Voter Participation Rate (VPR)

William Parker and S. Stanley Young

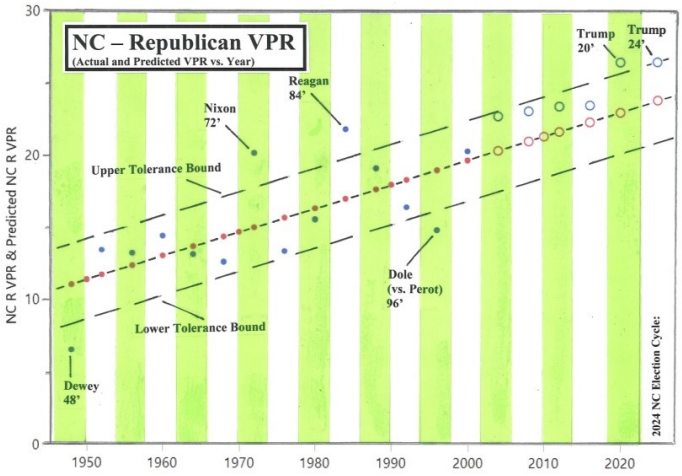
Voters are a subset of the population; therefore, they can and should be measured in terms of the population for proper and accurate election analysis. This is best accomplished with the use of the Voter Participation Rate (VPR).

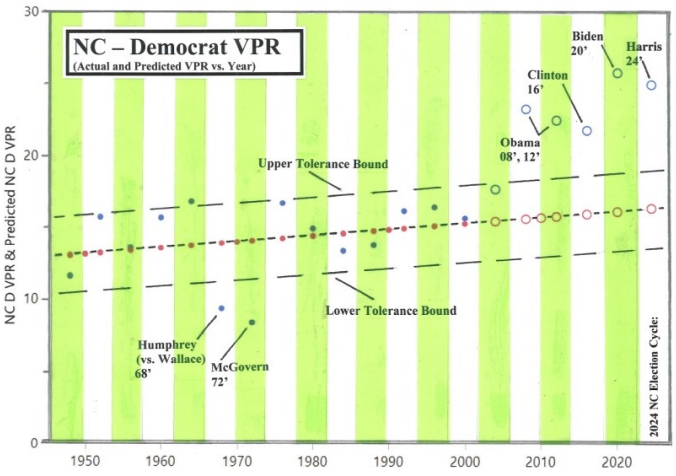
We all have a tendency of wanting to compare one election cycle to another. But there's one little problem: the population keeps changing with increasing (and possibly decreasing) numbers. With any high degree of reliability, it's nearly impossible to compare the election result numbers for the election cycle of 2024 to those of the 2000 cycle or even 1960, because the population is completely different. It's like comparing apples to oranges.

Instead of measuring the number of ballots cast in an election and trying to compare them directly to different election cycles; a better solution is to measure the level of voting in the total population. Over time, a population can double, but the rate of voting within that population should be somewhat similar, at least that is what is reasonably assumed. By dividing the number of votes cast (the election results) by the population (the Census numbers), you get a "percentage" – that is automatically adjusted for increases and decreases in the population from one election cycle to another. We call this method of calculating the level of voting, the "Voter Participation Rate" or simply the "VPR." By this method, you are then able to compare one cycle to another with a much greater degree of reliability and compatibility. Also, the VPR can be calculated for the total vote or for a political party, such as the Republican and/or Democrat Party.

Dividing election results by Census numbers is a super simple concept. It thus begs the question of why hasn't this approach become mainstream for election analysis way before now. Well, there are basically two reasons. One is that it is a very time-consuming process to pull the numbers, especially for a time analysis involving multiple election cycles. It is a process that has to be done by hand at this point – there is no place on the Internet where this data of election results and Census numbers is being paired up, put into chronological order, and the VPR calculated. And second, general election cycles and the Census don't usually fall in the same year. The Census is conducted once every decennial – 10 years, and the presidential general elections are conducted every four (4) years. There is only a match-up for both of these happening at the same time once every six presidential election cycles. If both happened the same time, all the time, then the VPR approach of analyzing election results would have been a common approach a long time ago. But, we have overcome this problem. The population is easily estimated for "off years" of the Census by a commonly used method called ***Interpolation***.

The VPR approach can be used in a number of ways for analysis. One such way is to simply plot the VPR data points over multiple election cycles in order to conduct a time series analysis. The "Unusualness" of any particular election cycle starts to become apparent just by looking at the data points over time. And when you apply a linear regression to the data, to estimate a long-term trend line, then the "Unusualness" of any particular cycle in question really becomes readily apparent. Shown below are the charts for the VPR of both the Republican and Democratic parties for the state of North Carolina. The results are no less than breathtaking, quite incredible; with the election cycle of 2020 apparently being very "Unusual", especially for the Democratic Party. One is now able to see, in crystal clear focus, precisely when and where anomalies have occurred.





Things you need to know about the charts: There are vertical strips, both white and shaded; each represents an election cycle from 1948 to 2024. Within these election cycle strips, you will notice dots and circles. Up and down the strip, you will notice a dot/circle that is not associated with any of the dashed lines; simply scattered along the vertical strip, with some actually being labeled, like "Nixon 72" for the Republicans and "McGovern 72" for the Democrats. These are the actual VPR data points, where the election results are divided by the population for each respective party. Then you will notice a dot/circle as part of the middle dashed line, which is somewhat horizontal with a positive incline. This represents the Linear Regression based on the scattered VPR data points. It is as if you are threading a straight line with a needle through the middle of all the data points. This determines the Long-term Trend Line for the two parties. The two outside, equal-distanced, parallel dashed lines are the Tolerance Bounds – the majority of the data points fall within these two bounds, with data points outside being "Outliers." And last, you will notice dots versus circles. We found a variance in the voting patterns starting after the 2000 election. Therefore, and in order to project the Long-term Trend Line for the two parties, we are only using the data points from 1948 up to 2000 to calculate the Linear Regression; after 2000, the circles associated with the middle dashed line are a projection or "prediction" of this line.

	VOTE TOTALS				ELECTION YEAR POPULATION	% of POP. WHO VOTED			
	Total	Republican	Democrat	Other		Total (VPR)	Rep.	Dem.	Other
North Carolina:									
1940	N/A	N/A	N/A	N/A	**3,571,623**	N/A	N/A	N/A	N/A
1948	791,209	258,572	459,070	73,567	3,963,868	19.96%	6.52%	11.58%	1.86%
1950	N/A	N/A	N/A	N/A	**4,061,929**	N/A	N/A	N/A	N/A
1952	1,210,910	558,107	652,803	0	4,160,774	29.10%	13.41%	15.69%	0.0%
1956	1,165,592	575,062	590,530	0	4,358,465	26.74%	13.19%	13.55%	0.0%
1960	1,368,556	655,420	713,136	0	**4,556,155**	30.0%	14.4%	15.7%	0.0%
1964	1,424,983	624,844	800,139	0	4,766,517	30.0%	13.1%	16.8%	0.0%
1968	1,587,493	627,192	464,113	496,188	4,976,878	31.9%	12.6%	9.3%	10.0%
1970	N/A	N/A	N/A	N/A	**5,082,059**	N/A	N/A	N/A	N/A
1972	1,518,612	1,054,889	438,705	25,018	5,242,000	29.0%	20.1%	8.4%	0.5%
1976	1,677,906	741,960	927,365	8,581	5,561,883	30.2%	13.3%	16.7%	0.2%
1980	1,855,833	915,018	875,635	65,180	**5,881,766**	31.6%	15.6%	14.9%	1.1%
1984	2,175,361	1,346,481	824,287	4,593	6,180,514	35.2%	21.8%	13.3%	0.1%
1988	2,134,370	1,237,258	890,167	6,945	6,479,263	32.9%	19.1%	13.7%	0.1%
1990	N/A	N/A	N/A	N/A	**6,628,637**	N/A	N/A	N/A	N/A
1992	2,611,850	1,134,661	1,114,042	363,147	6,912,772	37.8%	16.4%	16.1%	5.3%
1996	2,515,807	1,107,849	1,225,938	182,020	7,481,043	33.6%	14.8%	16.4%	2.4%
2000	2,911,262	1,631,163	1,257,692	22,407	**8,049,313**	36.2%	20.3%	15.6%	0.3%
2004	3,501,007	1,961,166	1,525,849	13,992	8,643,781	40.5%	22.7%	17.7%	0.2%
2008	4,310,789	2,128,474	2,142,651	39,664	9,238,249	46.7%	23.0%	23.2%	0.4%
2010	N/A	N/A	N/A	N/A	**9,535,483**	N/A	N/A	N/A	N/A
2012	4,505,372	2,270,395	2,178,391	56,586	9,716,264	46.37%	23.37%	22.42%	0.58%
2016	4,741,564	2,362,631	2,189,316	189,617	10,077,826	47.05%	23.44%	21.72%	1.88%
2020	5,524,804	2,758,775	2,684,292	81,737	**10,439,388**	52.92%	26.43%	25.71%	0.78%
2024	5,699,141	2,898,423	2,715,375	85,343	10,800,950	52.77%	26.83%	25.14%	0.79%

Where the numbers come from to calculate the VPR: Above is a chart with 10 columns. The 1st column shows, in chorological order, both presidential general election years and/or Census years. Columns 2, 3, 4, & 5 show the actual election results for the state of North Carolina. Column 6 is the population count. The years in bold print are the actual Census count for every decennial; and the in-between years, in regular print, are the estimated population count base on the method of ***Interpolation***. Columns 7, 8, 9, & 10 are the actual **VPR**s for the various vote counts reported, where the vote count is divided by the population.