INVESTIGATING THE EFFECTS OF THE 2013 VOTING RIGHTS ACT AMENDMENT ON VOTER ACTIVITY BY RACE

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1. Introduction

Voter suppression is a strategy used, typically by the majority group in power, to influence the outcome of an election by discouraging or prohibiting voting among certain groups. It was especially rampant in the period after the Civil War in the form of Jim Crow laws, through which former Confederate states were able to retain power over the freed black population. Although black men were given the constitutional right to vote, severe voter suppression meant that Southern black men had next to no political power, and thus politics and law-making remained the jurisdiction of wealthy white men (women of any race still did not have the right to vote). Voter suppression in these times was blatant, targeted, and highly subjective to the people in power. For example, a voting literacy test was commonly administered to any black man who attempted to vote, under the guise of maintaining the "integrity" of politics. The tests were administered under a strict and unforgiving time constraint, the questions were specifically designed to confuse the test takers and to have ambiguous answers, and a single wrong answer would disqualify the test taker from voting. In most cases, regardless of the answer provided, the answer would be scored wrong due to the ambiguous nature of the questions to "justify" blocking a vote. Needless to say, this prevented many black men, as well as lower class white men, from voting. Other forms of voter suppression included voter intimidation and racial gerrymandering, among others. The Voting Rights Act of 1965 ruled that the federal government was able to monitor new laws surrounding voting regulations and intervene if any were deemed discriminatory and unconstitutional. This led to a huge increase in the minority vote, as many barriers to voting were overruled.

However, after almost 50 years of voting rights protections, two key provisions of the Voting Rights Act were struck down in the 2013 Supreme Court Decision *Shelby County v. Holder*: Section 4b and Section 5. The removal of these two sections meant that states under jurisdiction of the VRA would no longer require government preclearance to pass voting laws. Unsurprisingly, after the landmark 2013 ruling, many forms of voter suppression have returned, albeit in more subtle ways: strict voter ID laws

disproportionately affect minorities and poor people, lack of language accommodations bar many non-English speaking citizens, voter intimidation of immigrant families by threatening ICE investigations, and racial gerrymandering along minority districts to shift the voting power. Intuitively, these forms of voter suppression must have some kind of effect on the voting patterns of targeted groups. Thus, we determined that we would investigate how voting rates changed, if at all, among members of different racial groups after the VRA amendment in 2013.

Preliminary investigation into this topic led us to searching for prior research into this subject. Voter suppression has been a topic of interest for many mathematicians so we were able to find some published papers that ended up inspiring our investigation. One paper from the National Bureau of Economic Data titled "Racial Disparities in Voting Wait Times: Evidence from Smartphone Data" seemed like the perfect intersection between technology and social studies, by utilizing data collected by technological devices to draw conclusions about the rules and regulations that shape our society. The paper drew smartphone data from 46 states and generalized the racial profiles of each polling place based on the community demographics. The researchers were also able to identify differences in wait times due to income, yet the most overwhelming factor in determining wait time was race. Interestingly, there was no correlation between region, party, or state that could explain the disparity in wait times, which indicates a more systemic level of racial discrimination that is independent of local voting laws. This is contrary to our initial expectations that there would be differences in voting between states that were under the jurisdiction of the VRA and states that were not. We were ultimately unable to conduct similar data analysis due to a lack of access to relevant smartphone data. Nevertheless, this paper showed us that there were significant differences in the voting experience due to race, specifically during the 2016 presidential election, that were not necessarily tied to the 2013 VRA amendment.

Another paper that we found, “Strict ID Laws Don’t Stop Voters: Evidence from a U.S. Nationwide Panel, 2008-2016”, caught us by surprise, as it claimed that there is “no negative effect on registration or turnout, overall or for any group defined by race, gender, age or party affiliation.” The paper used data by Catalist (a U.S. company that provides data to certain organizations and academics), giving them access to 1.3 billion observations. The data reported state and county residence, registration states and voter turnout as well as age, race and gender. The authors used regressions on this data to find the average impact of strict ID laws on potential voters, ultimately coming to the conclusion that the laws had no negative effects on people that voted and registered. However, the authors were not able to rule out the possibility that minority outreach from candidates - after the laws were passed- might have lessened the negative effects of the laws. If this factor were significant enough, the data could be skewed considerably. This possibility made us skeptical of the claim’s credibility, moving us to evaluate the claim in depth by investigating the effects of strict ID laws. Initially, we wanted to narrow our calculations to a single state but we were not able to acquire the data necessary for this. So, instead, we decided to investigate the effects of the Voting Rights Act amendment of 2013 on voting and registration -- for both the presidential and midterms elections -- among different racial groups.

2. Assumptions

For our project, we still wanted to investigate the effects of the 2013 Voting Rights amendment on a national scale. Although the use of national voting data over a period of 4 years would not allow us to draw strong conclusions about the immediate effects of changes in voting laws in specific states or counties, we hope that our analyses will be able to shed some light on voting trends based on race. Another drawback to using national level data is that only some states and regions were under the jurisdiction of the original Voting Rights Act, and national level data may not accurately capture the

changes that were allowed to occur in those states after 2013. In analyzing this data, we are operating under the assumption that voting regulations did not change in states not affected by the VRA, and thus changes in voter participation in the states that were affected by the VRA due to the effects of the 2013 amendment will be reflected in the national data. The assumptions made in order to perform our statistical analysis of the accessible data are as follows:

- The states not under the jurisdiction of the original VRA were not affected by the 2013 amendment.
- We can treat the election directly before and directly after the 2013 amendment as proxies for overall voting trends.
- The changes in voter turnout and registration only stem from legislative changes to voting laws and regulations as a result of the 2013 VRA amendment.
- The conclusions drawn from this paper demonstrate trends in national voting that reflect state-level voting trends.
- The data used is representative of the national population.

The assumptions made in this paper were necessary due to the limitation of voter data access. The reasoning behind the assumptions are explained in the following sections, as well as in the data analysis section.

2.1. Data Selection

To conduct our analysis, we obtained data for each national election cycle from the U.S. Census Bureau. We were forced to only use this national data, as state-level data was difficult to obtain due to data protection laws and state regulations on access. Having access to state-level voter data would have allowed us to more easily and reliably identify the effects of specific voting legislation passed in each state, focus our project on the voting trends in a specific state that was previously under the jurisdiction of

the VRA, and allowed us to operate under smaller time scales by tracking local election participation and outcomes, among other things. However, we did our best to conduct informative analyses of the data that we did have to draw some answers to the questions posed. Using national data to analyze changes in state-level and regional legislation demands that many assumptions must be made clear before performing any sort of analysis on the data, and must be considered when drawing conclusions from the results. As such, our data will not produce precise results, but rather expose the trends in voting activity that may have resulted from the 2013 VRA amendment allowing more unjust voting regulations.

The data that we found to be most effective for our investigation was "Table A-1. Reported Voting and Registration by Race, Hispanic Origin, Sex, and Age Groups: November 1964 to 2018" from the Historical Reported Voting Rates section. Even though this project is centered around an event with a regional effect (the majority of the states that were under the jurisdiction of the VRA are located in the South), we chose not to use the regional voting and registration information from "Table A-2. Reported Voting and Registration by Region, Educational Attainment, and Labor Force: November 1964 to 2018". This was because we wanted to specifically investigate the effects of race on voter activity, and regional data would not allow us to separate the potential effects of conflicting trends in that particular region. For example, an increase in the White vote that occurs over the same time period as a decrease in the Black vote expresses itself as a net neutral data point when clumped into regional data.

We separated our national voting data according to presidential and midterm elections, since voter turnout is inherently very different for those two types of national elections due to the issues at hand as well as publicity and social expectations. As a result, we only have one point of data after 2013 for the presidential data set, which was the 2016 election. Based on the huge social and political difference (change in presidential party, political rhetoric, social movements of the time on both the political left and right, etc.) between the 2012 and 2016 election, is it difficult to draw any singular conclusion from this

data. While we have also performed statistical analysis on the change in voter participation between the 2012 and the 2016 elections (located in Appendix A), we ultimately decided against using the data or analyses of the data from the presidential elections since there were too many factors that each had a hugely significant effect on the voter turnout. For the midterm elections data set, we have two points of information after 2013, which are the 2014 and the 2018 midterm elections. However, the 2018 midterm voting data is also not a reliable indicator of any changes in voting laws, for the same reasons we discarded the 2016 presidential election voting data. The 2018 elections saw a far greater social movement to vote, occurred under a different presidential party, and generated more significant changes in the political racial and gender demographics, than the 2014 elections did. Fortunately, we are able to look at the data from the 2010 elections and the 2014 elections for data from directly before and after the 2013 amendment. These midterm elections were both held under the Obama administration, and so were more politically and socially comparable than the 2012 and 2016 presidential elections. Although the 2014 elections occurred within a year of the 2013 VRA amendment, information from the Brennan Center for Justice states that "since the beginning of 2013, and as of December 18, 2013, restrictive voting bills have [already] been introduced in more than half the states". For many states the 2014 midterm elections were a test run for the new voting legislation, freely implemented without the oversight of the federal government. Based on these findings, we chose to utilize the midterm election data to conduct our analyses of voter turnout by race from before and after the 2013 VRA amendment. The data includes both voter registration and voter participation in the elections. To justify some claims made in the application of statistical models, we also utilized data from "Table 10. Reasons for Not Voting, by Selected Characteristics" from each significant election year.

Although the U.S. Census data is extensive and taken from a reliable source, the method of data collection itself requires the assumption that it is representative of the entire population. While the

2.2. Initial hypothesis

Not all of the newly implemented legislation after the 2013 VRA amendment was aimed at fraud minimization or limiting the rights of certain people to vote -- many states took the opportunity to implement beneficial laws such as access to online registration and digitized voting. Nevertheless, the overall changes that the states previously under the VRA made were inherently discriminatory towards minorities and low-income voters, but only some of them were flagged and challenged. As such, we expect to see a negative impact on the minority vote as a result of the 2013 VRA amendment. This extends to also include the expectation that registration rates would also be impacted, and we would see these changes disproportionately in the Southern region of the country where the amendments to the VRA should have had the greatest impact on legislation.

3. Questions and data analysis

To perform our statistical analysis of the difference in voting rates before and after the 2013 amendment, we decided to use a difference-in-differences model to analyze the data. A difference-in-differences (DID) model makes use of longitudinal data from treatment and control groups to obtain an appropriate counterfactual to estimate a causal effect. DID is typically used to estimate the effect of a specific intervention or treatment (such as a passage of law, enactment of policy, or large-scale program implementation) by comparing the changes in outcomes over time between two groups, typically a control group and a treatment group. In this case, the event that causes an intervention in the voting behaviour of the population is the 2013 Voting Rights Act amendment. Since the amendment applies to all voters regardless of demographic, we do not have a control group that was unaffected by treatment. As such, we decided to instead analyze the degree to which different racial groups were affected, and so our event changed to be “the effect of the 2013 Voting Rights Act amendment on different racial groups”. To

perform the DID analysis, we first had to construct the regression model that utilizes the DID interaction term. The model takes the common form:

$$y = \beta 0 + \beta 1 * [Time] + \beta 2 * [Intervention] + \beta 3 * [DID] \quad (1)$$

where β0 is the baseline value or average, β1 is the trend over time in the control group, β2 is the difference between the two groups before the intervention event, and β3 is the difference in the changes over time between the two groups. All the data used in these calculations, the statistical summaries, and other useful graphs are located in Appendix A.

3.1. First null hypothesis [$H_0(1)$]

In our analysis, we first wanted to determine whether or not the 2013 VRA amendment actually had a negative effect on voter participation or not, regardless of race. To visualize our data, we simply graphed the voting and registration rates from 1978-2018 to see if we could make some preliminary observations.

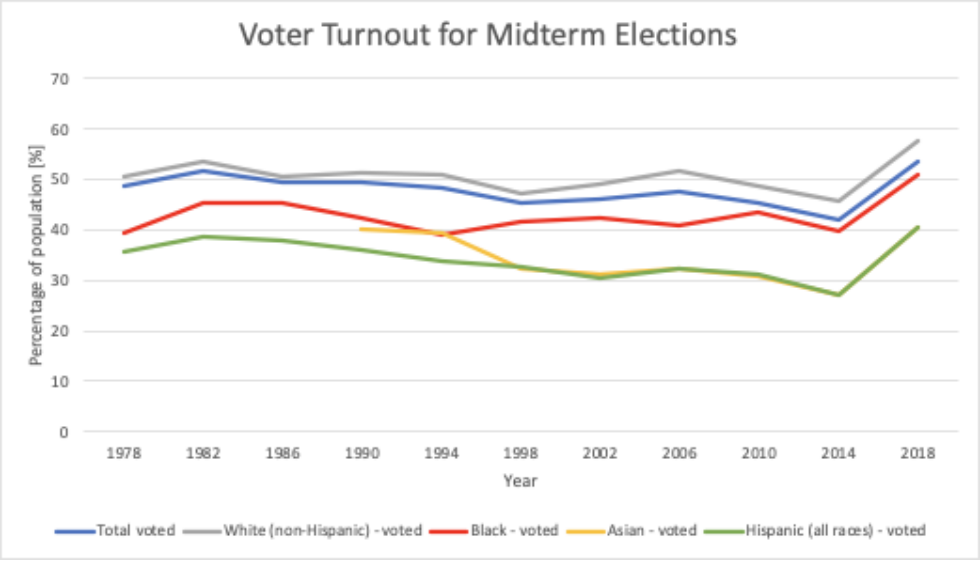


Figure 1. Graph of voter turnout for Midterm elections (1978-2018) by percentage of population

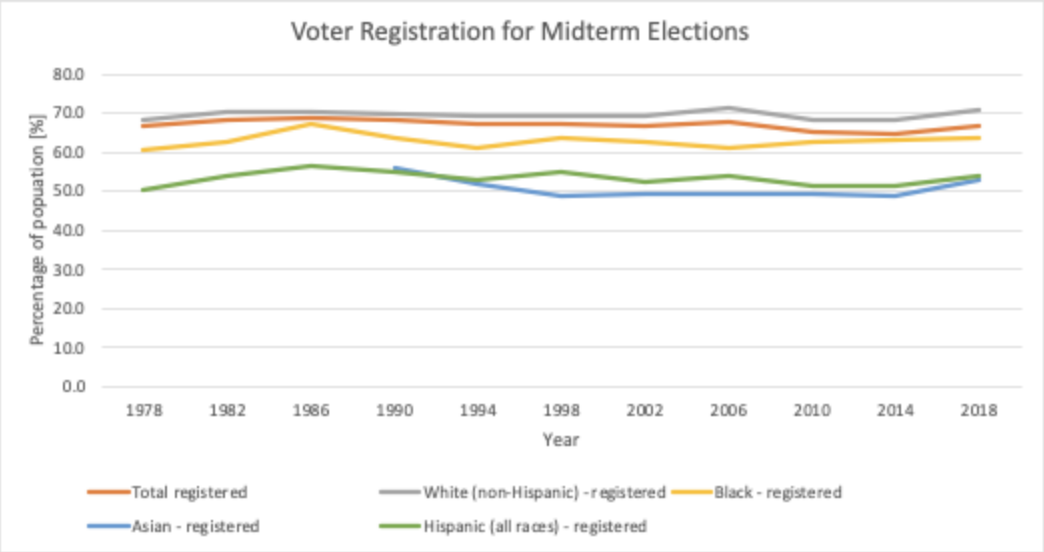
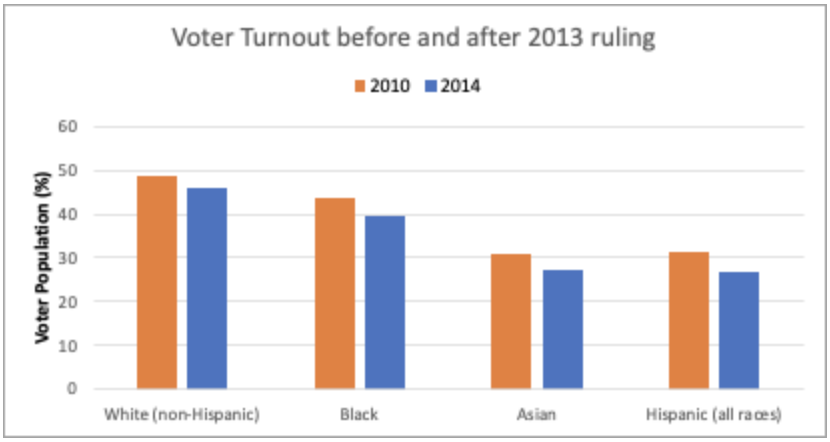


Figure 2. Graph of voter registration for Midterm elections (1978-2018) by percentage of population

The most significant feature of these graphs is the sudden decrease in voter turnout across all racial groups from 2010 to 2014, which is consistent with our expected results. This is followed by a sharp increase in voter turnout in 2018 across all racial groups, which is also consistent with our knowledge of the way a growing social movement surrounding voting rights and the importance of voting heavily influenced the unprecedented turnout of the 2018 midterm elections. However, when looking at the voter registration rates, the same trends do not appear. From 2010 to 2014, the voter registration rates for all races stayed relatively consistent. We can take a closer look at rates of voter registration and turnout specifically between 2010 and 2014, our key years that surround our intervention event:



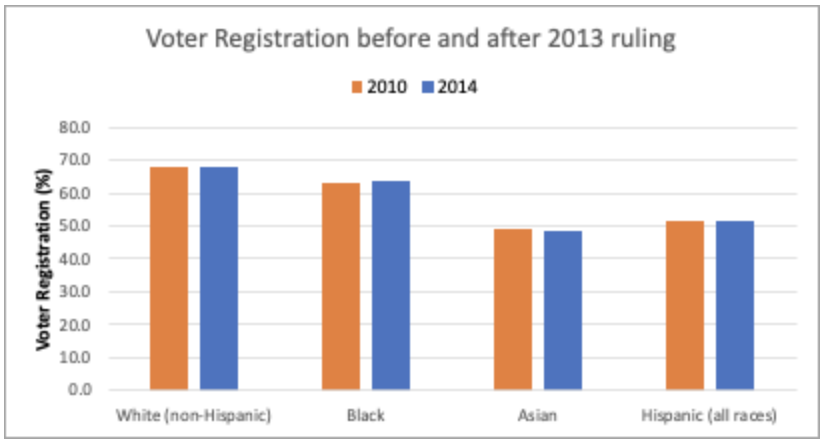


Figure 3. Bar chart showing voter turnout (top) nd registration (bottom) before and after 2013

Here we can see more clearly that there is a decline in turnout across all races while registration has remained very consistent. However, we cannot confidently claim that a steady voter registration rate through the years meant that there was no barrier for people who wanted to vote but could not due to targeted registration laws. For this reason, we must turn to another source of data to justify this claim.

The U.S. Census Bureau also provides a data set for each national election cycle that collects all the reasons that people didn't end up casting a vote. The data is broken down by characteristics such as age, race, education, and income, but the category we were most interested in was the breakdown by region, as we know that the Voting Rights Act mostly covered jurisdictions in Southern states, with the exception of Alaska, Virginia, and a few counties in various other states. As such, a regional look at the

reasons why people didn't go to vote could shed some light on how these reasons have changed from before and after the 2013 VRA amendment, if at all.

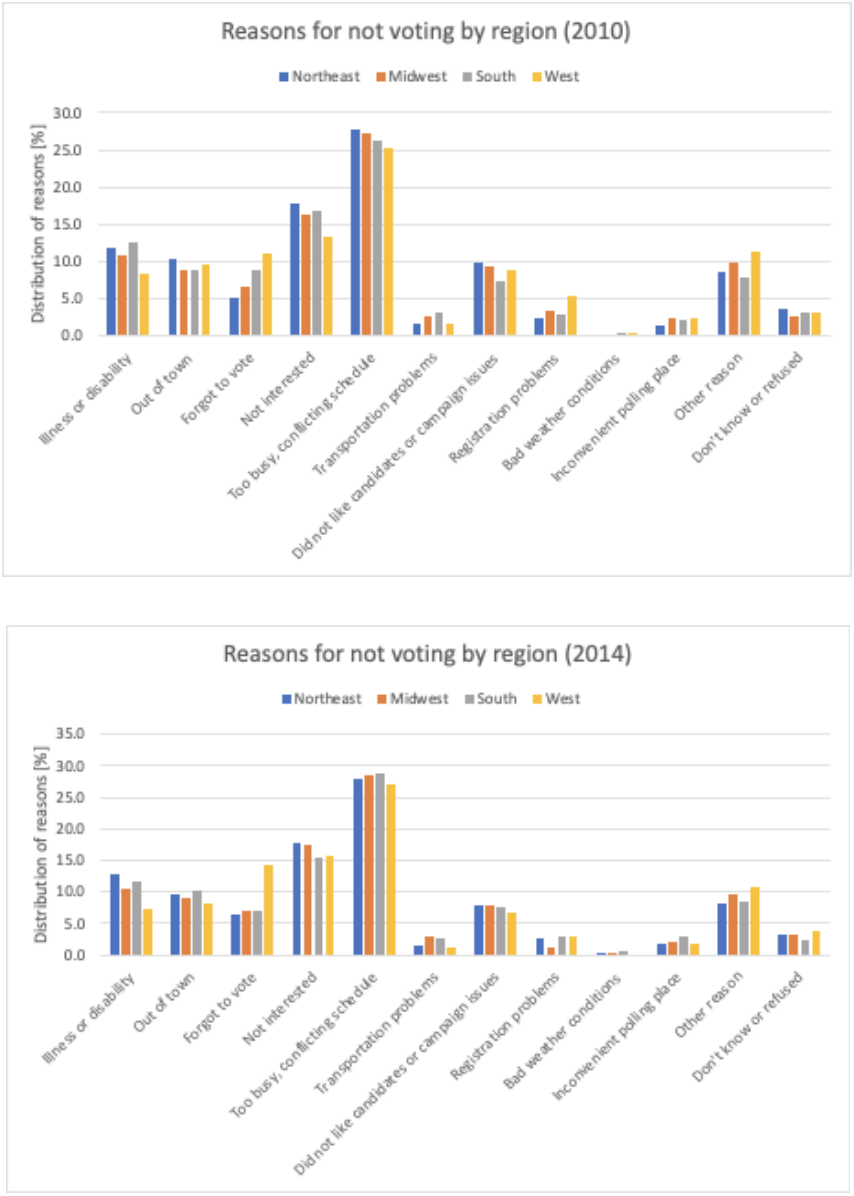


Figure 4. Bar chart of reasons for not voting by region (Top: 2010 data, Bottom: 2014 data)

As we can see from the bar charts, the reasons for not voting are fairly consistent across each region, with some exceptions. The most interesting category for our investigation is the group of voters who deemed

"registration problems" as the most significant thing that barred them from voting. We then rearranged the data to take a closer look at that category in particular.

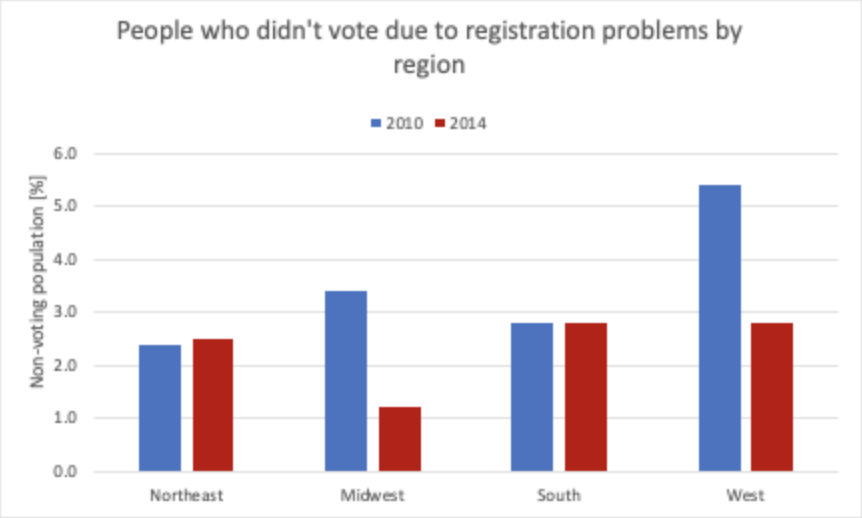


Figure 5. Bar chart comparing the distribution of people who didn't vote due to registration problems by region in 2010 and 2014

This visualization was particularly interesting, as it shows a contrary result from what we initially thought -- instead of seeing an increase in people who felt that they had difficulty registering, as would be expected from the implementation of more strict voter eligibility requirements, there was actually a large decrease in registration difficulty in the West and Midwest regions, while our area of focus, the South, did not see any change at all from 2010 to 2014. The VRA was not aimed at Western or Midwestern states, and so those regions are outside of our treatment group that experienced the intervention event. The South was the only region to have been mostly targeted by the VRA, but as we can see by the chart, voters in the South did not experience a difference in registration difficulty from before and after the 2013 VRA amendment. Although there could have been other factors involved in the level of ease or difficulty of registering, this implies that the 2013 VRA amendment did not have a significant effect on the registration process for voters. We may draw this assumption because this category is specific to people who weren't able to vote due to registration problems -- strict legislation laws are such that there is very rarely the case

that people who are able to register after the laws were unable to register before the laws, and more inclusive laws do not take away the ability to register. Unlike with regional voting data, an decrease in one group's ability to register cannot exactly be 'offset' by an increase in another group's ability to register, because registration laws that target one group do not affect the other. A net zero change in this particular category of registration problems means that overall, the 2013 amendment did not have an effect on the registration ability of voters.

This conclusion now allows us to try to answer our first null hypothesis: the 2013 removal of regulatory provisions in the Voting Rights Act had no negative effect on voter turnout, regardless of race. To perform our DID analysis on the shift from before and after the intervention event, we must first establish our regression model (Eqn. 1). In this case, our control group that was not affected by the intervention treatment is the registration rate, specifically from 2010 to 2014, and the treatment group is the voter turnout rate. Since we have only looked at the data for factors that prevented people from voting for 2010 and 2014, we should use the 2010 registration and voting rates data for the "before" coefficients and the 2014 registration and voting rates data for the "after" coefficients to build the regression model.

Race	**P-Value for the DID estimator**
White	<2E-16
Black	<2E-16
Asian	<2E-16
Hispanic	<2E-16

Table 1. P-Values of DID analysis of the difference between voting and registration rates by race from before and after 2013

As we can see, the p-value is smaller than 2E-16 (smaller than can be displayed) for each racial group, which means we can reject the null hypothesis that the 2013 VRA amendment had no negative effect on

the voter turnout, regardless of race. Thus, we accept our alternative hypothesis that the 2013 VRA amendment had a statistically significant negative effect on the voting turnout and rate.

3.2. Second null hypotheses [$H_0(2)$]

After establishing that there was indeed a statistically significant effect on voter turnout, we then wanted to determine whether or not there was a significant difference between voting rates of different racial groups before and after the 2013 Voting Rights Act amendment. Our second null hypothesis was that the removal of regulatory provisions in the 2013 Voting Rights Act amendment did not disproportionately affect voters of different racial groups. To test this hypothesis, we compared the voting rates between White and Black voters, White and Asian voters, and White and Hispanic voters. We chose to do these comparisons because the VRA was implemented in order to protect Black voters and other minority voters from discrimination and suppression, and thus the 2013 amendment that removed these protections would have a greater impact on the non-White votes.

As seen in Figure 1, every racial group experienced an overall drop in voting rates from 2010 to 2014. This preliminary finding gave us the question: how much did the voting rates of each racial group change when compared to the others and how statistically significant was that difference? For each coefficient of the regression model (1), we were not sure whether it was more appropriate to keep the focus centered on the elections directly before and after the 2013 VRA amendment and simply use the 2010 voting data for the "before" coefficients and the 2014 voting data for the "after" coefficients, or to use the average of all voting data from before 2013 and the average of all voting data from after 2013 as our coefficients. After conducting the same analysis but using different coefficients, we were able to conclude that the statistical significance is the same for each situation regardless of the coefficients.

Coefficient Source	Races	P-Value for the DID estimator
"Before": 2010 data "After": 2014 data	White v. Black	<2E-16
	White v. Asian	<2E-16
	White v. Hispanic	<2E-16
"Before": Average before 2013 "After": Average after 2013	White v. Black	<2E-16
	White v. Asian	<2E-16
	White v. Hispanic	<2E-16

Table 2. P-Values of DID analysis of the change in voting rates by race from before and after 2013

Again, the null hypothesis is that there is no difference in voting rates between different racial groups both before and after 2013. For each comparison, we obtain a p-value of <2E-16, which indicates a very small number. 2E-16 is much smaller than 0.05, so we may reject the null hypothesis for each compared racial category. As such, we have determined that there is a statistically significant difference that exists between the voting rates of White and minority groups before and after the 2013 VRA amendment and we must accept the alternative hypothesis that the 2013 Voting Rights Act amendment did in fact disproportionately affect voters of different racial groups.

4. Results and Conclusions

From our statistical analysis, we found that we must reject both of our null hypotheses to conclude that the 2013 VRA amendment had a negative effect on national voter turnout, regardless of race, with the following conclusion that the 2013 Voting Rights Act amendment did disproportionately affect voters of different racial groups.

In order to conduct any sort of statistical analysis on the data sets that we had access to and come to these conclusions, we had to make a lot of assumptions. Only by operating under the assumptions that states outside of the jurisdiction of the VRA held their voting legislation constant, all voting legislation

changes were a result of the 2013 amendment, registration rates were unaffected by the 2013 amendment, and that this data was representative of the entire population, were we able to directly analyze the overall trend that voting took from before and after the 2013 amendment. Although this means that we cannot come to a definitive conclusion about the data, as the statistical models are also subject to these assumptions, we were able to see how the voting rates changed over time due to events surrounding the amendment.

5. Discussion and Impact

Voter suppression is one of the many ways that the valuable members of our society - immigrants, minorities, and low income people - are immobilized. Ironically enough, these are the same people that built the United States that we know today. They do the work that the upper class, which is predominantly white, does not want to do but they continue to get immensely underpaid. The policies that support immigrants and poor people (socially and financially) are usually more liberal ones which is why many studies show that immigrants and low-income people are less likely to vote Republican. Republicans majorities are aware of this so they suppress their vote whatever way they can. As previously stated, voter suppression comes in many forms, all aimed to lessen the immigrant and low income vote. This is why, historically, black, asian and hispanic people vote less than white people. The conclusions that we drew from this project, which show that there is a statistically significant difference between the white vote and any other vote, support this phenomenon.

We compared the voter turnout among different racial groups and discovered that there exists a racial bias. If we had access to state level data, it would be interesting to explore the severity of this bias for states across the U.S., considering the suppressive laws for the particular state. It would much like this project except we would be able to draw more precise conclusions because the data would distinguish people that live under different laws. So we would be able to compare how different races in distinct

states are being affected by voter suppression. It would also be worthwhile to look into other forms of voter suppression. Language discrimination has interested us since it seems to blatantly impede the immigrant vote. Perhaps, the inhumane ICE raids have affected the ways immigrants vote so counties have decided to use more language discrimination. There are many factors that can alter our results so looking into immigrant voting trends among different states can really help us understand the gravity of the laws that have been passed.

The impacts of this project go beyond the scope of statistics. It has given us insight into biases within voting and registration turnouts, which evidently target minorities. These findings have illustrated the rooted racism in the United States, showing us that nonwhite voters are often stripped of their chance to make their voices heard because of inequitable laws. At the same time, our findings have revealed ways in which we can help the people that are affected by such laws - and maybe inspiring other people to do the same. This project has also shown us that statistical modeling does not have to be set aside for analyzing topics in physics and engineering, it can be used to explore issues in social justice. It has provided us with tools to better understand our reality.

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Appendix A.

	Voted					Registered				
Year	**Total**	**White (non-Hispanic)**	**Black**	**Asian**	**Hispanic (all races)**	**Total**	**White (non-Hispanic)**	**Black**	**Asian**	**Hispanic (all races)**
1978	48.9	50.6	39.5	NA	35.7	66.7	68.2	60.6	NA	50.1
1982	51.9	53.4	45.4	NA	38.5	68.5	70.1	62.6	NA	53.7
1986	49.4	50.7	45.5	NA	38.0	69.0	70.2	67.3	NA	56.4
1990	49.3	51.4	42.4	40.0	36.0	68.2	69.9	63.5	56.0	55.2
1994	48.4	51.0	38.9	39.4	34.0	67.1	69.4	61.3	51.9	52.9
1998	45.3	47.4	41.8	32.4	32.8	67.1	69.3	63.6	48.9	55.2
2002	46.1	49.1	42.3	31.2	30.4	66.5	69.4	62.4	49.2	52.5
2006	47.8	51.6	41.0	32.4	32.3	67.6	71.2	60.9	49.1	53.7
2010	45.5	48.6	43.5	30.8	31.2	65.1	68.2	62.8	49.3	51.6
2014	41.9	45.8	39.7	27.1	27.0	64.6	68.1	63.4	48.8	51.3
2018	53.4	57.5	51.1	40.6	40.4	66.9	71.0	63.9	53.0	53.7

Table A.1. Reported voting and registration by race in the Midterm elections (November 1978 to 2018)

	Voted					Registered				
Year	**Total**	**White (non-Hispanic)**	**Black**	**Asian**	**Hispanic (all races)**	**Total**	**White (non-Hispanic)**	**Black**	**Asian**	**Hispanic (all races)**
1980	64.0	66.2	53.9	NA	46.1	72.3	74.1	64.1	NA	56.0
1984	64.9	66.4	60.6	NA	50.0	73.9	75.1	72.0	NA	61.4
1988	62.2	64.2	55.0	NA	48.0	72.1	73.6	68.8	NA	59.1
1992	67.7	70.2	59.2	53.9	51.6	75.2	77.1	70.0	61.6	62.5
1996	58.4	60.7	53.0	45.0	44.0	71.0	73.0	66.4	57.2	58.6
2000	59.5	61.8	56.8	43.4	45.1	69.5	71.6	67.5	52.4	57.4
2004	63.8	67.2	60.0	44.1	47.2	72.1	75.1	68.7	51.8	57.9
2008	63.6	66.1	64.7	47.6	49.9	71.0	73.5	69.7	55.3	59.4
2012	61.8	64.1	66.2	47.3	48.0	71.2	73.7	73.1	56.3	58.7
2016	61.4	65.3	59.4	49.0	47.6	70.3	73.9	69.4	56.3	57.3

Table A.2. Reported voting and registration by race in the Presidential elections (November 1980 to 2016)

		Percent distribution of reasons for not voting											
	Total not voting[1]	Illness or disability	Out of town	Forgot to vote	Not interested	Too busy, conflicting schedule	Transportation problems	Did not like candidates or campaign issues	Registration problems	Bad weather conditions	Inconvenient polling place	Other reason	Don't know or refused
Northeast	7,335	11.8	10.3	5.1	17.7	27.8	1.6	9.9	2.4	-	1.4	8.5	3.5
Midwest	9,534	10.8	8.9	6.6	16.4	27.2	2.6	9.4	3.4	0.0	2.3	9.8	2.6
South	16,182	12.5	8.7	8.9	16.9	26.2	3.1	7.4	2.8	0.3	2.2	7.8	3.2
West	6,403	8.4	9.5	11.1	13.3	25.3	1.6	8.9	5.4	0.1	2.3	11.3	3.0

Table A.3. Reasons for not voting in the 2010 Midterm election by region

		Percent distribution of reasons for not voting											
	Total not voting[1]	Illness or disability	Out of town	Forgot to vote	Not interested	Too busy, conflicting schedule	Transportation problems	Did not like candidates or campaign issues	Registration problems	Bad weather conditions	Inconvenient polling place	Other reason	Don't know or refused
Northeast	9,073	12.9	9.7	6.3	17.8	28.0	1.4	7.9	2.5	0.3	1.9	8.2	3.1
Midwest	11,026	10.5	9.1	7.0	17.6	28.6	2.8	7.8	1.2	0.4	2.1	9.6	3.2
South	18,466	11.7	10.2	7.0	15.3	28.7	2.6	7.7	2.8	0.6	2.8	8.4	2.3
West	9,027	7.4	8.3	14.4	15.6	27.1	1.1	6.7	2.8	0.0	1.9	10.7	3.9

Table A.4. Reasons for not voting in the 2014 Midterm election by region

```
Call:
lm(formula = y ~ treated + time + did, data = whitevotereg)

Residuals:
       Min         1Q     Median         3Q        Max
-4.636e-14  0.000e+00  0.000e+00  6.061e-15  6.562e-15

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  6.820e+01  3.877e-15  1.759e+16   <2e-16 ***
treated     -1.960e+01  5.483e-15 -3.575e+15   <2e-16 ***
time        -1.000e-01  9.093e-15 -1.100e+13   <2e-16 ***
did         -2.700e+00  1.286e-14 -2.100e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.163e-14 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 5.501e+30 on 3 and 18 DF,  p-value: < 2.2e-16
```

Figure A.1. White voting rates compared to registration rates in the Midterm elections

```
Call:
lm(formula = y ~ treated + time + did, data = blackvotereg)

Residuals:
       Min         1Q     Median         3Q        Max
-7.723e-14  0.000e+00  0.000e+00  7.778e-15  2.223e-14

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  6.280e+01  6.523e-15  9.627e+15   <2e-16 ***
treated     -1.930e+01  9.225e-15 -2.092e+15   <2e-16 ***
time         6.000e-01  1.530e-14  3.922e+13   <2e-16 ***
did         -4.400e+00  2.164e-14 -2.034e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.957e-14 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.955e+30 on 3 and 18 DF,  p-value: < 2.2e-16
```

Figure A.2. Black voting rates compared to registration rates in the Midterm elections

```
Call:
lm(formula = y ~ treated + time + did, data = asianvotereg)

Residuals:
       Min         1Q     Median         3Q        Max
-2.018e-14  0.000e+00  0.000e+00  2.146e-15  7.910e-15

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  4.930e+01  2.672e-15  1.845e+16   <2e-16 ***
treated     -1.850e+01  3.779e-15 -4.895e+15   <2e-16 ***
time        -5.000e-01  5.345e-15 -9.355e+13   <2e-16 ***
did         -3.200e+00  7.559e-15 -4.233e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6.546e-15 on 12 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.175e+31 on 3 and 12 DF,  p-value: < 2.2e-16
```

Figure A.3. Asian voting rates compared to registration rates in the Midterm elections

```
Call:
lm(formula = y ~ treated + time + did, data = hispanicvotereg)

Residuals:
       Min         1Q     Median         3Q        Max
-2.876e-14  0.000e+00  0.000e+00  4.054e-15  4.363e-15

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  4.930e+01  2.416e-15  2.040e+16   <2e-16 ***
treated     -1.850e+01  3.417e-15 -5.414e+15   <2e-16 ***
time        -5.000e-01  5.667e-15 -8.823e+13   <2e-16 ***
did         -3.200e+00  8.014e-15 -3.993e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 7.249e-15 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.285e+31 on 3 and 18 DF,  p-value: < 2.2e-16
```

Figure A.4. Hispanic voting rates compared to registration rates in the Midterm elections

```
Call:
lm(formula = y ~ treated * time, data = votingwhiteblack)

Residuals:
       Min         1Q     Median         3Q        Max
-4.333e-15 -3.390e-15  0.000e+00  0.000e+00  2.484e-14

Coefficients:
              Estimate Std. Error    t value Pr(>|t|)
(Intercept)   4.860e+01  2.106e-15  2.308e+16   <2e-16 ***
treated      -5.100e+00  2.978e-15 -1.713e+15   <2e-16 ***
time         -2.800e+00  4.938e-15 -5.670e+14   <2e-16 ***
treated:time -1.000e+00  6.983e-15 -1.432e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 6.317e-15 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.586e+30 on 3 and 18 DF,  p-value: < 2.2e-16
```

```
Call:
lm(formula = y ~ treated * time, data = votingwhiteblack)

Residuals:
       Min         1Q     Median         3Q        Max
-1.332e-14 -6.725e-15  0.000e+00  0.000e+00  5.955e-14

Coefficients:
              Estimate Std. Error    t value Pr(>|t|)
(Intercept)   5.042e+01  4.987e-15  1.011e+16   <2e-16 ***
treated      -8.156e+00  7.053e-15 -1.156e+15   <2e-16 ***
time          1.228e+00  1.170e-14  1.050e+14   <2e-16 ***
treated:time  1.906e+00  1.654e-14  1.152e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.496e-14 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 5.27e+29 on 3 and 18 DF,  p-value: < 2.2e-16
```

Figure A.5. Comparison of White and Black voting rates in the Midterm elections (Right: 2010 v. 2014 coefficients, Left: avg. before v. avg. after 2013 coefficients)

```
Call:
lm(formula = y ~ treated + time + did, data = votingwhiteasian)

Residuals:
       Min         1Q     Median         3Q        Max
-4.687e-15  0.000e+00  0.000e+00  2.039e-16  2.551e-15

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  4.860e+01  4.387e-16  1.108e+17   <2e-16 ***
treated     -1.780e+01  6.205e-16 -2.869e+16   <2e-16 ***
time        -2.800e+00  1.029e-15 -2.721e+15   <2e-16 ***
did         -9.000e-01  1.455e-15 -6.185e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.316e-15 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 3.483e+32 on 3 and 18 DF,  p-value: < 2.2e-16
```

```
Call:
lm(formula = y ~ treated + time + did, data = votingwhiteasian)

Residuals:
       Min         1Q     Median         3Q        Max
-2.213e-14 -5.283e-15  0.000e+00  0.000e+00  6.036e-14

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  5.042e+01  5.177e-15  9.739e+15   <2e-16 ***
treated     -1.602e+01  7.322e-15 -2.188e+15   <2e-16 ***
time         1.228e+00  1.214e-14  1.011e+14   <2e-16 ***
did         -1.778e+00  1.717e-14 -1.035e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.553e-14 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 2.034e+30 on 3 and 18 DF,  p-value: < 2.2e-16
```

Figure A.6. Comparison of White and Asian voting rates in the Midterm elections (Right: 2010 v. 2014 coefficients; Left: avg. before v. avg. after 2013 coefficients)

```
Call:
lm(formula = y ~ treated + time + did, data = votingwhitehispanic)

Residuals:
       Min         1Q     Median         3Q        Max
-9.517e-14  0.000e+00  0.000e+00  1.346e-14  1.637e-14

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  4.860e+01  8.022e-15  6.058e+15   <2e-16 ***
treated     -1.740e+01  1.134e-14 -1.534e+15   <2e-16 ***
time        -2.800e+00  1.881e-14 -1.488e+14   <2e-16 ***
did         -1.400e+00  2.661e-14 -5.262e+13   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.407e-14 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.011e+30 on 3 and 18 DF,  p-value: < 2.2e-16
```

```
Call:
lm(formula = y ~ treated + time + did, data = votingwhitehispanic)

Residuals:
       Min         1Q     Median         3Q        Max
-1.181e-14 -1.032e-14  0.000e+00  0.000e+00  8.380e-14

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  5.042e+01  6.984e-15  7.220e+15   <2e-16 ***
treated     -1.612e+01  9.877e-15 -1.632e+15   <2e-16 ***
time         1.228e+00  1.638e-14  7.496e+13   <2e-16 ***
did         -1.828e+00  2.316e-14 -7.891e+13   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.095e-14 on 18 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.133e+30 on 3 and 18 DF,  p-value: < 2.2e-16
```

Figure A.7. Comparison of White and Hispanic voting rates in the Midterm elections (Right: 2010 v. 2014 coefficients, Left: avg. before v. avg. after 2013 coefficients)

```
Call:
lm(formula = yB ~ treatedB + timeB + didB, data = votingB)

Residuals:
       Min         1Q     Median         3Q        Max
-4.262e-14  0.000e+00  0.000e+00  5.334e-15  5.488e-15

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  6.410e+01  3.767e-15  1.701e+16   <2e-16 ***
treatedB     2.100e+00  5.328e-15  3.941e+14   <2e-16 ***
timeB        1.200e+00  1.191e-14  1.007e+14   <2e-16 ***
didB        -8.000e+00  1.685e-14 -4.748e+14   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 1.13e-14 on 16 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 1.34e+29 on 3 and 16 DF,  p-value: < 2.2e-16
```

Figure A.8. Comparison of White and Black voting rates in the Presidential elections

```
Call:
lm(formula = yA ~ treatedA + timeA + didA, data = votingA)

Residuals:
       Min         1Q     Median         3Q        Max
-1.384e-13  0.000e+00  0.000e+00  1.557e-14  2.997e-14

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  6.410e+01  1.228e-14  5.219e+15   <2e-16 ***
treatedA    -1.680e+01  1.737e-14 -9.673e+14   <2e-16 ***
timeA        1.200e+00  3.884e-14  3.090e+13   <2e-16 ***
didA         5.000e-01  5.492e-14  9.103e+12   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 3.684e-14 on 16 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 3.454e+29 on 3 and 16 DF,  p-value: < 2.2e-16
```

Figure A.9. Comparison of White and Asian voting rates in the Presidential elections

```
Call:
lm(formula = yH ~ treatedH + timeH + didH, data = votingH)

Residuals:
       Min         1Q     Median         3Q        Max
-8.730e-14  0.000e+00  0.000e+00  1.284e-14  1.312e-14

Coefficients:
             Estimate Std. Error    t value Pr(>|t|)
(Intercept)  6.410e+01  7.816e-15  8.201e+15   <2e-16 ***
treatedH    -1.610e+01  1.105e-14 -1.457e+15   <2e-16 ***
timeH        1.200e+00  2.471e-14  4.855e+13   <2e-16 ***
didH        -1.600e+00  3.495e-14 -4.578e+13   <2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.345e-14 on 16 degrees of freedom
Multiple R-squared:      1,     Adjusted R-squared:      1
F-statistic: 8.024e+29 on 3 and 16 DF,  p-value: < 2.2e-16
```

Figure A.10. Comparison of White and Hispanic voting rates in the Presidential elections