 |

In our simple regression we observed that State GDP was significant using a 5% level of significance in a two-tailed t-test. Our intercept had a t-value that made it significant at 10%, 5%, and 1%, so this leads us to believe that our error term contains much of the information of our model. In our unrestricted multiple regression model, again we observed that State GDP was the only variable that was significant at 5%. This tells us that the rest of our variables are less significant. Finally, in our restricted model, we continued to observe that state GDP was the only significant variable.

P-Value Inferences

For the simple regression, the p-value for state GDP is 0.018. This means that we can reject the null hypothesis that state GDP is not significant. This makes sense because the t-value indicated that state GDP is significant at 5%. For the unrestricted multiple regression, the p-value for state GDP is 0.011, the value for unemployment rate is 0.267, the value for average income tax is 0.429, the value for percent urban population is 0.117, and the value for college enrollment is 0.555. This means that we continue to

reject the null hypothesis for state GDP, but we fail to reject the null hypothesis for the remaining variables. Finally, for the restricted model, the p-value for state GDP is 0.038, the value for unemployment rate is 0.564, and the value for average income tax is 0.328. This means that we once again reject the null hypothesis for state GDP, and we fail to reject the null hypothesis for unemployment rate and average income tax.

F-Test

To conduct our F-test, we found the SSR values for both our unrestricted and restricted models, and there were 2 restrictions in our restricted model. We dropped the variables of college enrollment and percent urban population and found the f-value to be 2.30. Then we compared our value to the critical value at 5% which was 3.20. Since our value was smaller than the critical value, we can conclude that our variables are not jointly significant at 5%. Therefore, we fail to reject the null hypothesis which is that our variables are not significant. At a 10% level of significance, we determined that the critical value was 2.42, and that our value of 2.30 was again less than the critical value, so we again fail to reject the null hypothesis and our variables are not jointly significant.

Different Functional Forms

Our model using different functional forms utilized logarithms, as seen below.

$$Voter\ Turnout = \beta_0 + \beta_1 \log(StGDP) + \beta_2 \log(ColEnr)$$

$$Voter\ Turnout = -7.56 + 7.47 \log(StGDP) - 0.522 \log(ColEnr)$$

Going back to our methods of analysis using t-statistics and p-values, we found that the t-statistics for our model were as follows:

| Dependent Variable: % Voter Turnout | |
|-------------------------------------|---------------------------|
| Independent Variables | Multiple Regression Model |
| log(StGDP) | 7.47** (2.89) |
| log(ColEnr) | -0.522 (0.694) |
| Intercept | -7.56 (31.59) |
| R-Squared | 0.131 |
| Number of Observations | 51 |

In this model, the data shows that $\log(\text{StGDP})$ is significant at 5%, while $\log(\text{ColEnr})$ is not significant at that level. What this means is that we can reject the null hypothesis for $\log(\text{StGDP})$, but we fail to reject it for $\log(\text{ColEnr})$. Using the different functional form of a logarithm failed to provide meaningfully different results from our previous models. So, state GDP appears to be the only one of our variables that is significant. Moving on to the p-values of our model, we found that the p-value for $\log(\text{StGDP})$ is 0.013, and the value for $\log(\text{ColEnr})$ is 0.456. This tells us that StGDP is significant due to how small its p-value is compared to the significant level of 5%, but $\log(\text{ColEnr})$ is not significant, due to how much larger its p-value is.

Conclusion

Overall, our models did not live up to our hypothesis, since most of our variables were found to be insignificant at any of the three suggested significance levels. However, our variable of per capita state GDP was found to be significant at 5%. This means that, out of all the variables we studied, per capita state GDP was the only variable we can conclusively say influenced voter turnout in the 2008 Presidential election, and it influenced voter turnout positively, as we thought it would in our hypothesis. For our simple regression, the coefficient for per capita state GDP was 0.0001. This means that, for every \$1 increase in per capita state GDP, percent voter turnout increased by 0.0001%. A more practical interpretation for this would be to say that, for every \$1,000 increase in per capita state GDP, voter turnout increases 0.1%. However, the simple regression model omitted many other variables that may potentially impact percent voter turnout.

For our unrestricted model, we added the variables of state unemployment rate, average state income tax brackets, state unemployment rate, and percent urban population for each state. Again, none of these variables proved to be significant, so we looked at the coefficient for per capita state GDP. The coefficient was 0.0002, so this means that a \$1,000 increase in per capita state GDP resulted in a 0.2% increase in voter turnout. From this data, state GDP per capita is again the only variable that is significant, at least for our regression model. This means that many of the other variables are perhaps unnecessary and should be replaced with more significant variables. These variables could include such things as age, inflation rate, monetary policy, and weather patterns on voting days.

In conclusion, future research on this topic should attempt to better specify the regression models by replacing our insignificant variables with variables that may be more significant in determining voter turnout. The implications of this research could have large impacts in voter turnout in future elections. If political entities are made more aware of voting patterns, they can better tune their platforms to appeal to wider audiences. Also, by seeing voter turnout data and conclusions, individual voters may be more influenced to get out and vote.

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Appendix

Simple Regression Model

```
. reg Vote StateGDPPerCapita
```

| Source | SS | df | MS | Number of obs | = | 51 |
|----------|------------|----|------------|---------------|---|--------|
| Model | 153.762874 | 1 | 153.762874 | F(1, 49) | = | 5.99 |
| Residual | 1256.92301 | 49 | 25.65149 | Prob > F | = | 0.0180 |
| Total | 1410.68588 | 50 | 28.2137176 | R-squared | = | 0.1090 |
| | | | | Adj R-squared | = | 0.0908 |
| | | | | Root MSE | = | 5.0647 |

| Vote | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|--------------|----------|-----------|-------|-------|----------------------|
| StateGDPPe~a | .0001238 | .0000506 | 2.45 | 0.018 | .0000222 .0002255 |
| _cons | 59.80173 | 2.057103 | 29.07 | 0.000 | 55.66782 63.93563 |

Unrestricted Multiple Regression Model

```
. regress Vote ColEnr UnemployRate StateGDPPerCapita AvgIncTax Urban
```

| Source | SS | df | MS | Number of obs | = | 51 |
|----------|------------|----|------------|---------------|---|--------|
| Model | 300.908358 | 5 | 60.1816716 | F(5, 45) | = | 2.44 |
| Residual | 1109.77752 | 45 | 24.6617228 | Prob > F | = | 0.0486 |
| Total | 1410.68588 | 50 | 28.2137176 | R-squared | = | 0.2133 |
| | | | | Adj R-squared | = | 0.1259 |
| | | | | Root MSE | = | 4.9661 |

| Vote | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] |
|-------------------|-----------|-----------|-------|-------|----------------------|
| ColEnr | -1.12e-06 | 1.88e-06 | -0.59 | 0.555 | -4.91e-06 2.67e-06 |
| UnemployRate | .6716405 | .5973332 | 1.12 | 0.267 | -.5314504 1.874731 |
| StateGDPPerCapita | .0001561 | .0000591 | 2.64 | 0.011 | .0000371 .0002751 |
| AvgIncTax | .2815751 | .3526429 | 0.80 | 0.429 | -.4286843 .9918344 |
| Urban | -.0972175 | .0608082 | -1.60 | 0.117 | -.2196914 .0252564 |
| _cons | 61.60967 | 4.713832 | 13.07 | 0.000 | 52.11552 71.10381 |

Restricted Multiple Regression Model

```
. regress Vote UnemployRate StateGDPPerCapita AvgIncTax
```

| Source | SS | df | MS | Number of obs | = | 51 |
|----------|------------|----|------------|---------------|---|--------|
| Model | 187.34243 | 3 | 62.4474768 | F(3, 47) | = | 2.40 |
| Residual | 1223.34345 | 47 | 26.0285841 | Prob > F | = | 0.0797 |
| | | | | R-squared | = | 0.1328 |
| | | | | Adj R-squared | = | 0.0774 |
| Total | 1410.68588 | 50 | 28.2137176 | Root MSE | = | 5.1018 |

| Vote | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-------------------|----------|-----------|-------|-------|----------------------|----------|
| UnemployRate | .3352065 | .5769326 | 0.58 | 0.564 | -.8254322 | 1.495845 |
| StateGDPPerCapita | .0001112 | .0000522 | 2.13 | 0.038 | 6.22e-06 | .0002163 |
| AvgIncTax | .352605 | .3564072 | 0.99 | 0.328 | -.3643938 | 1.069604 |
| _cons | 57.22508 | 3.612475 | 15.84 | 0.000 | 49.95772 | 64.49245 |

Different Functional Form Multiple Regression Model

```
. regress Vote lStateGDP lEnroll
```

| Source | SS | df | MS | Number of obs | = | 51 |
|----------|------------|----|------------|---------------|---|--------|
| Model | 184.671017 | 2 | 92.3355083 | F(2, 48) | = | 3.62 |
| Residual | 1226.01487 | 48 | 25.5419764 | Prob > F | = | 0.0345 |
| | | | | R-squared | = | 0.1309 |
| | | | | Adj R-squared | = | 0.0947 |
| Total | 1410.68588 | 50 | 28.2137176 | Root MSE | = | 5.0539 |

| Vote | Coef. | Std. Err. | t | P> t | [95% Conf. Interval] | |
|-----------|-----------|-----------|-------|-------|----------------------|----------|
| lStateGDP | 7.470763 | 2.893207 | 2.58 | 0.013 | 1.653581 | 13.28794 |
| lEnroll | -.5221609 | .6945855 | -0.75 | 0.456 | -1.918719 | .8743968 |
| _cons | -7.562989 | 31.59985 | -0.24 | 0.812 | -71.09874 | 55.97276 |