

# About political polarization in Africa: An experiment on Approval Voting in Benin

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*February 2013*

*Abstract:* Uninominal majoritarian voting systems force voters to "choose sides", which might possibly be a factor of exacerbation of political, social, ethnic or religious divisions. Elaborating on this idea, we wanted to know if, in Africa, voters would be willing to vote "by approval", that is with the ability to approve of/vote for several candidates. This article reports on such an experiment, conducted in Benin on the day of the 2011 presidential election.

## **1. Introduction**

Politics is how societies choose collectively and, in particular, how they solve conflicting claims stemming from different groups or individuals. In democratic countries, general elections are a crucial moment in the life of the society, the moment when those antagonisms get expressed and resolved. This might explain why, in Africa and elsewhere, election periods are often quite tense, and why it is often after elections that countries slide into violence and civil wars.

A number of theories in political philosophy or in political science defend the idea that democratic institutions in general, and electoral competition in particular, are a fair and efficient way to resolve those conflicts (Downs 1957, Cox 1997).

For example, in the classical Downsian model, it is assumed that citizens are equipped with some predefined preferences over the set of possible collective decisions. In the simplest model, this policy space is assumed to be one-dimensional, representing a left-right axis (e.g. Progressive vs. Conservative, Democrats vs. Republicans...). During elections, candidates put forward platforms, and the most popular platform is chosen through the election of the most

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popular candidate. Under some assumptions, a consensual platform is likely to emerge at the equilibrium of this strategic game played by the candidates (the celebrated Median Voter theorem).

Elections in this setting can be perceived as a peaceful way to aggregate conflicting views and/or interests. Note that these classical theories are based on specific assumptions about the electoral competition game (symmetric and trustable parties with no ideological stands) and about the structure of voter preferences (for example as mentioned here, preferences are one-dimensional and single-peaked). These assumptions might describe quite well the current political structure of Western societies, but seem less relevant for African countries where the Left-Right dimensional structure is less prominent (for a description of the partisan system and the political landscape in Benin, see Engels et al., 2008).

Other authors have also warned against the possibility that democracy might lead to some “tyranny of the majority” (Emerson 1998; Liphart 2004). Indeed, if the society is divided into two groups, such that individuals within each group have aligned interests, democracy might result in the largest group confiscating the resources of the society and imposing its will on the minority group.

Most of the attention in the theoretical literature about elections has been devoted to studying how different electoral systems resolve these conflicting claims among groups. For example, proportional representation guarantees a minimal level of representation and power to all minority groups. Other specific mechanisms can be coupled with elections to guarantee that all groups are guaranteed a minimal representation. For example, Lebanon reserves key positions of governance for the various religions (Picard 1994; Winslow 1996). The premise of those analyses is that individuals and groups have predefined preferences over the set of possible outcomes, and act according to these preferences. They take the partition of society into distinct groups as a premise.

It is certainly true that different social groups may share different interests, which translates into support and votes for different candidates/parties. But in this article, we want to defend the view that political institutions, in a reverse direction, may also shape political preferences, and influence the formation of groups within societies. In particular, in majoritarian systems – and all the more so in Presidential systems – the candidate and the party winning the elections receive a lot of power. As underlined by Duverger (1951), the logic of electoral competition in such a winner-take-all system tends to lead to the formation of two (and only two) main, big, parties. Such a system can thus endogenously lead to the formation of two big sides/electoral coalitions within the society. Even if *ex ante*, the society was not so clearly divided into two groups, those groups may emerge endogenously. The lines along which those two sides will emerge depend on the context. In Western societies, it can be the rich vs. the poor, or the conservative vs. the progressive. In some African countries, it might be along ethnic or religious lines (Reynal-Querol 2002; Montalvo and Reynal-Querol 2005). In all these cases, however diverse, a common mechanism of polarization seems to be inherent in the democratic electoral competition. (See Spector (2000) or Duggan and Martinelli (2011) for more theory on the endogeneity of the electoral space.)

In the frequent case where the number of candidates with a chance of winning is low, especially in the second round of run-off elections, voting for a candidate is also, simultaneously, voting *against* the other. At the individual level, having to choose sides in such a context may make the partisan affiliation so salient that it becomes in itself a determinant of individual opinions.<sup>5</sup> Uninominal majoritarian systems are extreme in that respect: not only do they endow the winner of the competition with a lot of power, they also require voters to take position for one and only one candidate, even if they might think that several candidates are acceptable. So they may, by their mere logic, induce a strong polarization across groups supporting different candidates.

Many tragic examples show that the democratic vote can accommodate extreme levels of political polarization, which can sometimes degenerate into conflict (Glickman 1995, Posner 2005). This paper deals with an experiment realized in Benin during the 2011 presidential election. In the same region of West-Africa, elections led to violence in Togo in 2005, in Nigeria in 2007, and in Ivory Coast in 2010.

Such violence or civil wars are the extreme expression of the divisions of societies into opposing camps. Political institutions should find ways to break these antagonisms, not to institutionalize or even create them through the partition of society into separate groups of supporters.

As mentioned above, some institutions, such as proportional representation, may help alleviate the extreme polarization of societies. Here, remaining within a majoritarian system, our work explores another route, which aims at breaking the logic of attachment-exclusion at work in the individual act of voting for one and only one candidate or party.

On the occasion of the presidential election of 2011 in Benin, we asked voters how they would vote if the election, instead of being run under the actual uninominal two rounds system, was run with "approval voting". The principle of approval voting is the following: rather than necessarily voting for a single candidate, the voter has the opportunity to vote for as many candidates as desired, one, two, three or all if he wishes. The winner is the candidate who gets the highest number of approvals. See Brams and Fishburn (1983, 2005).

With this experiment, we are able to tackle two issues. First, do voters use or not this opportunity to vote for several candidates when they are allowed to do so? In other words, is the exclusivity to one candidate, which is inherent to uninominal systems, an artifact of the existing system, or does it express a real exclusive attachment from voters to their preferred candidate? Second, insofar that some exclusive group voting, e.g. ethnic voting, is observed with the actual uninominal system, it is legitimate to ask whether it would (at least partially) disappear if other methods of voting were in force, and here if voters were able to express some support for more than one candidate.

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<sup>5</sup> At the extreme, if party membership (or support for a candidate) was based only on itself instead of being indirectly determined through parties' programs and positions, the classical theories justifying electoral competition would collapse, and electoral competition would only be a modern form of struggle for power, organized by and for those who are in a position to obtain it.

The protocol used here is not that of an ordinary opinion survey, mainly because we wanted to give the respondent the possibility to respond anonymously, as in a real vote. The experience was conducted on the very same day as the official vote, in the immediate vicinity of the official polling stations. Such experiments have already been successfully conducted in France in 2002, 2007 and 2012 and in Germany in 2008 (Laslier and Van der Straeten 2004, 2008; Alós-Ferrer and Granic 2010; Baujard et al. 2012).

The choice of Benin as a place of experimentation is mainly due to practical considerations. The organization of such a "scientific experiment" on the day of a major political election is a delicate operation that may raise the suspicion of the authorities and voters (see below). Benin is one of the most stable democratic countries in West Africa, and we had good relay there<sup>6</sup> to get the authorizations and the support of research assistants needed to run such an operation. Therefore, good conditions were met for this experience.

In the remainder of this paper we will first provide a summary of the political history of Benin, for a better understanding of terms and names that will be discussed later on. Then we will make a brief description of the experience itself and enumerate the relevant descriptive statistics obtained from the experiment. Finally, we will present some descriptive statistics and econometric analyzes to help answer the two main questions we are interested in:

1. What can this experiment teach us about voters' polarization in Benin?
2. Would ethnic voting observed under the actual uninominal system, if any, be reduced if approval voting were used instead.

The last section contains some comparisons with approval voting experiments run in Europe and concludes.

## **2. Political history of Benin, and context of the 2011 Presidential election**

### **2.1. Past history**

Benin (formerly known as Dahomey) has a turbulent political history. A former French colony, Benin became independent in 1960. Between 1960 and 1972, Benin is marked by political instability, with a dozen of coups d'état occurring in the period. In 1972, Mathieu Kérékou, after taking power by force, set a Marxist-leninist dictatorship. He remained in power until 1991, when he was defeated democratically, in an election that he himself organized, and ceded power peacefully. Ever since 1991, Benin has been a quite stable democracy. In 1991, Nicéphore Soglo defeated Mathieu Kérékou and became the first president of the "Democratic Renewal". The next two presidential elections (in 1996 and 2001) were democratically won by the former dictator Mathieu Kérékou, who twice defeated Nicéphore Soglo. In the 2006 elections, both Mathieu Kérékou and his long-term opponent Nicéphore Soglo were banned from running again by the age limit set by the Constitution (70 years). Yayi Boni, an economist running for the first time, was elected with nearly 75% of the

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<sup>6</sup> We gratefully acknowledge the support of the Institute for Empirical Research in Political Economy in Cotonou (<http://www.ireep.org/>).

votes, ahead of his main challenger Adrien Houngbedji. In 2011, during the election we are focusing on, Yayi Boni was a candidate to his own succession, his main challenger being again Adrien Houngbedji. He was reelected president on the first round with 53% of the votes.

Although Benin appears to be a peaceful democracy, with several successful examples of democratic changeover, the fear of a potential surge in ethnic and regional conflicts remains real. The notion of ethnic polarization and regional vote in Benin goes way back. It dates at least from the colonial period with the creation, in 1951, of political parties representing each region (North and South). The main two parties were the "Groupement Ethnique du Nord Dahomey" (GEND) and the "Parti Républicain Dahomey" (PRD), representing respectively the people of Northern and Southern Benin. These parties and their candidates had a strong electoral base in the areas they were supposed to represent. With the evolution of political parties, the country seems to have retained, at least partially, this legacy of regional vote.

### **ADD Table and comments.**

In particular, voters from the northern part of Benin express a much stronger support for candidates from the North of the country than to candidates from the South. Regional voting, although present, seems to be less prevalent in the South of the country (Dissou 2002; Somé 2009). Looking at the origin of the three persons who have been elected President of the Benin since 1991, two come from the North (Kérékou and Yayi Boni), and one comes from the South (Soglo).

## 2.2. The 2011 Presidential election

The political system of Benin is very similar to the French system. The president of the Republic is given by the institutions, and by the way they are implemented, a lot of power, formally and in practice. He is directly elected by the people and the voting rule is two-round: If a candidate obtains more than half of the votes in the first round, this candidate is elected. If not, a run-off is organized between the two first-ranked candidates.

While the global political climate of the country in early 2011 is generally described as relatively peaceful, the election itself was run in an unquiet context. The main difficulties occurred with the constitution of the new country-wide computerized list of registered voters, an important issue in a country where the registry office is problematic. Challengers to the incumbent claimed that hundreds of thousands of voters had not been properly registered, and therefore were running the risk of being prevented from voting. They also claimed that those unregistered voters were mainly located in the South of the country, the stronghold of the incumbent's main opponent Adrien Houngbedji. Because of those difficulties, the election had to be postponed twice. Initially scheduled for February 28, the election was, in a one-week notice, postponed to March 6. But on March 4, the government announced that the election was once again postponed, to the next Sunday.

The election was finally held on March 13. Suspicions of fraud arose. When the CENA (the Autonomous National Electoral Committee) announced the results, they were contested

by the main two challengers, Adrien Houngbédji and Abdoulaye Bio Tchané. Adrien Houngbédji declared himself elected president, opening way to a potential electoral crisis, as experienced in neighboring countries such as Ivory Coast a few months earlier. The special representative of the UN secretary general for West Africa, Said Djinnit, called for efforts so that post-electoral contestation does not lead to violence as in Ivory Coast.<sup>7</sup>

Although no such crisis occurred in Benin, since the defeated candidates eventually acknowledged Yayi Boni's victory, this election raised the issue of a potential political division of the country. In the media, some commentators mentioned the depth of regional and ethnic divisions in Benin as the source of these problems, whereas others would rather put the blame on the power struggle between politicians.

During this election, incumbent Boni Yayi faced 12 competitors. We provide in the Appendix (Table ListeCandidats) a list, with short descriptions, of the candidates. In the main text below, we only present the three main candidates: Boni Yayi (53.17% of the votes in the official election), Houngbedji (35.65%) and Bio Tchané (6.28%). All other candidates received less than 0.66% of the official votes.

**Thomas Boni Yayi:** An economist by training, he was a technical advisor on monetary and banking issues for Nicéphore Soglo from 1991 to 1994, before being appointed president of the West African Development Bank (WADB). He resigned in 2006, to run for the presidential election, which he won over Houngbedji. He campaigned on a promise of good governance, of development of the private sector ("make Benin the Hong Kong of Africa"), and on the education of girls. He was reelected in 2011. Boni Yayi was born in Tchaourou, in the North of the country. It belongs to three influential ethnic groups in Benin, Nago (Yoruba) by his father, Fulani and Bariba by his mother. Himself a Christian, he left an important place for the different religions in the country, including traditional religions.

**Adrien Houngbedji:** A lawyer by training, he is the President of the Democratic Renewal Party (PRD) and in 2011, candidate of the main opposition coalition, namely, "Union is the Nation" (UN). It was his fifth Presidential campaign, and also his last, due to the age limit of 70 years fixed by the Constitution. Having been several times candidate for the Presidency, and having exercised a function of prime minister and government spokesman in 1996, Houngbedji is well known to the public. He is originally from southern Benin, and of Goun ethnicity.

**Abdoulaye Bio Tchané:** An economist by training, like Boni Yayi, he resigned from his position as President of the West African Development Bank to run for the 2011 presidential election (again like Boni Yayi in 2001). Although it was his first Presidential campaign, he is

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<sup>7</sup> « La situation au Bénin est évidemment préoccupante, compte tenu de la contestation des résultats provisoires et des incidents de violence qui ont été relevés. Nous souhaitons que tout soit fait, d'abord au niveau national et si c'est nécessaire par le soutien international à travers des efforts de bons offices, pour éviter que la situation ne dégénère et que nous retombions dans une situation comme en Côte d'Ivoire. Tout doit être fait pour éviter cela. » (Said Djinnit, déclaration to AFP and RFI, 25 March 2012.)

known to the public because of this last position, and for having been the Minister of Economy and Finance of Benin under the governance of Kérékou in 1998. Bio-Tchané, often called "ABT" was presented as the "third man" of this election, although he finally collected only 6.28% of the votes. He is originally from northern Benin, and a Muslim.

### **3. The experiment**

#### **3.1. Practical organization of the experiment**

The experiment was conducted in two locations in southern Benin: Cotonou and Ouidah. Cotonou is the largest city in the country. In Cotonou, the experiment was done in two polling stations, in different neighborhoods (Vodjè-Kpota and Fifadji). In Ouidah, the experiment was performed in one single polling station (the Hounhanméde village), a rural location. We thus have two urban and one rural polling stations. These three places are the stronghold of no candidate. Initially, we also planned to perform the experiment in a polling station in the city of Porto-Novo (a stronghold of the candidate Adrien Houngbedji), but this project had to be interrupted due to perceived threats by the team in charge of the on-site preparation.

We obtained from the CENA (the Autonomous National Electoral Committee) the authorization to run the experiment, and contacted local officials in the two sites (Cotonou and Ouidah) to let them know that we were planning to run an experiment in their city.

On the day of the election, research assistants<sup>8</sup> were present in the three selected voting stations, from opening to closing. Once voters had voted in the official election, they were invited to take part in our experiment. Those who accepted were required to perform two tasks. First, they were asked to fill in a questionnaire with demographic questions, and questions about political attitudes. Second, they were asked to do the following thought experiment: "Assume that the voting rule in Benin were Approval Voting (AV), whereby voters can vote for as many candidates as they want, the elected candidate being the one getting the highest number of votes. How would you vote?" (See a copy of the experimental voting ballot and of the questionnaire in the appendix). The questionnaire and the AV voting ballot were printed on the two sides of the same sheet of paper. The AV voting ballot was almost identical to, although smaller than, the official ballot. Indeed, the normal procedure in Benin is that the voters vote by putting a stamp on the image of the candidate of their choice. We simply proposed voters to put a stamp on the image of any number of candidates; therefore the AV ballot could look quite similar to the official ballot.<sup>9</sup> Instructions and questions were written in French (the official language in Benin). Participants who could read and write French were invited to fill in the questionnaire and the ballot themselves. They were invited to seat in separate places, so that secrecy when filling the AV ballot was respected. For those who could not, research assistants speaking local languages were present, and

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<sup>8</sup> Students from the the Institute for Empirical Research in Political Economy in Cotonou (<http://www.ireep.org/>).

<sup>9</sup> To avoid any possible confusion, the experimental AV ballot was smaller in size than the official ballot, and the logo of the academic institutions financing this research were printed on it.

administered the questionnaire. Participants were then invited to fill in the AV voting ballot themselves, with an ink marker, once they had been reminded of the details of the AV rule.

One month before the election, research assistants visited all the households registered in these three polling stations, explaining to the voters that an experiment was to take place on the day of the election, to which their participation was kindly requested. They spent some time in each household explaining how Approval Voting works, to make sure that everybody understood the electoral rule, and had some time to think about it ahead of time. Indeed it was obvious during the experiment that many participants had thought through and discussed the matter before coming to the station.

### 3.2. Participation

Although we had obtained all the required official authorizations to make this survey, the police interrupted our collect of data in Vodjè-Kpota, and we had to stop operating there by the end of the morning. Except for this interruption, no incident was to be reported, and we were able to collect 1470 questionnaires in those three voting stations. The Table **TableParticipation** below reports, for each voting station, the number of voters who voted in the official election, as well as the number of voters who agreed to take part in the experiment, that is, to return the sheet of paper on which the questionnaire and the AV voting ballot were printed. We also provide participation rate to the experiment. (Only voters who had voted in the official election could take part in the experiment).

**[Insert Table **TableParticipation** about here]**

The participation rates are around 80% in Fifadji and 70% in Hounhanméde, the two polling stations where they are meaningful. These are remarkably high figures, in a situation of high political tension, given that participation was, of course, purely voluntary. Similar experiments had been run in France and Germany; the participation rates observed in Europe are similar or slightly smaller, that is, around 70%.

*Excluded observations.* As indicated in Table **TableParticipation**, 1470 persons agreed to return the sheet of paper on which the questionnaire and the AV voting ballot were printed. Since the main focus of the study is voting behavior under AV, we exclude observations where the AV ballot is not properly filled in. Among those 1470 response sheets, 10 turned out to be actually empty (neither the AV ballot nor the questionnaire had been filled in). Among the 1460 remaining response sheets, 40 participants approved of no candidate (but answered at least one question in the questionnaire). For those ballots, the question is whether they should be considered a genuine ballot with zero approval (the possibility to approve of no candidate was explicitly mentioned as an option), or as improperly filled AV ballot. We decided to count them as genuine ballot with zero approval only when the questionnaire on the other side had been completely filled in. 5 of these 40 ballots met this condition. In the sequel, we will therefore consider the remaining 1425 respondents.



### 3.3 Socio-demographic description of the sample

Table **TableSampleCharacteristics** in the appendix presents some descriptive statistics of the sample. The majority of the sample (66%) lives in urban areas, that is, in one of the two polling stations located in Cotonou. The sample is young: 94% are aged between 18 and 54 years, with a slight over-representation of males (53 %). 25% of these people are uneducated, 28% have only a primary school education. Individuals with a secondary level of education represent 34% of the sample and those who have reached university a proportion of 14%. We have a predominantly Christian sample (83%).

The Fon ethnic group is the most represented (58 %), followed by Adjias (23%), Yoruba and Gouns (7 %). These ethnic groups all traditionally live in the South of the country. The Dendis and other Northern ethnic groups represent only 4% of the sample (59 observations). The weakness of this number makes a detailed comparison of voting behaviors between Northern and Southern ethnic groups impossible. We will only provide some aggregate statistics on this issue below. The same thing holds for region of origin. An overwhelming majority of the people in our sample (96%) come from regions located in the South of the country.

### 3.4. Aggregate vote results

We first compare, for each candidate, the score obtained under Approval Voting to the score obtained during the official election. To compute the scores obtained at the official elections, two options are possible: we can use the official actual scores (which are available at the polling station level), and we can use answers to a question about official vote which was asked in the questionnaire. In the sequel we use both options.

Table **TableResultVotingStation** in the appendix reports the results at the voting station level, whereas Table **TableResultByCandidate** below provides some summary over the three voting stations. Official scores are reported in columns 1 (actual average scores) and 2 (reported average scores), whereas AV scores are reported in column 3.<sup>10</sup> To have an idea on

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<sup>10</sup> To compute the average AV scores of the candidates, we equally weight all participants in the experiment: the average AV score of a candidate is simply the sum of the AV votes he/she gets in each voting station, divided by the total number of participants in the experiment. The reported official scores are computed in the same way, that is, the average reported official score of a candidate is simply the number of respondents who report having voted for this candidate at the official election, divided by the total number of participants who answered this question. Let us now explain how the average actual official scores were computed. Remember that the objective is to compare AV and official scores. As actual official scores and participation rates to the experiment are quite different across voting stations (see Table **TableResultVotingStations**), we decide to take as the average official score a weighted average of the scores a candidate gets in the various voting stations, where the weight given to a voting station is proportional to the participation rate to the experiment in that voting station.

whether our three selected voting stations are representative of the votes at the national level in Benin, column 4 also provides the actual official scores in the whole country.

**[Insert Table TableResultByCandidate about here]**

If one compares the actual official votes and the reported official votes, one observes that they are quite close. Therefore, we tend to be confident that the sample of voters who actually agreed to take part in the experiment are a representative sample of voters who actually turned out at the official election in those voting stations. This is a noticeable difference with Europe where the conservative voters tend to participate less to these experiments, whose sample thus suffer from an important “Left” bias.

If one now compares official results in our three voting stations (column 1) to nationwide results (column 4), one observes that our sample is more supportive of Adrien Houngbedji and less supportive of Boni Yayi than the average of the country (the bias is smaller for reported votes – in column 2 – than for actual votes). This can be accounted for by the fact that all our voting stations were located in the South of the country, a region where Adrien Houngbedji (whose stronghold is Porto-novo, in the South) gathered a stronger support, whereas Boni Yayi is considered as a candidate “from the North”.<sup>11</sup> We observe here as expected an important feature of the political landscape in Benin: two locations in the south of the country cannot be representative of the whole country, and we expect a bias in favor of "Southern" candidates.

Let us now comment on AV votes. The first thing to be noticed is that among the main three candidates, the hierarchy is preserved: Boni Yayi comes first (59%), followed by Houngbegji (51%) and Bio Tchané (36%). All candidates get higher scores under AV than under the official voting rule, but the candidates quite differ in their propensity to increase their support. If Yayi Boni and Houngbegji only slightly increase their support (attracting some additional 10% of the electorate), Bio Tchané substantially increases his own (from about 7.6% to 36%). Four other candidates get significant scores under AV (over 9%: Gbédo (16,4%), Lagnide (11,2%), Issa (10,4%), Yahoudeou (9,1%)) when they collected less than 1% of the votes in the official election. All other candidates receive the approval of less than 4% of the voters.

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<sup>11</sup> If one looks closer at the voting station level (see Table **TableResultVotingStations** in the Appendix), one observes that the bias against Boni Yayi in actual official votes compared to the nation-wide result is the largest in the village of Hounhanméde. According to the chief of the village, this might be explained, among other things, by broken electoral promises made by Boni Yayi to the Hounhanméde village. Specifically, the emissaries of Boni Yayi during his first presidential campaign in 2006, promised to the people of Hounhanméde the electrification of their village. This promise was not kept: the work indeed begun shortly after the election of Boni Yayi, but was quickly interrupted. This could have caused some resentment among villagers.

To make those figures easier to visualize, we plot on Figure **FigureScores** the official scores (both actual and reported), as well as AV scores (candidates are ranked by decreasing AV scores).

**[Insert Figure FigureScores about here]**

What are the characteristics of those candidates who manage to attract much more votes under AV than under the run-off system, where the vote is restricted to give one's vote to only one candidate? In Europe we were able to answer this question, by referring to the political Left-Right structure: centrist candidates benefitted the most from the AV system. Here we do not have such a reference, but approval voting clearly does not impact all "small" candidates in the same way: 6 small candidates remain below 4% of approvals whereas four candidates (Gbedo, Lagnide, Issa and Yahouedou) grow from less than 1% official votes to around 10% of approvals.

#### **4. What can be learnt from this experiment about political polarization in Southern Benin?**

##### **4.1. Exclusive attachment to one candidate?**

One way political polarization may manifest itself is by a strong and exclusive attachment of voters to their preferred candidate. By definition, approval voting allows voter to support several candidates. Do voters actually use that possibility? Figure **NumberAPPPerBallot** shows the distribution of the number of approved candidates. The average number of approvals per ballot is 2.1, with a mode at one single approval (44.35% of the voters approved a single candidate).

**[Insert Figure NumberAPPPerBallot about here]**

Those results differ from those obtained in Europe, where the number of approval per ballots was much higher (around 3 approvals per ballot), in elections with similar numbers of candidates. We now try to isolate factors that increase this propensity to vote for several candidates.

Table **ProbitMultipleApp** shows the results of a Probit regression using as the dependent variable a dummy which takes the value 1 if the respondent approves of several candidates. It turns out that younger people, those living in urban areas, with secondary or college education have a higher propensity to approve of several candidates. People with traditional religion have a higher propensity to approve of one single candidate.

**[Insert Table ProbitMultipleApp about here]**

The multivariate regression shows a strong impact of education on the propensity to approve of several candidates. To visualize this effect, Figure **AppPerEduc** shows the distribution of the number of approvals per ballot, depending on the level of education.

**[Insert Figure AppPerEduc about here]**

Figure **AppPerEduc** clearly shows large differences. The percentage of voters who support a single candidate is decreasing as we move to a higher level of education: from 57% for voters with no primary education, 52% for voters with primary education, down to 33% for voters with no secondary education and 24% for voters with some college education. Note that for voters with some college education, the mode of the distribution is at two, with an average of 2.5. The graph of the number of approvals for the highest level of education is similar to that obtained in Europe.

Several reasons may explain the effect of education on the number of approvals.

- First, there might be a psychological mechanism. One hypothesis could be that voters differ in their relationship to political leaders and in their conception of the act of voting. Several conceptions are possible. Some voters may strongly identify with one and only one candidate. This exclusivity may be driven by ethnic or religious identification, or may correspond to some “feudal” conception of the leader.<sup>12</sup> Some other voters may rather conceive an election as a way to pick the most appropriate candidate for some specific task. If so, they are likely to evaluate separately the different candidates, gauging their abilities to perform the task, and may come to the conclusion that several candidates are fit to the job, or at least, display some interesting qualities. Under such a conception, they may very well approve of more than one candidate.

- Second, there might be a mechanism related to information: more educated people have better access to political information and thus are able to form some views and opinions about a larger set of candidates.

To disentangle the two effects (the psychological effect and the informational effect of education), we perform the same regression analysis, and draw the same graph as in figure **AppPerEduc**, but restricting attention to the major four candidates. The idea is that those candidates are famous enough to be known even by voters with a poor level of political education. The first two candidates, Boni Yayi and Adrien Houngbedji were known to all voters: Boni Yayi in the incumbent, and Adrien Houngbedji, running for the fourth time, was the leader of the main opposition coalition. Abdoulaye BIO TCHANE, even if he was running for the first time in the Presidential election, is well known to the public because of his former position as the President of the Bank of West African Development Bank and for having been Minister of Economy and Finance of Benin in 1998 when Kerekou was President. He was

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<sup>12</sup> Note that this kind of relationship might be strengthened by uninominal voting systems, where voters have to select only one name.

widely perceived as a credible outsider in this election. Marie-Elise Gbedo, lawyer by profession, was running for the third time in a Presidential election (after unsuccessful attempts in 2001 and 2006). Although she never got more than 1% of the vote, she is very popular for being the first and only female candidate in the presidential election in Benin.

These analyses are presented in Table **TableAppPerEduc4** and Figure **FigureAppPerEduc4** in the Appendix. We observe that the effect of education on the propensity to approve of several candidates remains very strong, even when one restricts attention to the main four candidates. In particular, the same variables remain significant in the regression. When one looks at the distribution of the number of approvals by levels of education, one sees that the percentage of voters who support a single candidate (among the main four candidates) is still decreasing as we move to a higher level of education: from 62% for voters with no primary education, 57% for voters with primary education, down to 44% for voters with no secondary education and 33% for voters with some college education. This suggests that information about the candidate is not the only channel through which education might affect the way voters behave under approval voting, but that some psychological effect is at play.

#### 4.2. Joint approvals for the main two candidates?

Another way to assess the degree of polarization in the electorate is to look more closely at the pair of the main two candidates, Boni Yayi and Houngbedji, and to count how many voters were ready to give their approval to both of them. We find that out of 1245 participants to the experiment, 270, that is, 19%, approved of both Boni Yayi and Houngbedji. This number is quite high, especially if we compare it to figure obtained in Europe, where the proportion of voters approving of the main two candidates is around 5%. This figure runs against the perceived polarization of the electorate.

It is also interesting to know from which electorates these voters come from. Table **AppByOff** shows the approved candidates by official votes. The proportion of Yayi Boni official voters who approve of Houngbedji is quite high (18%), and similar to the proportion of Houngbedji official voters who approve of Yayi Boni. These figures show no rejection of the other big candidate in neither of the electorates of the main two candidates.<sup>13</sup>

It is also worth noting at this stage that voting for the main two candidates runs against the “rational” economic theory of instrumental voting. Indeed, according to this theory, in order to decide for which candidate to vote, a voter should try to determine the situations in which he/she is most likely to be pivotal, and maximize the utility of his/her vote under such circumstances. For example, in uninominal first past the post elections, rational vote theory predicts that the voter should vote for his preferred candidates, among the main two

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<sup>13</sup> An additional point worth noting in this table is that Yayi Boni and Houngbedji both get approvals from voters of Bio Tchane (21% and 32% respectively) and other candidates.

candidates (they are indeed the most likely to tie for the first place), see for example Cox, 1997. Under approval voting, a similar reasoning should lead the voter not to approve of the main two candidates, but only for the one he prefers among these two (see Laslier 2009 for an analysis of rational instrumental voting under AV).

Who are the voters who approve of the two main candidates? Table **Probit2Main** shows that the older voters and the Muslims are less likely to approve of both Yayi Boni and Hounbedji. The variable education is no longer significant. This probably means that the above-mentioned effect of education is mainly that better educated people more often give further votes to smaller candidates (such as ABT). An alternative explanation is that they are more ready to behave according to the instrumental voter model.

[Insert Table AppByOff about here]

#### 4.3. Does approval voting reduce polarization compared to uninominal voting?

This question is new to the literature, since approval voting is not in use in any country. Conroy-Krutz (2009) provides an international comparison of ethnic voting under proportional and majoritarian systems. He shows empirically that in countries using proportional representation systems, the ethnic vote is more pronounced than in others. He also shows that, comparing African countries using majority voting for the presidential elections to those using a different method of voting, the two-round majority system leads to a decrease in the ethnic vote, or at least is statistically associated with a lower level of ethnic voting. The mechanism at work seems to be that electoral competition under a direct majoritarian system forces potential winners to gather votes from different segments of the society. In highly fragmented societies, it is clear that a candidate, in order to gather an absolute majority of the votes, has either to secure the votes of several different groups or, and this may be the winning strategy, to step aside from such a fragmented structure, to call for the “unity of the nation” and to seek for a larger electoral basis.

To that respect, the case of Benin in 2012 is one of a mature direct majoritarian democracy, since all the main candidates seemed to have chosen this nationalist strategy. At least this is what they claim, but the regional results show that voters still quite strongly identified the challenger, Adrien Hounbedji, as a Southern politician, despite his party’s official name (Union is the Nation). Therefore the starting point seems to be this one: a mature African democracy under a direct majoritarian system, a polarized electoral supply (precisely two main candidates), with a hidden but latent regional fragmentation.

Since the experience was conducted only in the South of the country, we do not have the opportunity to perform a detailed study of the ethnic and regional vote. More precisely, as reported in Table **SampleCharac** in the appendix and already mentioned earlier, we asked participants to indicate their ethnicity. The majority of participants (over 94%) responded to this question: the largest represented group is the Fon (58%), and we also have a significant number of Adja (23%), Yuraba and Goun (7%). All these ethnic groups are ethnic groups

from the South of Benin. We have only 4% (that is, 59 subjects) belonging to Northern ethnic groups (mainly Dendi). With this caveat in mind, we nevertheless show the scores of the three main candidates by ethnicity, in the official vote (Figure **OffByEthnie**) and approval (Figure **AppByEthnie**).

Concerning the official vote (Figure **OffByEthnie**), we observe quite large differences between ethnic groups. Consider first the ethnic groups from the South. If Adjas and Fons do not differ, the vote for candidate Houngbedji is more important among Gouns than in other ethnic groups, which should not come as a surprise since that candidate is Goun himself. The same applies to Boni Yayi, whose support in the southern ethnic groups is largest among Yoruba, which can be explained by the fact that Boni Yayi's father is Yoruba. Regarding the ethnic groups from the North, compared to other ethnic groups, they endorse the candidate Boni Yayi (also North) at the expense of the candidate Houngbedji in larger proportion. They are also more likely to vote for the candidate Bio Tchané (also from the North) than the Fon and the Goun. However, once again, these figures are to be treated with caution given the small numbers at hand.

Turning to approval vote (Figure **AppByEthnie**), differences between ethnic groups from the South diminish when going from the official vote to approval voting. But Approval voting does not make ethnic differences disappear. Indeed, the singularity of the very low support for Houngbedji among Northern ethnic groups remains strong. If some ethnic groups (especially those from the South) seem to be ready to approve of candidates from different ethnic groups, others, such as the Dendi and other ethnic groups the North, only approve of candidates from their own region (Yayi Boni and Bio Tchané).

When restricting attention to Southern ethnic groups only, we therefore conclude that the use of approval voting, given the actual political supply in this election, tends to lessen the ethnic differences in votes. When also considering our small sample of voters from the North, we find opposite effects: approval voting, if anything, increases differences between Northern and Southern groups (since Northern voters are much more likely to approve Bio Tchané than the other groups), This suggests that AV might not be able to make ethnic voting patterns disappear.

The most noticeable effects of AV on polarization seem to be different.

The first, and obvious, fact is that a non-negligible fraction of the electorate (about one fifth), approves of both Boni Yayi and Houngbedji. This is a typical expressive vote, which cannot be accounted by the “rational” economic theory of instrumental voting (see section 4.2 for a description of the rational instrumental voting under AV). It is a direct statement, by these voters, that they reject the polarization induced by the majoritarian single-name vote.

The second fact is the increase in apparent political strength of some candidates. For instance, in this election, the third candidate, Bio Tchané, has a score of 7%, as to the official votes, but of 35% as to approval votes. Following the AV scores, the election at hand, and hence the Benenese political landscape, cannot be described as two serious candidates plus many unimportant ones. One mechanical effect of this system is the enrichment of the set of

apparently important candidates. This may look similar to what happens under proportional systems, where the number of viable parties is larger than under majoritarian systems, but the mechanisms at work are different. Indeed, under a proportional system, a party (or a politician) can depend of a relatively narrow niche of exclusive voters, so that the political competition under proportional representation may settle in a situation where the representation replicates a fragmented society; this is part of the argument of Conroy-Krutz. Under AV only one candidate is to be elected, but the voter's support to a candidate does not need to be exclusive.

All of the observations above are made taking the political supply as given. If the AV system was implemented, it might also change the political supply. Of course we can only speculate about what would be the consequences, on the electoral supply, of the use of approval voting for direct presidential elections,<sup>14</sup> but the theory (Laslier 2009; Laslier and Maniquet 2010) gives some insights. For rational instrumental voters, the more consensual candidate wins the election by gathering approvals from all the voters who prefer this candidate to his main challenger but the next candidates. If this is true, and taking also into account purely expressive motivations such as the one that we have observed in this experiment where many voters approve simultaneously the main two candidates, one comes to predict that, under this system, (i) the main candidates should strategically campaign toward the whole electorate and (ii) even if there are only two candidates who have a serious chance to win, the election will not resume to a pure duel between them. Then, approval voting should simultaneously let ethnic votes be cast and reduce polarization.

## **5. Comparison with European experiments**

Laslier and Van der Straeten (2004, 2008) report on a similar experiment during the 2002 French presidential election. Their observations have been confirmed and made more precise in a number of studies in Europe (Baujard and Igersheim 2010; Alos-Ferret and Granic 2010, 2012; Dolez et al. 2011; Baujard et al. 2012) using the same methodology, and in other types of research: multi-agents systems (Laslier 2010a), laboratory experiments (Laslier 2010b) and internet surveys (Van der Straeten et al. 2013). The main findings, summarized in Laslier (2011) are the following.

1. One can observe a positive reaction of the general public to the use of “scientific” experimentation about politics and elections. People are curious about it and ready to take part; they show very little hostility towards the idea of experimenting in Politics.
2. People who accept to take part in such an experiment understand the voting rule.

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<sup>14</sup> It is also difficult to predict what would be the content of the electoral campaigns. Supporters of approval voting have often mentioned the idea that this system would alleviate negative campaigning (Brams 2008), a phenomenon which is explicit in American politics but obviously exists everywhere. If this is correct, then the point maybe important in situations where politicians raise one ethnic group against another.



3. One goal of the experiments should be to observe voters' behavior at the individual level. Unfortunately important participation bias, as well as the protocol of these experiments, makes this uneasy.
4. In theory, different voting rules may yield different outcomes. Yet, little empirical evidence is provided to support this idea on large scale elections. Approval voting tends to favor consensus candidates.
5. Even elected candidates in France (Chirac, Sarkozy, Hollande) may not have a huge support in the population. Approval voting gives a quite different picture of the preferences of voters. By comparison the picture offered by the single-name systems seems to be distorted in favor of the two main candidates.
6. More detailed information can be obtained on the structure of the political space. For instance, with Approval Voting, one can infer some information on empirical "correlations" between candidates, two candidates being "close" when voters treat them alike: the same voters vote for both of them or for none of them.

This experiment in Benin has confirmed the two first points. In Benin as in France we noticed that the authorities may be reluctant to let scientist operate during the election process. But the ordinary citizens who are proposed and who come to participate can see that there is no real problem with the experiment, and they are keen to understand and to participate.

As to the third point, a methodological issue, we could not detect in the Beninese experiment a participation bias in the sample similar to the important left-wing bias observed in Europe. On the contrary, the comparison between the official results at the level of the pooling stations and the declarations of the participants seems to indicate that the set of participants is a representative subset of the local electorates.

With respect to the results of the experiment, the findings which are related to the particular structure of European politics, with centrist, moderate and extreme candidates, are absent in the context of this election. But some more fundamental patterns are identical. Having the opportunity to vote for several candidates makes it possible for the voter to simultaneously say her word about the candidates who are running for the victory, and to express her support for some other candidates. This limits the concentration of the votes and the "strategic" voting effects. In Europe, this is beneficial to mid-range candidates such as the centrist candidates in France or the green candidates. The same phenomenon was beneficial in Benin to A. Bio-Tchané and to M.-E. Gbedo.

## **Conclusion**

In this paper, we showed that approval voting is easily understood and accepted by voters. Level of education, age, religion and place of residence influence the propensity to approve more than one candidate. The evidence, among voters from Southern Benin, indicates that approval voting should induce a reduction in the polarization of the political structure, compared to the actual uninominal system.



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## **TABLES ans FIGURES**

**Table Participation:** Participation to the experiment

Voting station	Number of voters in the official election	Number of participants to the experiment	Participation rate to the experiment
Fifadji	789	624	0.79
Hounhanméde	729	494	0.68
Vodjè-Kpota	1710	352	0.21
Total	3228	1470	0.46

**Table ResultsByCandidates: Average official and AV scores (in %), and national official scores (in %).**

	Average scores in the three voting stations			Nation-wide results
	1	2	3	4
	Official Actual	Official reported	AV	Official Actual
BONI	47,59	51,62	59,09	53,17
HOUNGBEDJI	41,63	38,38	51,37	35,65
BIO TCHANE	7,55	7,67	35,86	6,28
GBEDO	0,9	1,14	16,42	0,41
LAGNIDE	0,33	0,33	11,23	0,65
ISSA	0,28	0,4	10,39	0,65
YAHOUDEDEOU	0,77	0,14	9,12	0,49
TCHALA SARE	0,076	0	3,58	0,49
TOPANOU	0,06	0	3,23	0,49
SINZOGAN	0,23	0	2,88	0,47
BIOKOU	0,1	0,14	2,81	0,26
DA HISSIHO	0	0,11	2,11	0,31
KOUAGOU	0,07	0	2,04	0,31
Withdrawn cdt	0,13	0	0	
Number of voters	3185	693	1425	

Note: Candidates are ranked by average AV scores.

To compute the score of candidate X (in each of the columns 1, 2, 3), we use the following formula:

$$\% X = (\% X \text{ Fifadji} * 606 + \% X \text{ Hounhanméde} * 478 + \% X \text{ Vodjè-kopta} * 341) / 1425,$$

where 1425 is the total number of completed AV ballots, 606 is the number of completed AV ballots in Fifadji, 478 is the number of completed AV ballots in Hounhanméde, and 341 is the number of completed AV ballots in Vodjè-kopta. (See footnote XX for a justification of this formula.)

**Table ProbitMultipleApp: Probit Dependent Variable: MultipleApprovals**

```

Probit regression                               Number of obs   =       1262
                                                LR chi2(9)      =       97.72
                                                Prob > chi2     =       0.0000
Log likelihood = -813.29524                    Pseudo R2      =       0.0567
    
```

MultipleApproval	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Urban	.1628154	.0819002	1.99	0.047	.0022939	.3233368
PrimaryEducation	.0330248	.1024681	0.32	0.747	-.167809	.2338585
SecondaryEducation	.4826339	.1023811	4.71	0.000	.2819707	.6832972
CollegeEducation	.7216808	.1362195	5.30	0.000	.4546955	.9886661
OtherChristian	.0102316	.0837496	0.12	0.903	-.1539147	.1743779
Islam	-.0365871	.1320868	-0.28	0.782	-.2954725	.2222983
TraditionalReligion	-.3071697	.1538572	-2.00	0.046	-.6087243	-.005615
Female	-.1078162	.0772842	-1.40	0.163	-.2592904	.0436581
Age	-.005933	.0031118	-1.91	0.057	-.0120321	.0001661
_cons	.0746873	.1627672	0.46	0.646	-.2443305	.3937052

Note: For Education: NoPrimaryEducation is the reference category; For religion: Catholic is the reference category.

**Table Probit2Main: Probit Dependent Variable: Approve Of The Main Two Candidates**

```

Probit regression                Number of obs   =    1262
                                LR chi2(9)        =    17.64
                                Prob > chi2         =    0.0396
Log likelihood = -599.27485      Pseudo R2       =    0.0145

```

top2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Urban	.1489627	.093663	1.59	0.112	-.0346134	.3325387
PrimaryEducation	-.0659852	.1190761	-0.55	0.579	-.29937	.1673996
SecondaryEducation	-.1069975	.1176802	-0.91	0.363	-.3376465	.1236515
CollegeEducation	-.0771277	.1477232	-0.52	0.602	-.36666	.2124045
OtherChristian	.0023817	.0937391	0.03	0.980	-.1813435	.1861069
Islam	-.4524403	.1678268	-2.70	0.007	-.7813748	-.1235058
TraditionalReligion	-.2449045	.1897101	-1.29	0.197	-.6167295	.1269205
Female	-.089435	.0879973	-1.02	0.309	-.2619066	.0830366
Age	-.0076356	.0036437	-2.10	0.036	-.0147772	-.000494
_cons	-.5785714	.1881789	-3.07	0.002	-.9473952	-.2097475

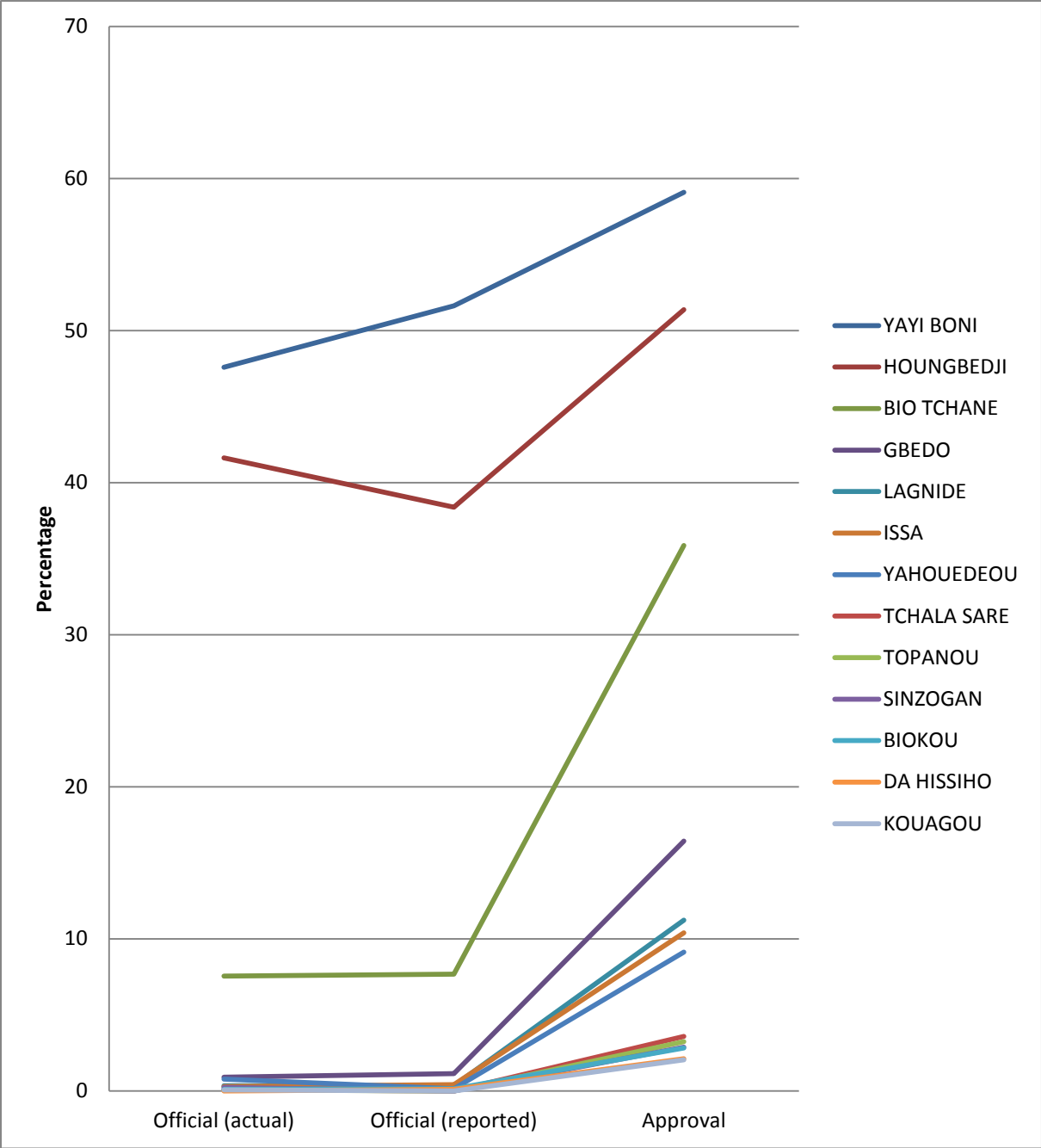
Note: For Education: NoPrimaryEducation is the reference category; For religion: Catholic is the reference category.



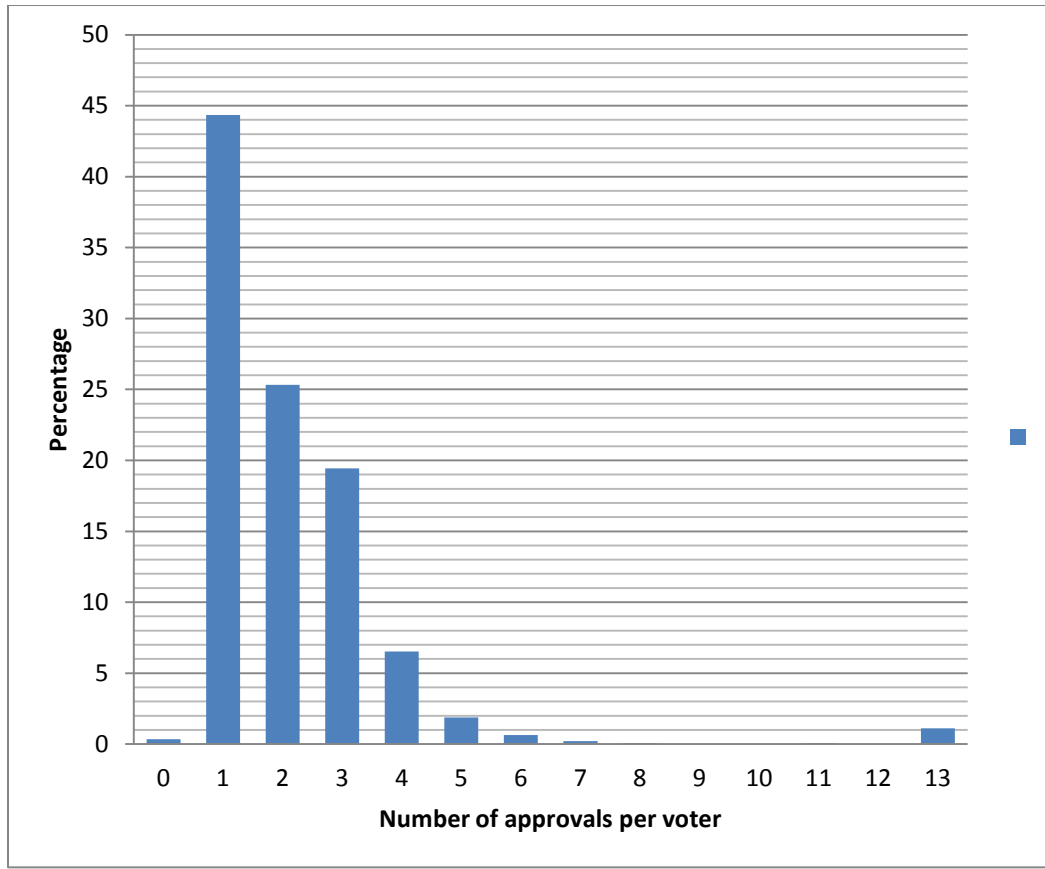
**Table AppByOff: Approved candidates by reported official vote**

Approved candidate	Reported official vote				
	Yayi	Houngbedji	Bio-Tchané	Others	TOTAL
YAYI BONI	93,84	16,29	21,43	43,75	397
HOUNGBEDJI	18,21	96,97	32,14	37,50	345
BIO TCHANE	30,53	31,82	98,21	50,00	256
GBEDO	18,77	12,12	7,14	50,00	111
LAGNIDE	8,40	9,85	5,36	37,50	65
ISSA	8,12	10,61	7,14	25,00	65
YAHOUEDEOU	5,88	10,98	7,14	25,00	58
Nb of obs.	357	264	56	16	693

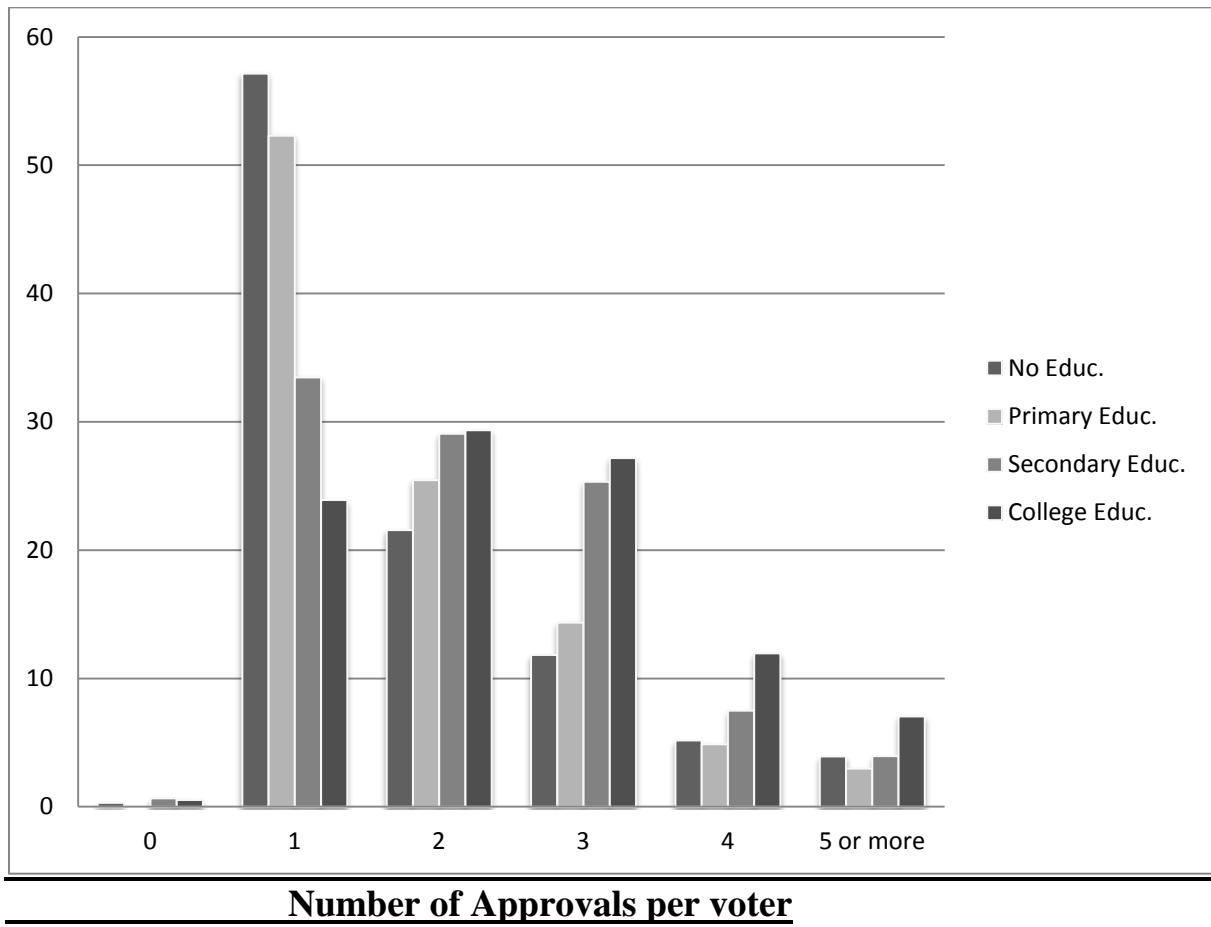
**Figure FigureScores: Average official and AV scores (in %)**



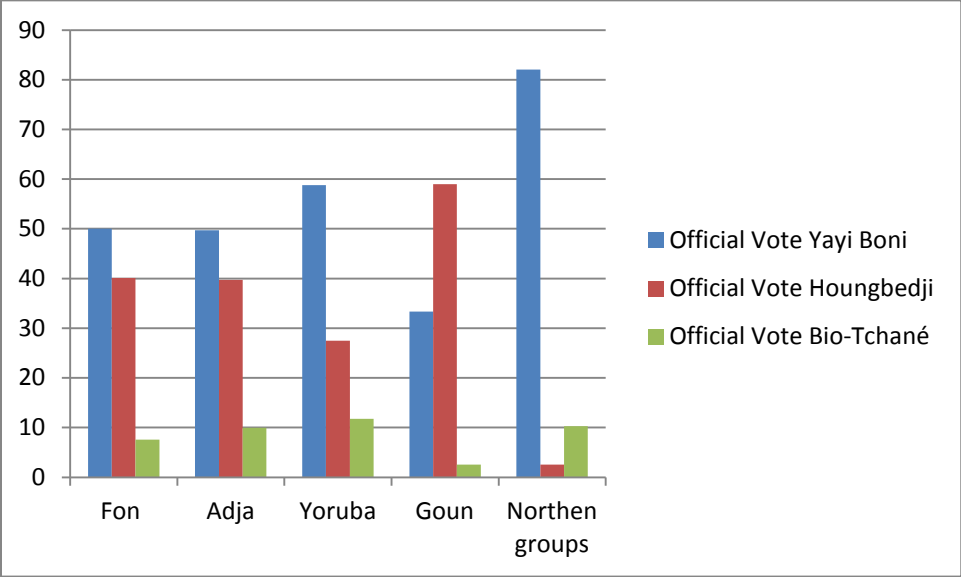
**Figure NumberAppPerBallot: Distribution of the number of approvals per ballot (%)**



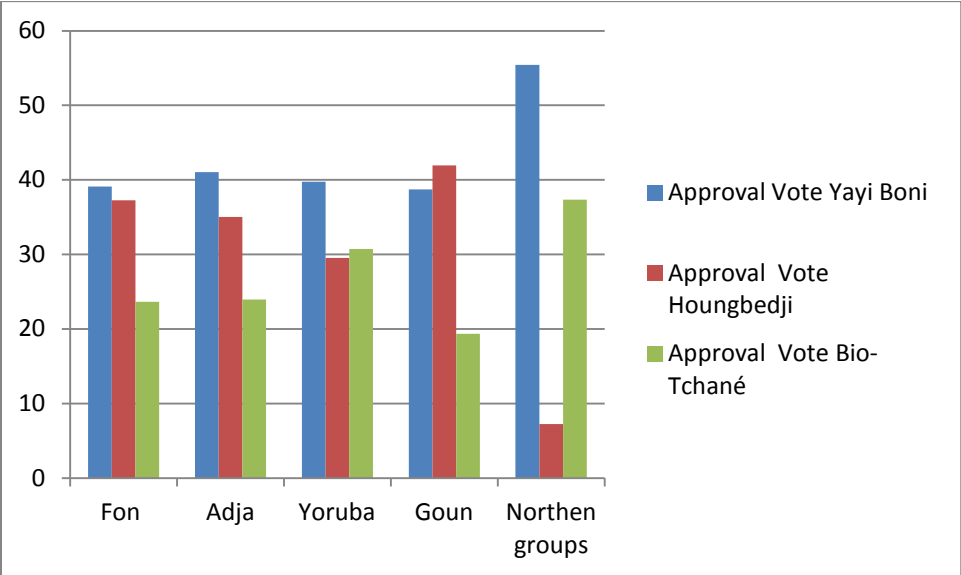
**Figure AppPerEduc: Distribution of the number of approvals per ballot (%), by level of education**



**Figure OffByEthnic: Scores of the three main candidates in the official vote (reported), by ethnic group**



**Figure AppByEthnic: Scores of the three main candidates in the approval vote, by ethnic group**



## **APPENDIX**

### **Table ListeCand: List of the candidates**

For the three main candidates: see the main text

<b>Name</b>	<b>Short description</b>
<b>Marie-Elise GBEDO</b>	Lawyer by profession, GBEDO was running for the third time (after unsuccessful attempts in 2001 and 2006). Marie-Elise GBEDO has never got more than 1% of the votes, but she is well known to the public for being the first (and so far unique? CHECK) female candidate in a Presidential election in Benin.
<b>Christian Enock Lagnidé</b>	Former Minister of Sports under President Kérékou, Lagnidé is a prosperous trader, owner of several companies, both in Benin and abroad. He is Chairman and CEO of a group of Beninese press "LC2" and was running for the first time for Presidency.
<b>Issa Salifou</b>	MP and businessman, Salifou is also the chairman of a parliamentary group called G13 in the National Assembly. The G13 is a group of members who had expressed their opposition to the regime of President Yayi Boni. It was his first Presidential campaign.
<b>January Yahouédéhou</b>	Member of the National Assembly, Yahouédéhou holds a PhD in Computer Science. It was his second Presidential campaign (after an unsuccessful attempt in 2006). First an ally of Boni Yayi in the second round of the 2006 Presidential election, Yahouédou then cut ties with the incumbent. He is publicly known for having publicly exposed several scandals involving Boni Yayi's governance. He is also the owner of a popular radio "Planet FM". Yahouédou is from Agonlin (Zagnanado, in the South of the country), a region dominated by the Mahi ethnic group.
<b>Tchala Sare</b>	
<b>Topanou</b>	
<b>Sinzogan</b>	
<b>Biokou</b>	
<b>Da Hissiho</b>	
<b>Kouagou</b>	

Note: Candidates are ranked by Approval scores.

**Add a description of the minor candidates, in order to differentiate them from those who have obtained approvals.**

**Table SampleCharac : Sample characteristics**

Variable	Answers	Numbers	Pourcentage (%)
Voting station	Fifadji	606	42,53
	Hounhamede	478	33,54
	Vodjè-Kpota	341	23,93
	Total	1425	100
Age	18-34	764	41,72
	35-54	463	35,32
	over 54	84	6,41
	Total	1311	100
Gender	Female	650	46,53
	Male	747	53,47
	Total	1397	100
Education	No primary educ.	329	24,63
	Primary educ.	369	27,62
	Secondary educ.	454	33,98
	College	184	13,77
	Total	1336	1000
Religion	Catholic	777	54,53
	Other Christian	410	28,77
	Islam	126	8,84
	Traditional	97	6,81
	Other religion	3	0,21
	No Religion	12	0,84
	Total	1425	100
Ethnic Group	Fon (& related)	783	58,26
	Adja (& related)	311	23,14
	Yoruba (& related)	100	7,44
	Goun (& related)	91	6,77
	Dendi	23	1,71
	Other Ethnic Group	36	2,68
	Total	1344	100
Region of origin	Zou	783	58,3
	Mono-Couffo	311	23,16
	Collines	100	7,45
	Oueme	91	6,78
	Alibori	24	1,79
	Donga	22	1,64
	Borgou	10	0,74
	Atacora	2	0,15
	Total	1343	100

**Table ResultVotingStations: Actual official, reported official and AV scores of the candidates (in %), in each voting station**

	Fifadji			Vodjè-Kpota			Hounhanmédé		
	1	2	3	4	5	6	7	8	9
	Official actual	Official reported	AV	Official actual	Official reported	AV	Official actual	Official reported	AV
YAYI BONI	49,42	55,6	59,57	51,8	57,14	66,57	42,28	42,62	53,14
HOUNGBEDJI	45,02	37,5	56,6	40,34	32,26	46,04	38,25	43,85	48,54
BIO TCHANE	2,97	4,31	33,99	4,84	6,61	39	15,3	12,7	35,98
GBEDO	1,29	2,16	19,64	0,89	0,92	21,99	0,42	0	8,37
LAGNIDE	0,26	0	15,18	0,71	1,38	15,25	0,14	0	3,35
ISSA	0,13	0,43	12,05	0,53	0,92	14,08	0,28	0	5,65
YAHOUDEDOU	0,26	0	7,76	0,24	0	9,97	1,81	0,41	10,25
TCHALA SARE	0	0	2,48	0,06	0	6,74	0,14	0	2,72
TOPANOOU	0	0	2,64	0,12	0	4,99	0,14	0	2,72
SINZOGAN	0	0	1,96	0,24	0	4,69	0,14	0	2,72
BIOKOU	0,39	0	2,15	0,06	0	4,4	0,14	0,41	2,51
DA HISSIHO	0,13	0	1,49	0,06	0,46	4,11	0	0	1,46
KOUAGOU	0	0	1,61	0	0	3,81	0	0	1,26
Withdrawn cdt	0,13	0	0	0,12	0	0	0,14	0	0
Nb of voters	773	232	606	1693	217	341	719	244	478

Note: Columns 1, 4, 7 give the actual official scores of the candidates, in each voting station. Columns 3, 6, 9 report the AV scores. During the experiment, voters were also asked to fill in a questionnaire, which included the following question: “For which candidate did you vote in the official vote?”. Results are given in columns 2, 5, 8. Candidates are ranked by average AV scores (see footnote 6 for an explanation about how those average scores are computed).



**Table ProbitAppPerEduc4: Probit Dependent Variable: MultipleApprovalTopFour**

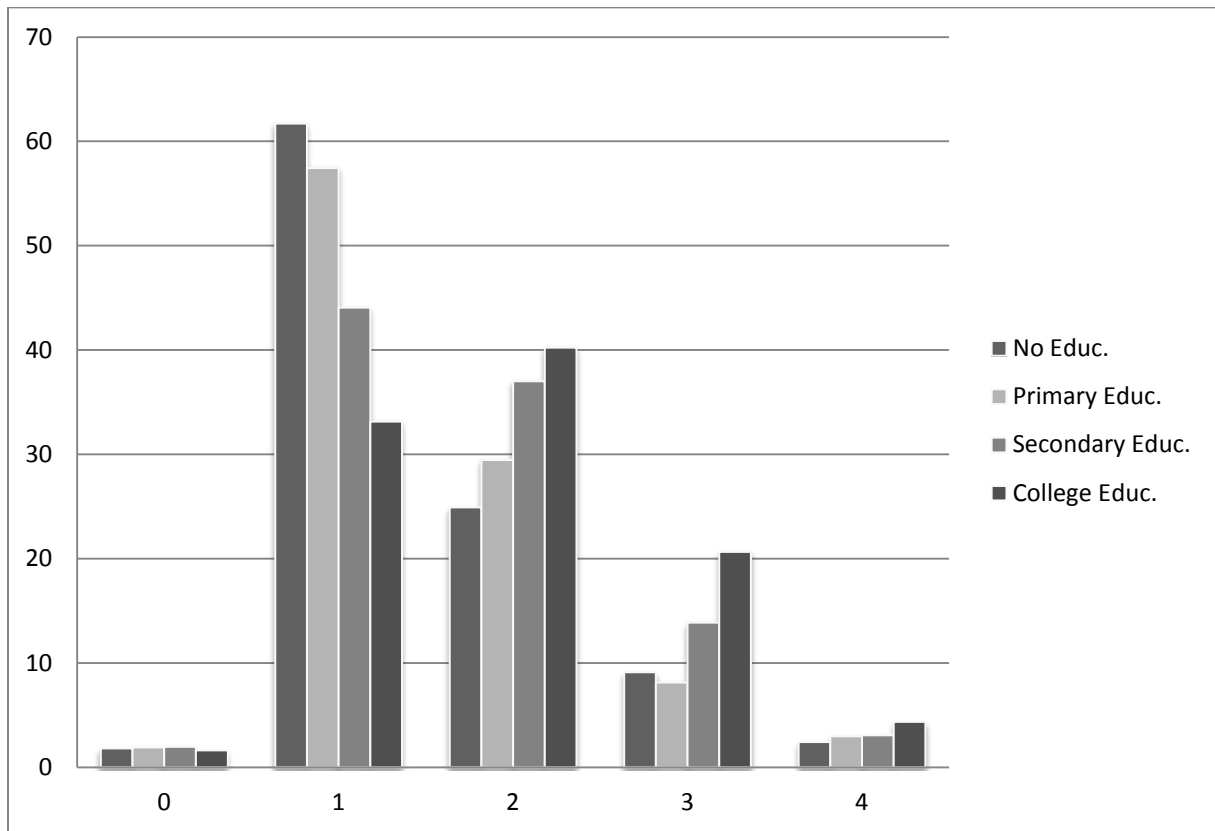
Probit regression

Number of obs = 1262  
 LR chi2(9) = 68.23  
 Prob > chi2 = 0.0000  
 Pseudo R2 = 0.0391

Log likelihood = -839.20764

MultipleApprovalTo~r	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Urban	.1557884	.0814679	1.91	0.056	-.0038857	.3154625
PrimaryEducation	.049208	.1036892	0.47	0.635	-.1540191	.2524352
SecondaryEducation	.3540941	.1021282	3.47	0.001	.1539265	.5542618
CollegeEducation	.5952575	.1316084	4.52	0.000	.3373098	.8532052
OtherChristian	.0267459	.0827425	0.32	0.747	-.1354264	.1889181
Islam	.0425326	.1297736	0.33	0.743	-.2118189	.2968842
TraditionalReligion	-.3303138	.1583068	-2.09	0.037	-.6405895	-.0200381
Female	-.0392001	.0763701	-0.51	0.608	-.1888828	.1104826
Age	-.0067615	.0031068	-2.18	0.030	-.0128507	-.0006723
_cons	-.1276258	.1625643	-0.79	0.432	-.4462461	.1909944

**Figure AppPerEduc4: Distribution of the number of approvals per ballot (%), by level of education, when restricting attention to the main four candidates**



**Number of Approvals per voter**