

Can ATMs Get Out the Vote? Evidence from a Nationwide Field Experiment^ψ

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Forthcoming at the European Economic Review

February 2021

Abstract

We report on a large-scale (randomized) field experiment we designed and conducted to assess ATMs' (automatic teller machines) capacity to "get out the vote". This is a heretofore unexploited method of voter mobilization. Our experimental design used the full universe of functioning ATMs in Portugal, which benefits from a sophisticated world class system, with wide national coverage. We randomly selected a set of treatment civil parishes, where a civic message took over the totality of ad time in ATMs, which we compare with a set of control civil parishes where advertisements ran as usual. The ATM campaign we follow was active for three days immediately before and during the 2017 local elections in Portugal. When we consider the intensity of treatment, for both the entire campaign period and the weekend, results show a statistically significant increase in the likelihood of voting. All three proxies for treatment intensity we employ deliver robust positive coefficients. Placebo tests using turnout rates in previous elections do not show significant coefficients, strengthening our interpretation of the experimental results.

Keywords: Voter mobilization, ATMs, Portugal, Local Elections.

JEL codes: C93, D72, H70.

^ψ The authors would like to thank Spectacolor, SIBS, and *Comissão Nacional de Eleições* for invaluable support, without which this project would not come to fruition. This work was funded by *Fundação para a Ciência e a Tecnologia* (UID/ECO/00124/2019, UIDB/00124/2020 and Social Sciences DataLab, PINFRA/22209/2016), POR Lisboa and POR Norte (Social Sciences DataLab, PINFRA/22209/2016). We thank Kai Barron, Miguel Costa-Gomes, Diogo Geraldes, Donald Green, Horacio Larreguy, Gianmarco León, Pedro Magalhães, Marco Le Moglie, David Nickerson, Susana Peralta, Vincent Pons, Pedro Robalo, Carlos Santos, and Francisco Veiga, as well as participants in Nova SBE-ISEG seminar, Advances with Field Experiments 2018 (B.U.), the Lisbon Meeting on Economics and Political Science 2018, the 12th NYU-CESS Experimental Political Science Conference, the 77th Annual MPSA Conference, the Silvaplane Political Economy Workshop 2019, the SABA 2020 Online Conference, and the ESA 2020 Global Around-the-Clock Virtual Conference for comments and suggestions. Darya Bereziy, Ernesto Freitas, and Jacob Macdonald provided excellent assistance. All errors are our own.

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I. Introduction

Low and declining levels of voter turnout constitute a fundamental problem for democracies, raising questions of legitimacy and representativeness, as well as challenging the idea of political accountability. Why a rational individual would spend time and resources to become informed and vote constitutes a classical puzzle, which has attracted a significant body of work in economics and political science.⁴ In this context, studies examining which factors influence electoral participation have gained relevance. Observational studies, as surveyed in Cancela and Geys (2016), have addressed the question by establishing positive correlations of voter turnout with campaign expenditures and election closeness. In a more recent generation of studies, surveyed by Gerber and Green (2017), experimental methods have allowed researchers to credibly estimate the causal effects of specific interventions. Randomized field experiments, taking place unobtrusively in real-world settings, are better designed to address inference identification problems such as self-selection, strategic targeting, or unobserved confounders. This literature documents large impacts of relatively expensive personal contact and of interventions activating peer pressure.

This paper contributes to the literature on electoral participation using experimental methods through an experiment employing the highly granular universe of ATM (automatic teller machines) terminals in Portugal.⁵ Our aim is to determine whether low-cost, impersonal reminders which emphasize the idea of civic duty, when exhibited in the days leading to local elections, can mobilize voters to vote, and if yes, by how much. The ATM network in Portugal, *Multibanco*, is known to be a credible communication channel, associated with high levels of security, performance and reliability. Besides account information and withdrawals, the ATM network has the largest number of functionalities worldwide – 60 innovative operations including mobile top-ups, the possibility of buying transportation and music festival tickets, as well as performing instantaneous interpersonal transfers between accounts

⁴ Several distinct theories have tried to rationalize the act of voting. According to rational choice theory, the positive expected utility from participating is associated with the possibility of one's vote being decisive or pivotal – typically, a probability close to zero. See Downs (1957), and Dhillon and Peralta (2002) for a survey. A more general approach contemplates ideological and valence elements to voter's preferences, as in Feddersen and Pesendorfer (1997). The leading alternative to these instrumental voting models is ethical models, starting with Riker and Ordeshook (1968). This strand of the literature argues that voters derive utility from the act of turning out to vote (through a general sense of duty), separate from the consequences of their vote, as discussed, for instance, in Feddersen and Sandroni (2006). According to Hillman (2010), voting creates positive expressive utility, independent from the outcome, derived from a conception of civic duty or expressive confirmation of identity. Habit is also regarded as causing political action (Gerber et al., 2003; Bechtel et al., 2018). There is also evidence that we vote to tell others (Dellavigna et al., 2016) and we like to hear gratitude for voting in previous elections (Panagopoulos, 2011).

⁵The number of ATM machines increased steadily since the 1990s until 2010 (see Figure A1 in the Appendix to this paper). In per capita terms, ATM machines per 100 thousand inhabitants reached the record of 135.4 in that year. After that, the number of ATMs slightly decrease to 11570 in 2018 (112.6 per 100 thousand inhabitants). However, ATMs do not seem to be less used over time. Figure A2 displays the amount of withdrawals in ATMs (in €), which depicts an upward trend.

of different individuals, and paying for an array of government taxes and licences.⁶ It is one of the largest interbank networks within Europe, operating over 11,700 terminals and processing over 75 million transactions worth €4.8 billion per month.⁷ To contextualize, in 2017, there were more than 21,18 million of payment cards (Banco de Portugal, 2019) for a population of about 10,31 million citizens (Statistics Portugal).

Our ATM treatment was implemented in a randomly selected sample of municipalities, where a “get out the vote” (GOTV) advertisement reached potential voters using ATM machines. This message was activated during the two and a half days leading up to the election, in three different moments: before and after ATM users introduced their banking card, while they waited to withdraw cash, and while they waited to perform other operations.

We combine official turnout records for treated and control civil parishes (*freguesias*)⁸ with descriptive information provided by the ATM company on cards, operations, and withdrawals. We account for potential confounding factors using detailed socio-economic and political information for a cross-section of more than 1700 civil parishes. One week after the local elections, we conducted a follow-up survey in neighboring treated and control parishes in Lisbon, interviewing more than 200 ATM users, in order to gauge whether they recalled the treatment messages. The post-election survey showed that the treated civil parish had a significantly higher level of recall than the control civil parish.

We find no statistical significance impact of the treatment *per se*, but our results on the intensity of treatment, for either the entire campaign period or the weekend period (knowing that the election was on a Sunday), show the campaign leads to a statistically significant increase in the average turnout rate. Our findings are robust to three alternative measures of user intensity: number of cards used, operations conducted, and withdrawals. Placebo tests employing turnout rates in previous elections show no impact whatsoever of the intensity of treatment on turnout rates.

The application of field experiments to the study of electoral participation has its origins in the early contributions by Gosnell (1927) and Eldersveld (1956). However, this literature was only re-activated in the late 1990s. In this context, a plethora of (i)

⁶ A proof of the credibility and granularity of the Multibanco system is the 2011 public discussion of its potential use as a voting network (see https://www.rtp.pt/noticias/economia/voto-simplex-via-caixas-multibanco-distinguido-no-movimento-milenio_n430575).

⁷ The only competitor of the dominant *Multibanco* network has 300 terminals, concentrated in tourist areas and thus directed at non-voters. See <https://www.publico.pt/2017/01/02/economia/noticia/euronet-a-unica-alternativa-a-tradicional-rede-multibanco-da-sibs-ja-tem-300-caixas-em-portugal-1756507>.

⁸ Civil parishes (*freguesias*) are the lowest local administrative unit in the country.

communication modes and (ii) message contents to encourage citizens to go to the polls were studied using field experiments.

Communication modes tested in the literature range from the highly personal to the highly impersonal: results suggest that impersonal and passive methods of contact are less effective at mobilizing voter turnout than personal interactions. For example, Gerber and Green (2000) find that nonpartisan face-to-face canvassing increased turnout in an uncontested American election by five to eight percentage points, compared to less than 1 percentage point for live phone calls and mailings.⁹ Message contents tested in the literature explored various dimensions like social norms, explicit peer pressure, and reciprocity. In an influential study of American elections, Gerber et al. (2008) highlight that, even in one-way communications, showing citizens their voting record, or that of their neighbours, which are likely to activate existing social norms related to peer pressure, can render campaigns more effective.

Several one-way means of GOTV contact were also tested in the literature. Dale and Strauss (2009) show that text messages on mobile phones reminding recipients about the election day can succeed in increasing the turnout of registered voters, that is, those that have signalled their interest in voting. Other modes include radio – Panagopoulos and Green (2008), newspapers – Gerber et al. (2009), street signs – Panagopoulos (2009), TV – Gerber et al. (2011), and social media platforms such as facebook or whatsapp – Enríquez et al. (2019). Although this literature became most developed for the US, a number of different geographical contexts have expanded the scope and range of interventions studied.¹⁰ Our experiment has the benefit of estimating the impact of a low-cost one-way mode of communication – through ATM messaging, on the full universe of voters in Portugal, while using a message that targets the social norm of civic duty related to electoral participation.

⁹ This relative effectiveness has been replicated in local (Green et al. 2003) and federal elections in the U.S. (Nickerson et al., 2006). The findings of Green and Gerber (2000) have been contested by Imai (2005) who demonstrates that telephone canvassing increased turnout by five percentage points while employing matching techniques (see Green and Gerber, 2005, for an additional discussion). In Europe, Bhatti et al. (2016) show that the effects of door-to-door canvassing are substantially smaller than the ones found for the U.S.

¹⁰ Other examples of randomized voter mobilization applications include studies in the U.K. (John and Brannan, 2008), Mexico (Chong et al., 2014 and Enríquez et al., 2019), São Tomé and Príncipe (Vicente, 2014), Nigeria (Collier and Vicente, 2014), Sweden (Nyman, 2017), Mozambique (Aker et al., 2017), Perú (León, 2017), and France (Pons and Liegey, 2019). Large-scale partisan interventions have also been analysed in Benin (Wantchekon, 2003), Italy (Kendall et al., 2015), and France (Pons, 2018). Recent quasi-experimental studies have also looked at different types of voter mobilization: Barone et al. (2015) and Ellingsena and Hernæs (2018) looked at the case of access to digital/cable TV in Italy and Norway (respectively). Using similar methodologies, Shue and Luttmmer (2009) for the U.S., and Hodler et al. (2015) for Switzerland, analyze the impacts of different voting technologies. Card and Moretti (2007) test whether electronic voting technology affected electoral outcomes in the 2000 and 2004 US presidential elections and find a positive correlation between use of electronic voting and the Republican vote share.

The remainder of the paper is organized as follows. Section II addresses the institutional background whereas Section III presents and discusses the empirical strategy and data. Section IV describes the results. Section V concludes.

II. Institutional background

Local administration elected democratically exists in Portugal since the 1976 Constitution came into force, identifying three administrative divisions (Articles 235-262): civil parishes (*freguesias*), municipalities (*municípios*), and administrative regions (*regiões administrativas*). Civil parishes are the lowest administrative unit, ruled by an executive body, the civil parish board (*junta de freguesia*), and a deliberative body, the civil parish assembly (*assembleia de freguesia*). Local elections are exogenously fixed every four years for the civil parish assembly, whose winner is elected president.¹¹ The lists are closed, and the seats assigned according to the D'Hondt proportionality method. Unlike in national legislative elections, independent lists can run. The official campaign period happens during the two weeks before election. The exception is the day before the election, when the campaign is suspended. Moreover, debates on TV are organized around one month before the election, only for the races of the most populous municipalities.

Before 2013, the 308 municipalities were subdivided into 4259 civil parishes. However, in the aftermath of bailout negotiations during the financial crisis, the Portuguese government was forced to reduce the number of these units. This way, the number of parishes was reduced from 4259 to 3091.¹²

Our field experiment took place in the days leading up to the 2017 municipal elections, on October 1, 2017. Figure A3 presents turnout rates for this election. We exclude from our experimental sample all civil parishes with no ATM machines in the days before the 2017 local election. The official turnout rate in 2017 (which includes all civil parishes in Portugal) was 55% while this number was slightly lower in 2013 (the previous local election), i.e., 52.6%. In our sample, these numbers are very similar: 61% in 2017 vs. 59.5% in 2013. Internationally, these numbers are comparable to 65.2% (65%) in the 2019 Spanish local (regional) elections, and 63.5% at the first round of voting during the 2014 French local elections. Turnout is substantially lower at the 2018 England local elections (34.6%).

¹¹ Simultaneously, elections are held for Municipal Town Halls (*Câmara Municipal*), and Municipal Assemblies.

¹² Some of these amalgamations, especially in the Lisbon district, implied significant border changes.

III. Experimental design

III. 1. Treatment

Our treatment consisted on the exhibition, on all ATM machines of treated civil parishes, of an advert reminding voters that voting is a civic duty, as well as reminding them of the election day.¹³ This happened just before and on the election day for a period of three days, between Friday and Sunday (the election day), until 3 p.m. So, in succession, the messages pointed “Vote is a Civic Duty – Vote Sunday” presented Friday, “Vote is a Civic Duty – Vote Tomorrow” presented Saturday, and finally, “Vote is a Civic Duty – Vote Today” presented on election day.¹⁴ The advertisements are shown in Figure A4 of the Appendix to this paper. We obtained authorization to use the official layout – images, lettering, and official seal of the National Electoral Commission. ATMs in control civil parishes displayed publicity for a TV soap-opera and car commercials. This message was activated in three different moments: before and after ATM users introduced their banking card (around 3 seconds), while they waited to withdraw cash (around 6 seconds), and while they waited to perform other operations (around 6 seconds).

The Electoral Commission spent most of their funds in TV commercials and newspaper ads. Both are targeted to reach potential voters in the entire country and were broadcasted eight to two weeks before the local elections. In the last two weeks, the Electoral Commission did not make any efforts to publicize the election. Finally, it should be highlighted that we assured they did not modify what they typically did in previous elections to encourage turnout.

III. 2. Sampling, randomization, and measurement

We restrict our attention to the 1704 civil parishes that have at least one ATM, a geographical area comprising more than 92% of the population of Portugal according to the 2011 census. The allocation of treatment and control conditions to the set of civil parishes followed a standard randomization procedure in two steps: (i) we first formed blocks of civil parishes within each municipality, conditional on observables; (ii) we then randomly assigned

¹³ Dale and Strauss (2009) show that, for certain citizens, a noticeable reminder is enough to drive them to cast a vote.

¹⁴ Nickerson (2007) presents evidence on timing effects, namely that phone calls made more than one week before the election are ineffective.

the treatment and control conditions to civil parishes within each block. The referred observables, allowing for *a priori* balance between treatment and control, were: voters' density (i.e., the number of registered voters divided by the civil parish area), the number of well-functioning ATM devices, the number of commercial bank agencies, the turnout rate for the previous local elections in 2013, and a term limit dummy variable taking value one if the civil parish president cannot run for another term.¹⁵ As voter turnout tends to be highly persistent, controlling for pre-treatment records of the outcome variable is especially important, as pointed in McKenzie (2012). Figure A5 shows the spatial allocation of treatment and control groups.

During the 63 hours of the treatment, our campaign reached more than 1.5 million unique cards in 682 civil parishes, i.e., 40% of all the civil parishes.

III. 3. Data

Outcome variables, composed from the number of registered and actual voters for the 2017 local elections and for previous elections, are obtained from official turnout records for civil parishes. These data are combined with treatment assignment and descriptive information provided by the ATM company on three treatment intensity measures: the number of cards, the number of operations, and the number of withdrawals.¹⁶ Recall that withdrawals are just one of the possible operations that can be done in the Portuguese ATM network.¹⁷ All these numbers do not include foreign credit or debit cards. We can distinguish between number of operations during the three days of the campaign and during the weekend of the elections. We also collected data on a series of potential socio-demographic, political, and economic controls. Table 1 presents the descriptive statistics of our sample.

[Insert Table 1 here]

Besides the variables considered as part of the randomization procedure, we add a vector of socio-demographic covariates to our analysis. Education is one of the strongest

¹⁵ Veiga and Veiga (2018) study the impact of the 2013 introduction of mayoral term limits on turnout and show that presence of term-limited incumbents has a positive impact on voter participation. For more information about the impact of this reform on incumbency advantage see Fonseca (2017).

¹⁶ Unique cards as well as the other intensity measures are counted per civil parish in the three days before the 2017 local election. We do not know the origin of viewers (they could even be from civil parishes in areas without ATMs). Therefore, this may be overstating the actual number of reached potential voters if someone used the same card in different civil parishes or if there are some clients of the ATM machines with less than 18 years old, the minimum required age to vote.

¹⁷ In 2017, withdrawals accounted for less than 30% of the operations in *Multibanco* (Banco de Portugal, 2017).

predictors of voter turnout, so we include the shares of the population with no primary education and with tertiary education. We use the unemployment rate and the mean value withdrawn in ATMs on September 2016 as proxies for the economic environment.¹⁸ Both the education measures and the unemployment rate were obtained from the 2011 census operation of the Portuguese National Institute of Statistics (*INE*).

Our analysis also considers a vector of institutional variables. Political competition has been shown to positively affect turnout, as in Gerber et al. (2017) and others.¹⁹ We take two variables proxying for local competitiveness: the percentage difference in the vote on the two largest parties in the 2013 local elections, i.e., the winning margin in those elections, and the number of candidates in the 2017 municipal election. We also include whether the incumbent mayor has independently run for office and the share of leftist mandates in the Municipal Assembly as defined in the 2013 elections. These variables are provided by *Direção Geral Antarquias Locais (DGAL)*.

Balance tests on the variables described in this subsection are presented in Table A1 of the Appendix to this paper: they show that randomization was successful in creating comparable treatment and control groups.

III. 4. Econometric specifications

We estimate the intent-to-treat (average treatment effects) impact of the campaign using the following specification:

$$Turnout Rate_{im} = \alpha_m + \gamma.Treatment_i + \beta.X_i + \varepsilon_i \quad (1)$$

where the outcome variable is the *Turnout Rate* for the 2017 local elections, determining who will become president of the civil parish board. i denotes a Civil Parish. α_m includes binary variables for each of the 308 Portuguese municipalities (denoted by m). *Treatment* is a binary indicator that takes value one if the civil parish was treated. γ is our coefficient of interest, capturing the effect of being assigned to the treatment group. It captures both the direct impact of the campaign on voters who saw it and indirect spillover effects stemming

¹⁸ Martins and Veiga (2012), using panel datasets covering all mainland municipalities, from 1979 to 2005, and cross-sections of civil parishes for 2011 show that turnout in legislative and local elections react to the state of the economy.

¹⁹ This is consistent with evidence from lab experiments. Levine and Pelfrey (2007), Duffy and Tavits (2008), Agranov et al. (2017) find that a higher chance of being pivotal, as in smaller elections or when elections are closely contested, leads to higher voter turnout.

from interactions between voters who have seen the campaign. X is a vector of covariates including the stratification controls, as well as the socio-demographic and institutional variables specified above. ε_i accounts for robust standard errors given that the unit of observation and the unit of randomization are the same.

As it is the case in several GOTV efforts, our campaign does not reach everyone assigned to the treatment group and may reach people in the control group as a spillover effect. This happens because some of the voters in the treated civil parish may not use the ATM machines, nor interact with people who use them. In fact, it could happen that some of these voters are users of ATM machines in control locations (e.g., where they work, study, or shop). At the same time, voters in non-treated civil parishes, may have used ATM machines in treated civil parishes. As pointed out by Arceneaux and Nickerson (2009), “the failure to treat problem does not bias the estimates of the empirical model (...), because random assignment ensures that (within sampling variability) the treatment and control group have an equal proportion of contactable individuals.” Nevertheless, while the intent-to-treat effect allows us to evaluate the effects of a program, it is not suitable to estimate the behavioural response of individuals to the actual program intervention. Both these possibilities, if real in our experiment, contribute to bias treatment effects towards zero. Some of the robustness tests we show below attempt to minimize the extent that these biases are at work.

We also estimate the following equation considering three measures of campaign intensity:

$$Turnout Rate_{im} = \alpha_m + \gamma_1 Treatment_i + \gamma_2 Intensity_i + \gamma_3 Treatment_i * Intensity_i + \beta X_i + \nu_i \quad (2)$$

where we consider three different measures of *Intensity* provided by the ATM company: the number of cards, the number of operations, and the number of withdrawals. γ_3 is our coefficient of interest, which tests whether more intensely treated civil parishes are associated with significantly higher turnout rates. Control variables are particularly important in this setting. This is the reason we selected a set of control variables that features prominently in non-experimental turnout studies.

Finally, we run a specification to examine whether ATM user j recalled seeing the campaign in two similar civil parishes, but just one of them treated, as follows:

$$Recall_j = \gamma \cdot Treatment_j + \beta \cdot X_j + \varepsilon_j. \quad (3)$$

Here, *Recall* is a binary indicator taking value one if the subject recognizes the image of the campaign. γ is our coefficient of interest. X is a vector of control variables such as gender, age, self-reported education level, and self-reported interest in politics. We present the summary statistics for these variables in Table A2 of the Appendix to this paper.

III. 5 Treatment adherence: the post-treatment recall survey

We conducted a post-treatment survey in eight ATMs in two contiguous civil parishes in Lisbon on Sunday October 8, 2017, one week after the local elections, between 10 a.m. and 1 p.m. One of the civil parishes belonged to the treatment group and the other to the control, respectively *Campo de Ourique* and *Estrela*. Figure 2 presents a map of the exact location of the eight ATMs that were targeted by surveyors, four in the treated and four in the control civil parishes.

[Insert Figure 1 here]

All individuals who used these ATMs in the referred period were approached by the enumeration team, leading to slightly less than 200 valid interviews. All enumerators received detailed training and advice on how to start and lead the questionnaire. Moreover, enumerators were not told about whether they were in a treated or control area. The goal of this exercise was to assess whether there were significant differences in recall for treated and control groups. Enumerators confronted ATM clients with a visual copy of our campaign (see Figure A4), asked whether they recalled seeing the image, and further collected information on socio-demographic characteristics of the interviewees such as age, gender, self-reported education level, and self-reported interest in politics.²⁰ As a placebo, and before confronting ATM clients with the image of our campaign, we asked if they recalled seeing any particular ad in the ATM.

Table 2 presents the results using a linear probability model for the likelihood of recall using equation (3).²¹ The results show a large and statistically significant difference in recall between the treatment and the control civil parishes. Moreover, with respect to recalling past ATM campaigns, there are no reported differences as displayed in column (4).

²⁰ Table A2 of the Appendix to this paper presents the summary statistics for these control variables.

²¹ We examined results using a Probit specification and obtained very similar findings.

[Insert Table 2 here]

IV. Results

IV.1 Average treatment effects

In Table 3 we present the results for the intent-to-treat estimates from equation (1). Across specifications, our findings suggest that treatment causes an increase in turnout, although it never reaches standard levels of statistical significance. It is reassuring to see that the magnitude of the effect is stable as controls are added across specifications, while the precision of the treatment effect increases.²²

[Insert Table 3 here]

IV.2 Heterogeneous effects and Robustness

We now focus on estimating how the intensity of treatment affects voter turnout, making use of information provided by the ATM company, including the number of cards, operations, and withdrawals by civil parish. In addition to the binary treatment variable, we now include, successively, these three different indicators of intensity of ATM usage during the campaign, as well as the interaction term between intensity and treatment. Table 4 presents estimates for equation (2) using information on the intensity of treatment for the entire campaign period. Odd columns show results with fixed effects for the 308 municipalities, whereas even columns show similar results after adding the vector of stratification and additional controls.

Our results in Table 4 suggest that the wide use of ATMs can be a powerful tool for rallying voters. Considering the average ATM usage for the sample of civil parishes and the point estimate in Column (2), our results translate into an increase in the average turnout rate

²² Assuming for a moment the point estimate from column (3) as a treatment effect size, considering the mean turnout for the control group is 61.17%, , and taking the average number of voters per municipality, our treatment would increase turnout by 2.77 ($=0.101/61.173 * 1677.65$) voters, on average, per civil parish). Since our treatment was implemented in 682 civil parishes, our campaign would have a causal impact of 1889 more voters in the 2017 local elections.

by 0.14 percentage points (22.573×0.006), thus indicating that people who live in areas with high ATM usage are mobilized by our treatment. These results are statistically significant and stable across the three proxies of intensity of ATM usage.²³

[Insert Table 4 here]

In face of our concern that there could be a downward bias in treatment effects due to a mismatch between voting and treatment locations for a share of the voters, we restrict our attention to the intensity derived from ATM usage during the weekend, when voters moving across parishes for employment reasons is likely to be smaller. Table A4 presents results using weekend intensity measures, which confirm our previous findings.

For an easier interpretation of results, we compare the magnitudes for the mean and the median values of the three intensity measures. Figure 1 presents the results. We can see that point estimates for the total campaign period and weekend yield very similar results.

[Insert Figure 2 here]

In addition, we also run a battery of robustness exercises. First, we exclude the large urban areas of Lisbon and Oporto (in Table A5 of the Appendix to this paper), as well as the autonomous regions of Azores and Madeira (in Table A6 of the Appendix to this paper). These specifications aim to disregard possible concerns with the results being driven by more urban areas or insular regions. The results remain unchallenged. Finally, we run a horse race to test if our main result is affected by differences in important control variables in the treatment and control areas. For that we modify equation (2) by adding an interaction term between the treatment status dummy and the top 5 most highly correlated control variables with ATM usage.²⁴ These results (reported in Table A7 of the Appendix to this paper) confirm our main conclusions.

IV. 3 Falsification tests

²³ In Figure A6 we provide a graph of the estimated treatment effects in Table 3. As expected, we see no differences for areas with limited ATM usage while we observe sizable effects in the areas with many ATM users. We also relax the functional form by separating our sample by each tercile of parishes in terms of ATM usage (measured by the number of unique cards). The results are presented in Table A3.1 and show that the tercile with highest ATM usage seem to be most responsive to our treatment. In addition, we also test the robustness of our findings with a difference-in-differences exercise using the turnout for the 2017 and the 2013 local elections. The results in Table A3.2 are very similar to our baseline results.

²⁴ For space considerations, we present the results for the number of cards as our intensity measure. Results for the other intensity measures are available from the authors upon request.

In Table A8 of the Appendix to this paper we present again estimates considering the intensity of treatment for the entire campaign period but employ instead the turnout rates for (i) the 2014 European elections, (ii) the 2015 legislative elections, and (iii) the 2016 presidential elections as the dependent variable. This constitutes a placebo test for our parameters of interest. We find no statistically significant effect of the campaign on turnout using the alternative placebo dependent variables, further strengthening our interpretation of the results as causal, associated with the specific timing and scope of the nationwide field experiment.

IV. 4 Cost-effectiveness discussion

So far, we have analyzed the potential benefits of using ATMs to get out the vote. But how much does it cost to make someone vote instead of abstaining? Is it cost-effective? These are precisely the questions that we tackle in this subsection.

The cost of our campaign, in terms of revenue that was not received from selling the ad space to other clients of the ATM system was estimated, by the partner organization, at around 35,000€ (2017 current prices). In addition, since we used the official layout – images, lettering, and official seal of the National Electoral Commission, no further costs on creating the visual aspects of the campaign should be imputed. Taking this into consideration we can reach two conclusions with back-of-the-envelope computations: 1) the cost of reaching an additional potential voter was below 3 cents ($35,000\text{€}/1,547,197$ unique card users in the treated area); and 2) the cost effectiveness of our campaign, considering the numbers presented in Section IV. 1, was 18.53€ ($35,000\text{€}/1,889$ new voters) or \$20.81 (at September 2017 exchange rates).

We compare these numbers with the benchmark on other modes of communication provided by Green and Gerber (2019). For ease of comparison, we present their conclusions in Table A9 of the Appendix to this paper, adapted from Green and Gerber (2019). Two caveats should be mentioned. First, they only report cost-effectiveness estimates of tactics whose average impact has been demonstrated, in their survey of the literature, to be significantly greater than zero. Second, dollars-per-vote exclude start-up and management costs (which are included in our assessment). Regarding other modes of communication, costs range between \$31 (for door-to-door) and \$91 (for nonpartisan direct mail).

Hence, costs of converting get-out-the-vote efforts into voting, for the other means of communication reviewed by Green and Gerber (2019), seem to be substantially higher than the cost-benefit of our treatment. So, despite the relative modest effects of the treatment, it probably helps that the ATM campaign involved reaching people frequently in moments where they are, naturally, paying attention to a screen before withdrawing their own money or using the other wide-ranging services of the Portuguese ATMs.

V. Concluding Remarks

We conducted a field experiment that encompassed the entire universe of ATM machines in a country to assess whether treating a subset of civil parishes with a get-out-the-vote message based on activating the social norm of civic duty delivers higher turnout. Portugal is an appropriate testing ground as there is an ATM system that is both virtually universal, and particularly credible – it is the base for a wide array of sensitive financial and tax operations in the country. ATMs are so far an unexploited mode of communication for voter mobilization. All ATM users in treated civil parishes were subject to a message encouraging turnout based for three consecutive days leading to the day of the local elections in 2017. In the treated civil parishes, ATM users were exposed to no other message in ATMs, while in non-treated civil parishes voters were exposed to the usual advertisement messages. Considering the number of unique cards who saw our treatment in the 63 hours of the campaign, the cost of reaching an additional potential voter was below 3 cents.

While the estimated impact of treatment on turnout, despite the stability of the estimates, is not significant, results that consider the intensity of treatment measured by the number of ATM users, the number of operations and the number of withdrawals show a statistically significant effect on turnout. This is true for the whole treatment period, as well as for the weekend, when contamination between treatment and control is less likely. A placebo test using turnout for the previous election and a plethora of robustness checks further strengthen our causal interpretation.

The short time frame for which the experiment was run, and the low-cost and wide dissemination of the communication tool suggest a great potential of ATMs for channelling get-out-the-vote campaigns. The fact that voters were approached electronically at a moment when they are likely to be paying attention to the means of communication provides an indication of what can be done through the internet employing ads that are strategically placed. Based on our findings, it is likely that ads linked to the financial movements of voters

are effective at increasing electoral participation. These results can also potentially be generalizable to the use of automated kiosks that are being more and more used for transactions worldwide. Less closely related to ATMs, the (cost-)efficacy of ads in Youtube, Spotify, and other related digital platforms in get-out-the-vote efforts can also constitute an interesting avenue for future research.

Moreover, as voting moves to electronic platforms in many countries, and ATMs represent a highly secure network with unique capillarity, one can envision that electoral communication and procedures can increasingly be taken to these networks.

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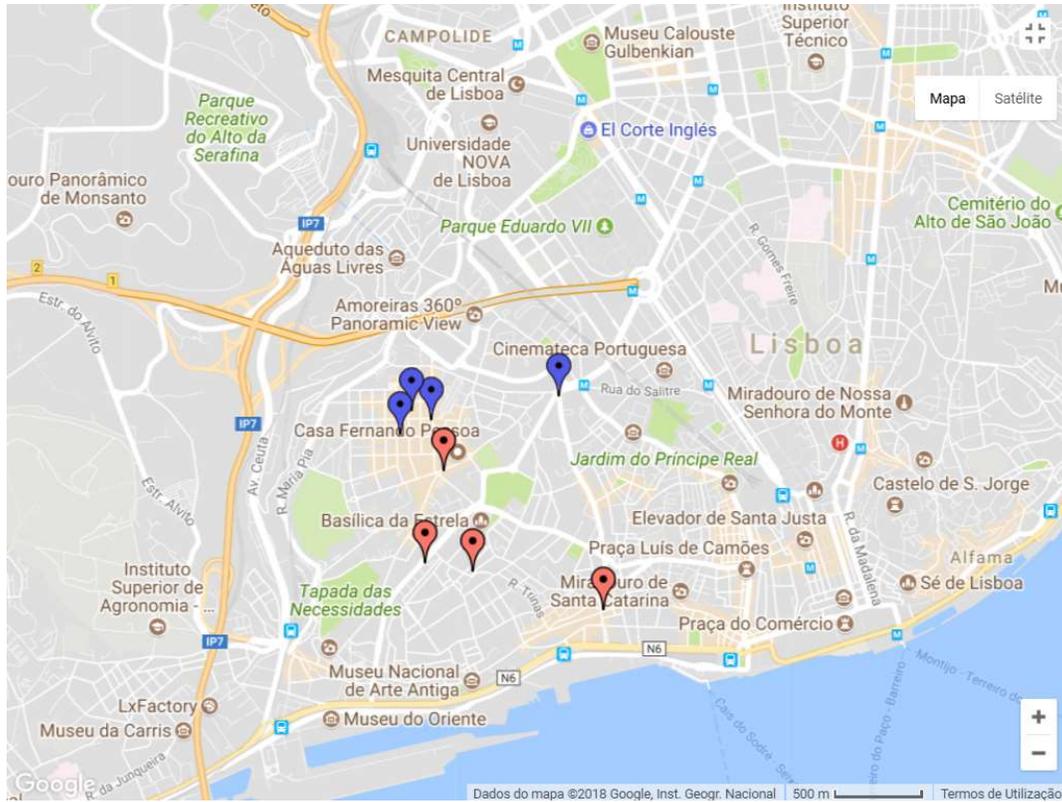
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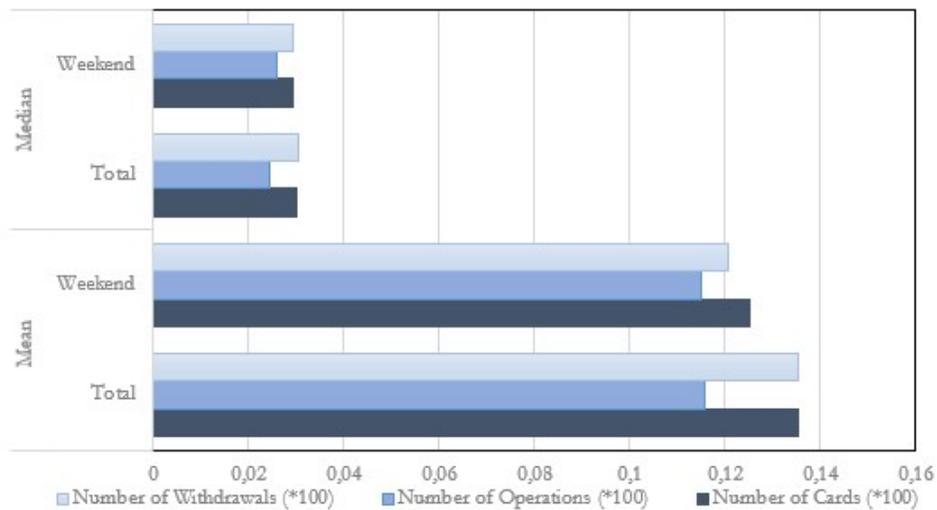
Figures

Figure 1. Recall: Treated and Control ATMs



Note: Treated ATMs (*Campo de Ourique* civil parish) in Blue and Control ATMs (*Estrela* civil parish) in Red.

Figure 2. Interpretation of Intensity Effects: Mean and Median



Tables

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Dependent Variable (%)				
Turnout Rate 2017	61.222	9.266	34.61	89.154
Turnout Rate EU 2014	33.833	7.278	0	64.63
Turnout Rate Legislative 2015	56.17	7.591	22.423	80.335
Turnout Rate Presidential 2016	48.957	8.025	17.09	74.36
Experimental Variables				
Treatment	0.4	0.49	0	1
Intensity Measures: Total				
Number of Cards (/100)	22.573	49.317	0	532.59
Number of Operations (/100)	38.522	84.409	0	869.99
Number of Withdrawals (/100)	19.305	41.691	0	467.8
Intensity Measures: Weekend				
Number of Cards (/100)	12.525	26.317	0	259.34
Number of Operations (/100)	19.123	40.695	0	399.11
Number of Withdrawals (/100)	10.042	20.884	0	224.09
Stratification Controls				
Voters Density	512.904	1292.266	1.729	14081.45
Number of ATM Devices	7.006	14.334	1	162
Number of Commercial Banks	1.19	3.225	0	36
Turnout 2013 (%)	59.509	9.913	5.869	100
Term Limit Dummy 2017	0.086	0.28	0	1
Other Controls				
Socio-demographic and Economic				
Population Below 15 Share 2011 (%)	24.658	4.973	5.941	47.09
Population Above 70 Share 2011 (%)	16.532	7.335	3.564	54.525
New Citizens Share 2011 (%)	2.143	1.258	0	12.209
Until Primary Education Share 2011 (%)	39.4	8.03	17.087	78.96
Tertiary Education Share 2011 (%)	7.763	5.172	0.301	41.829
Mean Value September 2016	40162.93	82599.15	0	825553.8
Unemployment Rate 2011 (%)	12.395	3.920	0.990	31.299
Service Workers Share 2011 (%)	61.828	14.019	23.696	91.474
Fiscal and Political				
Transfer to Civil Parishes per capita	0.031	0.028	0	0.246
Winning Margin 2013 (%)	21.71	18.523	0.045	100
Number of Candidates 2017	3.585	1.303	1	10
Independent Mayor Dummy	0.098	0.297	0	1
Leftist Share 2013 (%)	48.924	22.586	0	98.587
Central Government Alignment Dummy	0.447	0.497	0	1

Note: N=1 703.

Table 2. Self-Reported Recall Results of the post-treatment recall survey

	Recall GOTV Campaign			Recall Any Campaign
	(1)	(2)	(3)	(4)
Treatment	0.113** (0.054)	0.118** (0.056)	0.092* (0.055)	0.016 (0.078)
Gender		0.078 (0.058)	0.063 (0.061)	-0.158** (0.077)
Age		0.002 (0.002)	0.002 (0.002)	0.004* (0.002)
Primary Education			-0.145 (0.152)	-0.093 (0.222)
Secondary Education			-0.024 (0.158)	0.104 (0.208)
Tertiary Education			0.022 (0.154)	0.142 (0.202)
Low Interest in Politics			-0.035 (0.072)	0.034 (0.095)
Medium Interest in Politics			-0.020 (0.105)	-0.063 (0.123)
_cons	0.111*** (0.037)	-0.029 (0.108)	0.012 (0.171)	0.257 (0.238)
Mean of Control Group	0.111	0.113	0.113	0.486
N	188	176	175	175
Adjusted R2	0.015	0.025	0.017	0.011

Note: The main dependent variable, Recall GOTV Campaign, is a binary indicator that takes value one if the ATM user reported to recall seeing our treatment message. Recall Any Campaign is a binary indicator that takes value one if the ATM user reported to recall seeing any advertising campaign in the ATM. Treatment is a binary indicator that takes value one if the ATM user was asked in one of the four ATMs in *Campo de Ourique*. The omitted categories in the control variables are No Primary Education and High Interest in Politics. Robust standard errors are depicted in parenthesis. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***)

Table 3. Treatment Effects

	Turnout Rate 2017			
	(1)	(2)	(3)	(4)
Treatment	0.119 (0.458)	0.109 (0.322)	0.101 (0.178)	0.091 (0.175)
Municipal dummies	No	Yes	Yes	Yes
Stratification Controls	No	No	Yes	Yes
Other Controls	No	No	No	Yes
Number of observations	1 703	1 703	1 703	1 703
Mean of Control Group	61.173	61.173	61.173	61.173
Adjusted R2	0.001	0.574	0.870	0.876

Note: The dependent variable, Turnout Rate 2017, is measured in percentage terms. Treatment is a binary indicator that takes value one if all ATMs in the civil parish displayed the voting campaign. There are 308 municipal dummies. The vector of Stratification Controls includes registered voters' density, the number of ATM devices, the number of commercial banks in 2016, and turnout in 2013 municipal elections. The vector of Other Controls includes the share population below 15 years old in 2011, the share of population above 70 years old in 2011, the share of new citizens in 2011 (since 2007), the share of citizens with primary education and below in 2011, the share of citizens with tertiary education in 2011, the mean value withdrawn in ATMs in September 2016, the unemployment rate in 2011, transfers to civil parishes per capita, the winning margin share in 2013 Local Elections, the number of candidates in the 2017 local election, an independent mayor dummy for 2017, the share leftist votes in the 2013 local election, a central government alignment dummy. Robust standard errors are depicted in parenthesis. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***)

Table 4. Intensity Effects: Entire Campaign

	Turnout Rate 2017					
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.244 (0.350)	-0.035 (0.196)	-0.232 (0.349)	-0.034 (0.195)	-0.254 (0.351)	-0.039 (0.195)
Treatment * Number of Cards (*100)	0.016** (0.007)	0.006** (0.003)				
Number of Cards (*100)	-0.058*** (0.006)	-0.012 (0.010)				
Treatment * Number of Operations (*100)			0.009** (0.004)	0.003** (0.002)		
Number of Operations (*100)			-0.034*** (0.003)	-0.009 (0.006)		
Treatment * Number of Withdrawals (*100)					0.020** (0.009)	0.007** (0.003)
Number of Withdrawals (*100)					-0.069*** (0.007)	-0.020 (0.013)
Municipal Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Stratification Controls	No	Yes	No	Yes	No	Yes
Other Controls	No	Yes	No	Yes	No	Yes
N	1 703	1 703	1 703	1 703	1 703	1 703
Adjusted R2	0.617	0.876	0.618	0.876	0.619	0.876

Note: The dependent variable, Turnout Rate 2017, is measured in percentage terms. Treatment is a binary indicator that takes value one if all ATMs in the civil parish displayed the voting campaign. There are 308 municipal dummies. The vector of Stratification Controls includes registered voters' density, the number of ATM devices, the number of commercial banks in 2016, and turnout in 2013 municipal elections. The vector of Other Controls includes the share population below 15 years old in 2011, the share of population above 70 years old in 2011, the share of new citizens in 2011 (since 2007), the share of citizens with primary education and below in 2011, the share of citizens with tertiary education in 2011, the mean value withdrawn in ATMs in September 2016, the unemployment rate in 2011, transfers to civil parishes per capita, the winning margin share in 2013 Local Elections, the number of candidates in the 2017 local election, an independent mayor dummy for 2017, the share leftist votes in the 2013 local election, a central government alignment dummy. Robust standard errors are depicted in parenthesis. Stars indicate significance levels of 10% (*), 5% (**), and 1% (***).