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The effect of education on voter's turnout in african presidential elections

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Abstract

Many studies of political behavior point out that individual with higher education participate in the largest extent in political activities than those with less education. However, recent literature shows that in developing countries the level of education negatively affects voters' turnout. This article appreciates the impact of the level of education on voters' turnout in the African presidential elections from 1990 to 2017. Based on a sample of 43 countries and considering all the presidential elections that were held in each country since 1990, the results obtained by Ordinary Least Squares (OLS) and Fixed Effect models (FE) suggest that increase in the level of education negatively affects the rate of voting participation. The results show that primary school enrollment rate has a positive and significant effect on voting participation in presidential elections, while secondary and tertiary school enrollment rates reduce participation. Thus, the propensity to vote decreases as the level of education increases, which questions the institutional arrangements and contextual factors that characterize political life and the organization of presidential elections in Africa.

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1. Introduction

The point of view that individuals with higher education are more involved in political activities than those with lower level of education is widely recognized in literature (Bahtti, 2017; Schlozman et al., 2012; Verba et al., 1995; Wolfinger and Rosenstone, 1980). Verba et al. (1995) explain that the level of education improves citizens' civic skills and political knowledge, thus encouraging them to become more involved in political concerns. However, recent literature shows that education has a negative effect on voters' turnout (Akramov et al., 2008 and Fornos et al., 2004). According to these authors, an elector in a context of political patronage and electoral fraud anticipates that he is less likely to influence the outcome of an election by his vote and therefore abstains from voting. This hypothesis has been verified by the work of Akramov et al. (2008) who show that in developing countries and particularly in the case of Pakistan, the level of education positively affects the rate of abstention to vote[1]. The authors show that the least educated people, farmers and rural people are the most likely to vote than other categories in the society. Other authors, on the other hand, show that the level of education has no effect on voting participation (Persson, 2014). In this controversial debate, studies on African countries remain limited.

However, the wave of democratization experienced by developing countries in the early 1990s places elections at the heart of political life through multiparty political systems. As shown by Posner and Young (2007), from this period elections emerged as the main mode of access and legitimation of political power in Africa. This transition follows the long period of coups that followed independence in African countries. This legitimacy is based on the support or recognition of political leaders by the people who express it through voting. In this line, Powell (1985) shows that voters' turnout is one of the three indicators of democratic performance.

The question of the determinants of voter's turnout remains unresolved. The pioneering work of Dawn (1957) on the "paradox of voting" shows that a rational voter should abstain from voting not only because of moving and seeking information costs about candidates, but also because he anticipates that his vote has only a marginal effect on the outcome of the ballot. To this end, Blais (2000) shows that participation rates vary considerably over time and space, with a strong downward trend. Lassen (2005) also shows that this decline is stronger in developing countries than in advanced democracies. Thus, the question of factors affecting participation or abstention from voting remains a concern for the consolidation of democracy, especially for developing countries where the quality of institutions and levels of democracy remain unsatisfactory. Election gives citizens opportunity to choose competent leaders and to discipline them in making decisions (Rogoff, 1990). As such, abstention from voting may favor the marginalization of part of the population to the benefit of those who effectively participate in political life.

Indeed, less than 66% of registered voters effectively cast their votes during presidential elections in Africa. Rwanda is the African country with the highest average rate of voting participation (97.40%) followed by Equatorial Guinea and Seychelles with voting participation rates of 92.55% and 88.41%, respectively. On the other hand, countries such as Mali (34.52%), Egypt (40.76%) or Zimbabwe (47.45%) have the lowest average rates on the continent[2]. These participation rates are also correlated with education levels[3]. As illustrated in Figures A2 and A3 of appendices, countries with the lowest voting participation rates also have the highest average levels of education.

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[1] More explanations are provided in the review of the literature.

[2] These statistics were calculated by the author and statistics on the average rate of voting participation are presented in Table A1 of the Appendices.

[3] See appendices.

The purpose of this article is to measure and analyze the effect of education level on African presidential elections voter's turnout. Taking into account other factors mentioned in the literature, we formulate the assumption of voter naivety in Africa in their decision to vote, given the African socio-economic conditions, the quality of institutions, the political situation and transparency of electoral processes which are still worse than in advanced democracies.
Our article contribute to the debate on the effect of education on political participation in order to test the hypothesis that voter turnout decreases with the level of education. To achieve this goal, we conduct graphical analyzes and econometric tests for all presidential elections held in 43 African countries from 1990 to 2017. Using Ordinary Least Squares (OLS) and Fixed Effects (FE) models, our results show that the level of education negatively affects voters' turnout. On one hand, Primary education, and on the other hand, secondary and tertiary educations significantly affect the rate of voters' turnout, but with opposing signs. Only primary education has a positive and significant effect on voters' turnout regardless of the model used or the control variables taken into account. The robustness tests using an alternative measure the rate of voters' turnout confirm our results. This results show that during African presidential elections, the propensity to vote decreases as the level of education increases, *ceteris paribus*.
The rest of the article is structured as follows: Section 2 reviews the existing literature while section 3 presents the methodology. The results are presented and analyzed in Section 4. Section 5 concludes the article and delivers some recommendations.

2. Literature review

The factors that influence citizen's participation in voting have been widely debated in the economic, political and sociological literature. In this part, seminal works were led by Blais and Dobrzynska (1998), Jackman (1987) and Powell (1982, 1986). These authors mainly focused on the institutional arrangements that frame electoral systems and processes. For this purpose, political systems such as proportional rule and compulsory voting are presented as important institutional factors encouraging voters' turnout (Franklin and Hobolt, 2011; Henderson and McEwen, 2010; Rose and Borz, 2013). In his work, Jackman (1987) shows that the nature of parliament also influences voters' turnout in parliamentary elections. Based on a sample of 16 advanced democracies from 1960 to 1970, Jackman (1987) shows that electoral disproportion and the number of political parties negatively affect voters' turnout, while unicameral system has a positive effect on voting. He also shows that laws that make voting mandatory, as well as the systematic registration policies of citizens of voting age have a positive influence on voters' turnout.

Still in an institutional logic, the number of political parties is also presented as a factor that influences voting participation because of the cost of finding information about each party and/or candidate (see also Kuenzi and Lambright, 2007; and Merer, 2002). Indeed, the multitude of political parties reduces the chances of a citizen to influence the result of the vote and increases the costs of seeking information, which reduces his propensity to vote. In this line, Merer (2002) establishes a positive relationship between the two-party system and the voter turnout in European parliamentary elections. Kostadinova (2003) in his analysis also shows that multi-party system negatively affects voting participation in the post-communist European era. Brockington (2004) reaches a similar result with a sample of 15 advanced countries. Beyond the competitive nature of the election or mandatory voting, other institutional factors have been mentioned in the literature as determinants of voting.

According to Kuenzi and Lambright (2007), an environment in which civil and political freedoms are not respected is likely to result in less free and transparent elections, which discourages voters from voting. In this context, Fornos et al. (2004) show that in Latin America, democracy positively affects citizen participation in voting. Kostadinova (2003) and Mahler (2002) also show that income inequality and corruption negatively affect the voting decision.

An important part of the empirical literature is also concerned with socio-economic factors such as growth, inequality or educational attainment (Blais and Dobrzynska, 1998; Teixeira, 1987; Verba et al., 1995; Wolfinger and Rosenstone, 1980). Radcliff (1992) shows that there is a positive relationship between economic performance and participation in voting in advanced democracies, which is not the case for the study by Kostadinova (2003) which shows that in Latin America, economic performance does not significantly affect voting participation. In the case of African countries, Posner and Simon (2002) show that weak economic performance in some countries reduces people's support for government, but that discontent is manifested through abstention rather than voting in favor of the opposition.

Other recent works are also interested in the link between education and the political involvement of citizens. In this perspective, Milligan et al. (2004) show that in the United States of America, education positively affects participation in voting as it enhances knowledge and interest in political life, but for the United Kingdom, this relationship is not verified. However, the authors argue that the relationship between education level and participation in political activities depends on the conditions and difficulties associated with registration on the electoral lists. Thus, education is taken into account in the calculation of the vote. For developing countries, little work has been done to establish the relationship between the level of education and political participation. The work of Lesson (2008) on the countries of Central and Eastern Europe shows that the level of education positively affects political participation, results which is contrary to that of Akramov et al. (2008) who show that in Pakistan, most educated people are more likely to abstain from voting. Akramov et al. (2008) argue that in a context of political patronage, corruption and political instability, less educated individuals are more vulnerable to intimidation and manipulation and therefore more likely to vote.

In the same perspective, Fornos et al. (2004) in a study concerning Latin American countries between 1980 and 2000 show that the level of education does not affect voters' turnout. This is also the result of Persson (2014) in a study of individual data from Great Britain. Bhatti (2017) worked on Denmark's municipalities between 2009 and 2013 also shows that globally, education does not affect voting participation. However, he shows that it is the type of education that affects voting participation. In this part, Bhatti (2017) conclude that educational programs that contain more civic skills have a positive effect on voters' turnout. In sum, there is no consensus in the literature on the link between the level of education and voting participation, especially for African countries where the relationship seems to confirm the conclusions of Akramov et al. (2008) whose state that the more the educational level, the more abstention rate.

3. Methodology

3.1. Empirical model

In this article we analyze the effect of the level of education on the political implication of the citizens through their voting participation in a sample of 43 African countries from 1990 to

2017[4]. The econometric analysis of this relationship borrows from the recent literature on the determinants of voting and integrates the level of education as a social factor that can explain the interest that Africans give to politics and especially to participation in voting (see also Blais, 2006; Ebeke and Yogo, 2013; Fumagalli and Narciso, 2012; Kuenzi and Lambright, 2007). Thus, the specification of the equation to be estimated is as follows:

$$VOTE_{it} = \alpha + \beta EDUC_{it} + \theta X_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

In this equation, $VOTE$ corresponds to the rate of voters' turnout in country i for the presidential election organized in year t and $EDUC$ corresponds to the level of education. μ_i is the country's invariant specific effect and ε_{it} the standard error. All other controls are contained in matrix X.

3.2. Dependent and variables of interest

Our dependent variable is the rate of voters' turnout in presidential elections. It is calculated as the percentage of the number of votes casted on the total number of registered voters. This measure of voters' turnout does not takes into account the difficulties associated with voters' registration and allows for consideration of other factors that influence voters' turnout such as educational attainment. However, these difficulties are taken into account in an alternative measure of voters' turnout, which is based on the size of the voting age population[5]. The coefficient of interest β to be estimated measures the effect of educational level on voters' turnout in African presidential elections. Indeed, we try to verify the hypothesis according to which in Africa, citizens decide to vote by naivety according to the political context where electoral frauds, corruption and no-respect of civil and political liberties still remain a reality.

From Figures A2, A3 and A4 in appendices, one would expect the coefficient β to be positive for primary education in one hand and negative for secondary and tertiary education in the other hand. If the expected signs are verified by the empirical tests, this would mean that, on average, citizens who participate more in voting in African presidential elections are those with a lower level of education, *ceteris paribus*.

3.3. Control variables and the estimation strategy

The model is controlled by several other macroeconomic and institutional variables used in the literature and contained in the vector X, such as the level of economic development captured by the growth rate of GDP per capita (GDP/capita), the level of diversification of the economy approximated by the percentage of natural resource rents in the GDP (NR rents), transfers of migrants' funds (Remittance), the cost of living measured by the growth rate of the consumer price index (Inflation). Powell (1982) shows that economic development improves the level of information of citizens and therefore their commitment to participate in political life. In their study, Ebeke and Yogo (2013) show that natural resource rent and remittances affect the political involvement of voters in Africa. We also control our estimates by the size of the electorate (Population), measured by the proportion of the population aged between 15 to 64, and by civil liberties and voters' registration facilities (Costs). All these macroeconomic data are from the World Bank World Development Indicators.

[4] The period of study is dictated not only by the availability of data but also by the political context of the 1990s that was marked in Africa by the liberalization of the political market and the return to multiparty systems.

[5] Data on these two dependent variables are from International Institute for democratic and Electoral Assistance (IDEA).

To verify our hypothesis, we start by estimating equation (1) using Ordinary Least Squares (OLS), and then we take into account country fixed effects in order to control certain specificities related to each country and likely to affect voters' turnout[6]. Studies on voter's turnout use two main types of data. On one hand, there are micro level data responding to the question whether and individual has voted or not. For this type of data on voting participation, probit and logit estimation methods are used to determine the probability of an individual to vote (Gallego, 2010). On the other hand, there are macro data recording the rate of voting participation at national level. In this line, Kuenzi and Lambright (2007) using OLS, has analyzed the determinants on voter's turnout in African legislative elections. In the same vein, Ebeke and Yogo (2013) also made use of Ordinary Least Squares and Fixed Effects estimation strategies to determine the effect of remittances on voting participation in African Presidential elections in the period 1990-2010.

Our study is based on macro level data on voting participation rate during presidential elections in 43 African countries. For each estimation technique (OLS and FE), we first introduce the variables of interest individually, and then the three educational level indicators are introduced simultaneously into the model to ensure the stability of our results. Table 1 presents the descriptive statistics of the different variables used in our study.

Table1: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Vote	212	65.62	16.01	22.95	98.15
Vote/age	212	57.38	18.97	3.52	116.02
Primary	212	93.31	26.43	26.76	147.84
Secondary	205	36.80	22.27	4.56	112.85
Tertiary	206	6.25	6.718	0.11	34.86
Civil liberties	212	4.25	1.31	1	7
Costs	200	0.88	0.22	0.04	1.62
Remittance	181	39.48	66.63	0.03	368.83
Population	212	53.88	4.49	47.22	70.05
NR rents	208	11.30	10.09	0.08	71.26
GDP/capita	201	1.19	6.45	-22.34	60.50
Inflation	184	10.35	25.23	-6.25	299.50

Source: Author's construction

Note: Data on Civil Liberties are from Freedom House database.

4. Results and discussions

Our results are presented in two stages. First, we present the basic results obtained by estimating the level of education on voters' turnout as measured by the number of voters registered on the electoral lists. In a second step, we present the results of the sensitivity tests using an alternative measure of the dependent variable, which is calculated from the voting age population. We also introduce simultaneously the three variables of interest in our two models and for the two measures of voting participation in order to guarantee the stability of the results.

[6] However, Ebeke and Yogo (2013) whose used the same estimation strategies argue that the inclusion of fixed effects in estimates on small samples could absorb a large part of the variability of the studied phenomenon, which is the case in our study where the unit of observation is the year of the election, for an average of 5 observations per country over the period.

4.1. Basic findings

This article determines the effect of the level of education on voters' turnout using macroeconomic approach. The results obtained from the estimation of equation (1) are shown in Table 2. The first three columns correspond to the OLS estimates and the last three are for the Fixed Effects (FE) model. After controlling for other variables, our results show that primary education positively and significantly affects turnout (column 1), and while tertiary education has a negative and significant effect (column 3) at 1% and 5% significance level, respectively. Our findings presented in column 2 also suggest that secondary education negatively and significantly affects voters' turnout in African presidential elections.

Table 2: The effect of educational level on voters' turnout

Dependent variable: *VOTE*						
	OLS			Fixed Effects		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
GDP/capita	0.558***	0.537**	0.454**	0.244	0.224	0.190
	(0.205)	(0.220)	(0.217)	(0.277)	(0.287)	(0.290)
RN rent	-0.411***	-0.228	-0.136	0.602***	0.617***	0.621***
	(0.143)	(0.150)	(0.157)	(0.208)	(0.203)	(0.192)
Civil liberties	1.670	0.721	0.817	-0.188	-1.079	-0.976
	(1.029)	(1.123)	(1.075)	(1.663)	(1.569)	(1.646)
Remittance	-5.472***	-4.622***	-3.536**	-3.509*	-1.878	-2.323
	(1.486)	(1.549)	(1.660)	(2.044)	(1.808)	(1.854)
Inflation	0.043	0.083	0.118			
	(0.112)	(0.135)	(0.137)			
Population	0.745***	1.192***	1.793***			
	(0.271)	(0.291)	(0.371)			
Primary	**0.251*** **			0.0238		
	(0.0501)			(0.080)		
Secondary		**-0.004*** **			**-0.176** **	
		(0.009)			(0.084)	
Tertiary			**-0.681** **			**-0.449** **
			(0.279)			(0.169)
Costs				-7.145	-8.801	-8.742
				(5.972)	(5.900)	(5.773)
Constant	2.715	4.191	-26.65	67.51***	80.75***	76.65***
	(14.42)	(16.14)	(19.03)	(11.51)	(8.473)	(7.570)
Observations	154	150	151	163	159	160
Countries				41	40	41
F.Statistic	9.41	17.47	6.48	2.19	2.50	3.24
F.Proba.	0.000	0.000	0.000	0.064	0.038	0.010
Fixed Effects	No	No	No	Yes	Yes	Yes

Source: Author

Note: Robust standard errors are reported in brackets. (***, **, *) indicate statistical significance at 1%, 5% and 10%.

The level of economic development and external financial resources also appear to be important determinants of voting in Africa. According to the results in Table 2, the growth

rate of GDP per capita positively affects voting participation. Political involvement of citizens is affected by economic performance of policy makers. This is the result reached by Kuenzi and Lambright (2007) for the parliamentary elections in Africa. Thus, better economic performance may give electors more incentive to vote in order to keep the ruling class in power. However, Posner and Simon (2002) show that in Africa, voters express their dissatisfaction with macroeconomic performance by abstaining from voting rather than supporting opposition. Our results also suggest that migrant remittances negatively affect voters' turnout in the presidential elections. Indeed, citizens participate in politics often for financial reasons hoping to capture part of the public rent or for civic reasons by contributing to the consolidation of democracy.

Ebeke and Yogo (2013) show that remittances constitute an alternative financial resource that keep away beneficiaries from politics. Based on 41 African countries, they argue that remittances negatively affect voting participation at both individual and macro levels. In a similar way to migrant remittances, our results suggest that natural resource rent negatively affects voters' turnout rate during African presidential election. The resource curse theory developed by Sachs and Warner (1995) shows that countries rich in natural resources tend to be less economically efficient than countries that do not. In this line, Omgba (2014) also shows that this curse goes through political institutions. The author argues that political leaders in resource-rich countries do not favor the promotion of strong political institutions as these might pose a threat to their power. These institutions, however, constitute an incentive for political participation and in particular for voting (Powell, 1982, 1986). However, the channels through which the natural resources rent affects voting participation in Africa are not the concern of this paper but could be subject to future researches.

4.2. Robustness checks

To evaluate the stability of our results, we take the estimates using an alternative measure of our dependent variable. In this subsection, the dependent variable drowns from the IDEA database is calculated as a percentage of the voting age population (Vote/age). However, there are limitations in measuring voters' turnout rate on the basis of the voting age population, including the difficulty of estimating this portion of the population (Radcliff, 1996). According to IDEA data, the participation rate thus measured is 129% for the case of Guinea Bissau in the 1999 legislative election. For this same year, the voting age population is 311674 individuals then that the number of valid casted votes is 402400. Yet in 1994, the size of the population eligible to vote was estimated at 556500. Despite these limits, the variable (Vote/age) nevertheless allows to measure the political commitment of the voting age population[7]. The results obtained by OLS confirm those of Table 2 and show that the level of education negatively and significantly affects voters' turnout in African presidential elections.

[7] Several authors have used this variable in their studies as a measure of voting participation (Kuenzi and Lambright, 2007; Ebeke and Yogo, 2013).

Table 3: Robustness checks

Dependent variable: *VOTE/AGE*						
	OLS			Fixed Effects		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
GDP/capita	0.165	0.147	0.064	0.206	0.191	0.167
	(0.197)	(0.210)	(0.207)	(0.248)	(0.259)	(0.259)
NR rents	-0.146	0.050	0.140	0.629***	0.643***	0.634***
	(0.194)	(0.189)	(0.193)	(0.186)	(0.184)	(0.177)
Civil liberties	-1.296	-2.405*	-2.178	-0.239	-0.917	-0.760
	(1.286)	(1.333)	(1.325)	(1.640)	(1.548)	(1.579)
Remittance	-5.887***	-4.932**	-3.921*	-2.883	-1.678	-2.140
	(1.754)	(1.919)	(2.078)	(1.837)	(1.669)	(1.622)
Population	0.701*	1.180***	1.745***			
	(0.375)	(0.382)	(0.525)			
inflation	0.021	0.061	0.097			
	(0.154)	(0.177)	(0.180)			
Primary	**0.257*** **			0.024		
	(0.0632)			(0.074)		
Secondary		**-0.007*** **			-0.123	
		(0.001)			(0.080)	
Tertiary			**-0.683** **			-0.240
			(0.325)			(0.173)
Costs				63.06***	61.88***	62.07***
				(6.071)	(6.186)	(6.329)
Constant	6.806	7.828	-21.70	-3.003	7.225	3.650
	(18.53)	(20.15)	(26.56)	(11.49)	(9.020)	(8.430)
Observations	154	150	151	163	159	160
Countries				41	40	41
F. Statistic	5.94	17.09	3.41	22.01	21.30	19.63
F. Proba.	0.000	0.000	0.002	0.000	0.000	0.000
Fixed Effect	No	No	No	Yes	Yes	Yes

Source: Author

Note: Robust standard errors are reported in brackets. (***, **, *) indicate statistical significance at 1%, 5% and 10%.

In the following of robustness analyzes, we introduce simultaneously into the model our three variables of interest. For each of the measures of the dependent variable, the results obtained in Table 4 remain stables. Primary education has a positive and significant effect on voters' turnout while secondary education and tertiary education have negative effects. These results suggest that the voters' turnout rate decreases as the level of education of citizen's increases, *ceteris paribus*.

Table 4: Introducing the tree education level indicators

	Vote		**Vote/age**	
	OLS	Fixed Effects	OLS	Fixed Effects
Variable	(1)	(2)	(3)	(4)
GDP/capita	0.461**	0.285	0.066	0.122
	(0.198)	(0.290)	(0.189)	(0.289)
NR rents	-0.284*	0.271	-0.005	0.021
	(0.150)	(0.245)	(0.203)	(0.328)
Civil liberties	1.231	-1.308	-1.879	-1.181
	(0.948)	(1.740)	(1.174)	(2.362)
Remittance	-4.010**	-2.978	-4.260**	-1.250
	(1.597)	(2.463)	(1.894)	(3.025)
Population	0.0770	0.0671	1.573***	-0.747
	(0.113)	(0.140)	(0.473)	(0.607)
inflation	1.551***	0.00543	0.054	0.072
	(0.323)	(0.508)	(0.153)	(0.203)
Primary	**0.258*** **	**0.159** **	**0.269*** **	0.140
	(0.050)	(0.0647)	(0.065)	(0.108)
Secondary	**-0.008*** **	0.000422	**-0.0122*** **	**-0.003***
	(0.001)	(0.00167)	(0.002)	(0.001)
Tertiary	**-0.771*** **	**-0.403** **	**-0.822*** **	-0.021
	(0.256)	(0.188)	(0.286)	(0.349)
Constant	-36.580**	57.240**	-35.580	90.370***
	(16.62)	(27.94)	(23.19)	(27.69)
Observations	150	150	150	150
Countries		40		40
F.Statistic	19.11	2.84	17.42	400.76
F. Proba.	0.000	0.011	0.000	0.000
Fixed Effect	No	Yes	No	Yes

Source: Author

Note: Robust standard errors are reported in brackets. (***, **, *) indicate statistical significance at 1%, 5% and 10%.

Overall, our results show that in Africa, voting participation rate in presidential elections decrease as the level of education increases. Some variables lose their significance when estimating models with countries fixed effects. Ebeke and Yogo (2013) explain this loss of significance by the smallest of the sample size. Indeed, these authors argue that taking into account the fixed effects of each country can potentially absorb an important part of the variability of the phenomenon studied. Moreover, our results support those of Akramov et al. (2008) who show that high educational level negatively affects voting participation in developing countries, especially in Pakistan. Our results contribute to the existing literature by highlighting the debated subject of the effect of education on political implication of citizens for African countries where studies on voter's turnout determinants are still limited. We show that on average, differences in voting participation rates across African presidential elections can also be explained by the citizen's level of education. In addition, our results add to the literature on the effect of education on long run development, giving that democracy and economic development are closely related (Sharma, 2007). This study also helps to understood democracy dynamics in Africa through voting participation by showing that there

is a necessity to improve on the institutional environment and organization of free and fair elections so as to motivate citizens to take part in the political life.

5. Conclusion

This article has empirically examined the impact of the level of education – measured by primary, secondary and tertiary school enrollment – on voter's turnout based on a sample of 43 countries and takes into account 212 presidential elections organized from 1990 to 2017. In advanced democracies, elections are the mechanism by which political leaders are rewarded or disowned according to their economic, political and social performance. To this end, voting participation is essential for the functioning and consolidation of any democracy. Using Ordinary Least Squares (OLS) and Fixed Effects (FE) models, our finding suggest that the level of education negatively and significantly affects voters' turnout rate during African presidential elections. Primary education positively affects voters' turnout, while secondary education and tertiary education have negative effects.

Our empirical results thus contribute to the political economy literature on the determinants of voting participation. The assumption of naivety of voters does not find consensus in the literature but seems to be globally verified in African context. By reasoning *ceteris paribus*, our study suggests that on average, voting participation in African presidential elections is a negative function of the level of education. This result can be explained by the African socio-economic and political and institutional context, which is marked by poverty, poor institutional governance and electoral fraud. In fact, citizens become more involved in political activities when they feel that their needs are taken into account in public choices and when they think they can influence the outcome of the vote. Our results also show that economic development and improved civil liberties positively affect voters' turnout. Thus, an improvement of these factors on the one hand, the institutional governance through free and fair elections on the other hand, would significantly improve the political implication of African citizens encouraging them to vote. Free and fair elections give voters the impression that they have the ability to influence the outcome of the vote, which is a factor encouraging voting. Posner and Simon (2002) show that in Africa, voters often express their dissatisfaction with poor economic and social performance through abstention from voting, rather than support for the opposition, which in many countries cannot win elections against the ruling regimes[8]. Our analysis also opens up prospects for future work on African politics, including examining education programs content in relation to voting participation (Esaiasson and Persson, 2014; Bhatti, 2017).

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[8] Despite the multiplicity and competition of presidential elections in Africa, several political regimes have managed to stay in power for several decades. This is the case for example in Equatorial Guinea, Chad or Zimbabwe.

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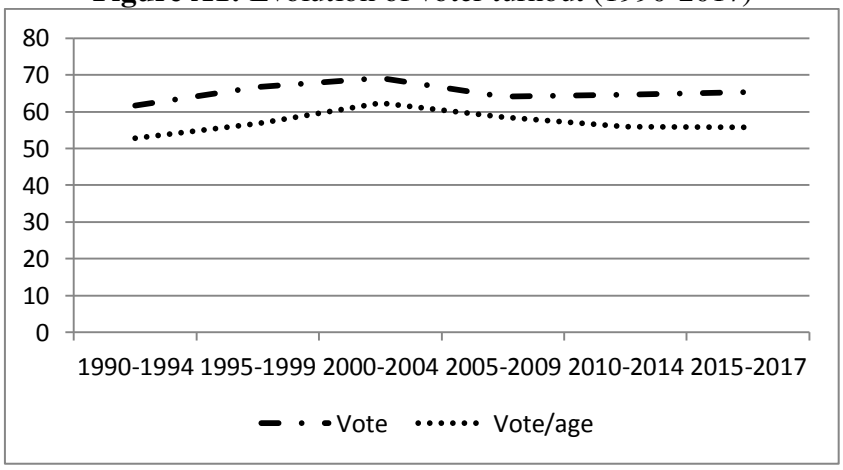
Appendices

Table A1: List of countries

Countries	Election Year	Vote (average)	Vote/age (average)
Algeria	1995, 1999, 2004, 2009, 2014	63.73%	61.38%
Angola	1992, 2017	83.47%	79.53%
Benin	1991, 1996, 2001, 2006, 2011, 2016	69.38%	64.40%
Burkina Faso	1991, 1998, 2005, 2010, 2015	52.76%	34%
Burundi	1993, 2010, 2015	82.57%	64.59%
Cameroon	1992, 1997, 2004, 2011	76.66%	51.05%
Cape Verde	1991, 1996, 2001, 2006, 2011, 2016	53.97%	53.53%
RCA	1993, 1999, 2005, 2011, 2015	63.77%	51.90%
Chad	1996, 2001, 2006, 2011, 2016	62.15%	70.04%
Comoros	1990, 1996, 2002, 2006, 2010, 2016	62.72%	55.23%
Congo, Rep.	1992, 2002, 2009, 2016	67.51%	64.60%
Congo, DR	2006, 2011	62.20%	56.31%
Côte d'Ivoire	1990, 1995, 2000, 2010, 2015	57.34%	40.97%
Djibouti	1993, 1999, 2005, 2011, 2016	66.03%	34.73%
Egypt.	2005, 2012, 2014	40.76	37.72%
Equatorial Guinea	1996, 2002, 2009, 2016	92.55%	75.58%
Gabon	1993, 1998, 2005, 2009, 2016	61.82%	46.42%
Gambia	1996, 2001, 2006, 2011, 2016	71.03%	60.20%
Ghana	1992, 1996,2000, 2004,2008, 2012, 2016	70.98%	73.11%
Guinea	1993, 1998, 2003, 2010, 2015	73.45%	74.23%
Guinea Bissau	1994, 1999, 2005, 2009, 2014	77.94%	72.86%
Kenya	1992, 1997, 2002, 2007, 2013, 2017	73.72%	48.36%
Liberia	1997, 2005, 2011, 2017	57.15%	51.85%
Madagascar	1992, 1996, 2001, 2006, 2013	63.02%	47.78%
Malawi	1994, 1999, 2004, 2009, 2014	77.38%	74.60%
Mali	1992, 1997, 2002, 2007, 2013	34.52%	37.45%
Mauritania	1992, 1997, 2003, 2007, 2009, 2014	61.71%	53.48%
Mozambique	1994, 1999, 2004, 2009, 2014	57.44%	49.84%
Namibia	1994, 1999, 2004, 2014	73.36%	69.75%
Niger	1993, 1996, 1999, 2004, 2011, 2016	49.11%	46.67%
Nigeria	1993, 1999, 2003, 2007, 2011, 2015	52.13%	47.87%
Rwanda	2003, 2010, 2017	97.40%	96.01%
Sao Tome	1991, 1996, 2001, 2006, 2011, 2016	65.49%	63.50%
Senegal	1993, 2000, 2007, 2012	60.36%	42.54%
Seychelles	1993, 1998, 2001, 2001, 2006, 2011, 2015	88.41%	94.19%
Sierra Leone	1996, 2002, 2007, 2012, 2015	78.81%	72.19%
Soudan	1996, 2000, 2010, 2015	62.97%	47.56%
Tanzania	1990, 1995, 2000, 2005, 2010, 2015	69.65%	54.15%
Togo	1993, 1998, 2003, 2005, 2010, 2015	61.75%	71.20%
Tunisia	1994, 1999, 2004, 2009, 2014	85.18%	48.04%
Uganda	1996, 2001, 2006, 2011, 2016	67.8%	62.70%
Zambia	1991, 1996, 2001, 2006, 2008, 2011, 2015	52.85%	36.26%
Zimbabwe	1990, 1996, 2002, 2008, 2013	47.45%	49.13%

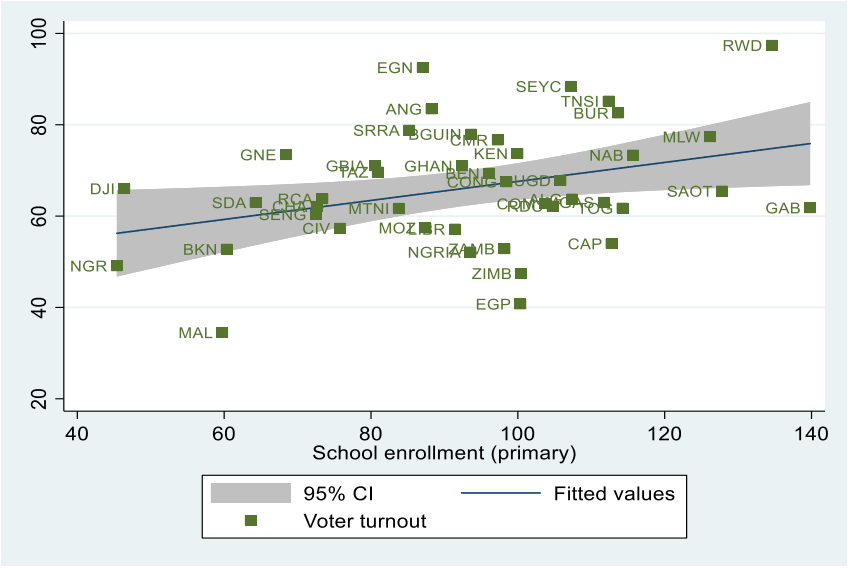
Source: Author's calculation using data from IDEA.

Figure A1: Evolution of voter turnout (1990-2017)



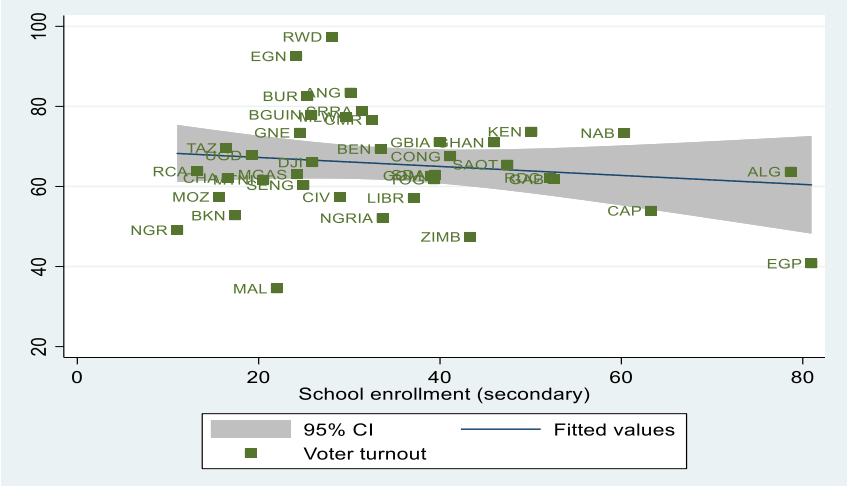
Source: Author's construction using data from IDEA.

Figure A2: Primary education and voters' turnout



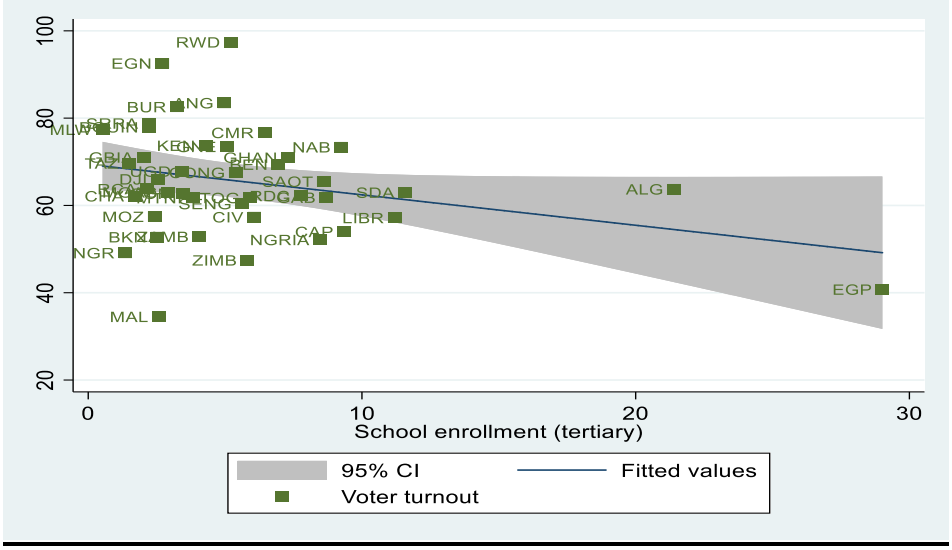
Source: Author using data from IDEA and WDI.

Figure A3: Secondary Education and voters' turnout



Source: Author using data from IDEA and WDI.

Figure A4: Tertiary education and voters' turnout



Source: Author using data from IDEA and WDI.