IMPACT OF EDUCATION ON CITIZEN BEHAVIOUR: A STUDY ON ARMENIA AND GEORGIA

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ABSTRACT

Studies on education investments and the educational sector overall have proved to be efficient and long-term contributions for the long-term development of the country and nation, meanwhile Armenia and Georgia have low public spending percentages of GDP on education. Besides that, voter turnout has been inconsistent in both countries.

These two measures inspired to understand if the level of education has impact on voting behavior alongside with other factors. Intuitively thinking, the more educated the person, the more responsible he feels about the future of the country, hence addresses elections in a rational manner, assuming voting is the rational choice in any condition.

As the research shows, higher education increases the probability of voting, due to the fact that education helps navigate voting easier and be more responsible in the democratic opportunity of voting for the governance.

Keywords: education, elections, voting behavior, voter turnout

ACKNOWLEDGEMENTS

CONTENTS

1. Introduction

Scholars and researchers agree that education is the foundation of the development of the nation and country. Spending and development of education should be one of the priorities in transition and developing economies in the nowadays world for ensuring the growth rate of economy and the overall country performance. According to the World Bank and UNESCO Institute of Statistics[1] Public Spending on Education in Armenia was reported at 2.8% of GDP and in Georgia at 3.8% of GDP in 2016. In contrast reports indicate 7.1% of GDP spent on education in Finland, 7.6% in Sweden, 5.4% in Netherlands as of 2015, countries that are considered to be the leaders in the education sector.

About elections and voting behavior, Armenia and Georgia, two neighboring countries being in the same development group according to the UN country classification report of 2019[2], perform poorly regarding the voter turnout. Elections held in the previous 5-10 years have indicated inconsistent behavior: ranging from 48% to 61% in Armenia[3] and from 25% to 62% in Georgia[4], thus not resulting in representative election outcomes.

As these two measures are central in building social and political foundation of a country, there is a need to understand if this two are empirically correlated and if increase in one will affect the other, specifically the research aims to understand if the level of education anyhow results in

[1] "Government Expenditure on Education, Total (% of GDP)" World Bank Group, accessed May 15, 2019, https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS?locations=AM-GE-FI-SE-NL.

[2] Economic Groups and Composition, report, accessed May 15, 2019, https://unctadstat.unctad.org/EN/Classifications/DimCountries_EconomicsGroupings_Hierarchy.pdf

[3] IFES Election Guide | Country Profile: Armenia, accessed May 15, 2019, http://www.electionguide.org/countries/id/12/.

[4] IFES Election Guide | Country Profile: Georgia. Accessed May 15, 2019. http://www.electionguide.org/countries/id/81/.

higher probability of participation in elections. Intuitively, the more educated the person, the more responsible he/she feels about the future of the country, hence addresses elections in a rational manner, assuming voting is the rational choice in any condition.

The main hypothesis to be tested is that higher education levels assume higher probability of voting, specifically within the households in Armenia and Georgia. Main findings of the research prove that both the level of education and other specific factors have significant positive effects on voting behavior.

2. Literature review

Education has been one of the most researched topics as a factor in social, behavioral and economic studies. Formal schooling, including both elementary and secondary education, is considered to provide private and public benefits, to their families and to the broader society. On the lowest level, education quality can be interpreted as investment and consumption value of education. The investment value is the private wellbeing through higher earnings, better health, contribution to arts and effective participation in the democratic process, while the consumption value can be considered the benefits to children and their families living in happy, supportive and healthy environments in the form of public benefits (Allen and Reich, 2013).

In terms of social value, education has been of interest to researchers due to the very strong empirical relationship between education and voting (Wolfinger and Rosenstone, 1980). As the

"civic education" theory suggests, as an individual's education development progresses, the increase in civic skills and knowledge results in greater political involvement. For decades, scholars have consistently noted that highly educated individuals participate in politics more than the average citizen (Campbell et al., 1960; Rosenstone and Hansen, 1993). Many researchers conclude that the most strongly correlated socio-demographic variable with election turnout is education (Wolfinger and Rosenstone, 1980). From as early as 1924, literally thousands of cross-sectional surveys have indicated that turnout rates rise with the increase of years of formal schooling (Merriam and Gosnell, 1924). A hypothesis on the argument can be that people who go to college are more likely to have educated and/or affluent parent, meaning they are more likely to come from homes where books, newspapers, and magazines were read and where politics was discussed (Sondheimer and Green, 2010).

Although data and studies repeatedly demonstrate, that individuals with higher attained level of education tend to vote in significantly higher numbers than other citizens (Rosenstone and Hansen, 1993; Wolfinger and Rosenstone, 1980), the causal factor of the relationship is less clear (Sondheimer and Green, 2010) or merely reflects pre-adult factors (Kam and Palmer, 2008). More precisely, education is known to be correlated with a host of individual-specific pre-adult factors such as intelligence, personality, early socialization, parental education, genetic predispositions and political interests (Kam and Palmer, 2008). This view is often called the "education as a proxy" (Berinsky and Lenz, 2011; Kam and Palmer, 2008; Persson, 2015). This perspective can be displayed with an example of parental political interest: children of parents who are highly politically interested are more likely to be involved in education, particularly civic-oriented education. Additionally, discussing politics with your parents during childhood is

also likely to lead to a higher frequency of voting (Bhatti, 2017). Advocates of the theory that relative than absolute education levels are most important, also claim that education is a proxy for pre-adult characteristics that in fact affect participation levels (Kam and Palmer, 2008).

Milligan, Moretti, and Oreopoulos(2004) and Dee(2004) conclude that education attainment strongly influences voter turnout, but more recent studies by Tenn (2007) and Kam and Palmer (2008) conclude that actual schooling has no effect. Milligan's method of study was using instrumental variables to separate the unobserved correlated variables from the causal effect of education and understand if education would still have effect on the voter turnout, which turned out to be true, while Tenn isolated the causal effect of education by comparing individuals to those who acquired education at the same or previous year, assuming similar unobserved characteristics, proving that education does not affect the voting behavior. The difference in the findings is due to the consideration of the impact on the general population by Dee and Milligan, while Tenn limits the impact to those still acquiring education.

The pre-adult factors suggested by Kam and Palmer are not the only reasons that education is not the only direct factor of voter turnout but as Brody (1978) identifies the puzzle: education predicts whether individuals will vote, but over time rising levels of education do not increase aggregate turnout. According to his studies education strongly predicts voter turnout and that aggregate education levels increased dramatically, yet voter turnout did not increase. Logic suggested that some other factors must be depressing turnout at almost equal rate that education was elevating it. Among these were the decline in part identification, decrease in elite mobilization, drop in church attendance, declining efficacy, growing popularity of television and

technologies, geographic mobility etc . (Abramson and Aldrich, 1982; Miller, 1992; Miller and Shanks, 1996; Putnam, 2000; Rosenstone and Hansen, 1993; Shaffer, 1981; Teixeira, 1992).

When trying to understand the reason behind the correlation between the education levels and voter turnout many researches (Berinsky and Lenz, 2011; Kam and Pamer, 2008; Persson, 2015) focus on the content of the given education. Education programs can increase cognitive abilities, knowledge and skills, and the resources may take the task of voting easier (Hillygus, 2005; Rosenstone and Hansen, 1993). Not only education provides skills that help make sense of the political worlds in terms of the critical thinking (Delli Carpini and Keeter, 1996) but also provides easier navigation of voter registration requirements and other impediments to voting (Highton, 2004). Moreover, the social networks in which higher educated people are situated create civic duty for the society (Campbell et al., 1960).

Education's predictive power is all more impressive because it has fundamentally non-political individual characteristics and is acquired outside of the political sphere, unlike attitudes or preferences toward candidates or parties, education yet has potential to affect political behavior in important ways (Burden, 2009). As already defined by the literature, education does have effects on voter turnout, which is why some scholars suggest to socially engineer education to some extent for increasing the political engagement of the society (Hoskins and Janmaat, 2016; Nie et al. 1996). Voter turnout can be increased by facilitating access to education or by increasing the civic content of existing education curricula (Peterson and Oscarsson, 2010), as an influential study by Hillygus (2005) finds that a social science curriculum increases turnout while science or business-related curricula tend to decrease the general political participation.

3. Data & Methodology

The data used for the research is extracted from the Caucasus Barometer datacenter. Caucasus Barometer is an annual household survey on social, political and economic status and opinion of the population conducted by Caucasus Research Resource Center (CRRC). The selected dataset is on the 2017 survey, specifically on Armenia[5] and Georgia[6]. The dataset consists of 4027 responses, collected from September to October of 2017, on the same year of held elections in both countries.

As the Figure 1.1 from Appendix shows, most of the respondents are from rural areas, while the rest is almost equally distributed in urban and capital settlements. According to Figure 2.2 the respondent's primary business were being a student or being employed. A big proportion of the respondents are unemployed and some of them retired. As the Figure 1.3 indicates, the respondent's opinions are mainly skewed to elections being somewhat fair. Most of the respondents consider voting as an important factor and characteristic for being a good citizen according to Figure 1.4. Finally, and most importantly, the highest gained level education of the respondents in Armenia and Georgia was mainly distributed among secondary, secondary technical and high (Figure 1.5). Due to the comprehensive survey and big number of respondents, there were no limitations, besides the missing value occurrence in some cases, that did not cause any significant inconveniences.

[5] "Caucasus Barometer." Caucasusbarometer.org. Accessed May 16, 2019.
https://www.caucasusbarometer.org/en/cb2017am/codebook/.
[6] "Caucasus Barometer." caucasusbarometer.org. Accessed May 16, 2019.
https://www.caucasusbarometer.org/en/cb2017ge/codebook/.

The research is done through binary outcome logistic regression modelling on the cross-sectional dataset. Dependent variable is the voting behavior of the respondent (VOTLELE: Did you vote during the last elections in 2017?). The independent variables are selected with the help of stepwise algorithm with regards selecting the lowest Akaike Information Criterion, the accuracy measurement for the logistic regression methods. What the algorithm does is to try all possible combinations of independent variables, select the one with the highest accuracy and lowest residuals and returning the set of chosen variables. The chosen set consists of the respondent's country of origin (ARM: Response from Armenian or Georgian data), the settlement type (STRATUM), the age of the respondent (AGE), the primary activity (EMPLSIT), opinion on the fairness of the conducted elections (ELCOND), opinion on the importance of voting (ICITVOTE) and most importantly the highest level of education achieved by the respondent (RESPEDU).

The assumptions for the logistic regression model are:

1. The outcome is binary.
2. There is a linear relationship between the outcome and each predictor variable.
3. No extreme/outlier values.
4. No high intercorrelations/multicollinearity.

First assumption is held, due to the Yes/No (1/0) response of the survey. Second assumption is tested and proved to be held, as seen from Figure 1.6 (a-g). To test the third assumption Absolute Standardized Residuals were plotted through the cook's distance method (Figure 1.7), where the

residuals are not above the 3% (0.03) threshold, thus indicating that the dataset does not include any outliers or extreme values. Regarding the fourth assumption, generalized variance-inflation factor was calculated for the model (Figure 1.8), and as the returned values did not exceed 5, the assumption is held, with no multicollinearity found.

For assessing the quality of the model and the selected variables random forest algorithm is implemented, that is an ensemble learning method for regression and other tasks, operating by construction of decision trees at training time and outputting the class that is the mode of the classes or mean prediction of the individual trees. Simply put it helps to understand the importance of the variables in the constructed regression. Plotting the results (Figure 1.9) we see that the taken variables are important in both Mean Decrease Accuracy and Mean Decrease Gini calculations.

4. **Estimation, hypothesis testing and results**

The result of the estimation is the following: most of the variables, and in the case of categoric variables at least one of the factors, are significant to some extent. In the logistic regression model the beta estimates, also known as the odds ratio (Formula 2.1), only show the positive/negative impact while the coefficients on how they affect are the exponents of the estimates, in this case the corresponding columns of the table.

$$\text{logit(p)} = \log(\text{p1}-\text{p}) = \beta 0 + \beta 1 x 1 + ... + \beta n x n \qquad (2.1)$$

For a more visualized example let us pick the age variable. As can be seen the estimate is positive, meaning that age affects the voting decision positively. The exponent of the estimate is around 1.03, meaning that a marginal change in age increases the probability of choosing to vote by 1.03%.

According to the table, variables "ARM", "STRATUM", "AGE", "RESPEDU", "ELCOND" and "ICITVOTE" have overall positive effects on the voting decision, meaning that Georgians tend to vote less in contrast to Armenians, being from Urban or Rural settlement increases the probability of voting in contrast with the capital-settlement-respondents, aging results in tendency of voting, increasing levels of education indicate higher probability of voting, all type of activities decrease the probability of voting in contrast with the employed respondents, any opinion on the fairness of elections results in higher probability of voting and at last, in contrast with the average importance of voting, people who think that voting is important tend to vote, and people who think that voting is unimportant tend to not vote.

As the results indicate, education has significant and positive effect on voting decision, as predicted. The baseline for the "RESPEDU" variable was chosen "Secondary", to result in a more realistic and significant output. According to the results, the hypothesis is accepted, hence education does positively affect the voting behavior of Armenian and Georgian citizens as of 2017 household survey.

Dependent variable:	votlele				
	Estimates	Coefficients		Estimates	Coefficients
Armenian	0.939***	2.557	Unable to work	-1.253***	0.286
	-0.121			-0.408	
Urban	0.609***	1.838	Other	-1.482**	0.227
	-0.135			-0.719	
Rural	0.672***	1.959	Somewhat Fair	0.472***	1.603
	-0.128			-0.118	
Age	0.029***	1.029	Completely Fair	1.576***	4.837
	-0.004			-0.188	
Incomplete Primary	1.243	3.467	icitvote1	-0.547**	0.579
	-1.197			-0.261	
Primary Education	0.327	1.387	icitvote2	-1.047**	0.351
	-0.456			-0.48	
Incomplete Secondary	-0.08	0.923	icitvote3	0.041	1.041
	-0.198			-0.362	
Secondary Technical	0.154	1.166	icitvote4	-0.475	0.622
	-0.139			-0.327	
Incomplete High	0.264	1.302	icitvote6	0.147	1.158
	-0.273			-0.264	
High Education	0.290**	1.337	icitvote7	0.348	1.417
	-0.143			-0.246	
Postgraduate	-1.943***	0.143	icitvote8	0.743***	2.102
	-0.557			-0.227	
Retired	-0.378**	0.685	icitvote9	1.108***	3.029
	-0.165			-0.241	
Student	-0.677***	0.508	icitvote10	1.087***	2.965
	-0.201			-0.178	
Housewife	-0.785***	0.456	Constant	-1.544***	0.214
	-0.289			-0.298	
Unemployed	-0.275*	0.759	Observations	3,165	
	-0.163		Log Likelihood	-1,220.31	
Self-Employed	-0.322	0.725	Akaike Inf. Crit.	2,500.62	
	-0.2		Note:	*p<0.1; **p<0.05; ***p<0.01	

As seen from the model education is not the most significant and highly-affecting factor among the independent variables, which can be interpreted with the help of the literature. As already mentioned, Kam and Palmer found that education is empirically correlated with voter turnout due to its inclusion of pre-adult or characteristic factors, such as behavior, preferences, worldview etc. Since the model includes variables that mainly cover for the characteristic representation (ICITVOTE, STRATUM, EMPLSIT) of the respondents, education tends to be less of an important factor affecting the voting decision, but still a significant and positively impacting one.

5. Conclusion

Although some inconsistencies with the outcomes in the beginning, efforts on data manipulation, model parameter changes and variable selection alterations proved the hypothesis to be true: education positively impacts voting behavior. Seeing the empirical relationship between education and voting behavior in two developing countries indicates that a change in the educational sector, increase in financial contribution in the education sector and increase in the education attainment rate will consequently increase the voter turnout, resulting in a more informed, literate, responsible society voting for more democratic and representative outcomes.

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7. Appendixes

Figure 1.1
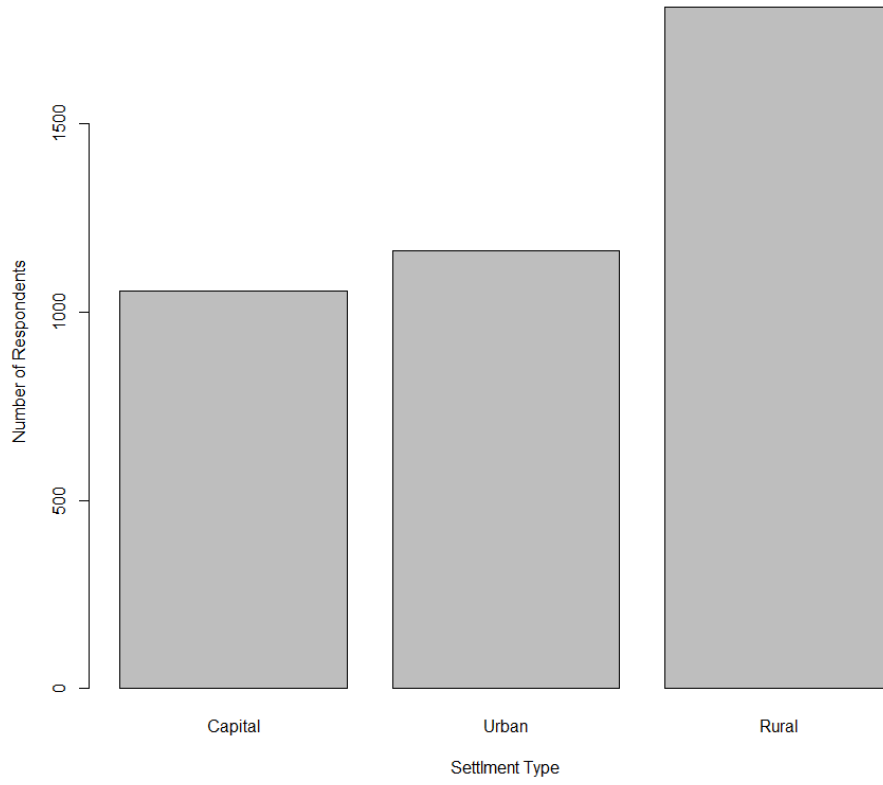
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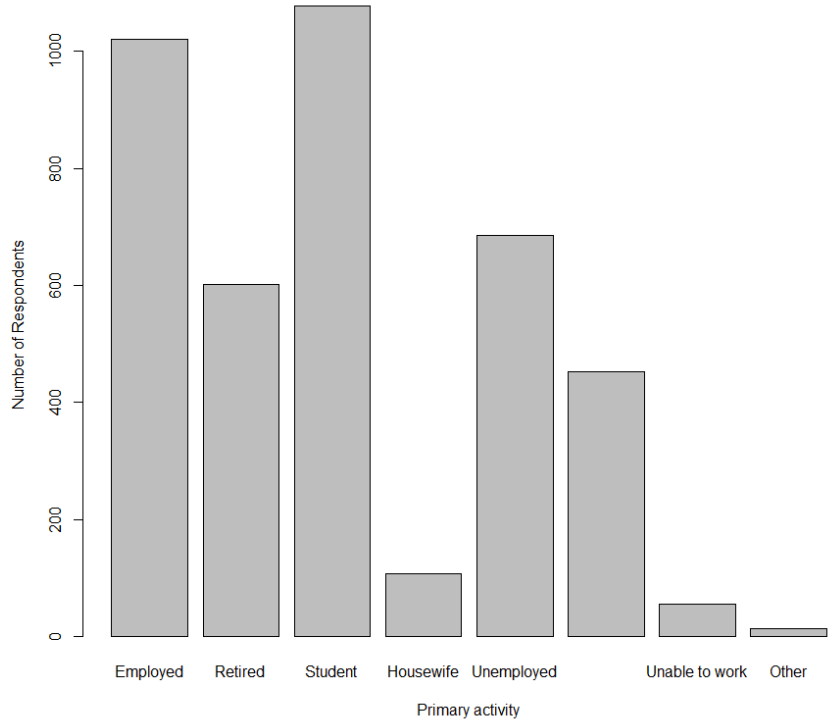
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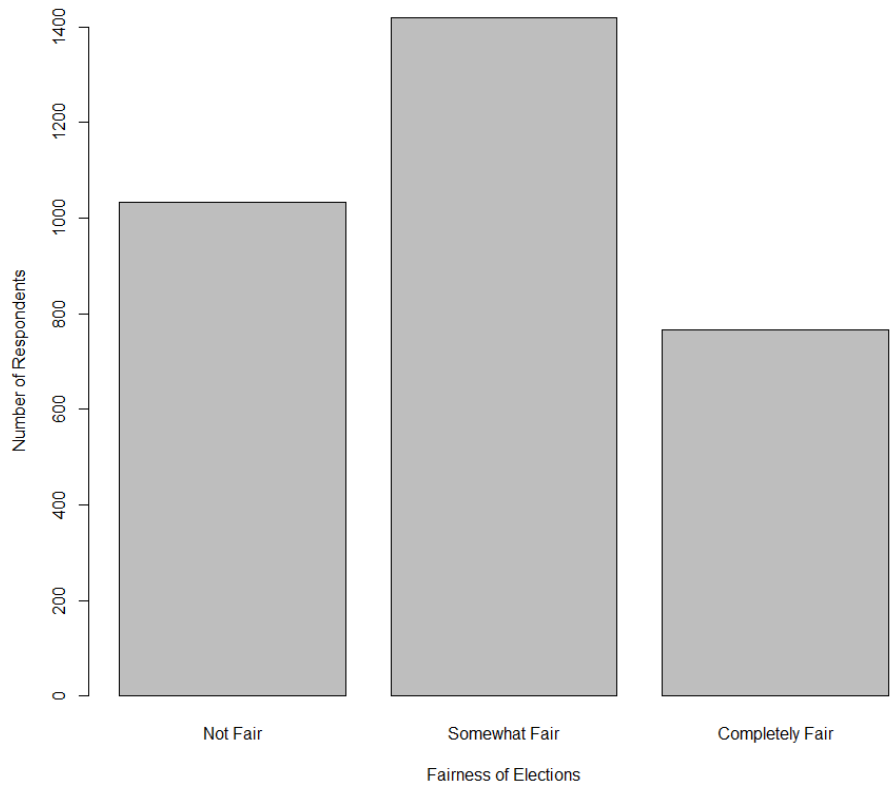
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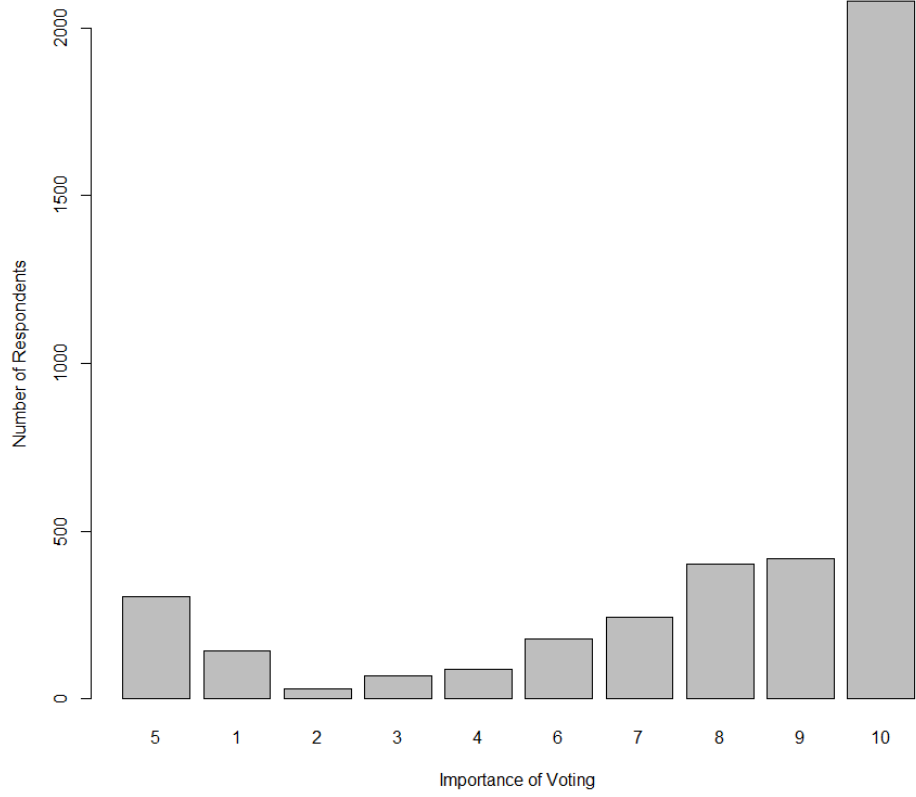
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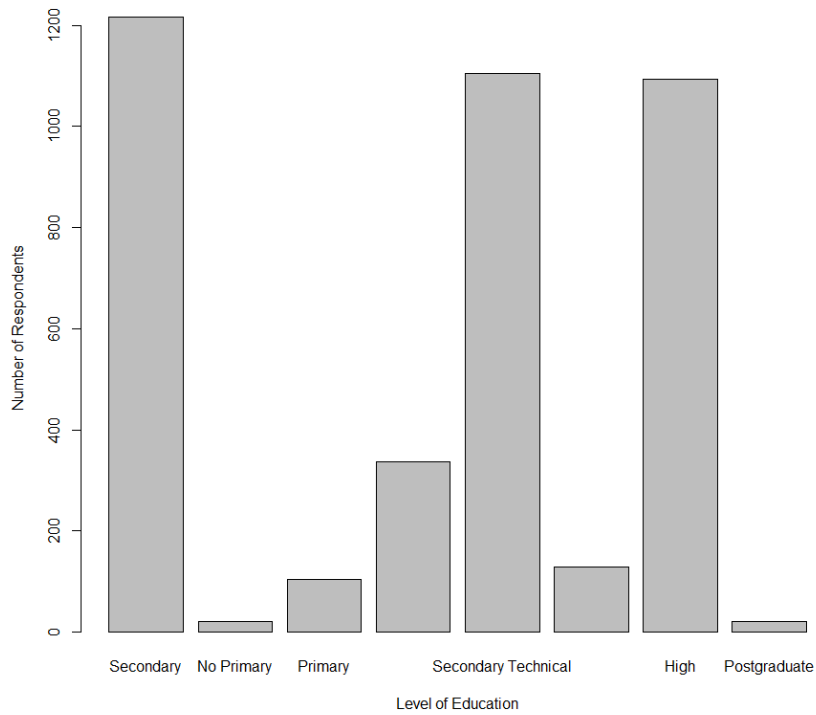
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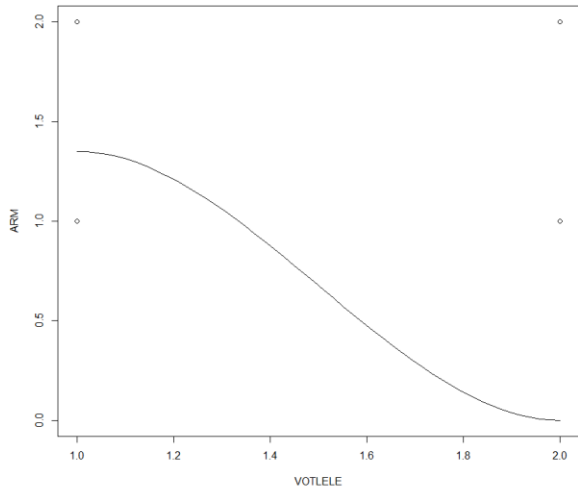
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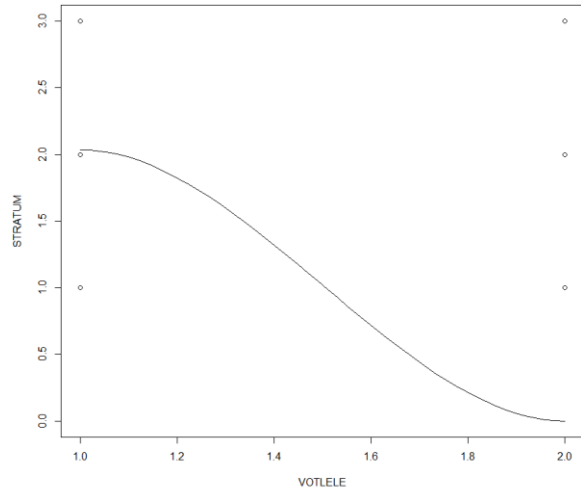
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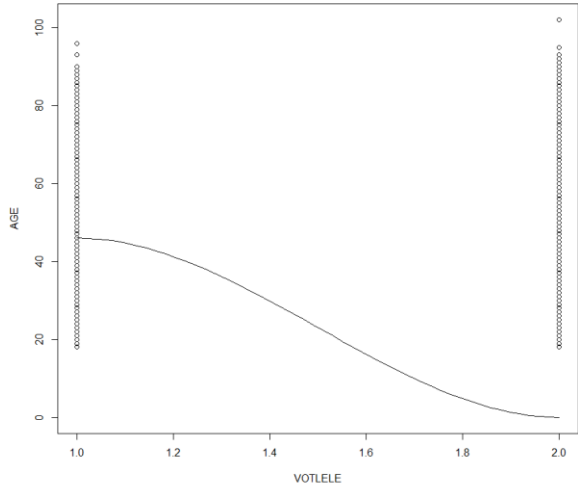
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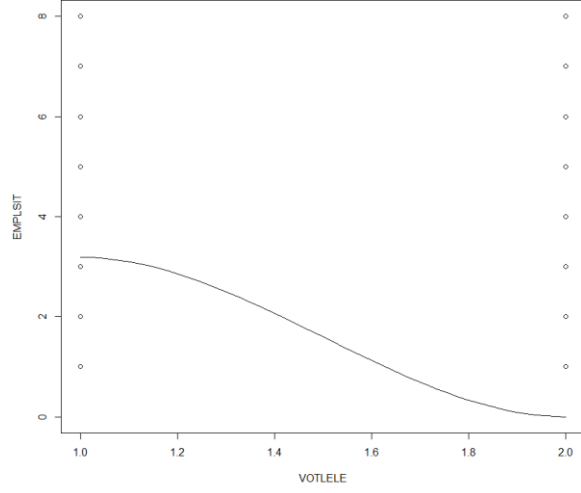
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Figure 1.6 f

Figure 1.6 g
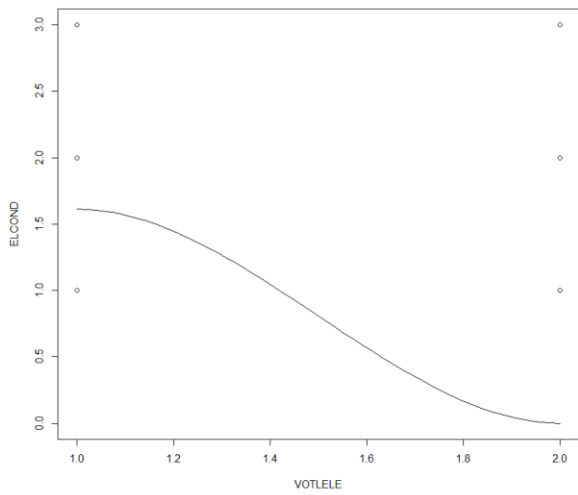
Figure 1.7
Cook's distance
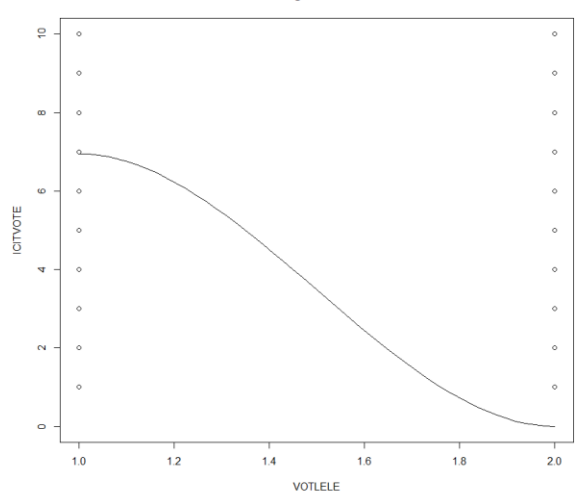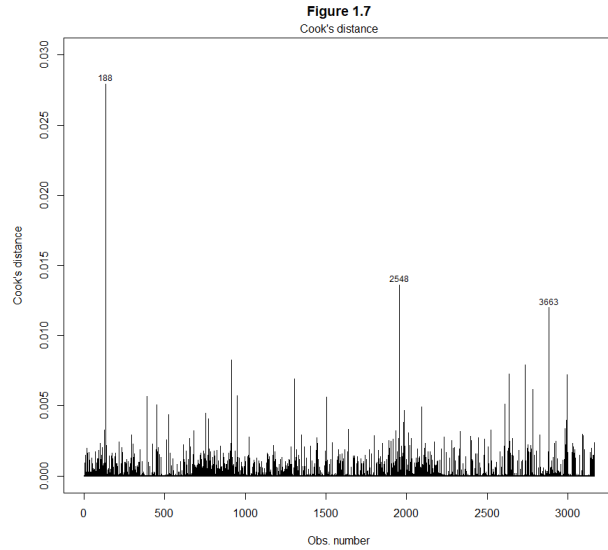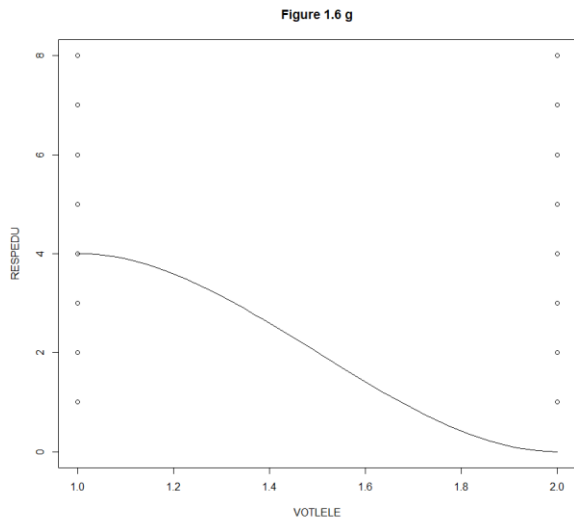
Figure 1.8			
	GVIF	Df	$GVIF^{\left(\frac{1}{2 \cdot Df}\right)}$
ARM	1.314515	1	1.146523
STRATUM	1.19143	2	1.044762
AGE	2.323207	1	1.524207
RESPEDU	1.439968	7	1.026386
EMPLSIT	2.92729	7	1.079739
ELCOND	1.244922	2	1.056296
ICITVOTE	1.28491	9	1.014026

Figure 1.9
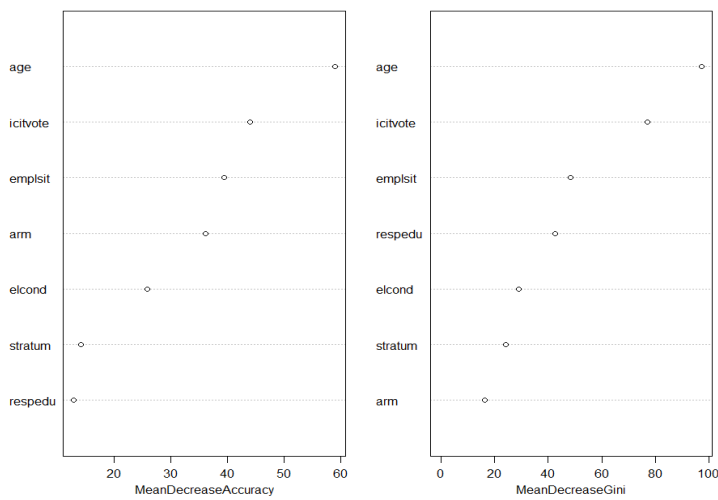
Hereby, I confirm that I agree for my work to be posted on the <u>library database</u> for an open access to the AUA community.