# Inequality and the Cost of Electoral Campaigns:
## The Cases of Brazil and Japan[A]

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### Abstract

Worldwide corruption scandal episodes frequently associate political corruption with the increasing costs of electoral campaign. This calls for better understanding the dynamics of electoral campaign financing. The present research analyzes the role of income inequality on the costs of elections. First, a game-theoretic, political-economy model of voting in unequal constituencies concludes that higher income inequality increases private contributions to electoral campaigns. The intuition of that result is straightforward. As society gets more heterogeneous, parties representing different income groups support opposing policies; therefore, interest groups have higher incentives to contribute to the campaign, in order to avoid a very unfavorable policy being implemented if an opposing party wins. Next, that hypothesis is carefully tested using both cross-sectional electoral data from Brazilian 5564 municipalities and panel data from Japanese House of Councillor's prefectural-tier elections from 1977 to 2010. All tests support the hypothesis that more unequal societies engender more expensive elections.

**Keywords:** Campaign financing, income inequality, lobby, voting, Brazil, Japan. **JEL code:** D72.

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# 1. Introduction

In September 1992 the Brazilian Lower House voted to impeach the first democratically elected President of Brazil in 30 years. President Fernando Collor de Mello was accused of political corruption associated to, among others things, the unlawful use of campaign finance funds. As a result, Congress revised the country's electoral finance law in 1994 (Fleischer, 1997). In 1993, on the other side of the globe, the Japanese National Diet "enacted the most far-reaching political reforms Japan has experienced since the American Occupation" (Reed, 2003). Among the three main goals of the reform was "the reduction of the costs of elections, which would presumably reduce corruption" (Reed, 2003).

The two examples above show how the concern about the cost of electoral campaigns is present in such diverse countries as Brazil and Japan, extremely different not only in their geographic location but most fundamentally in their history, institutions, level of inequality and per capita income. Expensive electoral campaigns are naturally associated with political corruption, as stated in Reed (2003). Corruption may affect the efficient use of public resources, contributing to a lower-than-potential growth; in the medium run, it may keep a country away from attaining higher development levels, by reducing foreign direct investment, for instance (Habib and Zurawicky, 2002, Mauro, 1995). More fundamentally, it may affect the stability of institutions by eroding public trust in the electoral process. In Brazil, according to Fleischer (1997), "[…] the rationale for the military intervention in 1964 was to 'end political corruption'." The result of that military intervention was the establishment of an authoritarian regime that lasted for the following two decades. Similarly, in Japan's fragile Taisho Democracy, "[…]parties became increasingly beholden to the *zaibatsu* (Japan's prewar industrial conglomerates) that funded their expensive electoral campaigns. By 1932, endemic political corruption, Zaibatsu favoritism, and an ambitious military had eroded public support for the parties. After the assassination of Prime Minister Tsuyoshi Inukai by ultranationalists, the military took over the government with little visible public opposition" (Rosenbluth and Thies, 2010). This event led the country into a period of 13 years of authoritarian rule that only ended with the occupation of the Allied powers at the end of World War II in 1945.

The above examples suggest that understanding what affects the cost of electoral campaigns constitutes a fundamental venture in order to assess the prospects of democratic consolidation. The present research aims at presenting one answer to the question of what explains the cost of elections, by focusing on one of its possible causes, namely income inequality.

The work is both theoretic and empiric, and is divided in the following parts. First, after this introduction, section 2 summarizes the main results of a political economy model of voting in income-unequal constituencies. The main tool used there is game theory. The political game includes voters, political parties and interest groups. Voters tend to choose their representatives from the parties that announce policies closer to their preferred ones, but voters are also influenced by the electoral campaign. Political parties seek electoral

victory and understand that the more money they spend in the campaigns, the more voters they will influence. Therefore, they seek private donations from interest groups in addition to their allotted public funds. In order to receive those donations, parties bias their political platforms in the direction of the lobby groups' preferred ones. Finally, lobbyists understand their effect on the electoral result and make private contributions in order to maximize the probability of a more favorable policy being implemented. The main testable theoretic result of the political economy model is that more unequal constituencies tend to have more expensive (per capita) electoral campaigns. The main explanation for this result is that, as society gets more heterogeneous, parties representing different income groups implement opposing policies; therefore, interest groups have higher incentives to contribute to the electoral campaign, in order to avoid a very unfavorable policy to be implemented if an opposing party wins. Such incentives do not manifest in homogeneous societies, where income differences are small and, thereby, party platform differences are also reduced.

The next sections are dedicated to the systematic empirical testing of the theoretic hypothesis using data from Brazil and from Japan. Section 3 analyzes the Brazilian empirical evidence. It uses a cross-section database of two simultaneous local level elections, for mayors and for local assemblies. There are over 5000 municipalities in Brazil; therefore each regression consists of over 5000 observations. The regressions confirm the significant, at the 1% level, positive impact of inequality on the cost of electoral campaigns. In addition, several other explanatory variables are shown to affect the amount of private donations to candidates in both elections. In particular, it shows that elections are less expensive in constituencies that are also more heterogeneous in terms of educational achievement.

Section 4, then, turns to the case of Japan. The econometric study uses a thirty-three-year panel database including all elections for the Japanese Upper House, the House of Councillors' prefecture-wise elections, from 1977 to 2010. There are about 600 observations, one for each of the 47 prefectures for each one of the 12 election years within that period. The regressions confirm, also for the case of Japan, the positive effect of inequality on the cost of campaigns, statistically significant at the 1% level. In addition, several other explanatory variables are shown to affect the amount of private contributions received by candidates in these elections. In particular, it shows that prefectures that have higher numbers of farm household population tend to have cheaper electoral campaigns, whereas prefectures that have higher investment budgets tend to have more expensive electoral campaigns.

Finally, section 5 concludes by summarizing the main results, discussing some policy implications and presenting new directions for future research.


## 2. A political economy model of voting in unequal constituencies

This section introduces the model developed in Bugarin, Portugal & Sakurai (2010) and summarizes its main findings. Society is divided in two classes, the "rich" and the "poor". The rich have high income whereas the poor have low income. There are two parties, the "left" and the "right" party. The electoral campaign begins

when each party announce its political platform, which corresponds to a certain amount of per capita public good to be provided if elected. All citizens pay taxes on their incomes to finance the public good provision. The tax rate is the same for everyone, so that a rich citizen pays a higher total amount of taxes than a poor one. Each party has a preferred level of public good provision; the left party prefers high public good provision whereas the right party prefers low public good provision. Moreover, parties value office-holding, i.e., they also want to win the electoral competition game. Each income class is organized as a lobby interest group that can provide private financing for the electoral campaign. Once a lobby group is informed of each party's political platform, it decides how much financing to contribute to each one of the parties. Each party uses the resources obtained from lobby groups to influence voters' electoral choices.

Each citizen, rich or poor, votes in a one-district national election for one of the two parties, according to his preferences. Voters' preferences are affected by several factors. First, they are affected by the policy announcement of the parties. As the rich pay relatively more for the public good provision, they prefer lower public output than the poor. Therefore, they tend to prefer a party which platform requires lower public good provision. Conversely, the poor tend to favor a party whose announced platform requires higher public good provision.

Second, voters preferences are affected by the electoral campaign in such a way that they tend to prefer a party that spends more money during the campaign over a party that spends less money. That is the influence effect of the electoral campaign.

Finally, stochastic variables that are realized just before voters take their ballots also affect voters' preferences. These variables capture the other factors that may affect voters' preferences that are not related to the parties' electoral platform neither campaign expenditure. Natural disasters, terrorist attacks, sudden news about politicians' private lives, corruption scandals, are all examples of such uncontrollable factors that may affect voters' preferences in favor of one party or the other. These variables introduce a probabilistic voting approach to the model.

Citizens vote sincerely, taking into consideration all deterministic and stochastic factors that affect their preferences. Then, the party that obtains a majority of votes implements its announced platform.

A careful analysis of the solutions to the model, not presented here for the sake of space, allows us to determine how the total amount contributed by the lobbyists to the electoral campaign is affected by a measure of income inequality. The main result is that, under simple regularity assumptions, we can prove a positive relationship between these two variables, i.e., the more unequal is a society, the more contributions the interest groups will be willing to make for the electoral campaign.

The intuition behind this result is rather simple. In more equal societies there is little difference between the two classes' preferred levels of provision of public goods. This commonality of interest, in turn, makes it more costly, in terms of votes, for a party to announce a policy away from the one preferred by the average voter. Therefore, parties announce platforms closer to each other. But then, interest groups see little gain in

spending money in the electoral campaign, as the differences in public good provision, depending on which party wins the elections, are small. Hence, the interest groups are less inclined to contribute to the electoral campaigns and, therefore, campaigns are cheaper.

The argument goes symmetrically as a society becomes more unequal. Indeed, higher inequality means a more polarized society which, in turn, allows for more divergent policy announcement by parties; but then, interest groups understand that there is a lot at stake in the election, as a policy very much distant from their preferred one may be implemented if the party farther away from them wins the election. Therefore, interest groups become more willing to contribute to their preferred party which, in turn, generates more expensive electoral campaigns.

In summary, more unequal societies are expected to yield more (per capita) costly political campaigns. The next part of the paper aims at developing an empirical methodology for testing this result. Next section presents the main econometric results for Brazil.

## 3. The econometric evidence for Brazil

### 3.1. Brazilian electoral system[1]

Brazil is presently a presidential federative republic composed of 26 states, one Federal District and 5564 municipalities. In Brazilian constitution, the states and municipalities are awarded the status of members of the federation, which grants them constitutional autonomy and discretion.

There are executive, legislative and judiciary branches at all levels of government.

The federal government executive is directed by the President, who is both the head of state and the head of government, and is elected for four-year terms, with one possible consecutive reelection (non consecutive elections are not restricted). Similarly, each one of the 26 states, the Federal District and each one of the 5564 municipalities elect their governors and mayors (for the municipalities) for four-year terms with the same reelection constraints. The elections for president, governors and mayors are staggered, so that municipal elections are held two years after the presidential and state governor's elections.

The federal legislative branch is bicameral, with the upper house –the Federal Senate– and a lower house –the Chamber of Deputies– forming a balanced system in which no house dominates the other. The Senate is meant to equally represent the higher members of the federation and is composed by three senators from each state and the Federal District. Senators are elected in a SVNT single state constituency system for eight-year terms in staggered elections that are held every four years for one-third and two-thirds of the Senate in alternation.

The Chamber of Deputies is meant to represent the entire country population and is composed of 513 deputies from the states and the Federal District. Deputies are elected in state-wise single districts in a single

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[1] The present section is based on Hagopian (2010).

proportional system for four-year terms. The size of each state delegation is roughly proportional to its population, with the caveat that there is a minimum of eight and a maximum of seventy deputies per state, which over represents the low population and under represents the high population states.

The states and municipalities' legislative branches are unicameral and are elected in one single constituency by a single voter proportional system. There are no term limits for the legislative representatives.

Finally, the judicial branch is an independent body composed of specialized courts which are the Supreme Court, the Superior Court, Regional Federal Appeal Courts (five regions), labor courts, electoral courts, military courts and state courts. Most important to this article, the electoral courts were introduced in 1932 to investigate fraud in the Old Republic elections. The Tribunal Superior Eleitoral, the higher electoral court, rules over all areas regarding parties, mandates of elected representatives, admissibility of candidacies, counting ballot procedures, notably the all-electronic voting system used in Brazil, and even the constitutionality of electoral legislation.

### 3.2. The data

The cross section econometric analysis for Brazil will focus on the 2004 elections for the Brazilian municipalities. In each of the 5564 Brazilians municipalities, citizens voted simultaneously for mayors in a plurality system with second round runoff in municipalities with a population of 200,000 or more, and for local assembly representatives, the municipal legislature, in a proportional municipality-wide single constituency system. The econometric study will test if the relationship between private electoral campaign donations and inequality suggested by the theoretic model holds for these elections. Most of the basic data used here is common to the data used in Bugarin, Portugal and Sakurai (2011).

### 3.2.1. The dependent variables

The main dependent variables are the aggregate electoral contributions candidates running respectively for mayors and for municipal assembly representatives received during the 2004 municipal elections. Campaign resources used at the municipal level can be classified into three categories: party's transfers from national and state level boards; party's transfers from local units (local political committees); and private donations (including private resources from the own candidates).

Since party funds are partially supplied by public contributions and we are more directly concerned with private contributions, our dependent variables will be based on total campaign resources received by all candidates exclusively from private donations (the third category above) in each Brazilian municipality, as declared to the Tribunal Superior Eleitoral (TSE, http://www.tse.jus.br/), in thousands of *real* (the Brazilian currency denomination[2]).

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[2] According to the Brazilian Central Bank, 1 US dollar was worth 2.65 real in December 31, 2004.
http://www4.bcb.gov.br/pec/conversao/Resultado.asp?idpai=convmoeda

The detailed, per candidate data, were obtained from the TSE. The per-candidate data were then aggregate per municipality, for the elections for mayors and for local assembly representatives, to form the variables Tdonm, Total private donations for mayor election, and Tdona, Total private donations for local assembly election, respectively. Next we divided the variable Tdonm by the city population, and the number of voters in the city, to form the variables Tdonmpop, Tdonmvot, respectively, for the mayor elections. Similarly, we divided the variable Tdona by the city population, the number of voters in the city, and the number of voters in the city and by the number of seats, to form the variables Tdonapop, Tdonavot, Tdonavotst, respectively, for the local assembly elections. The population data where obtained from the 2000 Brazilian population census, IBGE (Instituto Brasileiro de Geografia e Estatística, the Brazilian Institute of Geography and Statistics, http://www.ibge.gov.br/home/default.php), whereas the number of voters and the number of seats was obtained from the TSE electoral data base. Then we applied the log transformation to obtain the dependent variables used throughout the study, generating, respectively, the variables Logtdonmpop, Logtdonmvot, Logtdonapop, Logtdonavot, Logtdonavotst.

Table 3.1 below presents the summary statistics of the alternative campaign private donations variables used in this study. Note that the econometric studies only used the log versions of the campaign donations figures.

Table 3.1: Summary statistics of the private campaign donations variables

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| tdonmpop | 5266 | 6657.52 | 7444.19 | 0.00 | 111564.10 |
| tdonmvot | 5266 | 8786.31 | 9370.62 | 0.00 | 151399.60 |
| tdonapop | 5174 | 3285.18 | 3096.79 | 0.00 | 36654.09 |
| tdonavot | 5174 | 4351.23 | 3932.57 | 0.00 | 52985.63 |
| tdonavotst | 5174 | 476.33 | 438.77 | 0.00 | 5887.29 |

Source: Author's calculations

### 3.2.2. The explanatory variables

The main explanatory variable is the Gini coefficient. According to the theoretic model, we expect the Gini coefficient to be positively related to the cost of electoral campaigns, i.e., the more unequal a prefecture is, the more expensive the electoral process should be.

Several additional explanatory variables were tested. The main significant ones and their motivation are described below.

**Socio-economic indicators:**

Loginc: The 10-base log of the municipality income. This variable is meant to check if private campaign donations are higher or lower in richer municipalities. The municipalities' incomes where obtained from *Secretaria do Tesouro Nacional* (STN, the Brazilian Treasury Secretariat).

Educfrag: The population educational fragmentation index. This variable is a proxy for how heterogeneous is the electorate in terms of educational attainment. The index of educational fragmentation is calculated as

$1 - \sum_{j=1}^{8} \varepsilon_j^2$ , where $\varepsilon_j$ is the proportion of voters in class $j$, one of the 8 instruction levels. Therefore, the more

homogeneous is the educational level of society, the lower the educational fragmentation index. The objective of this variable is to test whether more educated cities have cheaper electoral campaigns. The instruction level information was obtained from the TSE.

**Demographic indicators:**

Percyoung: The percentage of young population, below 15 years old, in the municipality. Percold: The percentage of old citizens, above 65 years old, in the municipality. These two variables aim at testing if younger and/or older people participate more in the electoral process, making it more expensive.

Agefrag: The age fragmentation index of the population, as a proxy for how heterogeneous is the electorate in

terms of age span. The index of age fragmentation is calculated as $1 - \sum_{j=1}^{10} v_j^2$ , where $v_j$ is the proportion of

voters in age class $j$, one of the 10 age classes. As in the previous study, the higher the index, the more fragmented the population in different age groups.

Percurbanpop: The percentage of urban population. To check if elections tend to be more expensive in the more urban municipalities.

The demographic data were based on the 2000 population census, IBGE.

**Electoral indicators:**

Candm, canda: The number of candidates running in for mayor and for the local assembly representatives. To test if higher competition implies higher electoral costs in per capita terms.

Vot: The number of voters, in 1000 people. To check if there are gains of scale that could reduce the per capita cost of campaigns as the number of voters increase.

D2r: A dummy variable, which takes value 1 when a second round is to be held in the municipality. This happens in Brazil in cities with a population above 200,000 people, when the candidate with a plurality of votes does not have at least 50% of valid votes. In that case only the candidates who obtained the two highest numbers of votes compete in the second round. It is expected that a second round would increase the cost of elections. Note that a second round only applies to the mayors elections. Therefore, this variable will only be included in the elections for mayors.

Incumbent: A dummy variable that takes value 1 if there is an incumbent among the candidates for mayor. One would expect that the presence of an incumbent would reduce the competition, given to the incumbency advantage and, thereby, reduce the cost of electoral campaigns. Naturally, this variable will only be used in the mayors' elections.

All electoral variables were obtained from the TSE.

**Administrative regions variables:**

Brazil is divided in five administrative regions, each of which encloses several states. The different regions display different patterns of migration, history, development, GDP, among others. We include the region variables to test whether there is a regional component to the cost of electoral campaigns.

NO: Northern region, includes the states of Acre, Amapá, Amazonas, Pará, Rondônia, Roraima and Tocantins.

NE: Northeastern region, includes the states of Alagoas, Bahia, Ceará, Maranhão, Paraíba, Pernambuco, Piauí, Rio Grande do Norte and Sergipe.

CO: Center western region, includes the states of Mato Grosso, Mato Grosso do Sul, Goiás and the Federal District

SE: Southeastern region, includes the states of São Paulo, Rio de Janeiro, Espírito Santo and Minas Gerais.

SU: Southern region, includes the states of Paraná, Rio Grande do Sul and Santa Catarina.

In order to avoid perfect collinearity, the SE region dummy is removed from the regressions.

Table 3.2: Summary statistics of the main control variables

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| gini | 5266 | 0.56 | 0.06 | 0.36 | 0.82 |
| loginc | 5266 | 14.46 | 1.35 | 11.24 | 22.69 |
| educfrag | 5266 | 72.39 | 4.40 | 47.78 | 83.43 |
| percyoung | 5266 | 0.32 | 0.05 | 0.17 | 0.54 |
| percold | 5266 | 0.06 | 0.02 | 0.01 | 0.16 |
| agefrag | 5266 | 83.80 | 1.04 | 78.55 | 86.46 |
| percurbanpop | 5266 | 63.88 | 24.08 | 0 | 100 |
| vot | 5266 | 22.009 | 138.292 | 0.829 | 7771.274 |
| candm | 5266 | 2.35 | 1.01 | 1 | 11 |
| candm2 | 5266 | 6.54 | 6.45 | 1 | 121 |
| canda | 5174 | 38.23 | 37.55 | 1 | 858 |
| canda2 | 5174 | 2871.60 | 14040.35 | 1 | 736164 |
| seat | 5266 | 9.33 | 1.89 | 9 | 55 |

Source: Author's calculations

The summary statistics of the explanatory variables are presented in Table 3.2. Table 3.3 presents expected signs of these variables for each one of the three dependent variables' regressions, for each type of election.

Table 3.3: Expected signs of the control variables

| Variable | Expected signs | | | | |
|---|---|---|---|---|---|
| | logtdonmpop | logtdonmvot | logtdonapop | logtdonavot | logtdonavotst |
| gini | + | + | + | + | + |
| loginc | ? | ? | ? | ? | ? |
| educfrag | + | + | + | + | + |
| percyoung | ? | ? | ? | ? | ? |
| percold | ? | ? | ? | ? | ? |
| agefrag | ? | ? | ? | ? | ? |
| percurbanpop | + | + | + | + | + |
| vot | ? | ? | ? | ? | ? |
| candm | + | + | | | |
| canda | | | + | + | + |
| seat | | | + | + | ? |
| incumbent | ? | ? | ? | ? | ? |

Source: Author's calculations

## 3.3. The Cross Section Regressions

The econometric evidence for Brazil is separated in the two different elections, for mayors and for local assembly representatives.

### 3.3.1. The 2004 elections for mayors

First we regress the per capita total private donations for the mayor's elections on the explanatory variables. The Breush-Pagan test yielded a chi-square statistic of $\chi^2(1)= 305.81$, which shows clear evidence of linear heteroskedasticity; moreover, the White test yielded a chi-square statistic of $\chi^2(123)= 358.89$ which also confirms evidence of heteroskedasticity. Therefore, we used robust standard error estimates. The regression results are presented in Table 3.4. Throughout this article we use * to indicate a significant result at the 10% significance level, ** to indicate a significant result at 5% significance level and *** to indicate a significant result at the 1% significance level.

Table 3.4: Per-thousand-inhabitant private electoral campaign donations and inequality

The elections for mayors' cross section regression in Brazil

| logtdonmpop | Coef. | Robust Std. Err. | t | P>t | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gini*** | 1.23 | 0.29 | 4.27 | 0.000 | 0.67 | 1.80 |
| loginc*** | -0.44 | 0.02 | -25.38 | 0.000 | -0.47 | -0.41 |
| educfrag*** | 0.035 | 0.004 | 8.48 | 0.000 | 0.027 | 0.043 |
| percyoung*** | -2.12 | 0.57 | -3.71 | 0.000 | -3.25 | -1.00 |
| percold*** | -8.29 | 1.33 | -6.24 | 0.000 | -10.89 | -5.68 |
| agefrag | -0.03 | 0.02 | -1.34 | 0.179 | -0.08 | 0.02 |
| percurbanpop*** | 0.0023 | 0.0007 | 3.11 | 0.002 | 0.0008 | 0.0037 |
| candm*** | 0.33 | 0.02 | 18.59 | 0.000 | 0.29 | 0.36 |
| vot** | -0.0003 | 0.0001 | -2.21 | 0.027 | -0.0005 | 0.0000 |
| d2r*** | 0.47 | 0.13 | 3.67 | 0.000 | 0.22 | 0.72 |
| incumbent | 0.03 | 0.03 | 1.21 | 0.226 | -0.02 | 0.09 |
| NO* | 0.11 | 0.06 | 1.90 | 0.058 | 0.00 | 0.23 |
| CO*** | 0.64 | 0.06 | 10.17 | 0.000 | 0.52 | 0.76 |
| SE** | -0.10 | 0.04 | -2.26 | 0.024 | -0.19 | -0.01 |
| SU*** | -0.29 | 0.05 | -5.61 | 0.000 | -0.39 | -0.19 |
| _cons*** | 14.55 | 2.01 | 7.23 | 0.000 | 10.60 | 18.49 |

5170 observations, $R^2$: 0. 2491
*** Significant at the  1% significance level
** Significant at the  5% significance level
* Significant at the 10% significance level
Source: Author's calculations

Except for the age fragmentation and the incumbent variables, all explanatory variables used here are significant. In particular, inequality affects positively the cost of electoral campaigns and is significant at the 1% level. Furthermore, educational fragmentation, urban population, the number of competing candidates and the presence of a second round all increase the per capita cost of electoral campaigns. The positive sign of the coefficient of the percentage of urban population suggests that campaigns tend to be more competitive in the cities and that there are more citizens engaged in the electoral process there.

On the other hand, the richer the municipality and the higher the number of voters, the lower appears to be the volume of per capita donations.

Furthermore, the lower the proportion of young and old citizens in the population, the lower the volume of private contributions. This result seems natural, since younger and older people are not required to vote in

Brazil and, in fact, do vote less that citizens at intermediate age. In addition, citizens at those ages tend to be less wealthy, therefore, are expected to contribute less to the campaigns.

Moreover, campaigns seem more expensive in the north and center west regions and cheaper in the Southeastern and Southern regions, compared to the Northeastern region.

Except for the NO and SE region and the number of voters variables, which are significant at 5%, all significant independent variables are significant at the 1% level.

It is noteworthy that age educational fragmentation of the population also raises the cost of electoral campaigns in Brazil. This may be due to the fact that, in order to reach heterogeneous constituents, politicians need to use a greater variety of instruments, which increases the need for resources. A clear policy implication is that investment in education, as a byproduct, can help reduce the cost of electoral campaigns, in addition to, naturally, a reduction on the level of inequality and an increase in average income. This is particularly good news for Brazil, a country that is been able to reduce income inequality, improve education standards and grow over the last two decades.

Furthermore, a regression using the per-thousand-voter private donations as the dependent variable yielded similar results and are not presented here for the sake of space.


### 3.3.2. The 2004 elections for the municipal assemblies

First, we regress the per capita total private donations for the municipal assembly's elections on the explanatory variables. Note that for this study the incumbent and second turn variables have been removed and the number of seats under dispute variable has been introduced. The Breush-Pagan test yielded a chi-square statistic of $\chi^2(1)= 77.24$, which shows clear evidence of linear heteroskedasticity; moreover, the White test yielded a chi-square statistic of $\chi^2(109)= 260.90$ which also confirms evidence of heteroskedasticity. Therefore, we used robust standard error estimates. The regression results are presented in Table 3.6.

This regression confirms the main results of the previous one. First, it strongly reinforces, at the 1% level, that higher inequality induces higher volumes of campaign contributions. The main qualitative difference is that, except for the age fragmentation variable, all variables are significant at the 1% level. The age fragmentation variable, which was insignificant before, is now significant at the 5% level and negative. It suggests that having a more fragmented society in terms of age reduces the volume of private contributions. Since this is a proportional election with large number of seats, a greater segmentation of the population in different age groups may allow candidates to focus their campaigns towards specific age groups, permitting certain specialization which may reduce the costs needed to obtain a necessary number of votes to be elected.

Table 3.6: Per-thousand-inhabitant electoral campaign private donations and inequality

The elections for local assemblies' cross section regression in Brazil

| logtdonapop | Coef. | Robust Std. Err. | t | P>t | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| gini*** | 1.32 | 0.25 | 5.22 | 0.000 | 0.82 | 1.81 |
| loginc*** | -0.41 | 0.02 | -23.88 | 0.000 | -0.45 | -0.38 |
| educfrag*** | 0.02 | 0.00 | 6.60 | 0.000 | 0.01 | 0.03 |
| percyoung*** | -3.83 | 0.55 | -6.96 | 0.000 | -4.91 | -2.75 |
| percold*** | -5.49 | 1.25 | -4.41 | 0.000 | -7.93 | -3.05 |
| agefrag** | -0.06 | 0.02 | -2.52 | 0.012 | -0.10 | -0.01 |
| percurbanpop*** | -0.0017 | 0.0006 | -2.66 | 0.008 | -0.0030 | -0.0005 |
| vot*** | -0.0010 | 0.0002 | -5.35 | 0.000 | -0.0013 | -0.0006 |
| canda*** | 0.0168 | 0.0008 | 20.51 | 0.000 | 0.0152 | 0.0184 |
| seat*** | -0.05 | 0.02 | -2.99 | 0.003 | -0.09 | -0.02 |
| NO*** | 0.15 | 0.06 | 2.73 | 0.006 | 0.04 | 0.26 |
| CO*** | 0.38 | 0.06 | 6.66 | 0.000 | 0.27 | 0.49 |
| SE*** | -0.67 | 0.05 | -13.96 | 0.000 | -0.76 | -0.57 |
| SU*** | 0.14 | 0.04 | 3.23 | 0.001 | 0.06 | 0.23 |
| _cons | 18.03 | 1.91 | 9.44 | 0.000 | 14.29 | 21.78 |

5170 observations, $R^2$: 0. 2567

*** Significant at the   1% significance level

**   Significant at the   5% significance level

Source: Author's calculations

An important difference regards the role of the percentage of urban population. For the local assemblies' elections that variable takes more significance (1% significance level) and changes signs. Its contribution is now negative, reducing the volume of contributions. This would suggest that elections for local representatives may be less expensive in urban areas.

Another difference is that, for the case of municipal assemblies, the Southern region donors seems to contribute more than the Northeastern region, reversing the result for the mayors' elections.

Finally, the new variable, the number of seats, appears to reduce the total contribution, a somewhat counter intuitive result.

Furthermore, regressions using the per-voter total private donations for the municipal assembly's elections and the per-voter, per-seat total private donations for the municipal assembly's elections as alternative dependent variables yielded similar results and are not presented here for the sake of space.

# 4. The econometric evidence for Japan

## 4.1. Japanese electoral system[3]

Japan is presently a parliamentary monarchy in which, according to the 1947 constitution, the National Diet is given the status of "highest organ of state power" and "sole law-making organ of the State". Despite the existence of elected prefecture and local level governments, Japan is nonfederal: all local government authority is delegated by the national government and may be retracted by it.

The National Diet is bicameral, formed by an upper house, the House of Councillors and a lower house, the House of Representatives. The House of Representatives has the authority to choose alone the Prime Minister, to pass the budget, and to ratify treaties. Therefore, it is traditionally seen as preponderant compared to the House of Councillors, and that has been especially true as the major postwar party formation, the LDP, used to have a strong majority in that house throughout the second half of the 20s century. However, all legislation other than the ones described above need to pass both houses in identical form in order to become a law, and the more recent developments in Japanese politics, where the majority coalition in the Lower House does not detain a majority in the Upper House, has highlighted the importance of the House of Councillors. According to Rosenbluth and Thies (2010), "[…] the Japanese Upper House is among the world's strongest".

During the second half of the 20s century successive political corruption scandals has highlighted some adverse incentives generated by the specific electoral regime, especially for the Lower House. After several attempts, there was a significant change in the House of Representatives' composition rules in 1994. Most specifically, the medium-member electoral districts, ranging from size two to six, which prevailed throughout the postwar period, were finally substituted by single-member and large-member districts, as described below. The House of Representatives is composed of 480 members elected for a period of four years according to two complementary systems. A smaller number of 180 members are elected from eleven regional districts by closed list proportional representation. The districts typically encompass several prefectures. The remaining majority of 300 members are elected from 300 smaller single-member districts, which have roughly equal populations. Therefore, a voter casts two votes, one for a candidate in his single-member district and one for a party in the regional district. Note that a candidate may run in a single-member district and also be on a list in a regional district; therefore, he may lose in the single-member district and still be elected in the party list.

The House of Councillors is composed of 242 members elected according to two different systems for six-years in staggered terms, so that elections occur every three years. A smaller number of 96 representatives are elected by open list proportional voting in a single nation-wide constituency. The remaining majority of 146 representatives are elected from 47 prefectural constituencies by means of single non-transferable voting. Therefore, like for the Lower House elections, a voter casts two votes, but here the voter may, if he desires,

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[3] The present section is based on the presentation in Rosenbuth and Thies (2010).

vote for a specific candidate in the nation-wide election. Differently from the House of Representatives, a candidate cannot run in both tiers simultaneously.

## 4.2. The data

In order to test for the relationship between campaign contributions and income inequality one needs constituency-wise inequality data. If we were to perform a cross sectional study, like the Brazilian one, we would need to use the Lower House data for the medium-size districts (for the elections before 1994) or small-size districts (for the elections after 1994). Unfortunately, data on income inequality for such district areas are not available. On the other hand, the electoral system has been quite stable along the years for the Upper House prefecture-wise tier. Therefore, we opted for using the House of Councillors, local constituency electoral data, coupled with the prefecture Gini coefficients calculated by the Japan Statistics Bureau since 1979. Although there is additional electoral campaign information available for earlier years, the lack of inequality figures restricted our time span to 1977 to 2010, all together 12 elections, totaling 564 observations.

### 4.2.1. The dependent variables

The main dependent variable is the aggregate expenditure for local constituencies' electoral campaigns for the House of Councillors, from 1977 to 2010, Tcstexp. The variable Tcstexp was calculated from the data contained in the Report on the Result of the Elections for the House of Councillors (RRE, "Sangiin tsujo-senkyo kekka shirabe"), published by the Japan Statistics Bureau, Ministry of Home Affairs and Communication. The RRE contains detailed expenditure data, in Japanese currency (yen[4]), for each candidate in each prefecture ("ken") in current values. These expenditures were aggregated by ken for each electoral year, forming the Tcurexp variable. Next that variable was deflated using the Consumer Price Index calculated by the Statistics Bureau of the Government of Japan (JSB). The variable Tcstexp was then calculated, in constant *yen* values of 2005. The graph in Figure 4.1 below presents the per-year sum of Tcstexp for all prefectures, TTcstexp, in which the 1974 elections' data were also included. The graph suggest that there is a rather stable behavior of the cost of electoral campaigns in Japan, in constant terms, except for the year 1998, which seems to have been an abnormally election year.

All dependent variables used in the present econometric study of Japanese elections were derived from Tcstexp. First we calculated the following campaign expenditure variables.

Cstsxppop: The per-thousand citizens' electoral campaign expenditure. It is the Tcstexp divided by the prefecture population (in thousands) at the corresponding year. The population figures were collected from the Japan Statistical Yearbook published by JSB.

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[4] According to X-rates, one dollar was worth 118 yen in December 2005.
http://www.x-rates.com/d/JPY/USD/hist2005.html

Cstexpelvt: The per-thousand elective voters' electoral campaign expenditure. It is the Tcstexp divided by the number of elective voters (in thousands) in the prefecture at the corresponding year. The elective voters' figures were collected from the Japan Statistical Yearbook published by JSB.

Cstexpelvtst: The per-thousand elective voters' electoral campaign expenditure per number of seats available. It is the Tcstexp divided by the number of elective voters (in thousands) in the prefecture at the corresponding year, divided by the number of seats at stake.

The prefecture population, the number of elective voters and the number of seats' figures were collected from the Japan Statistical Yearbook published by JSB.

Figure 4.1: Total campaign expenditure for the Japanese Upper House elections,

local constituencies, 1974-2010, in constant 2005 yen
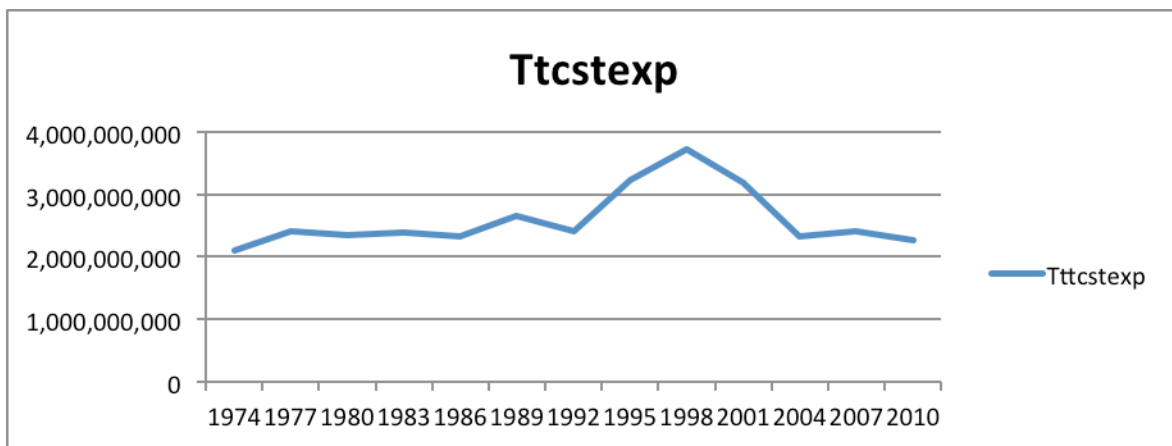


Source: Author's calculations

Then we applied the log transformation to obtain the dependent variables used throughout the study. These variables are Logcstexppop, Logcstexpelvt and Logcstexpelvtst, respectively.

Table 4.1 below presents the summary statistics of the alternative campaign expenditure variables used in this study and of their log transformations. The econometric studies only used the log versions of the campaign expenditure figures.

Table 4.1: Summary statistics of the dependent campaign expenditure variables

| Variable | Obs | Mean | Std. Dev. | Min | Max |
| --- | --- | --- | --- | --- | --- |
| totcstexp | 564 | 56200000 | 34500000 | 12800000 | 218000000 |
| cstexp | 564 | 27017.65 | 11554.69 | 5235.01 | 76761.68 |
| cstexpelvt | 564 | 35675.69 | 14779.96 | 6492.96 | 99522.41 |
| cstexelvtst | 564 | 28850.32 | 18255.88 | 3241.1 | 99522.41 |

Source: Author's calculations

### 4.2.2. The explanatory variables

The main explanatory variable is the Gini coefficient. According to the theoretic model, we expect the Gini coefficient to be positively related to the cost of electoral campaigns, i.e., the more unequal a prefecture is, the more expensive the electoral process should be. The JSB calculates Gini coefficients for all households for the prefectures of Japan every 5 years since 1979, i.e., 1979, 1984, 1989, 1994, 1999, 2004, 2009. There are no data available prior to 1979, which restricted the econometric study to the elections from 1977 to 2010: 1977, 1980, 1983, 1986, 1989, 1992, 1995, 1998, 2001, 2004, 2007, 2010. Since the Upper House elections occur at three years' intervals, there was not a perfect match between the Gini coefficient and election years, except for the years 1989 and 2004. Therefore, this study considered two approaches. The first was to take the Gini coefficient of the closest year to the election and, for those elections in years in between, calculate the average of the Gini coefficients of the two closest years. The second approach is to adjust the Gini coefficients according to a weighted average where the weights corresponded to the distance to the electoral year. Both adjusted Gini coefficients lead to similar results. Therefore only the more natural weighted Gini variable, Giniadj, is presented here.

Several additional explanatory variables were tested. The main significant ones and their motivation are described below. All the data were collected from the Japan Statistical Yearbooks (JSY) published by the JSB.

**Economic indicators:**

Logcstinv: The 10-base logarithm of the prefecture investment in constant 2005 billion yen. The hypothesis here is that the private companies that benefit from prefecture's investments are more willing to contribute to the electoral campaigns the higher the prefecture investment budget is, in anticipation of future benefits.

Giniadjloggdp: The product of the Gini and the log of the prefecture GDP in constant 2005 billion yen. This variable is meant to check if there is a difference in the effect of inequality on the cost of electoral campaigns as the prefecture becomes richer. There is no clear a priori expectation about the sign of this variable.

**Social distress indicators:**

Unemp: Prefecture unemployment rate. To check whether there is more electoral competition in prefectures with higher unemployment rates.

The JSB calculates prefecture unemployment rates every 5 years. Therefore, there is no complete match between election years and unemployment rate calculation year. In the electoral interval 1977-2010 only the years 1980, 1995 and 2010 corresponded to both electoral and unemployment rate calculation years. As we did for the Gini coefficient, we calculated weighted averages for the intermediate years. Note, however, that, although linear approximations for Gini coefficient appear reasonable, given the slow behavior of such time series, the same may not be true for unemployment rates, which are more volatile.

Percaidpop: Number of people receiving public livelihood assistance per 1000 prefecture inhabitants. To test weather public aid affects the cost of electoral campaigns.

The a priori expectations about the sign of the social distress variables is that people under social distress are more dependent on the government and, thereby, may be more inclined to vote for the ruling party. In that case, elections should be less competitive and, thereby, costs should be lowered.

**Demographic indicators:**

Pop: Prefecture population, in thousands inhabitants. Since all dependent variables have been divided by some measure of population, there is no clear expectation about the effect of that variable on electoral campaign expenditures.

Farmpop: Farm household population in 1000. Percfarmpop: Percentage of farm household population over total prefecture population. Postwar politics in Japan up until the 90s has been characterized by a partnership between the ruling party and small farmers, whereby LDP's clientelist organizations provided protection to the farmers and in return, the LDP received electoral support from the farmers' communities. According to Horiuchi and Saito (2008), "[…] throughout the postwar period, the governing party has provided generous support to part-time farmers who cultivate tiny rice paddies. […] these protective measures kept these farmers' income extremely susceptible to political discretion. Because of these peculiar features, rice farmers were induced to commit themselves to the LDP's electioneering as active campaigners through their 'rice roots' network". Therefore, we would expect that farm populations would reduce electoral competition and, thereby, reduce the cost of elections.

Percurban: Percentage of urban area over total prefecture area. These variable aims at testing if electoral campaigns expenditure is higher in more urban prefectures. Although this variable is calculated in terms of area and, therefore, does not directly reflect the population in urban areas, the same rationale used above would suggest that the pecurban would increase the cost of elections.

**Electoral indicators:**

Elivoters: Numbers of eligible voters. Voters: Total number of eligible voters who actually voted. These variables are expected to be positively correlated with the cost of electoral campaigns.

Seats: Number of seats at stake in each election. We would expect that a higher number of seats under contest might increase electoral competition and, therefore, increase the costs of electoral campaigns. Note, however, that the dependent variable logcstexelvtst divides the expenditure not only by elective voters, but also by the number of seats. Therefore, we would expect the seats variable to be non significant or to have negative sign in that regression. Observe that the number of seats is not a fixed characteristic of each prefecture, in which case this variable could not be included in the panel data regressions. Indeed, there were adjustments in the number of seats in the elections of 1995, 2001 and 2007. The adjustments of 1995 and 2007 preserved the total number of seats under dispute at 76 and 73, respectively. However, the 2001 adjustment actually reduced the total number of seats under dispute from 76 to 73.

Cnd: Number of candidates listed in the RRE reference. Efcnd: Number of candidates who actually reported campaign expenditures according to RRE. Cnd2: Number of candidates according to the JSY. It is noteworthy that, although in most of the observations Cnd2 equals Cnd, in a few instances it is actually higher. Since the Efcnd variable was obtained directly from the Report on the Result of Elections, this is the variable that we will use in the present work. We expect that Efcnd will have a positive effect on the dependent variables.

Time indicator:

D98: A dummy that takes value one in election year 1998. To try to single out the visual effects found in the aggregate expenditure graph 4.1. Therefore, we expect D98's coefficients to have a positive sign.

The summary statistics of these additional explanatory variables are presented in Table 4.3. Moreover, Table 4.4 presents expected signs of these variables for each one of the three dependent variables' regressions.

Table 4.3: Summary statistics of the main control variables

| Variables | Obs | Mean | Std. Dev. | Min | Max |
| --- | --- | --- | --- | --- | --- |
| giniadj | 564 | 0.2876 | 0.0200 | 0.232 | 0.375 |
| logcstinv | 564 | 2.7694 | 0.2809 | 2.17 | 3.74 |
| giniadjloggdp | 564 | 1.0839 | 0.1398 | 0.77 | 1.56 |
| unemp | 564 | 3.9329 | 1.9582 | 0.5 | 12.5 |
| percaidpop | 564 | 9.6950 | 6.0846 | 1.6 | 39.5 |
| pop | 564 | 2629.317 | 2431.238 | 588 | 13162 |
| percfarmpop | 564 | 17.40 | 10.70 | 0.21 | 58.35 |
| percurban | 564 | 37.27 | 19.09 | 8.93 | 93.72 |
| voters | 564 | 1181.812 | 1029.186 | 283 | 6234 |
| seats | 564 | 1.60 | 0.79 | 1 | 5 |
| efcnd | 564 | 4.95 | 3.10 | 2 | 27 |

Source: Author's calculations

Table 4.4: Expected signs of the control variables

| Variables | Expected sign | | |
|---|---|---|---|
| | logcstexp | logcstexpelvt | logcstexelvtst |
| giniadj | + | + | + |
| logcstinv | + | + | + |
| giniadjloggdp | ? | ? | ? |
| unemp | – | – | – |
| percaidpop | – | – | – |
| pop | ? | ? | ? |
| percfarmpop | – | – | – |
| percurban | + | + | + |
| voters | + | + | + |
| seats | + | + | – |
| efcnd | + | + | + |
| d98 | + | + | + |

Source: Author's calculations

## 4.3. The POLS regressions

The first exploration consists in pooling all data together to run POLS regressions.

### 4.3.1. The per capita cost of electoral campaigns

First, we regress the prefecture per-thousand-inhabitants expenditure (in log) on the Gini, the Gini-times-per capita GDP (log), the prefecture investment (log), the unemployment rate, the percentage of the population receiving livelihood aid, the population of the prefecture, the percentage of the farm population, the percentage of urban land, the number of effective candidates, the number of seats at stake, and the dummy for the electoral year 1998.

The Breush-Pagan test yielded a chi-square statistic of $\chi^2(1)=2.8$ which shows no evidence of linear heteroskedasticity; however, the White test yielded a chi-square statistic of $\chi^2(89)=163.74$ which shows evidence of unrestricted heteroskedasticity. Therefore, we used robust standard error estimates. The regression results are presented in Table 4.5.

Except for the unemployment rate, all explanatory variables used here are significant. In particular, the inequality affects positively the cost of electoral campaigns and is significant at the 1% level. Furthermore, prefecture investment budget, the number of effective voters, the number of competing candidates and number of seats at stake all increase the per capita cost of electoral campaigns. Moreover, campaigns have been exceptionally expensive in 1998. All these variables are significant at the 1% level.

The insignificance of the unemployment rate may suggest that unemployed citizens are not different from employed citizens in what concerns the sensibility towards electoral campaigns. It may also be a result of the use of linear approximations for the unemployment rates in electoral years where no data were available.

On the other hand, the variable giniajdloggdp suggests that the effect of inequality on the per capita cost of electoral campaigns decreases as the prefecture becomes richer.

The negative sign in percaidpop suggests that campaigns are less costly in areas where a higher percentage of the population depends on government social welfare support.

Table 4.5: Per-thousand-inhabitant electoral campaign expenditure and inequality

POLS regression 1

| logcstexp | Coef. | Robust Std. Err. | t | P>t | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| giniadj*** | 5.0714 | 0.6329 | 8.01 | 0.000 | 3.8282 | 6.3146 |
| giniadjloggdp*** | -1.0143 | 0.1553 | -6.53 | 0.000 | -1.3194 | -0.7091 |
| logcstinv** | 0.1005 | 0.0428 | 2.34 | 0.019 | 0.0163 | 0.1846 |
| unemp | -0.0009 | 0.0043 | -0.20 | 0.840 | -0.0092 | 0.0075 |
| percaidpop*** | -0.0042 | 0.0010 | -4.18 | 0.000 | -0.0061 | -0.0022 |
| pop*** | -0.0001 | 0.0000 | -7.18 | 0.000 | -0.00012 | -0.00007 |
| percfarmpop** | -0.0021 | 0.0008 | -2.55 | 0.011 | -0.00376 | -0.00049 |
| percurban*** | -0.00127 | 0.00034 | -3.77 | 0.000 | -0.00193 | -0.00061 |
| voters*** | 0.00008 | 0.00003 | 2.89 | 0.004 | 0.00003 | 0.00014 |
| efcnd*** | 0.0352 | 0.0046 | 7.58 | 0.000 | 0.0260 | 0.0443 |
| seats*** | 0.0333 | 0.0128 | 2.61 | 0.009 | 0.0082 | 0.0583 |
| d98*** | 0.0729 | 0.0177 | 4.12 | 0.000 | 0.0382 | 0.1076 |
| _cons*** | 3.8078 | 0.1429 | 26.65 | 0.000 | 3.5271 | 4.0885 |

564 observations, Adjusted $R^2$: 0.6377
*** Significant at the   1% significance level
** Significant at the   5% significance level
Source: Author's calculations

Moreover, the higher is the population of a prefecture, the higher is the per capita cost of electoral campaigns. In addition, the negative and significant sign of the variable percfarmpop suggests that elections may be cheaper in the more rural prefectures. A possible explanation for this result, as discussed before, is that the LDP has traditional roots in rural area, which makes competition less fierce there. The negative sign for percurban, on the other hand, suggests that there may be gains of scale or scope associated with campaigning in urban areas.

Similar results were obtained using the cost of electoral campaigns per eligible voter and the cost of electoral campaigns per eligible voter, per seat as dependent variables. These studies are not presented here for the sake of space.

**4.4. Panel Data Regressions**

In order to further explore the data, we first perform the Breusch-Pagan Lagrange Multiplier test for random effects for the model in which the dependent variable is the per thousand inhabitant electoral campaign expenditure, regression 1. The statistic $\bar{\chi}^2(1)$=134.63 rejects the null hypothesis that variances in groups are zero, in favor of the random group effects models. Therefore, panel data regressions appear more appropriate for furthering the understanding of the effects of inequality on the cost of electoral campaigns for the Upper House in Japan.

In order to check whether the random effects model is more appropriate for the present database we performed the Hausman test. The test yielded a $\chi^2(9)$= 33.24 with Prob>chi2=0.0001. Therefore, the null hypothesis is rejected, suggesting that a fixed effects regression is desirable.

Furthermore, in order to test for heteroskedasticity, we performed the xttest3 in Stata for the fixed effect panel data regression. The corresponding statistic is $\chi^2(47)$=352.20 with Prob>chi2= 0.0000, which gives strong support for the presence of heteroskedasticity. Therefore, in what follows we will only use the fixed effects model with robust standard deviation coefficients.

Table 4.11 present the results for the robust fixed effect panel data regressions for the dependent variable logcstexelvtst. Similar results were obtained for the logcstexp and logcstexpelvt variables respectively, but are not presented here for the sake of space. It is noteworthy that all but two explanatory variables are significant. The non-significant variables are the unemployment rate and the percentage of the population receiving livelihood government assistance.

The non-significance of the unemployment rate was found and discussed before. The percaidpop's non-significance here suggests that the social distress indicators do not seem closely related to the cost of electoral campaigns. In other words, unemployed people or people living under government assistance do not seem to display significant differences in their behavior towards the electoral process, compared to other voters.

The remaining explanatory variables, all significant, have the expected signs. The Gini coefficient, positive and significant at 1%, supports the hypothesis obtained from the theoretic model that more inequality engenders more expensive electoral campaigns.

Furthermore, the number of voters who actually participate in the electoral process and the number of effective candidates also increase the cost of campaigns. This naturally suggests that higher political participation and competition is associated with more expensive electoral processes.

The product of the Gini coefficient and the prefecture GDP has a negative significant sign and suggests that the effect of inequality on the cost of electoral campaigns becomes less accentuated when the prefecture improves its average wealth.

Table 4.11: Per thousand eligible voter, per seat elections expenditure for Japan's House of Councillors elections and inequality

Fixed effects robust regression

| logcstexelvtst | Coef. | Robust Std. Err. | t | P>t | [95% Conf. | Interval] |
|---|---|---|---|---|---|---|
| giniadj*** | 3.6229 | 1.2669 | 2.86 | 0.006 | 1.0728 | 6.1731 |
| giniadjloggdp** | -0.8411 | 0.3437 | -2.45 | 0.018 | -1.5329 | -0.1493 |
| logcstinv*** | 0.2339 | 0.0683 | 3.43 | 0.001 | 0.0965 | 0.3712 |
| unemp | -0.0077 | 0.0055 | -1.40 | 0.167 | -0.0188 | 0.0034 |
| percaidpop | -0.0015 | 0.0024 | -0.63 | 0.534 | -0.0064 | 0.0034 |
| pop*** | -0.0001 | 0.0000 | -2.78 | 0.008 | -0.00018 | -0.00003 |
| percfarmpop** | -0.0036 | 0.0015 | -2.39 | 0.021 | -0.00667 | -0.00058 |
| percurban** | -0.00120 | 0.00057 | -2.10 | 0.042 | -0.00235 | -0.00005 |
| voters*** | 0.00010 | 0.00003 | 3.34 | 0.002 | 0.00004 | 0.00016 |
| efcnd*** | 0.0253 | 0.0086 | 2.94 | 0.005 | 0.0080 | 0.0426 |
| seats*** | -0.1570 | 0.0313 | -5.02 | 0.000 | -0.2200 | -0.0941 |
| d98*** | 0.0523 | 0.0170 | 3.08 | 0.003 | 0.0182 | 0.0865 |
| _cons*** | 4.0086 | 0.2548 | 15.73 | 0.000 | 3.4956 | 4.5216 |

Number of obs = 564, Number of groups = 47, Obs per group=12
R-sq: within = 0.4138, between = 0.9202, overall = 0.8423
*** Significant at the   1% significance level
**   Significant at the   5% significance level
Source: Author's calculations

The percentage of farm population and the percentage of urban area tend to reduce the cost of campaigns. These effects have been discussed previously. The farm population effect may be related to the traditional stronghold of the LDP in the rural areas, which may make campaigns less competitive. The effect of urban land, on the other hand, may reflect some gains of scale or scope due to the population concentration.

The number of seats is a significant variable and is negative, probably due to the fact that the dependent variable is divided by the number of seats. Therefore, whereas the number of seats at stake increases the per capita and the per-elective-voter campaign expenditure (a result found in the other regressions not shown here), it reduced the per-elective-voter per-seat cost of the campaigns.

Finally, the 1998 election remains a singularity, as a higher than average expensive election. It is curious that that is also the first electoral year for the Upper House elections under the new electoral law, which had as one of its three main motivations, the reduction of the costs of elections[5].


## 5. Conclusion

The present research was initially motivated by the increasing concerns about campaign financing manifested all over the world. In order to better understand what explains the cost of elections, this research focused on one possible explanation: income inequality among citizens.

The role of income inequality on the cost of electoral campaigns was investigated here using essentially two different approaches, one theoretic and another one empirical. The theoretic approach used a game-theoretic, political economy model of voting in order to understand the incentives political lobby groups have to donate to electoral campaigns. The mains theoretic finding is that interest groups tend to donate higher amounts if policies implemented by opposing parties, if winners of the elections, are very unfavorable. The model shows that the more unequal society is, the more unfavorable is the policy implemented by a party that represents different constituencies. Therefore, the higher the level of income inequality, the more private contributions there will be, in per capita terms, to the electoral campaigns.

The empirical approach was meant to test the hypothesis of positive correlation between inequality and the cost of elections. It uses two different data sets for two different countries: Brazil and Japan. The Brazilian data consist of cross section information on 2004 municipal elections for Brazilian 5564 mayors and local legislatures. The Japanese data consist of 1977 to 2010 panel information on the House of Councillors' prefectural tier elections. The data was exhaustively tested, consistently supporting the theoretic hypothesis.

The main policy implication of this research regards the regulation of campaign financing. It is no coincidence that Japan has become more concerned about this issue exactly as inequality has grown in the country. Indeed, as the research suggests, higher inequality means more expensive campaigns, controlling for other explanatory variables, which, in turn makes politicians more vulnerable to corruption. A legislation that associates minimal public funding with rigid control of private funding may reduce that vulnerability. As for a country like Brazil that has had incredibly high historical inequality levels, the implication is very clear: in order to maintain institutional stability and the trust of citizens in the electoral process, it is paramount to reduce inequality. The country has achieved significant and continual reductions in inequality over the last 15 to 20 years; however, inequality levels are still very high and a strong effort still needs to be made to reduce income heterogeneity in Brazilian society.

In addition, the econometric investigation highlighted several significant variables that also explain the cost of elections. For the case of Brazil one can highlight education: the more homogeneous voters are in educational

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[5] See Reeds (2002), p. 244.

achievement, the cheaper are elections. Therefore, the country has an additional incentive to continue, and even increase, its effort to improve public education, as it will reduce the vulnerability of politicians. On the other hand, for the case of Japan the percentage of the urban area in a prefecture tends to increase the cost of elections. As the country has become more urban throughout the years and shall become even more so as the government protection for local small farmers gradually decreases, Japan needs to focus even more carefully on the cautious regulation of electoral financing.

The econometric studies highlight several other variables that impact the cost of elections. Others still need to be analyzed in additional empirical studies. In particular, the role of incumbency has not been explored for Japan and could present policy implications, including a contribution about term limits in the legislature. As for Brazil, a panel data analysis could bring additional light on the time and individual effects of elections in the country. These additional explorations are left here as suggestions for further research.

Finally, the political economy model focuses on the role of inequality on the cost of elections and does not include any of the additional significant explanatory variables used in the econometric studies. Enriching the theoretic model to better understand these additional effects is also presented here as a suggestion for further research.

**References**

Barros, R. P., Henriques, R., and Mendonça, R. 2002. 'Inequality and poverty in Brazil: Portrait of an unacceptable stability. *Brazilian Review of Social Science*, 15(42): 123-142. (In Portuguese, with English and French abstracts).

Bugarin, M. 1999. 'Vote splitting as insurance against uncertainty'. *Public Choice*, 98: 153-69.

Bugarin, M. 2003. 'Vote splitting, reelection and electoral control: Towards a unified model'. *Social Choice and Welfare*, 20: 137-54.

Bugarin, M. 2012. *Inequality and the Cost of Electoral Campaigns: Theoretic Predictions and Econometric Evidence for Brazil and Japan*, VRF Series No. 475. IDE: Chiba.

Bugarin, M., Portugal, A. and Sakurai, S. 2011. 'Inequality and the cost of electoral campaigns' In M. Blofield ed.,*The Great Gap: the Politics of Inequality and Redistribution in Latin America,* Penn State University Press, 215-244.

Downs, A. 1957. *An Economic Theory of Democracy*. New York: Harper and Row.

Ferdinand, P. 2003. 'Party funding and political corruption in East Asia: The cases of Japan, South Korea and Taiwan'. In Austin, R. and Tjernström, M. (editors): *Funding of Political Parties and Electoral Campaigns*. Stockholm: IDEA, 55-69.

Ferejohn, J. 1986. 'Incumbent performance and electoral control'. *Public Choice*, 50: 5-26.

Fleischer, D. 1997. 'Political corruption and campaign financing: Brazil's slow shift towards anti-corruption laws'. Paper prepared for the XX LASA Meeting.

http://168.96.200.17/ar/libros/lasa97/fleischer.pdf

Fiorina, M. P., 1992, An era of divided government. *Political Science Quarterly* 107, 387-410.

Fiorina, M. P., 1996, *Divided Government*, 2nd. ed. Boston: Allyn and Bacon.

Grossman, G. and Helpman, E. 2001. *Special Interest Politics*. Cambridge: MIT Press.

Habib, M. and Zurawicki, L. 2002. 'Corruption and foreign direct investment'. *Journal of International Business Studies*, 33(2): 291-307.

Hagopian, F. 2010. 'Politics in Brazil', in Almond, G., Powell Jr., G., Dalton, R. and Strom, K., *Comparative Politics Today: A world view*. New York: Longman, 500-555.

Horiuchi, Y. and Saito, J. 2008. 'Cultivating rice and votes: Demand-side origins of agricultural protectionism in Japan', mimeo, http://pantheon.yale.edu/~js454/research.html

Hotelling, H. 1929. 'Stability in competition'. *Economic Journal*, 39: 41-57.

Lindbeck, A. and Weibull, J. 1997. 'Balanced-budget redistribution as the outcome of political competition'. *Public Choice*, 52: 273-297.

Mauro, P. 'Corruption and growth' *The Quarterly Journal of Economics*, 110(3): 681-712.

Olson, M. 1971. *The Logic of Collective Action*. Cambridge: Harvard University Press.

Persson, T. and Tabellini, G. 2000. *Political Economics – Explaining Economic Policy*. The MIT Press.

Poiré, A. 2005. "The Problem of Money in Electoral Politics: A Latin American Perspective". Presented as the Robert F. Kennedy Professorship Lecture, David Rockefeller Center for Latin American Studies. October 17, 2005.
(http://drclas.fas.harvard.edu/papers/files/4575c321922ca/05-06-1_poire.2.pdf)

Portugal, A. and Bugarin, M. 2003. 'Financiamento público e privado de campanhas eleitorais: Efeitos sobre bem-estar social e representação partidária no Legislativo'. *Economia Aplicada*, Vol. 7, nº 3: 549–584.

Portugal, A. and Bugarin, M. 2007. 'Electoral campaign financing: The role of public contributions and party ideology'. *Economia, The Journal of the Latin American and Caribbean Economic Association*, 8 (1): 143-171.

Reeds, S. R. 2002. 'Evaluating political reform in Japan: A midterm report'. *Japanese Journal of Political Science* 3(2): 243-263.

Roemer, J. 2006. 'Party competition under private and public financing: A comparison of institutions'. *Advances in Theoretical Economics*, 6 (1), article 2.

Rosenbluth, F. and Thies, M. 2010. 'Politics in Japan', in Almond, G., Powell Jr., G., Dalton, R. and Strom, K., *Comparative Politics Today: A world view*. New York: Longman, 305-353.

Samuels, D. 2001. 'Incumbents and challengers on a level playing field: Assessing the impact of campaign finance in Brazil', *The Journal of Politics*, 63(2), 569-584.

Samuels, D. 2003. 'Financiamento de campanha e eleições no Brasil: o que podemos aprender com o "caixa um" e propostas de reforma', Câmara dos Deputados. Mimeographed.