

# How do Brazilian voters trade school quality and other government outputs when evaluating municipal politicians?

## Online survey pre-analysis plan

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### **Abstract**

In a working paper combining a natural experiment and a field experiment (“Evaluating students and politicians: Test scores and electoral accountability in Brazil”), we find that positive information about the performance of municipal schools has a negative effect on voting for the incumbent. This goes against established theories of retrospective voting and electoral accountability. In this pre-analysis plan we detail a design for an online survey that aims at understanding these counter-intuitive findings. We lay out a number of hypotheses and a simple survey design, with an experiment at its core, aimed at testing them.

# 1 Background

In a working paper (“Evaluating students and politicians: Test scores and electoral accountability in Brazil”), we find that positive information about the performance of municipal schools has a negative effect on voting for the incumbent. This goes against established theories of retrospective voting and electoral accountability.

Our findings stem from two research designs and two datasets from Brazil. First, in a regression discontinuity design (RDD) exploiting data for the municipal elections of 2008, 2012 and 2016 across Brazil, we study the effect of municipalities meeting a highly visible school quality target (IDEB) on electoral outcomes. Second, in a randomized controlled trial (RCT) in a sample of municipalities in Pernambuco, we study the effect on individual vote choice of informing voters before the election about their municipality’s performance rank in an early student assessment (ANA).

Contrary to expectations, we find in both the RDD and the RCT that signals about school quality *decrease* rather than increase electoral support for the incumbent. In the RDD, we find that municipalities that meet the IDEB target have a lower vote share for the mayor than those that miss their target. In the RCT, we find that voters are less likely to vote for the mayor the better the performance of the municipal schools.

We do find more intuitive results for individuals (or in municipalities) where one would expect school quality to be most salient and valuable. In the RCT, we find that parents whose children are enrolled in municipal schools respond to the information about school quality in the expected direction, i.e. the more positive the signal, the larger the treatment effect on voting for the incumbent. Similarly, in the RDD we find that the negative effect of meeting the IDEB target disappears for municipalities where the number of children who are enrolled in municipal schools (as a proportion of the population) is high.

Our next step is to conduct an online survey of Brazilian voters to un-

derstand what drives our counter-intuitive results. What makes voters (at least those without a direct stake in the quality of primary education) respond negatively to positive signals of school quality? This pre-analysis plan outlines our hypotheses, the survey design, the outcomes we will measure, the survey flow, and our strategy for respondent recruitment.

## 2 Hypotheses

The main hypothesis stemming from the RCT and the RDD is that voters are less likely to vote for the incumbent when they receive positive signals about the quality of public schools (H1). The main goal of the survey is to explain this counter-intuitive finding. We have developed a number of hypotheses that could explain it:

1. Trade-off hypotheses:

- H2: Education quality vs public jobs trade-off. Voters punish good performers because they perceive a trade-off between the quality of schools and the number of people employed by the municipality (in education or other sectors) or, more generally, a trade-off between government performance and jobs.
- H3: Education quality vs healthcare quality trade-off. Voters punish good performers because they perceive a trade-off between improving the quality of municipal schools and the quality of municipal clinics, which they value more.
- H4: Education quality vs poverty alleviation trade-off. Voters punish good performers because they perceive a trade-off between the quality of municipal schools and the municipal government's efforts at reducing poverty, which they value more.
- H5: Education quality vs government responsiveness trade-off. Voters punish good performers because they see politicians who improve school quality as less responsive to their needs.

2. Mediated trade-off hypotheses:

- H6: People who give less importance to education, relative to other policy areas, are more likely to punish the incumbent when informed about good school performance because they perceive

such information as a signal of the incumbent not prioritizing their interests.

- H7: Parents (H7a), parents of primary- and middle-school aged children (H7b), or parents of primary- and middle-school aged children enrolled in municipal schools (H7c) have a direct stake in education quality and thus respond positively to good school quality signals (i.e., in the opposite direction than hypothesized in H1-H5). We expect parents with a more direct stake in school quality to respond more positively to good school quality signals (i.e. our prior belief about the likelihood of these sub-hypotheses is higher for H7c than for H7b, and higher for H7b than for H7a).

### **3 Design**

To test these hypotheses, we will conduct a short online survey with Brazilian respondents recruited via Facebook. The core of the survey is an information experiment, which will be preceded by some questions that help us collect pre-treatment covariates and simulate the conditions in which voters make decisions during electoral campaigns.

#### **3.1 Pre-treatment primes**

Before the experiment we will expose respondents to a battery of questions about how important they think different policy areas are for their personal interests. In particular, respondents will be asked to rank improvements in education, healthcare, employment in the municipal sector, economic activity in general, security, and fight against poverty. This will allow us to (i) collect data about saliency of different policy areas for voters; and (ii) prime respondents to think about the importance of different policy areas, and thus simulate the conditions in which voters decide their vote during electoral campaigns.

Immediately before the experiment, we will inform voters about IDEB (what it is and what it means for a municipality to meet its IDEB target),

and ask them whether they had already heard about it.

### 3.2 Information experiment

Rather than use a vignette experiment with information about a hypothetical mayor (Boas et al., 2018; Weitz-Shapiro and Winters, 2017), we provide real-world information about the performance of the mayor (or former mayor) of the respondent's self-reported municipality.<sup>1</sup> Respondents will be randomly assigned to one of two groups: control (where they are not given information about whether their municipality met its target) and treatment (where they are informed about whether their municipality met its school quality target, as per the data published in 2016). Those in the treatment group read the following question:

In the year 2016, at the end of the term of Mayor [Name], [Municipality] [did not achieve / achieved] its IDEB target. Have you heard about that result?

The treatment information is accompanied by two images designed to reinforce the message: a photograph of the mayor (obtained from the official repository of the Supreme Electoral Court) and a red cross or a green checkmark, depending on the municipality's IDEB performance. Those assigned to the control group do not read any version of this question or a substitute.

### 3.3 Outcomes

Next, all respondents, regardless of random assignment, read the following text: "Thinking about [Mayor], do you agree or disagree with the following statements about [his/her] term as Mayor of [municipality] during the period 2012–2016?" Response options are on a 4-point Likert scale ("totally agree", "partially agree", "partially disagree", "totally disagree"). To collect

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<sup>1</sup>Given that the most recent IDEB data corresponds to 2015, we provide information about the mayor during the 2012-2016 term. In some cases the current mayor, elected in October of 2016 and in office since January of 2017, differs.

outcome data, we will ask about their agreement with the following statements, with the order of items randomized within respondents.

- As mayor, he/she hired a lot of public servants.
- As mayor, he/she improved municipal health clinics.
- As mayor, he/she helped people like you solve problems.
- As mayor, he/she reduced poverty in the municipality.
- As mayor, he/she improved municipal schools.
- As mayor, he/she invested a lot of money in education.

After these main outcomes, we will ask respondents whether they would vote for that mayor if they were to run for another term, again with response options being in a 4-point Likert scale from "great chance" to "no chance".

## 4 Estimation and inference

To analyze the impact of the information treatments on outcomes, we estimate the average treatment effect using the following estimating equation:

$$Y_i = \alpha + \beta_1 T_i^p + \beta_2 T_i^n + \sum_{k=1}^K (\theta_k X_i^k + \gamma_k X_i^k T_i^p + \delta_k X_i^k T_i^n) + \varepsilon_i \quad (1)$$

$Y_i$  is the outcome variable for respondent  $i$ ,<sup>2</sup>  $T_i^p$  is an indicator for the positive treatment group and  $T_i^n$  is an indicator for the negative treatment group. We include  $K$  covariates (sex, gender, race, education level, and region fixed effects) to increase precision. To ensure that  $\beta_1$  and  $\beta_2$  are consistent estimators of the treatment effects, we demean all covariates  $X_i^k$  and interact them with the treatment indicators. We will use the HC2 estimator for the standard errors to account for heteroskedasticity.

To estimate heterogeneous treatment effects, as specified by hypotheses H6 and H7, we will add interactions between treatment and the corre-

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<sup>2</sup>As outcomes we will have respondents' answers to individual items, as well as an index of the non-education items constructed with principal component analysis.

sponding mediator variable  $M_i$ , namely an indicator for whether they assign below-median value to education, or whether they have / had / will have kids enrolled in public / municipal schools):

$$Y_i = \alpha + \beta_1 T_i^p + \beta_2 T_i^n + \beta_3 M_i T_i^p + \beta_4 M_i T_i^n + \pi M_i + \quad (2)$$

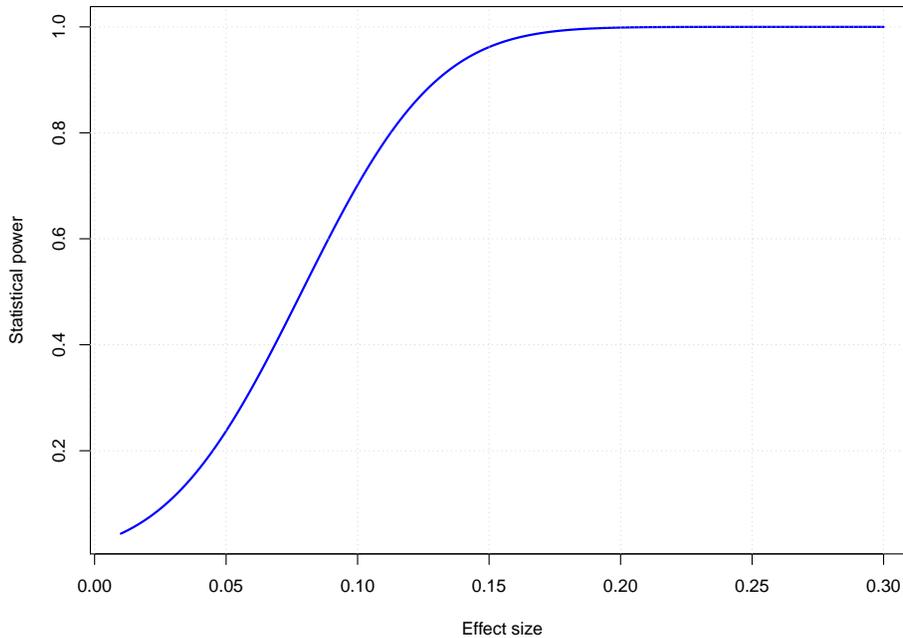
$$+ \sum_{k=1}^K (\theta_k X_i^k + \mu_k X_i^k M_i + \gamma_k X_i^k T_i^p + \delta_k X_i^k T_i^n + \phi_k X_i^k M_i T_i^p + \lambda_k X_i^k T_i^n M_i) + \varepsilon_i \quad (3)$$

In these estimating equations,  $\beta_3$  and  $\beta_4$  are consistent estimators for the conditional treatment effect for the group of respondents with the indicator  $M_i$ . We also interact the mediator indicator with demeaned covariates and their interaction with treatment in order to ensure that we consistently estimate the conditional average treatment effect.

## 5 Power analyses

We simulate how the statistical power of our difference-in-means will vary with the size of the effect. Our dependent variables are 4-point Likert scales. We assume these will have a sample standard deviation of 1.1, which is the average standard deviation we found in a pilot of the survey, and that we will have a sample size of 3,000 respondents, half of which will be assigned to treatment.

As can be seen in Figure 1, for the usual power of 0.8, our design would detect effects of 0.11 standard deviations or more. For reference, [Weitz-Shapiro and Winters \(2017\)](#) find in a vignette experiment with Brazilian voters that respondents treated with messages about the corruption of a hypothetical mayor showed effects of between 0.76 and 1 standard deviations in a 4-point Likert scale of electoral support. Moreover, the simulations included here are for difference-in-means tests – we expect to gain some power by controlling for pre-treatment covariates.



**Figure 1** – Statistical power under varying effect sizes, assuming there are 1,500 respondents in each treatment group and the sample standard deviation of the outcome is 1.1

## 6 Respondent recruitment and incentives

Respondents will be recruited via Facebook ads. Last year, Facebook reported that slightly more than half of the Brazilian population accesses Facebook each month, mostly through mobile devices.<sup>3</sup> Using Facebook to recruit subjects is a well-established, low-cost method for online survey experiments targeting non-Americans. Ads will be targeted to municipalities in Brazil excluding the largest ones. This restriction will be imposed to ensure that we get enough respondents from small and medium municipalities, which make the immense majority of the sample in the RDD and RCT designs. Targeted Facebook users will view advertisements offering a chance to win 100 Brazilian reais (about 24 US dollars) for taking a survey,

<sup>3</sup><https://www.facebook.com/business/news/102-milhes-de-brasileiros-compartilham-seus-momentos-no-facebook-todos-os-meses>.

with a 1/100 probability of winning.<sup>4</sup> Once they click on the ad, they will be redirected to an external website, Qualtrics, which hosts the survey. The survey itself will be conducted on the Qualtrics platform, and on respondents' own devices.

## 7 Survey flow

The survey, which we estimate will take about 10 minutes to complete, will have the following structure:

- A first section will welcome respondents and present them with information about the research and the survey, asking them to confirm whether they want to participate. If they decide they do not want to participate, the survey will end.
- A second section will ask respondents 3 eligibility questions: whether they live in Brazil, their age (they must be 18 or older), and whether they are registered to vote. If they do not fulfill any of these 3 conditions, the survey will end.
- A third section will collect data on pre-treatment covariates. Respondents will be asked in what state and municipality they live. Next, they will be asked to rank a number of policy areas according to the importance they have for them. They will also be informed about IDEB and asked whether they already knew about it.
- A fourth section will provide those assigned to the treatment group with information on the performance of their municipality on IDEB.
- A fifth section will collect data on outcomes.
- A sixth section will collect data on socioeconomic covariates: race, gender, education level, and whether they have kids enrolled in primary or middle school, and what kind of school (municipal / state / federal / private) their kids attend / attended / will attend.
- A final section asking them whether they want to participate in the 100-reais raffle. If they decide they do, they are redirected to a sepa-

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<sup>4</sup>Winners will be contacted so that they can choose whether they want the 100 reais as phone credit or as a bank transfer. We will send one reminder after a few days to those who do not respond. If an email bounces back (e.g. if the person had entered an in-existent email) we will draw another winner.

rate Qualtrics survey that asks them to submit their name and email address, such that responses cannot be linked to respondent identifiers.

## References

Boas, T. C., F. D. Hidalgo, and M. A. Melo (2018). Norms versus Action: Voting Against Malfeasance in Brazil.

Weitz-Shapiro, R. and M. S. Winters (2017). Can citizens discern? information credibility, political sophistication, and the punishment of corruption in Brazil. *The Journal of Politics* 79(1), 60–74.