Presidential Election Swing States

W200 - Project 2 - Dec 2020

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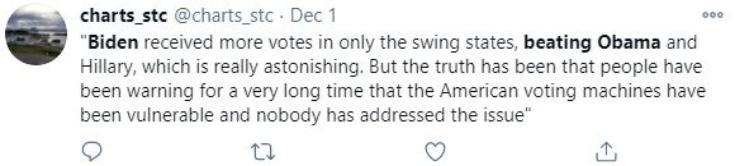
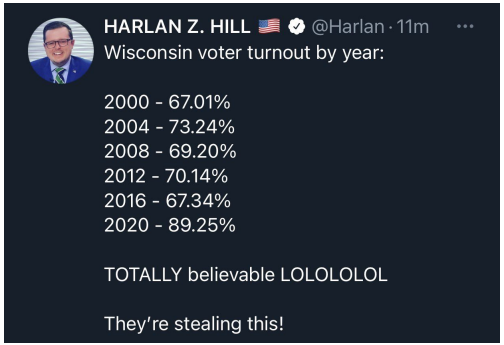
Overview

What should an election look like?





Research Questions

1) What was the voter turnout in the States of Interest in 2012, 2016, and 2020?
2) Which counties had the largest change in voter turnout from 2016 to 2020?
3) Which states and counties flipped between the 2012 and 2016 elections and between the 2016 and 2020 elections?
4) Did more counties flip from 2016 to 2020?
5) What proportion of the voters do flipped counties represent? Were they enough to flip a state?
6) Are county metrics a good indicator of state results?
7) How have demographic (ethnicity, education, age) voting trends changed between the 2012, 2016, and 2020 elections

Data Sources

United States Census Bureau

- Voting Age population data
- At state and county levels
- 2020 census results not yet released
- Census estimates for 2019 used as proxy for 2020

- 2012 and 2016 voting data
- 2020 voting data not available in Harvard Dataverse
- 2020 voting data from official state election websites pulled (11/22/2020)

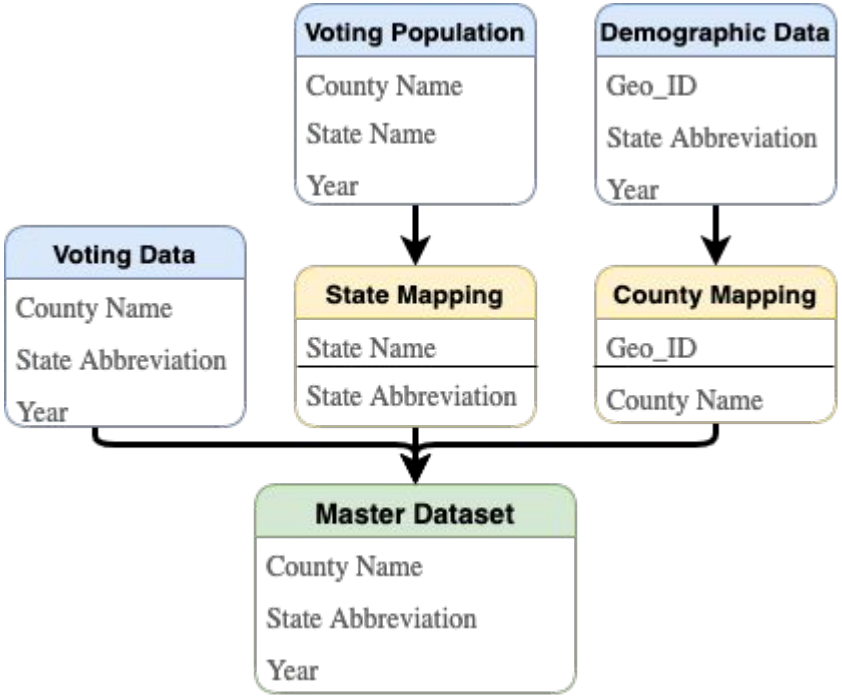
MIT ELECTION DATA + SCIENCE LAB

Google Big Query

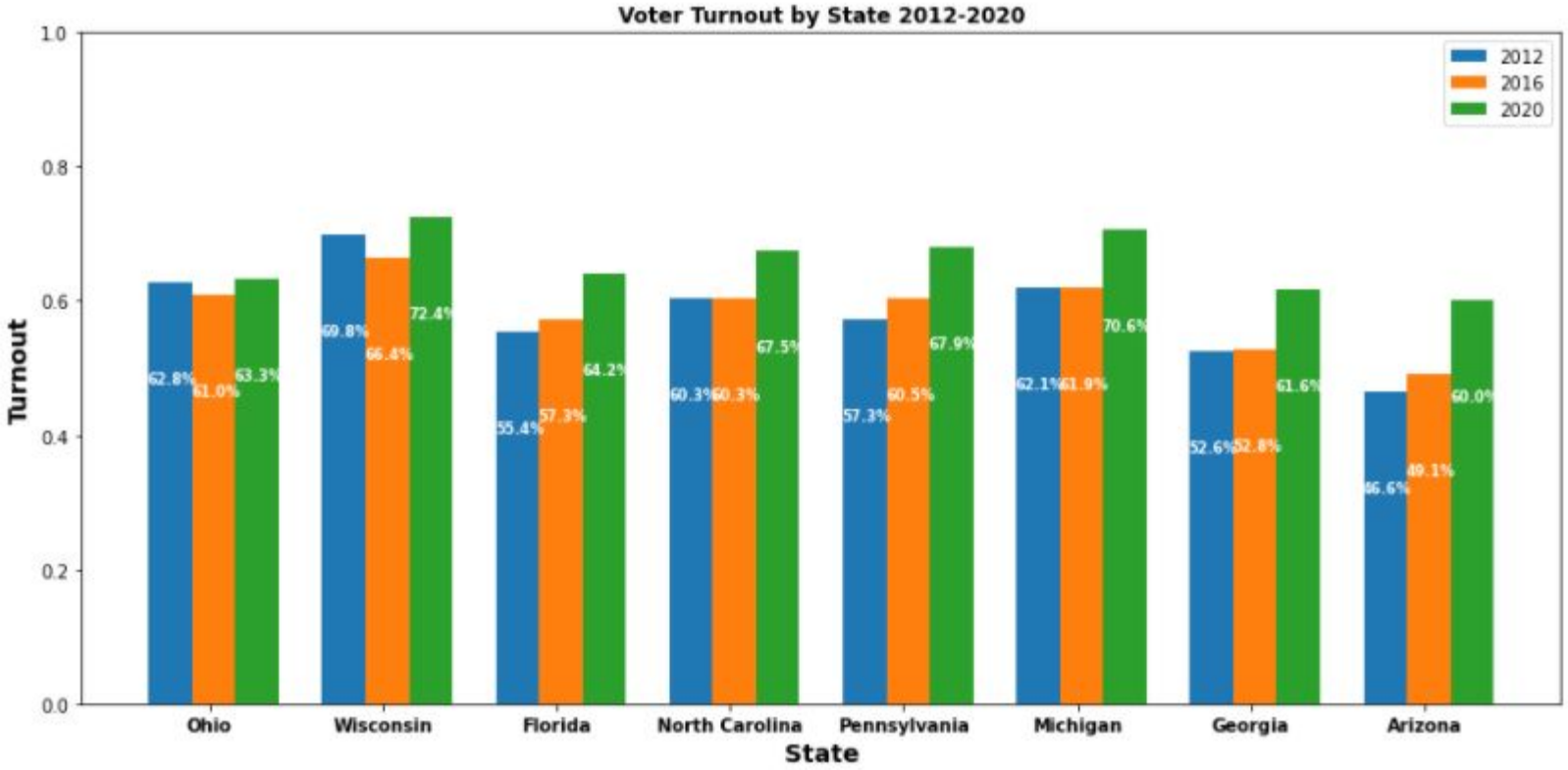
- US Census demographic county level data for each state
- 2012, 2016 and 2018 data used (2020 data unavailable)
- 253 total variables, crtical metrics pulled for study dataset

Data Cleaning and Sanity Checks

- Merge Data
  - Manually Map Mismatched Counties
  - Remove Duplicate Entries
- Derive Variables
  - Voting and Demographic Percentages
- Sanity Checks
  - Check Geo_ID Map
  - No NULL or Duplicate records
  - Check for all counties and years
  - Voting data validation
    - No unusual totals



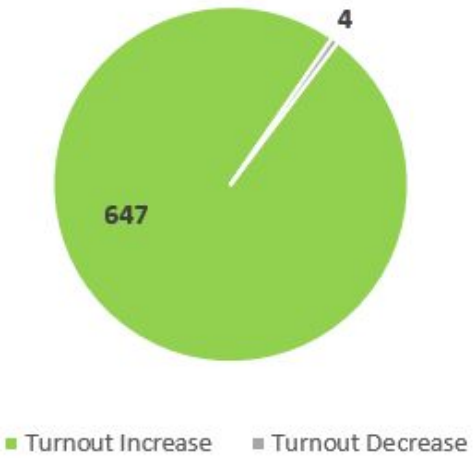
Total voter turnout* increased across all states of interest with the largest increases in MI, GA, and AZ



*Total voter turnout = [Total votes cast] / [Voting age population]

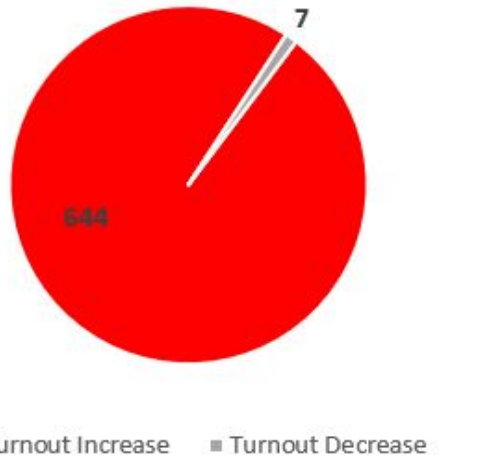
In the states of interest, the vast majority of counties saw voter turnout increase from 2016 to 2020. This was true for both parties.

Total voter turnout*
by county



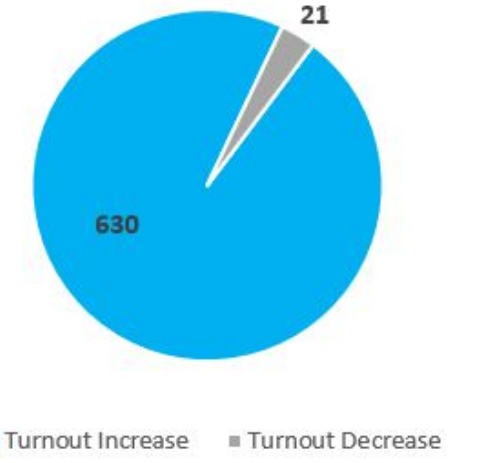
Median change in turnout: +7.38%

Republican voter turnout**
by county



Median change in turnout: +5.06%

Democrat voter turnout***
by county



Median change in turnout: +3.23%

*Total voter turnout = [Total votes cast] / [Voting age population]
**Republican voter turnout = [Votes cast for the republican candidate] / [Voting age population]
***Democrat voter turnout = [Votes cast for the democrat candidate] / [Voting age population]

Counties with large increases in total voter turnout* can be seen in many states. Most of the counties with large increases in total voter turnout went red. This is consistent with that fact that the majority of counties overall went red.

Top 20 Counties by Increase in Total Voter Turnout (2020-2016)

Rank	State	County	Turnout		Winner		Turnout Increase (2020 - 2016)	Voting Age Pop 2020
			2016	2020	2016	2020		
1	Florida	GULF COUNTY	53.7%	73.2%	red	red	19.5%	11,147
2	Georgia	BRYAN COUNTY	60.0%	76.3%	red	red	16.3%	27,979
3	Georgia	DAWSON COUNTY	62.8%	77.1%	red	red	14.4%	20,853
4	Michigan	GOGEBIC COUNTY	56.8%	71.1%	red	red	14.3%	11,633
5	Arizona	APACHE COUNTY	53.8%	67.0%	blue	blue	13.3%	52,462
6	Georgia	JACKSON COUNTY	56.1%	69.1%	red	red	13.1%	54,499
7	North Carolina	DARE COUNTY	67.8%	80.5%	red	red	12.7%	30,088
8	Michigan	OSCODA COUNTY	60.9%	73.3%	red	red	12.5%	6,646
9	Pennsylvania	PIKE COUNTY	58.2%	70.6%	red	red	12.4%	46,099
10	Arizona	NAVAJO COUNTY	51.0%	63.3%	red	red	12.2%	81,804
11	Georgia	JASPER COUNTY	57.8%	70.0%	red	red	12.2%	10,924
12	Michigan	BENZIE COUNTY	71.7%	83.9%	red	red	12.2%	14,621
13	Georgia	EFFINGHAM COUNTY	54.6%	66.7%	red	red	12.1%	47,339
14	Georgia	LIBERTY COUNTY	36.6%	48.6%	blue	blue	12.0%	44,034
15	Arizona	MOHAVE COUNTY	47.4%	59.2%	red	red	11.8%	176,822
16	Michigan	MISSAUKEE COUNTY	63.4%	75.1%	red	red	11.6%	11,658
17	Michigan	LIVINGSTON COUNTY	72.1%	83.7%	red	red	11.6%	151,981
18	Georgia	GILMER COUNTY	53.4%	65.0%	red	red	11.6%	25,438
19	Georgia	WEBSTER COUNTY	53.9%	65.4%	red	red	11.5%	2,124
20	Georgia	CHEROKEE COUNTY	62.1%	73.6%	red	red	11.4%	196,911

*Total voter turnout = [Total votes cast] / [Voting age population]

Republican voter turnout increases by county were larger than Democrat voter turnout increases by county. However, large increases in Democrat voter turnout***occurred in counties with larger populations.**

Top 20 Counties with the Largest Increase in Republican Voter Turnout (2020-2016)

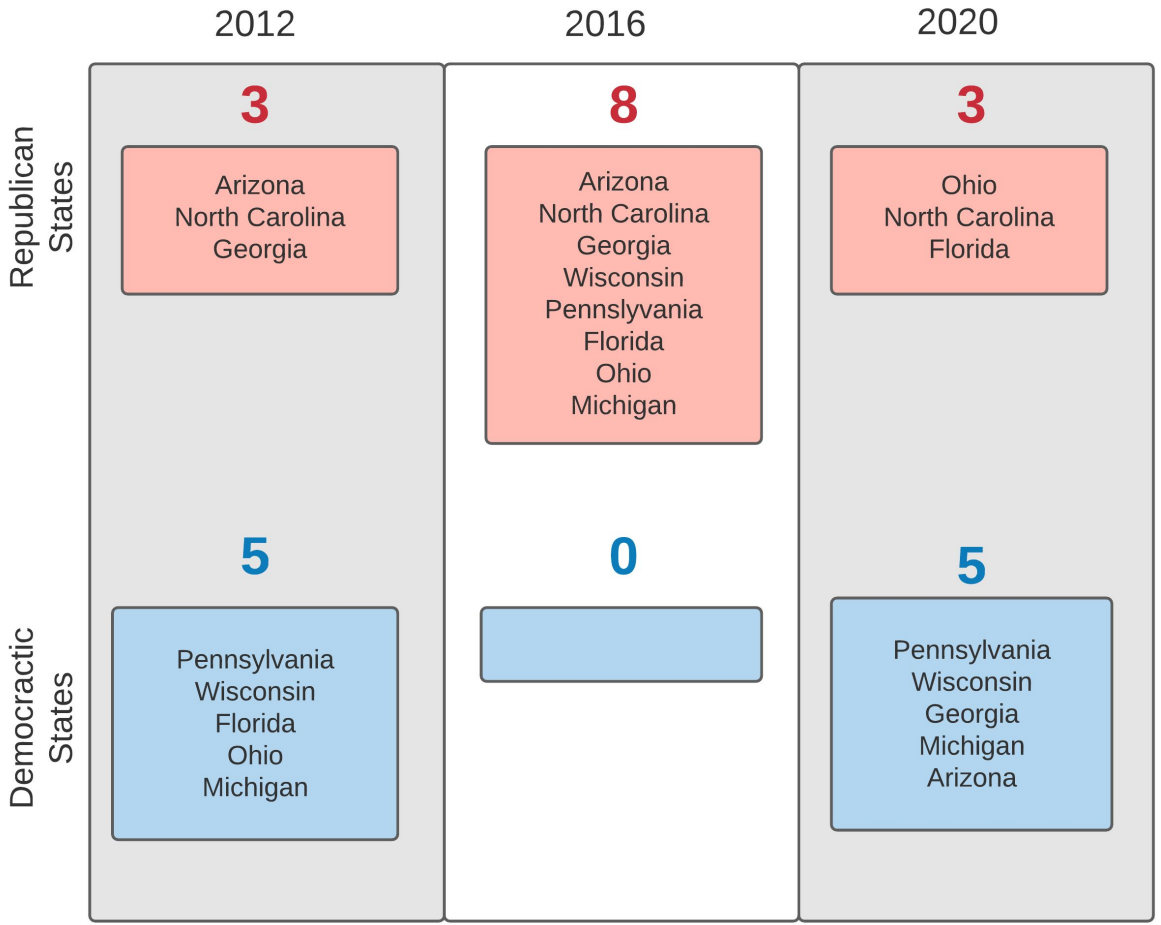
Rank	State	County	Republican Turnout 2016	Republican Turnout 2020	Rep Turnout Increase (2020-2016)	Republican Votes 2020	Voting Age Pop 2020
1	FL	GULF COUNTY	39.2%	54.8%	15.6%	6,113	11,147
2	GA	JASPER COUNTY	41.7%	53.3%	11.6%	5,822	10,924
3	GA	DAWSON COUNTY	52.8%	64.2%	11.4%	13,398	20,853
4	GA	HEARD COUNTY	37.8%	48.6%	10.9%	4,516	9,284
5	GA	HARALSON COUNTY	43.8%	54.5%	10.6%	12,331	22,637
6	MI	MISSAUKEE COUNTY	46.7%	57.0%	10.3%	6,648	11,658
7	AZ	MOHAVE COUNTY	34.6%	44.4%	9.9%	78,535	176,822
8	GA	PIERCE COUNTY	44.0%	53.7%	9.7%	7,899	14,696
9	MI	OSCODA COUNTY	42.5%	52.2%	9.7%	3,466	6,646
10	PA	FULTON COUNTY	49.1%	58.5%	9.5%	6,824	11,655
11	GA	BRYAN COUNTY	41.6%	50.9%	9.3%	14,244	27,979
12	PA	ELK COUNTY	40.9%	50.2%	9.3%	12,140	24,173
13	GA	HART COUNTY	36.3%	45.5%	9.2%	9,464	20,783
14	GA	FRANKLIN COUNTY	40.5%	49.7%	9.2%	9,069	18,249
15	GA	JACKSON COUNTY	44.9%	54.1%	9.2%	29,497	54,499
16	WI	OCONTO COUNTY	44.5%	53.7%	9.2%	16,266	30,302
17	GA	PIKE COUNTY	53.3%	62.5%	9.2%	9,127	14,613
18	PA	BEDFORD COUNTY	50.3%	59.5%	9.2%	23,025	38,720
19	MI	MONTCALM COUNTY	34.7%	43.8%	9.0%	21,815	49,856
20	GA	UNION COUNTY	52.0%	61.0%	9.0%	12,651	20,737
						SUM	596,233

Top 20 Counties with the Largest Increase in Democrat Voter Turnout (2020-2016)

Rank	State	County	Democrat Turnout 2016	Democrat Turnout 2020	Dem Turnout Increase (2020-2016)	Democrat Votes 2020	Voting Age Pop 2020
1	AZ	APACHE COUNTY	33.2%	44.4%	11.2%	23,293	52,462
2	GA	HENRY COUNTY	30.8%	41.8%	11.0%	73,276	175,285
3	GA	ROCKDALE COUNTY	34.9%	45.4%	10.4%	31,244	68,889
4	MI	LEELANAU COUNTY	37.8%	48.1%	10.4%	8,795	18,267
5	GA	FAYETTE COUNTY	27.3%	37.5%	10.2%	33,065	88,100
6	GA	GWINNETT COUNTY	25.3%	35.2%	9.9%	241,827	687,242
7	MI	GRAND TRAVERSE COUNTY	28.7%	38.5%	9.8%	28,683	74,544
8	GA	COBB COUNTY	28.3%	38.0%	9.8%	221,846	583,231
9	AZ	COCONINO COUNTY	29.3%	39.0%	9.7%	44,698	114,726
10	WI	MENOMINEE COUNTY	33.2%	42.8%	9.7%	1,303	3,041
11	GA	DOUGLAS COUNTY	29.7%	39.4%	9.6%	42,809	108,767
12	WI	BAYFIELD COUNTY	40.2%	49.5%	9.3%	6,155	12,431
13	PA	CHESTER COUNTY	35.7%	44.8%	9.1%	182,372	407,024
14	MI	WASHTENAW COUNTY	43.3%	52.4%	9.1%	157,136	299,837
15	MI	EMMET COUNTY	26.5%	35.6%	9.1%	9,662	27,161
16	PA	MONTGOMERY COUNTY	40.0%	49.0%	9.0%	319,511	652,435
17	MI	KENT COUNTY	28.6%	37.6%	9.0%	187,915	499,890
18	GA	FORSYTH COUNTY	14.9%	23.6%	8.8%	42,203	178,574
19	MI	BENZIE COUNTY	28.8%	37.5%	8.7%	5,480	14,621
20	GA	DEKALB COUNTY	44.0%	52.7%	8.7%	308,227	584,968
						SUM	4,651,495

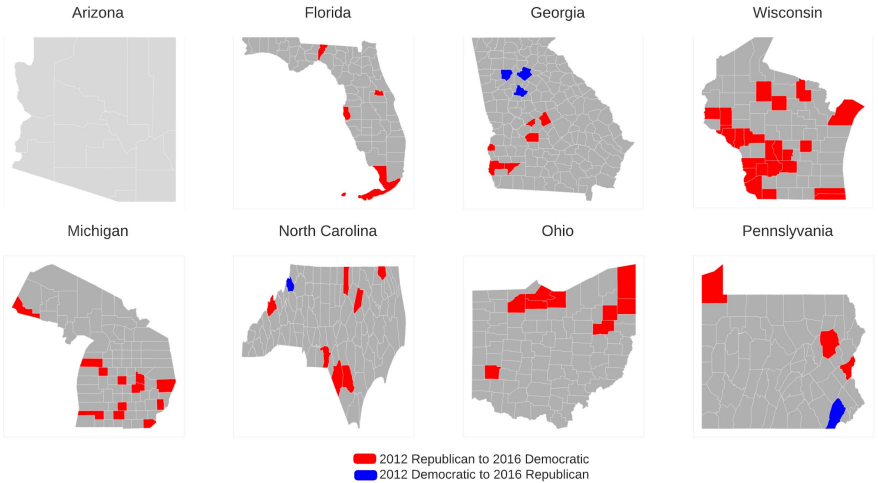
**Republican voter turnout = [Ballots cast for the republican candidate] / [Voting age population]
***Democrat voter turnout = [Ballots cast for the democrat candidate] / [Voting age population]

Winning Party by Year

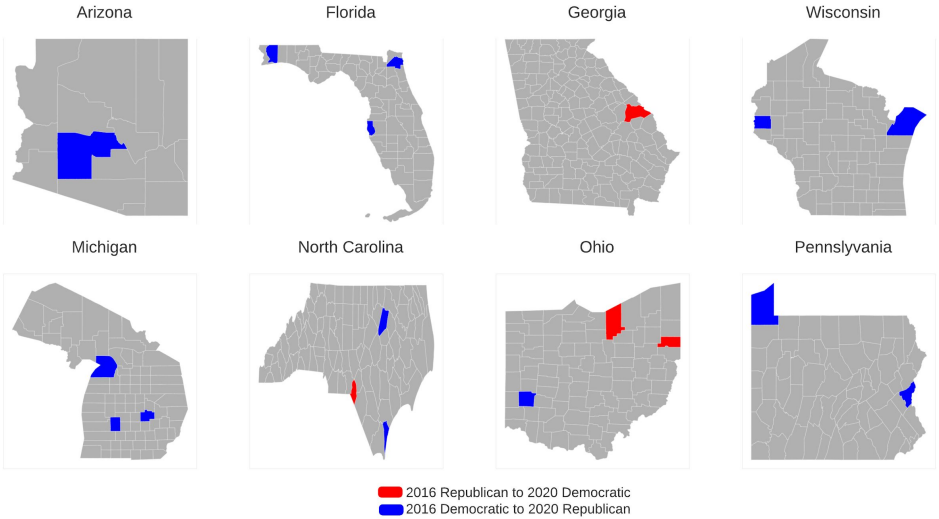


Flipped Counties

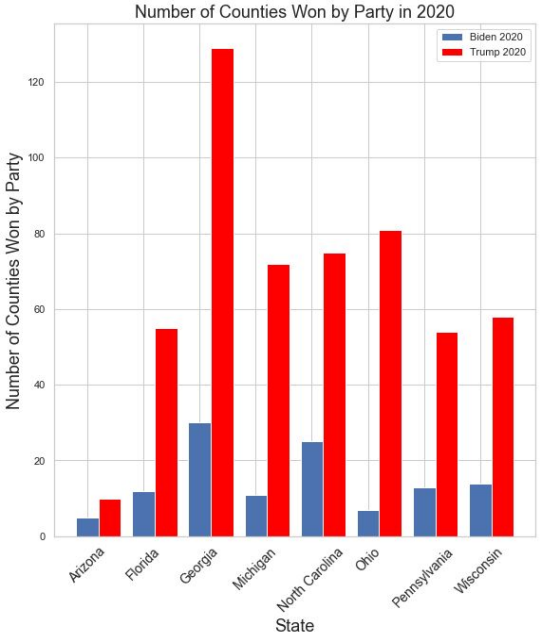
Counties that flipped in the presidential election from 2012 to 2016



Counties that flipped in the presidential election from 2016 to 2020



Voter Distribution by County



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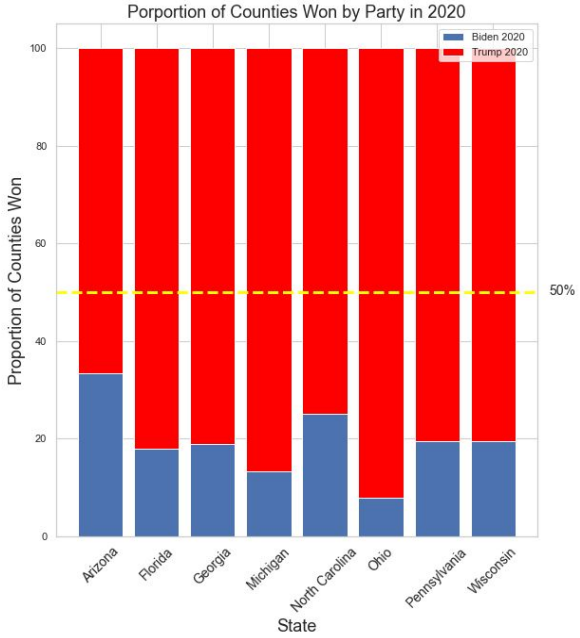
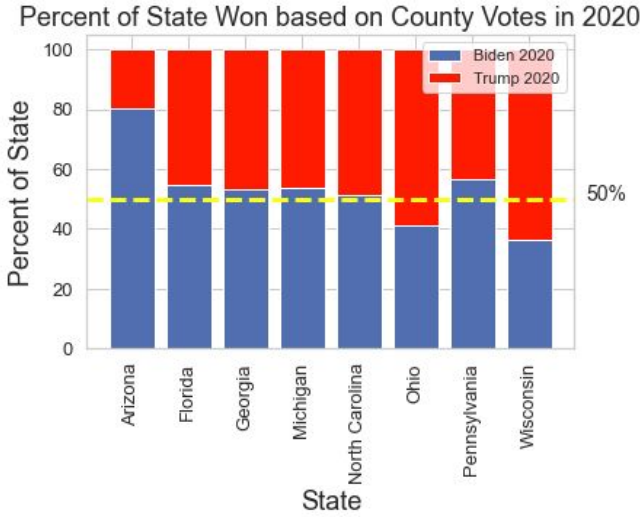


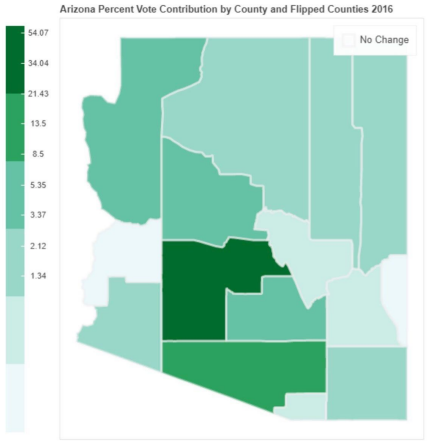
B

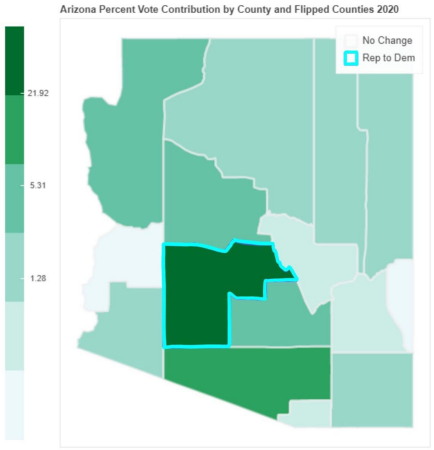
$$p_{state} = \frac{votes\ in\ county}{votes\ in\ state}$$



C

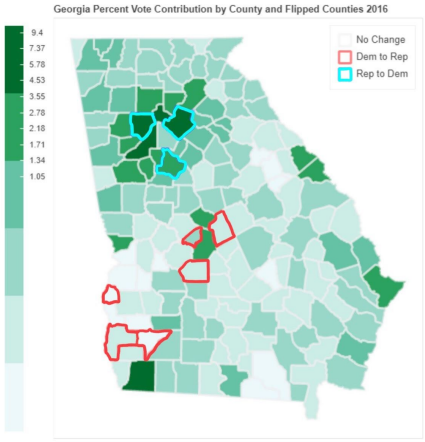
Arizona and Georgia p_state Heat Maps

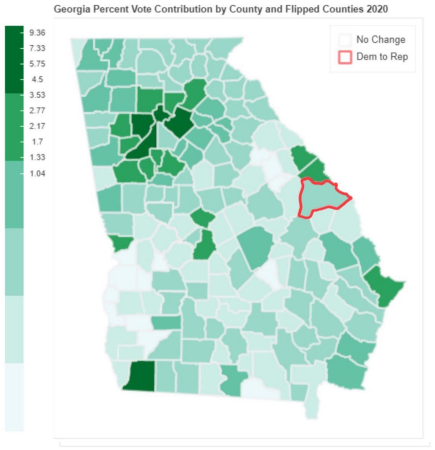




2016 2020

Arizona

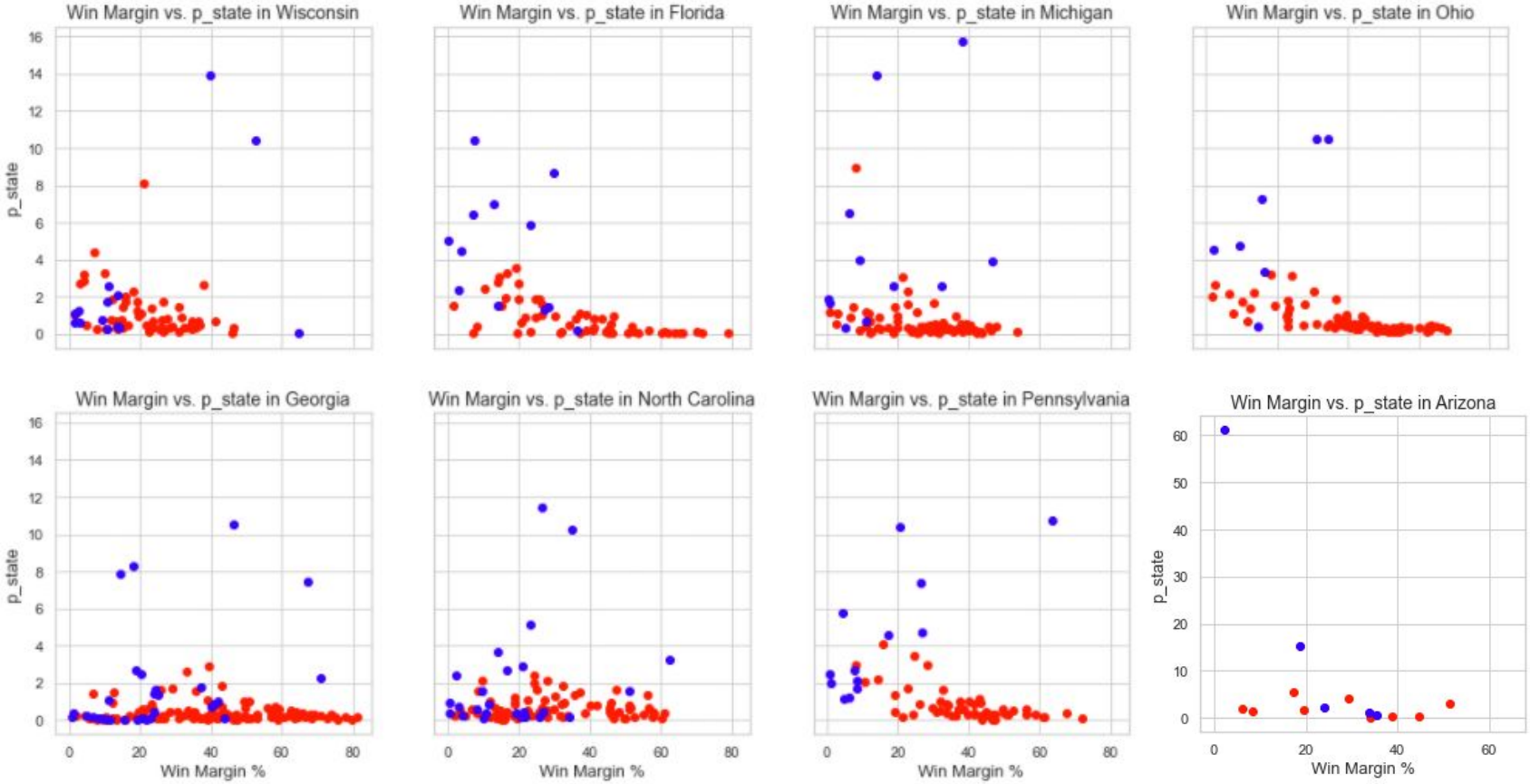




2016 2020

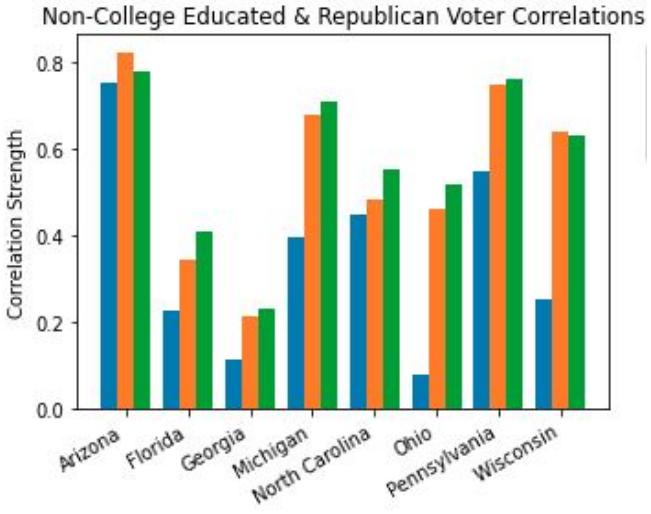
Georgia

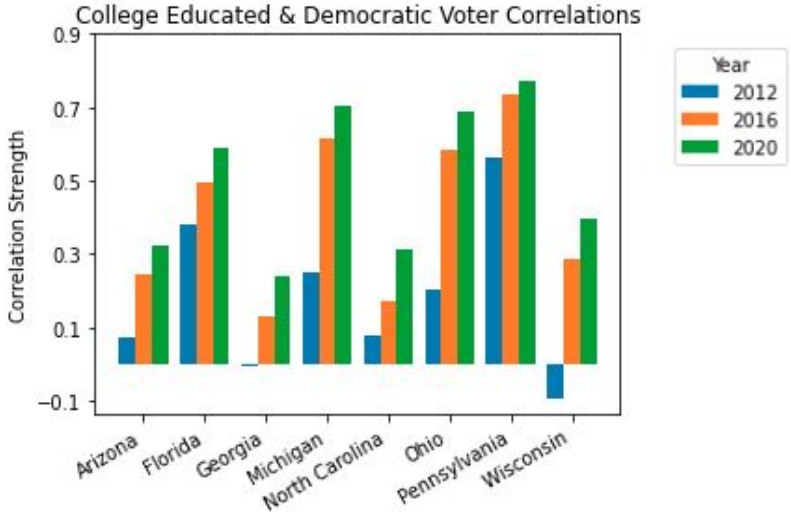
Margin of Victory vs. p_state



Voter Demographics (Education)

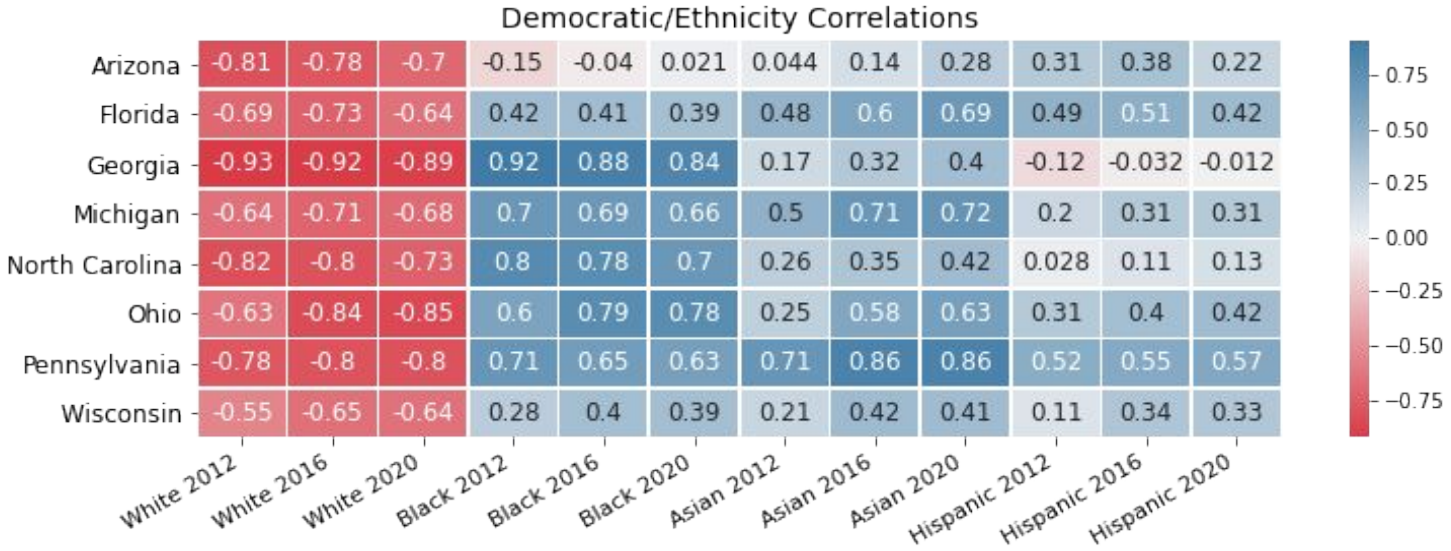
- Pearson correlation between % population and % Republican or Democratic votes
- Large change between the 2012 and 2016 election





Voter Demographics (Ethnicity)

- Pearson correlation between % population and % Republican or Democratic votes
- Demographic



Conclusion

Countless variables affect election results and examining a single variable will not be able to explain why a state’s voting patterns have changed.

Thank you for listening.