Is the effect of campaign spending higher in poorer electoral districts?

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Abstract

This paper estimates the moderator impact of poverty on the effect of campaign spending on electoral outcomes. Methodologically, the research design combines both descriptive and multivariate statistics to analyze data from Electoral Superior Court (Tribunal Superior Eleitoral) regarding 2010 House of Representatives Brazilian elections.The results suggest that: (1) an extra additional 1% in spending produces an average increase of 0,7% on votes; (2) non-elected candidates ($\beta = .606$) benefit more for spending than elected ones ($\beta = .276$) and (3) the effect of campaign spending on electoral outcomes depends upon district income levels and follows a quadratic function (r^2 quadratic $= .510$).

Keywords: campaign spending; electoral outcomes; poverty levels.

1 Introduction[1]

Imagine the following situations: (1) an election where candidates provide both food and beverages (including alcoholic) for voters just before they cast their votes; (2) a public service system where jobs are assigned by political criteria and (3) an incumbent candidate is charged of receiving campaign contributions in exchange for making favors for state contractors. These cases are not about Latin American countries that are well known by lack of law enforcement. These cases are not about African nations that are worldwide acknowledged by high levels of corruption. These cases represent both the U.S. (cases 1 and 2) and Canada (case 3) before regulate their campaign finance[2].

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[1] This paper is based on my PhD thesis submitted to Political Science Department (DCP) at Federal University of Pernambuco (UFPE) and it was developed during my visit to The Vincent and Elinor Ostrom Workshop in Political Theory and Policy Analysis, Bloomington, Indiana. I am thankful for all support received for both institutions. Replication data is available at:

[2] According to Smith (2001), in 1757, George Washington spent £39 to buy food and rum for his voters.

Theoretically, campaign finance regulation aims to achieve two goals: (1) to promote political equality and (2) to prevent corruption (SMITH, 2001). Arguments that favor increasing regulation are based on four assumptions: a) too much money is spent on political activity; b) campaigns funded with large contributions are not representative of public opinion but biased toward big donors; c) a candidate's spending largely determines electoral results and d) money exerts a powerful corrupting influence on the legislature.

This paper focus on the third argument: the effect of spending on votes. In particular, we investigate the moderator effect of poverty on the impact of money on votes. Substantively, we test the hypothesis that the impact of campaign spending on electoral outcomes is higher in poorer electoral districts. Methodologically, the research design combines both descriptive and multivariate statistics to analyze data from Electoral Superior Court (Tribunal Superior Eleitoral) regarding 2010 Brazilian federal deputies elections. All statistical analysis were performed based on Statistical Package for Social Sciences (SPSS) and Geoda.

The remainder of the paper is divided as follows. Next section reviews the literature on campaign spending and electoral outcomes. Then we present the main characteristics of research design. Third section summarizes all statistical results. Final section presents our concluding remarks.

2   Literature review[3]

The relationship between campaign spending and electoral outcomes is a canonical issue in Political Science. According to Figueiredo Filho (2012), 62 papers were published on the subject between 1973 and 2008. The typical research design has three main characteristics: (1) it estimates a regression of a candidate's vote share on some function of the candidate's spending levels after controlling for additional variables; (2) it uses ordinary least squares functional form[4] and (3) the unit of analysis is the United States House of Representatives[5]. According to Gerber (2004), the basic model to analyze the relationship between money and votes is the following:

$$\text{Votes}_{\text{inc}} = \alpha + \beta_1(\text{spending}_{\text{inc}}) + \beta_2(\text{spending}_{\text{chal}}) + \beta_3(X) + \epsilon$$

where Votes_{inc} is the incumbent's share of the two-party vote, spending_{inc} is the total incumbent campaign spending, spending_{chal} is the total challenger campaign spending, and X represents a set of variables other than campaign spending that are thought to influence candidate election outcomes, such as challenger quality or constituency partisanship (GERBER, 2004).

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[3] Jacobson (1985) reviews the empirical literature produced during the mid-1980s.

[4] Regarding functional form, Welch (1974), Jacobson (1976) and Shepard (1977) employ linear models. Welch (1976) use a semi-log model, Lott e Warner (1974) use a log-log model and Silberman and Yochum (1978) insert a quadratic term in the model.

[5] Figueiredo Filho (2012) data suggest that 64.50% of all literature is based on U.S. institutions (40 articles).

Some scholars examine municipal elections (FLEISCHMANN and STEIN, 1998), subnational legislative (OWENS and OLSON, 1977; TUCKER and WEBER, 1987; JEWELL and BREAUX, 1988; HUDSON, 2006; BROWN, 2009), state primaries (BREAUX and GIERZYNSKI, 1991; HOGAN, 1999), the Senate elections (GRIER, 1989; GERBER, 1998), gubernatorial races (PATTERSON, 1982; PARTIN, 2002; BARDWELL, 2005) and presidential nomination campaigns (HAYNES, GURIAN and NICHOLS, 1997).

On methodological grounds, some pundits employ two-stage least squares (GREEN and KRASNO, 1988), logarithmic transformations (JACOBSON, 1978), computational experiments (HOUSER and STRATMANN, 2008), field experiments (GERBER and GREEN, 2000; GERBER, 2004) and natural experiments (MILYO, 1998) trying to properly identify the mechanisms that link spending and votes.

On theoretical grounds, Gary Jacobson has produced the seminal work on campaign-spending literature. Figure 1 illustrates the Jacobson's effect.
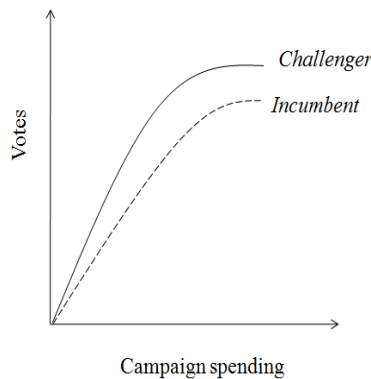

Figure 1 - Jacobson's effect.

Both challengers' and incumbents' spending exert a positive effect on their share of votes and suffer from diminishing returns. However, each extra dollar spent by challengers has a higher impact than incumbents spending. Levitt (1994) argues that campaign spending has an extremely small impact on election outcomes, regardless of who does the spending (LEVITT, 1994: 777). Gerber (1998) points out that when endogeneity problems are properly taken into account, the marginal effects of incumbent and challenger spending are roughly equal (GERBER, 1998: 401). Jacobson (1990) argues that

> the OLS regression models reported in most studies are inappropriate for estimating reciprocal relationships; a simultaneous equation system is required. OLS estimates of parameters when the true relationship is reciprocal are biased and inconsistent because endogenous variables (those which have a reciprocal effect on one another), when treated as explanatory variables, are correlated with the error term (JACOBSON, 1978: 470).

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Nevertheless, there are controversial findings even among studies that employ two-stage least squares regression. Green and Krasno (1988) report that incumbent campaign spending coefficients' were positive and statistically significant. On the other side, Jacobson (1978) argued that spending by challengers has a much more substantial effect on the outcome of the election even with simultaneity bias purged from the equation (JACOBSON, 1978: 475).

Despite scholarly efforts, comparative empirical work is still very limited and our current understanding about the effects on money on votes outside of the United States is scarce[6].Thus, this paper aims to advance our existing knowledge on this subject by analyzing the moderator effect of poverty on the impact of money on votes. The research hypothesis holds that the impact of campaign spending on electoral outcomes is higher in poorer electoral districts.

3   Data and methods

This section describes all methodological procedures in order to facilitate the replicability of the observed results (KING, 1995). Figure 2 depicts the research hypothesis.
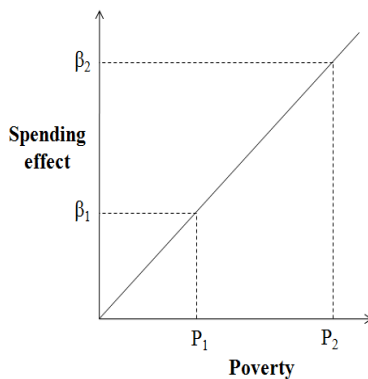

Figure 2 - Research hypothesis

The higher the poverty level of a specific electoral district, higher should be the effect of campaign spending on votes. To explain, we are assuming a model where politicians try to buy electors votes. On average, the higher the poverty levels, higher are the incentives to trade votes for money since opportunity costs for not taking the bribe is higher for poorer voters. Therefore, we expect to observe a positive correlation between poverty and the regression coefficient of spending on votes. On average, when $P_2 > P_1$, then $\beta_2 > \beta_1$. In order to test this hypothesis, the research design has the following featutures: the population

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[6]Palda (1973; 1975), Eagles (1993), Carty and Eagles (1999) examine spending and votes in Canada. Johnston (1979) and Johnston, Pattie and Johnston (1989) analyze the England case. Epstein and Franck (2007) study the French elections. Samuels (2001a; 2001b; 2001c) has done pioneer work on campaign spending in Brazil. Fink (2011) estimates the effects of campaign spending in Germany.

of interest is the candidates running for the Brazilian House of Representatives during 2010 national elections. We analyze the relationship of three variables: (1) campaign spending which as measured in U$ 2010 dollars; (2) poverty levels which were measured by per capita income, poverty index and mortality rate and (3) number of votes received for each candidate. We employ descriptive statistics do examine the distribution of the variables. Then, we estimate an ordinary least squares regression model taking campaign spending as independent variable and votes a dependent variable. The next step is to split the dataset and run a unique regression for each electoral district. The final approach is to correlate the regression coefficients with the per capita income of each district.

4   Results

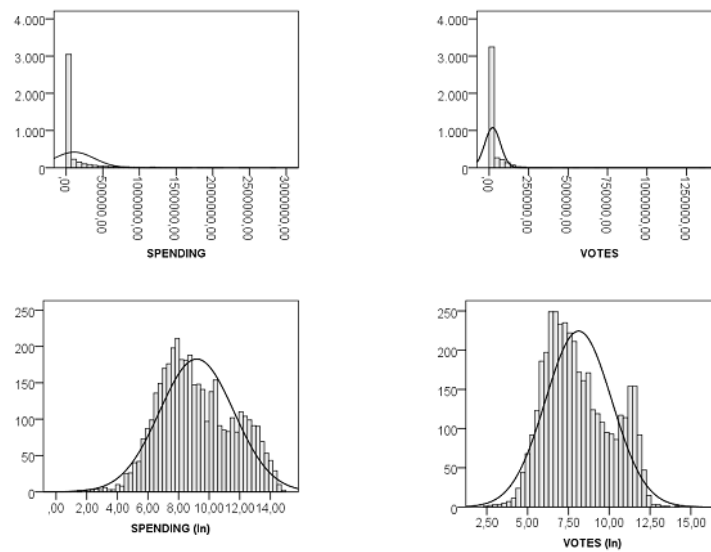Figure 3 illustrates the distribution of both campaign spending and votes.

Figure 3 - Distribution of both campaign spending and votes

In general, logarithmic transformations have three main goals: (1) to reduce distribution asymmetry; (2) to reduce distribution variance and (3) to conduct to normality. In addition, logarithmic transformations facilitate the visual display of quantitative information. Figure 4 depicts the relationship between campaign spending and votes.
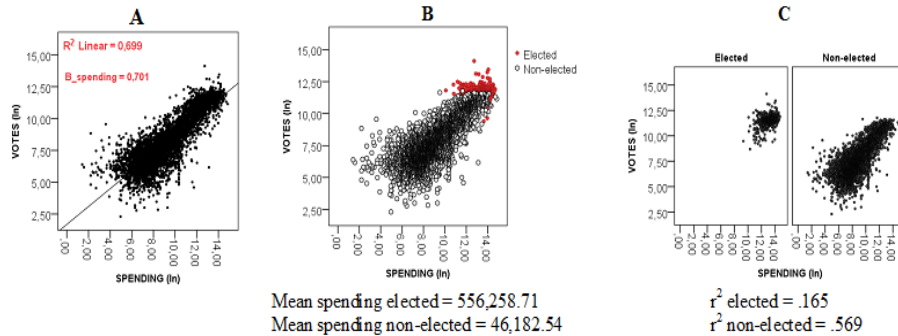
Figure 4 - Correlation between spending and votes

Regarding panel A, ordinary least squares estimates indicate that a 1% increase in campaign spending is associated with a 0,701% increase in votes. The coefficient of determination (r2) indicates that spending explains almost 70% of dependent variable (votes). Panel B shows the correlation between money and votes disaggregating by candidates' final situation: elected x non-elected. On average, it is clear that elected candidates spend ($\bar{X}$ = U\$ 556,258.71) more money than non-elected ones ($\bar{X}$= U\$46,182.54). Finally, Panel C shows that the effect of money is very different for elected (r^2 = .165) and for non-elected candidates (r^2 = .569). In particular, a 1% increase in campaign spending generates an average gain of .276% votes from elected candidates while non-elected ones get .606% more votes.

After examine the relationship between money and votes, the next step is to test the research hypothesis that campaign spending effect is higher in poorer electoral districts. Figure 5 illustrates the distribution of per capita income and the magnitude of effect of spending on votes per electoral district.
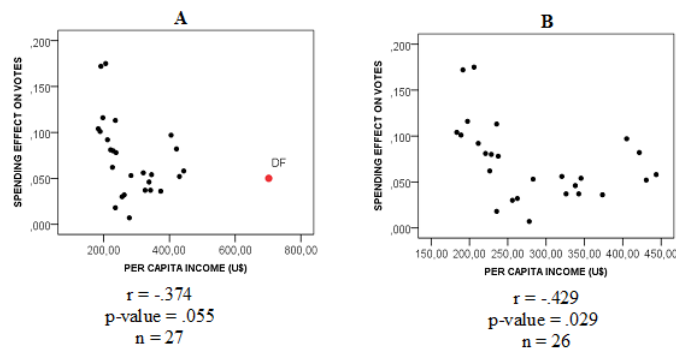

Figure 5 - Correlation between per capita income and campaign spending effect

Panel A shows the correlation between per capita income and the effect of money on votes for all 27 Brazilian electoral districts. The correlation is negative (r = -.374) and the p-value is statistically significant at 10% level (.055). However, Brazil capital (DF) is a clearly outlier and may overestimate

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the standard error and consequently underestimate t statistic magnitude. Panel B replicates the analysis excluding the outlier observation (Z = 3.55). The new correlation between per capita income and the effect of campaign spending on votes is negative .429 and statistically significant at 5% level (p-value = .029) (n = 26).

Although preliminary results suggest evidence in favor of research hypothesis, graphical analysis indicates that linear functional form is not the best option to estimate the model. Figure 6 compares the fit of both linear and quadratic functional forms.
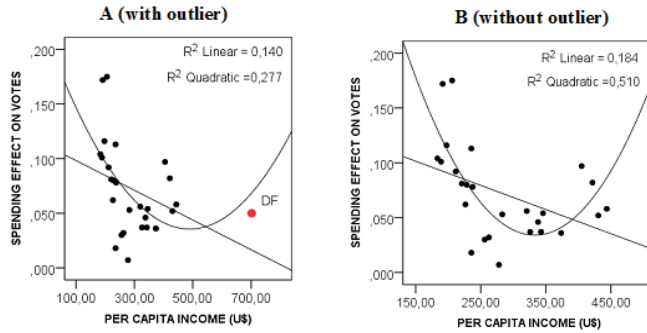

Figure 6 - Model fit comparison

Both models suggest that quadratic promotes a better fit than linear functional form. We just need to compare the coefficient of determination of each model. In particular, the model without outlier (DF) shows a fit of 0,510 using quadratic functional form instead of assuming linearity (r^2=.184). Substantively, these results indicate that the best model to estimate Y is using a curve and not a straight line. Therefore, the effect of spending on votes is higher when the poverty increases. Then we observe a drop down when poverty is on average. Finally, the effect of spending comes to increase again in higher income electoral districts.

5   Conclusion

Theoretically, our model assumes that politicians try to buy votes during the elections. We also assume that on average, the higher the poverty levels, higher are the incentives to trade votes for money since the opportunity cost for not taking the bribe is higher for poorer voters. This paper found preliminary evidence the effect of campaign spending on electoral outcomes indeed depends upon district income levels but follows a quadratic (r^2 quadratic = .510) and not linear function as we originally believed. We assumed linearity for two reasons: (1) there is no previous theory that suggests a precise functional form and (2) linearity is the simplest and most commonly used function form (SCHDOEDER, SJOQUIST AND STEPHAN, 1986).

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