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Are Voters Mind Static? Statistical Analysis of Unremitting Shift of Mind of Ghanaian Voters (2016-2020)

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Abstract

Elections play a crucial role in a very democratic society as they provide a means of electing their preferred candidates or leaders. It serves as a mechanism for expressing the collective will of the people and ensuring a peaceful transfer of power. This study therefore seeks to determine the difference between the proportion of votes garnered by the two main political parties during 2016 and 2020 elections. The study employed descriptive research design with two population proportion tests and found that Ghanaian voters in 2020 shifted towards the National Democratic Congress (NDC) at 95% confidence level. Moreover, in 2016, the New Patriotic Party (NPP) defeated the National Democratic Congress (NDC) with close to a million votes. Thus, in 2020 election, the results clearly indicate a shrank in the margin of votes between the two main political parties in Ghana. The results further revealed that during the 2016 and 2020 elections, Ghanaians changed their pattern of voting towards these two political parties. Additionally, the New Patriotic Party lost more votes as compared to what they garnered in the year 2016 at 95% and 99.9% confidence level. Also, the gap of votes between the two main political parties shrank at 95% and 99.9% confidence level. Based on the findings of the study, it was further concluded that political parties should not take the voters for granted and it should be known to political leaders that the voters have now changed their mindset and have shifted from the previously tribalistic line of voting. Therefore, for a political party to remain in power, it must promote good public relations with the masses and good campaign messages or policies that are beneficial to the electorates.

Keywords

Voters, Mindset, Unremitting Shift, Ghanaian, Electorate

1. Introduction

Many African countries have embraced multi-party systems, enabling citizens to participate in the political process and select their leaders through periodic elections. Elections, however, play a crucial role in democratic societies as they provide a means for citizens to choose their representatives and leaders. African countries of late have seen significant progress in terms of democratic governance and conducting elections. However, it is important to note that challenges still exist, including issues related to transparency, inclusivity, and the independence of electoral institutions [1] [2].

Ghana has been recognized as a relatively stable democratic nation on the continent of Africa. Ghana gained independence from colonial rule in 1957 and has since held several elections. The country's electoral system has generally been praised for its credibility and transparency, although there have been occasional concerns and disputes [3].

Ghana's most recent presidential and parliamentary elections took place in December 2020. The election saw the incumbent president, Nana Akufo-Addo, of the New Patriotic Party (NPP), win a second term in office. The elections were closely contested, and the main opposition candidate, John Mahama of the National Democratic Congress (NDC), challenged the results in court. However, the Supreme Court upheld the victory of President Akufo-Addo [3].

Comparing Ghana's elections to those in other African countries, it is important to note that each nation has its own unique political landscape and historical context. Countries like South Africa, Kenya, Nigeria, and Senegal have also held notable elections, each with its own set of circumstances and outcomes. Some countries have made significant progress in conducting credible elections, whereas others continue to face challenges related to political instability, electoral fraud, or lack of institutional trust [4].

Regional organizations such as the African Union (AU) and the Economic Community of West African States (ECOWAS) have played an important role in promoting democratic practices and ensuring peaceful elections across the continent. These organizations often deploy election observation missions to assess the fairness and transparency of elections, and they can provide support and mediation in case of post-electoral disputes [5]. Elections in Africa, including Ghana, are essential for democratic governance and the expression of the will of the people. While progress has been made, there are still challenges that need to be addressed to further enhance the integrity and inclusiveness of the electoral processes in various African countries [6].

Elections are conducted in Ghana in every four years [7]. In the year 2016, the New Patriotic Party (NPP) defeated the National Democratic Congress (NDC) with close to a million votes [8]. However, in the year 2020, there had been a shrank in the margin of votes between these two main political parties. One thing that is not clear is whether Ghanaians have changed their pattern of voting towards these two political parties with reference to the 2016 and 2020 electoral

years [8] [9].

In the 2016 electoral year, the NPP secured 5,755,758 votes representing 53.7% while the NDC got 4,771,188 votes representing 44.5% out of a total valid vote of 10,713,650 [8] [9]. Moreover, in 2020, the electoral commission declared the NPP as the winner with a percentage of 51.30% while the NDC garnered 47.36% out of the total of 13,119,541 valid votes cast [9].

Although, the 2020 election results are in contention, can we state that the voters shifted their loves for the political parties with reference to the 2016 electoral results? To provide a solution to this problem, this study sought to find whether there exists any significant difference between the proportion of votes secured by the two main political parties between the years 2016 and 2020 [10].

Empirically, there has been scanty works done in this area [11] [12] [13] [14] [15], trying to find the variation of love towards the two main political parties in Ghana. Also, none of the reviewed works tested a hypothesis for the difference between the proportion of votes secured by the two main political parties between 2016 and 2020 electoral years [8]. This study therefore bridges this gap by unearthing the significant difference between the proportion of votes secured by the two main political parties in 2016 and 2020 electoral years.

Objective of the study

The main objective of the study is to examine whether there was a shift of love towards the two main political parties between 2016 and 2020 electoral years. The specific objectives are to:

1) Examine the difference between the proportion of votes garnered by the two main political parties between 2016 and 2020.

2) Inspect whether there is a significant difference between the absolute proportion of the gap of votes secured by the two main political parties for 2016 and 2020 electoral years.

Research Hypothesis

1) There is a significant difference between the proportion of votes garnered by the two main political parties between 2016 and 2020.

2) There is a significant difference between the absolute proportion of the gap of votes secured by the two main political parties for 2016 and 2020 electoral years.

1.1. Empirical Review

In a study conducted by Coticchia and Vignoli [15] in Italy, it was illustrated that the main opposition parties, despite a consensus on the missions expressed several times in the parliament, aimed to defeat the government before the assembly by exploiting divisions in the majority coalitions during 'crucial votes', when the government had a slim margin of support. For instance, in parliamentary debates, Forza Italia (FI) consistently backed the Italian contribution to Allied Harbour in Kosovo in 1999. Nevertheless, when it came to debate the resolution by the majority coalition, they twice voted against it. This shows that the

voters do change their mind over some periods. They achieved this by employing curvilinear regression analysis. However, they were not able to test the difference between the proportion of votes for the two periods [15].

Another work was done by Agomor *et al.* [16] in Ghana. Their main objective was to examine the determinants of electoral patterns and voter decisions in the Ghanaian politics and in the politics of many other African countries. They obtained a primary data from a nationwide survey of 3160 voters who have voted in 2016. They used descriptive and logistic regression for their analysis and found that the ability to develop one's locality, campaign message and human relation of the candidate were the key factors that influenced voters' choices. They also demonstrated that Ghanaian voter has defied what has been described as "ethnic census" about African voting behaviour. Therefore, promoting the public good and having a good relationship with people were key factors that influenced the vote choice. Although, they were able to ascertain that voters change their love towards political parties through promotion of public good and having.

1.2. Significance of the Study

This study is very important because it will unearth whether voters shift their votes towards the two main political parties. This will alert the political parties to fulfill their promises when they are in government. It will also help in reducing corruption and serve as a check for the political parties since it will be clear to them that voters do shift their mindset towards the parties. This study will as well serve as an empirical review for future studies.

2. Materials and Methods

Research Design

The research design used was descriptive research design that falls under conclusive research designs. The descriptive research design was used since the study was to examine the shift of love among voters. The study gave a concluding result on the difference between the proportion of votes obtained by the two parties for 2016 and 2020, hence conclusive research design.

Source of Data

A secondary data of votes obtained by the two main political parties between 2016 and 2020 was downloaded from the Electoral Commission of Ghana's website.

Target Population

The target population was the voters for 2016 and 2020 electoral years. Since the entire data was downloaded, there was no need to calculate a sample. Therefore, sampling was not necessary for this study.

Data Analysis

Population proportion analysis was used to unearth the difference between the proportion of votes obtained by the two parties between 2016 and 2020 electoral years. The levels of significance for the study were 0.1 and 0.05 since this

research falls under the social sciences.

Limitations

There was no specific limitation for this study since the data used was rightly available on the website of the Electoral Commission of Ghana. However, this study is limited to the outcomes of the 2016 and 2020 presidential elections. Primary data could be collected to buttress the results in future studies.

3. Analysis of Results and Discussions

Hypothesis Testing for Two Population Proportion (no-pooled variance)

Comparing two proportions, like comparing two means, is common. If two estimated proportions are different, it may be due to a difference in the populations or it may be due to chance. For a test for two proportions, we are interested in the difference between two groups. In this case, the 2016 and 2020 electoral years, if the difference is zero, then they are not different (*i.e.*, they are equal). In the two-population proportion hypothesis testing, the null and alternative hypotheses are stated as follows:

1) $H_{01} : \hat{p}_1 = \hat{p}_2$ Versus $H_{A1} : \hat{p}_1 \neq \hat{p}_2$; this is often called the two-tailed test.

2) $H_{02} : \hat{p}_1 \leq \hat{p}_2$ Versus $H_{A2} : \hat{p}_1 > \hat{p}_2$; this is often called the upper-tailed test.

3) $H_{03} : \hat{p}_1 = \hat{p}_2$ Versus $H_{A3} : \hat{p}_1 \neq \hat{p}_2$; this is often called the lower-tailed test.

The test statistic is given as

$$Z^* = \frac{\left(\hat{p}_1 - \hat{p}_2\right) - 0}{\sqrt{\dfrac{\hat{p}_1\left(1 - \hat{p}_1\right)}{n_1} + \dfrac{\hat{p}_2\left(1 - \hat{p}_2\right)}{n_2}}}$$

where $\hat{p}_1 = \dfrac{x_1}{n_1}$ and $\hat{p}_2 = \dfrac{x_2}{n_2}$, x_1 and x_2 are the total values of the desired categories from both samples over the total number of sampling units in the sample.

For instance, using the NPP's values,

$$Z^* = \frac{\left(0.537 - 0.513\right) - 0}{\sqrt{\dfrac{0.537\left(1 - 0.537\right)}{10713650} + \dfrac{0.513\left(1 - 0.513\right)}{13119541}}}$$

$$Z^* = \frac{0.0240}{\sqrt{0.00000004224960}}$$

$$Z^* = \frac{0.0240}{0.000205547}$$

$$Z^* = 116.7615739 \cong 116.762$$

The decision rule is to reject the null hypothesis if Z^* is greater than the table values. An alternative way is by computing the p-values. In this case, when the p-value is less than the significance level (0.1 or 0.05), we reject the null hypothesis.

Hypothesis Testing for Two Sample Proportion (with pooled variance)

Two sample proportion test is used to determine whether the proportions of two groups differ. It calculates the range of values that is likely to include the difference between the population proportions.

Assumptions of the Two Sample Proportion Hypothesis Tests:

1) The data are simple random values from both the populations.

2) Both populations are following a binomial distribution.

3) When both mean (np) and $n[1 - p]$ of the variance ($np[1 - p]$) values are greater than 10, the binomial distribution can be approximated by the normal distribution.

Under the two-sample proportion hypothesis testing, both the null and the alternative hypothesis are same as that of the population proportion. However, the test statistic is given as

$$Z^* = \frac{(\hat{p}_1 - \hat{p}_2) - 0}{\sqrt{\hat{P}^*(1 - \hat{P}^*)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

where $\hat{P}^* = \frac{x_1 + x_2}{n_1 + n_2}$, $x_1 + x_2$ is the total value in the desired categories from both samples over the total number of sampling units in the combined sample.

Also, using the NPP's values as an example,

$$\hat{P}^* = \frac{5755758 + 6730587}{10713650 + 13119541} = 0.523905716$$

$$Z^* = \frac{(0.537 - 0.513) - 0}{\sqrt{0.523905716(1 - 0.523905716)\left(\frac{1}{10713650} + \frac{1}{13119541}\right)}}$$

$$Z^* = \frac{0.0240}{\sqrt{0.0000000422934}}$$

$$Z^* = \frac{0.0240}{0.000205653}$$

$$Z^* = 116.7011513 \cong 116.701$$

The decision rule is to reject the null hypothesis if Z^* is greater than the table values. An alternative way is by computing the p-values. In this case, when the p-value is less than the significance level (0.1 or 0.05), we reject the null hypothesis.

The election results as presented in Table 1 revealed that the NDC increased their proportion of votes in 2020 by a margin of 0.0286 as compared to what they got in 2016. However, the NPP's proportion of votes reduced by a margin of 0.024. It was also obvious that the gap of proportion of votes between the two main parties reduced by a margin of 0.0536. This therefore indicates that the mind of the voters shifted towards the NDC's direction thereby having a negative effect on the votes garnered by the NPP in the 2020 election. However, to justify whether this shift of voting was statistically significant, the two-proportion hypo-

thesis test was done.

The hypothesis test in Table 2 revealed a significant difference between the proportion of votes garnered by the two parties for 2016 and 2020 electoral years at both 90% and 95% confidence levels and even at 99.9% confidence level since 0.0001 (the p-value) is less than 0.1, 0.05 and 0.001. Also, the true interval of the difference of proportion of votes by the NPP, the NDC and the gap between the two parties were (0.0237, 0.0243), (−0.029, −0.028) and (0.053, 0.054) at 90%, 95% and 99.9% confidence levels. This confirms the first assertion that the mind of the voters shifted towards the NDC thus having a negative effect on the proportion of votes for the NPP between 2016 and 2020 electoral years at 90%, 95% and 99.9% confidence levels. This result is in line with the findings of Coticchia and Vignoli [11] and Agomor *et al.* [12] that voters do change their minds or pattern of votes.

The result in Table 3 affirms that the NDC gained more votes in 2020 at 90%, 95% and 99.9% confidence levels since the p-value (0.0001) was less than the significance levels (0.1, 0.05 and 0.001). However, for the NPP, there was not enough evidence to state that they garnered more votes in the 2020 electoral year. This manifested in the gap proportion test which also indicated that, there was not enough evidence to state that the gap of votes in 2016 is less than that of 2020 at 90%, 95% and 99.9% confidence levels.

Table 1. Election results between 2016 and 2020 electoral years in Ghana.

Political Party	2016		2020	
	Votes	Proportion	Votes	Proportion
NPP	5,755,758	0.537	6,730,587	0.5130
NDC	4,771,188	0.445	6,213,182	0.4736
Total Valid Votes	10,713,650	-	13,119,541	-
Gap between NPP&NDC	98,4570	0.092	517,405	0.0394

Source: Electoral Commission of Ghana (2020).

Table 2. Hypothesis of the difference between the 2016 and 2020 proportions ($\alpha = 0.05$).

Political Party	Type	Z Value	Z Critical Value		P-value		Confidence Interval	
α			0.1	0.05	0.1	0.05	0.1	0.05
NPP	No-pooled variance	116.762	1.645	1.960	0.0001	0.0001	(0.0237, 0.0243)	(0.0237, 0.0243)
	With pooled variance	116.701	1.645	1.960	0.0001	0.0001	(0.0237, 0.0243)	(0.0237, 0.0243)
NDC	No-pooled variance	−139.463	1.645	1.960	0.0001	0.0001	(−0.029, −0.028)	(−0.029, −0.028)
	With pooled variance	−139.339	1.645	1.960	0.0001	0.0001	(−0.029, −0.028)	(−0.029, −0.028)
Gap between NPP & NDC	No-pooled variance	507.707	1.645	1.960	0.0001	0.0001	(0.052, 0.053)	(0.052, 0.053)
	With pooled variance	524.285	1.645	1.960	0.0001	0.0001	(0.052, 0.053)	(0.052, 0.053)

Source: Authors own Estimation (2020).

Table 3. Hypothesis of 2016 proportion being less than 2020 proportion ($\alpha = 0.05$).

Political Party	Type	Z Value	Z Critical Value		P-value		Confidence Interval	
α			0.1	0.05	0.1	0.05	0.1	0.05
NPP	No-pooled variance	116.762	−1.282	−1.645	1.000	1.000	(−1.000, 0.0243)	(−1.000, 0.0243)
	With pooled variance	116.701	−1.282	−1.645	1.000	1.000	(−1.000, 0.0243)	(−1.000, 0.0243)
NDC	No-pooled variance	−139.463	−1.282	−1.645	0.0001	0.0001	(−1.000, −0.028)	(−1.000, −0.028)
	With pooled variance	−139.339	−1.282	−1.645	0.0001	0.0001	(−1.000, −0.028)	(−1.000, −0.028)
Gap between NPP & NDC	No-pooled variance	507.707	−1.282	−1.645	1.000	1.000	(−1.000, 0.053)	(−1.000, 0.053)
	With pooled variance	524.285	−1.282	−1.645	1.000	1.000	(−1.000, 0.053)	(−1.000, 0.053)

Source: Authors own Estimation (2020).

Table 4. Hypothesis of 2016 proportion being greater than 2020 proportion ($\alpha = 0.05$).

Political Party	Type	Z Value	Z Critical Value		P-value		Confidence Interval	
α			0.1	0.05	0.1	0.05	0.1	0.05
NPP	No-pooled variance	116.762	1.282	1.645	0.0001	0.0001	(0.0237, 1.0000)	(0.0237, 1.0000)
	With pooled variance	116.701	1.282	1.645	0.0001	0.0001	(0.0237, 1.0000)	(0.0237, 1.0000)
NDC	No-pooled variance	−139.463	1.282	1.645	1.000	1.000	(−0.029, 1.000)	(−0.029, 1.000)
	With pooled variance	−139.339	1.282	1.645	1.000	1.000	(−0.029, 1.000)	(−0.029, 1.000)
Gap between NPP & NDC	No-pooled variance	507.707	1.282	1.645	0.0001	0.0001	(0.052, 1.000)	(0.052, 1.000)
	With pooled variance	524.285	1.282	1.645	0.0001	0.0001	(0.052, 1.000)	(0.052, 1.000)

Source: Authors own Estimation (2020).

The result in Table 4 demonstrated that NPP lost more votes in 2020 at 90%, 95% and 99.9% confidence levels since the p-value (0.0001) was less than the significance levels (0.1, 0.05 and 0.001). Additionally, the test for the gap of votes shows that the margin of votes shrank between the two main parties in 2020 electoral year at 90%, 95% and 99.9% confidence levels. However, there was not enough evidence to state that the NDC lost votes in 2020 at 90%, 95% and 99.9% confidence levels. This therefore revealed that the pattern of voting in 2020 shifted towards the National Democratic Congress (NDC) significantly at 99.9% confidence level. However, as declared by the electoral commissioner on 9th December 2020, this was not enough for the Opposition Party to win power.

4. Conclusions

The study concludes that the minds of Ghanaian voters in 2020 shifted towards the National Democratic Congress (NDC) at 95% and 99.9% confidence level. The findings indicate that, the New Patriotic Party lost more votes as compared to what they garnered in the year 2016 at 99.9% confidence level. Also, the gap of votes between the two main political parties shrank at 99.9% confidence level.

The study further, concludes that political parties should not take the voters for granted because they have shifted from the previous tribalistic line of voting. Therefore, for a party to remain in power, it must promote good public campaign messages with better policies that are beneficial to the masses and a good human relation.

Further work should analyze the elections at the regional, constituency and parliamentary levels.

Implications and significance for Ghanaian politics, political parties, future elections, and the broader landscape of democracy and governance in Ghana

The findings of the study suggesting a significant shift in voting patterns among Ghanaian voters in 2020 have several implications for Ghanaian politics, political parties, future elections, and the broader landscape of democracy and governance in Ghana:

1) Impact on Ghanaian Politics: The shift in voting patterns indicates that Ghanaian voters are becoming less predictable and are willing to change their allegiance to different political parties. This suggests a growing level of political consciousness and a desire for change among the electorate. It also implies that voters are no longer strictly adhering to tribal or ethnic lines when making their voting decisions, which is a positive development for Ghanaian politics as it promotes a more inclusive and issue-based democracy.

2) Consequences for Political Parties: The study highlights that the New Patriotic Party (NPP) lost more votes compared to the previous election in 2016. This suggests that the NPP may need to reassess its strategies, policies, and messaging to regain the trust and support of voters. On the other hand, the National Democratic Congress (NDC) experienced a significant increase in support. This presents an opportunity for the NDC to consolidate its position and build on this momentum in future elections. Both parties need to take note of the shifting voter preferences and adjust their platforms accordingly. They should focus on addressing the concerns and aspirations of the electorate to maintain relevance and secure their support.

3) Future Elections: The study's findings have implications for future elections in Ghana. Political parties will need to adapt their campaign strategies to target the changing preferences of the electorate. They must develop comprehensive policies and manifestos that address the pressing issues faced by Ghanaians. Furthermore, parties should invest in effective communication channels to reach out to voters and convey their messages clearly. The narrowing gap between the two main political parties suggests a more competitive political landscape. This competition can be healthy for democracy, as it fosters accountability, encourages parties to deliver on their promises, and enhances voter participation.

4) Broader Implications for Democracy and Governance: The shift in voting patterns reflects a maturing democracy in Ghana. It signifies that voters are not simply voting along tribal or ethnic lines but are assessing parties based on their

performance, policies, and ability to address national issues. This shift promotes a more inclusive and representative democracy, where political parties are incentivized to prioritize the needs of the entire population rather than specific interest groups. Additionally, the study's findings emphasize that political parties should not take voters for granted. Parties must continuously engage with the electorate, understand their concerns, and work towards meeting their expectations. This encourages accountability and responsiveness in governance.

Overall, the shifting voting patterns in Ghanaian politics indicate a dynamic and evolving political landscape. The implications of these findings highlight the need for political parties to adapt, engage, and deliver on the aspirations of the electorate. It also signifies the progress of democracy and governance in Ghana, where voters are increasingly focused on policy issues and the performance of political parties rather than voting based solely on tribal or ethnic affiliations.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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