

RESEARCH ARTICLE

The Statistical Relationship between Voluntary Transfers From the Union to States and the Budgetary Political Cycles

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Abstract

The objective of this study is to verify the relationship between the amount of federal government voluntary transfers to the Brazilian states and the Federal District and their political motivations. To achieve this objective, the panel data methodology will be used for data analysis and treatment. Thus, an econometric model was carried out with the objective of verifying the existence of evidence of party motivation in the transfer of voluntary resources from the Union to the states and the Federal District. For this, the hypothesis tested is that voluntary transfers are greater when the state governors are allied with the heads of the executive of the Union. The data analyzed comprise the period from 1997 to 2015. The results confirm that, although there are laws that regulate the initiatives of public managers in the electoral period, political alignment between state governors and the President of the Republic contributes to an increase in voluntary transfers to states during the campaign period.

Keywords: *Voluntary Union transfers to the states. Budgetary Political Cycles. Panel analysis.*

Introduction

The political and economic context established in Brazil reveals a major institutional crisis. Given this context, there is a strong interest in highlighting the importance of party elections and ideology in the macroeconomic results of society. Among the global lines of research that involve this theme are the political business cycles, which had their discussions emphasized by Nordhaus [1]. According to the author, voters are politically myopic, which reveals that, at the time of the election, there is a preference of voters for the recent state of the economy in relation to its evolution throughout the period of government.

Thus, in order to maximize votes in the next election, the rulers increase the supply of the currency in electoral year, thus generating a context of increase in the country's product

ion and decrease in the unemployment rate. As a result, according to Ferreira and Bugarin (2007: 272), "voters react positively at the polls, ignoring the fact that the act of the federal government will lead to inflation, bringing new problems to society in the future" – having, thus, politically myopic voters.

A refinement of this theory was presented by Rogoff [2]. in the theory of the political budget cycle, which emphasizes that when voters are not aware of the administrative competence of heads of government, they tend to distort the fiscal policy by cutting taxes and increasing transfers and, in this way, intend to show a supposed competence - and, for that reason, increase their chances of re-election.

Regarding the Brazilian scenario, Ferreira and Bugarin [3] show that higher levels of government, in the years of state election, [probably] with the goal of receiving greater support from mayors (with parties belonging to the same coalition) and recognition of the population, increase the volume of voluntary transfers to the partner municipalities. Voluntary transfers, according to the Transparency Portal of the Federal Government, are the financial resources the Union gives to the states, Federal District and Municipalities as a result of the agreements, adjustments or other similar instruments, with the premise of investing in infrastructure and / or services of common interest.

To prove their hypothesis, the authors constructed a theoretical model showing that the distribution logic of discretionary transfers from the federal government to the lower spheres of government goes through the existing party bond: president and mayors belong to parties of the same coalition that governs the country. This support guarantees mutual reciprocity in electoral terms: such distribution of resources should enable mayors to win votes in municipal elections and the president in federal elections.

In Brazil, voluntary transfers are mainly done through agreements and contracts. These instruments offer great flexibility to deal with specific or unforeseen situations, since budgetary resources can be authorized without explicit budget contemplation. However, with this practice, there is an increase in the discretionarity of the resource managers, enabling them reach agreements with no objective criteria, no technical justification, no public purpose and thus to use voluntary transfers as "political currency".

In this line of research there are different studies that relate the connection between political factors and the allocation of public resources, as in the studies of Cossio, Souza, Gibson, Calvo and Falleti [4]. Ferreira and Bugarin [3] Arretche and Rodden [5] Neto and Simonassi [6]. Those researches show, among other results, the existence of electoral political cycles in their most

different periods and contexts of analysis. Because of that, and in order to follow up on these researches and observe them within the current Brazilian context, the objective of this study is to verify, using panel data methodologies, the relationship between the amount of voluntary transfers from the federal government to the Brazilian states and to the federal district and their political motivations.

The Voluntary Transfers and the Theories of Nordhaus and Rog Off

The current political-economic configuration of Brazil presents two types of transfers of public resources: compulsory and voluntary. The first are those that do not involve the discretionarity of the transferring organ or Power. These transfers may be constitutional or legal, according to the legal norm that established this obligation. Voluntary transfers, however, have been the subject of discussion in various research spheres and environments. According to D'Abadia [7], this type of transfer has had a significant growth in importance and volume of resources in the last 15 years.

According to the Fiscal Responsibility Law (FRL), in its article 25, voluntary transfers are defined as "the delivery of current resources or capital to another entity of the Federation, in the form of cooperation, aid or financial assistance, which does not derive from a constitutional or legal determination or those destined to the Unified Health System". In article 4 of the FRL it is also stated that the Budgetary Guidelines Law (BGL) will rule the other conditions and requirements for transfers of resources to public and private entities.

The model presented by Nordhaus [1] qualified as the model of the business political cycle, is a model of intertemporal public choice inserted in an electoral process, in which the problem of a choice between inflation and unemployment is analyzed. For the author, the unemployment rate is a variable of control of the economy, and the politician can set it at any level he wishes. Nordhaus [1] admits individuals as rational and, therefore, considers aggregate unemployment and inflation rates in their utility functions.

These same individuals, according to the author, prefer having lower unemployment and inflation rates to higher rates. Faced with the rationality of the individuals, Nordhaus [1] sets them as ignorant on macroeconomic trade-off between the Phillips curve, which correlates inflation and unemployment, that is, how individuals do not have macro view and are not able to evaluate the economic policies of the holders of public positions, they make their decisions according to past experiences.

Contrary to the ideas presented so far, Rogoff [2] brings the perspective of the model of the political budget cycle, composed of voters and politicians, all of them endowed with rationality.

The voter hopes to maximize the expected value of his utility function, consisting of the consumption of private good, consumption of public good (per capita), investment in public good (per capita), and a shock (random) of appearance (popularity) of the candidate. In this model, when voting, voters do not know the competence of the candidate, however, make assumptions based on the fiscal policy that the politician chose that year. Also, there is a trade-off between inflation and production (or, equivalently, unemployment).

Methods

This study, as previously mentioned, will use panel data methodologies for data treatment and analysis. Thus, this section presents an econometric model with the goal of verifying the existence of evidence of party motivation in the transfer of voluntary resources from the Union to the states and Federal District. For this, the hypothesis tested is that the voluntary transfers are greater when the governors of the states are allied to the members of the executive of the Union.

Considering that the collected present characteristics of time series conjugated with cross-section individuals, this study developed a model of data in panels. Three methods can be cited to estimate panel data models: Pooled Aggregates, Fixed Effects Model and Random Effects Model. In the first model, Pooled aggregates models,

estimate is made assuming that parameters a and b are common for all individuals:

$Y_i^t = a + bX_i^t + \dots + u_i^t$, where homogeneity is in the constant part and in the slope.

In Fixed Effects Model, in turn, the estimate is made assuming that the heterogeneity of individuals is captured in the constant part, which is different from individual to individual:

$Y_i^t = a_i + bX_i^t + \dots + u_i^t$, there being heterogeneity in the constant part and homogeneity in the slopes. The constant part a_i is different for each individual, capturing time-invariant differences (e.g. country size, natural resources, and other characteristics that do not vary in the short term).

In Random Effects Models, lastly, the estimate is made introducing the heterogeneity of the individuals in the term of error:

$Y_i^t = a + bX_i^t + \dots + (c_i + u_i^t)$, where $a_i = a + c_i$. And c_i represents the unobserved individual random effect. Random effects models consider the constant not as a fixed parameter but as an unobservable random parameter.

To support the choice of the most appropriate estimator for the model, the first step is the execution of Breusch-Pagan LM Test, which is used to choose between the estimate grouped MQO and of random effects. The second step is to perform the Hausman test to choose between the Fixed Effects and Random Effects estimators.

The model for the analysis in question will follow the idea of the model proposed by Ferreira and Bugarin [3]. However, this paper will only present the transfers from the Union to the states of the Federation. The proposed model will be given by:

$TVe_i^t = \alpha_1 + \alpha_2 TCE_i^t + \alpha_3 TVm_i^t + \alpha_4 Tx_i^t + \alpha_5 Pib_i^t + \alpha_6 gini_i^t + \alpha_7 Part_i^t + \alpha_8 Colig_i^t + \alpha_9 ano_i^t + \varepsilon_i^t$.

In the above expression, the subscripts i, t indicate observations taken from state i in

period t. As in the study by Ferreira and Bugarin [3], the Colig coefficient is expected to be positive, indicating that there is an increase in voluntary transfers, characterizing the political cycle.

The sample of the study consists of the data referring to the 27 federative units of Brazil and the choice of the period was based on a) data availability; B) the continuity of the studies of Cossio [8], Souza [9], Gibson, Calvo and Falletti [4] Ferreira and Bugarin [3] Arretche and Rodden [5] Neto and Simonassi [6] and c) the temporal scope capable of harboring partisan alternation in the Brazilian federal government. All the data used comprise the periods from 1997 to 2015 and all the econometric tests were done using the statistical package STATA 14. Thus, the variables of the research are:

- **Voluntary Transfers from the Union to the states (VTS):** It is the estimated dependent variable. It corresponds to the total voluntary transfers from the Union to the states. All values were collected at the National Treasury Secretariat and deflated for the year 1997. Data per capita.
- **Constitutional Transfers from the Union to the states (CTS):** Constitutional transfers are a significant percentage of the state budget. It is expected that the larger the constitutional transfers, the smaller the voluntary transfers done to the states. All data were collected on the website of the National Treasury Secretariat and deflated for the year 1997. Data per capita.
- **Voluntary Transfers from the Union to the municipalities (VT m):** This amount corresponds to the voluntary transfers from the Union to the municipalities.

It is expected that the greater the voluntary transfers from the Union to smaller municipalities, the smaller the voluntary transfers to the states to which these municipalities belong. Data collected on the website of the National Treasury Secretariat and deflated for the year 1997. Data per capita.

- **Taxes collected (T x):** This variable corresponds to state taxes and duties capitalized annually. It is expected that the larger the state collections, the smaller the voluntary transfers received from the Union. These data were collected on the website of IBGE (Brazilian Census Bureau) and deflated for the year 1997. Data per capita.
- **GDP:** State GDP data are used to measure the collection potential and the state's economic influence in relation to the central government. GDP per capita variable is herein used.
- **Gini:** This variable captures the inequalities of income distribution. It is expected that the greater the value of the index in the state, the greater the flow of voluntary transfers received.
- **Colig:** A dummy variable that will have a value of 1 when the state Governor's party belongs to the coalition of the President (ally of the president's party); and zero otherwise.
- The list with the summary of the variables used, as well as their statistics calculated for the years 1997 to 2015 is highlighted in Table 1. Except for the gini variable, all are per capita.

Table 1: Variables from 1997 to 2015

| Variables | | Media | Default.Error | Min | Max |
|-----------|---------|-----------|---------------|-----------|-----------|
| VTS | overall | 0,0226376 | 0,0245166 | 0,0026267 | 0,145533 |
| | Between | 0,0194305 | | 0,0054153 | 0,0815468 |
| | Within | 0,0153773 | | 0,0370181 | 0,1004866 |
| VTM | overall | 0,0151289 | 0,0108397 | 0 | 0,0988651 |
| | Between | 0,0094427 | | 0 | 0,0543758 |

| | | | | | |
|--------------|---------|-----------|-----------|------------|-----------|
| Within | | 0,0056028 | | D0,019961 | 0,0596183 |
| CTS | overall | 279,6467 | 287,5711 | 16 | 1440 |
| Between | | 285,3931 | | 58,15385 | 1.150,15 |
| Within | | 63,56464 | | 82,41595 | 592,416 |
| gini | overall | 0,558843 | 0,0390167 | 0,4427 | 0,6554 |
| Between | | 0,0303189 | | 0,4841769 | 0,6164846 |
| Within | | 0,025191 | | 0,4734353 | 0,6267046 |
| Pib | overall | 5.848.091 | 3,671729 | 1,5 | 24,36 |
| between | | 3,530007 | | 2,213077 | 18,89846 |
| within | | 1,203278 | | D1,410370 | 11,30963 |
| Colig | overall | 0,2962963 | 0,4572751 | 0 | 1 |
| between | | 0,2284934 | | 0 | 0,6923077 |
| within | | 0,3983482 | | D0,3960114 | 114,245 |
| Tx | overall | 3.671.994 | 189,4533 | 75 | 993 |
| between | | 172,8527 | | 123,0769 | 715,6923 |
| within | | 83,89814 | | 122,1225 | 684,661 |

Analyses of Results

This section reports the results obtained for the political and economic determinants of the voluntary transfers from the Union to the Brazilian states. The main purpose of going back to this study is to check the sign and significance of the variable *Colig*. A significant coefficient with a positive sign suggests that the states whose governors are politically aligned with the President of the Republic receive, on average, greater

volumes of voluntary transfers compared to the other states.

Table 2 reports the results of the regression with TVS dependent variable for the methodologies presented in Chapter 3. According to the results obtained in LM test of Breusch-Pagan and Hausman test, the fixed effects methodology is more suitable for the analysis in question, being the results analyzed based on this methodology.

Table 2: Tvs Estimates

| Fixed effects | | | | | Random effects | | | | Pooled2OLS | | | |
|-----------------|--|---------------|-------|---------|---|---------------|-------|---------|------------|---------------|-------|---------|
| | Coef. | Default error | t | P2valor | Coef. | Default error | z | P2valor | Coef. | Default error | t | P2valor |
| VTM | 0,8751725 | 0,124089 | 7,05 | 0 | 1.009.337 | 0,1193387 | 8,46 | 0 | 0,8060695 | 0,1137655 | 7,09 | 0 |
| CTS | 20,0000417 | 0,0000155 | 22,69 | 0,007 | 0,0000204 | 7,26E+206 | 2,81 | 0,005 | 0,0000379 | 4,26E+206 | 8,89 | 0 |
| Gini | 20,0859537 | 0,0370103 | 22,32 | 0,021 | 20,0190606 | 0,0350694 | 20,54 | 0,587 | 0,1174051 | 0,0283618 | 4,14 | 0 |
| Pib | 20,0037784 | 0,0008508 | 24,44 | 0 | 20,0018053 | 0,0006769 | 22,67 | 0,008 | 0,0002023 | 0,0004621 | 0,44 | 0,662 |
| Colig | 0,0063874 | 0,0018123 | 3,52 | 0 | 0,0044422 | 0,0018609 | 2,39 | 0,017 | 0,003586 | 0,0020621 | 1,74 | 0,083 |
| Tx | 0,0000674 | 0,0000155 | 4,36 | 0 | 0,0000377 | 0,0000134 | 2,81 | 0,005 | 9,51E+206 | 9,79E+206 | 0,97 | 0,332 |
| Year | 20,0016876 | 0,000415 | 24,07 | 0 | 20,0020672 | 0,0003213 | 26,43 | 0 | 20,0016093 | 0,000289 | 25,57 | 0 |
| Constant | 3.444.777 | 0,8335423 | 4,13 | 0 | 4,148291 | 0,6483824 | 6,4 | 0 | 3,152003 | 0,5825797 | 5,41 | 0 |
| R2 | within=(0,4067 (between=(0,1649(overall=(0,0002 | | | | within=0,3573(between=0,4831(overall=(0,4312(| | | | 0,5406 | | | |

| | | | |
|---------|--------------------------------|-------------------------------------|-------------------------------|
| Signif. | F(7,317)=31,05 (Prob>F(2(0,000 | Wald(chi2=205,64((Prob>chi2(=0,000 | F(7,343)=57,67 (Prob>F(=0,000 |
| Obs. | 351 | 351 | 351 |

*Coef.: Coefficient *Signif.: Significance
 *Obs.: Observations

The results point to the existence of a positive correlation between the political alignment of the governors and the presidents and the transfers received by the states, which can be verified by the sign and significance of the variable *Colig*.

According to the theory of fiscal federalism, intergovernmental transfers have the objective of leveling the expenditures of the regions in order to correct local inequalities.

Thus, it is expected that the lower the constitutional transfers from the Union to the states, the total taxes collected by the states and the per capita income, the greater the voluntary transfers. The hypothesis above was verified in the variables CTS and GDP since they presented negative signs.

However, it can be verified that the variable regarding the taxes collected per capita, Tx, presents a significant and positive signal, contrary to the theory of fiscal federalism. Another coefficient confirming the hypothesis that voluntary transfers are used to minimize was gini, which presented a negative and significant signal, indicating that the more unequal the state, the less voluntary transfers it will receive.

And the greater the gini, the greater the inequality. It is also noteworthy that the coefficient regarding the voluntary transfers from the Union to the municipalities presents a significant and positive signal, which contradicts the intuition that the more resources the Union transfers to the municipalities, the less resources would be necessary for the states.

In order to confirm the results presented, a robustness analysis was performed. Therefore, the model of difference in difference is used to verify whether with the re-election of the chief of the executive the flow of transfers to states not allied politically before the elections but that now belongs to the same alliance has an increase.

In econometric studies, several researches are conducted analyzing the so-called natural experiments. Natural experiments take place when some exogenous event, such as a change in government policy, changes the environment in which individuals, families, firms, or cities operate.

In order to analyze a natural experiment, it is necessary to have a group that was not affected by the change, called the control group, and a group that was affected by the event, called the treatment group. Unlike a real experiment in which treatment and control groups are randomly chosen to prevent bias in estimates, groups in a natural experiment emerge from the way the change is made.

To study the differences between the two groups, it is necessary to have data before and after the event for both groups. Thus, for this study, the sample will be divided into 3 groups:

- Group of states not politically aligned with the president's party before 2006;
- Treatment group: states that, in 2014, became politically aligned with the president;
- Control group: states that, in 2014, continued to have no alliance with the president's party.

The model proposed will be:

$$VT \text{ and TVS} = \beta_0 + \beta_1 D2 + \beta_2 \text{treatment} + \beta_3 \text{treatment} \cdot d2 + E$$

Variable d2 is equal to one when the data refer to the second period (after the 2014 elections) and zero if the data refer to the first period. The treatment variable is equal to one when the state belongs to the treatment group and zero if it belongs to the control group. Coefficient β_1 is our estimate from differences in differences, through which we determine the impact of political alignment on federal voluntary transfers.

Given the data collected, there is a set of 24 states in which the governor was not politically aligned with the president. The control group consists of 21 states and the

treatment group consists of 3 states. Table 3 shows the result of the regression.

Table: 3 Estimates of the Robustness Test

| vtspc | Coef. | Default error | t | P1valor |
|--------------|------------|---------------|------------------|---------|
| d2 | 10,0036998 | 0,0030332 | 11,22 | 0,23 |
| dummytrat | 10,0035674 | 0,0062003 | 10,58 | 0,568 |
| d1 | 0,0094678 | 0,0085671 | 1,11 | 0,276 |
| tcepc | 0,0000353 | 6,57E+106 | 5,37 | 0 |
| tvmpc | 10,0209957 | 0,3435307 | 10,06 | 0,952 |
| gini | 0,0557588 | 0,0446673 | 1,25 | 0,219 |
| pibpc | 0,0001519 | 0,0006836 | 0,22 | 0,825 |
| icmspc | 1,24E+107 | 0,0000144 | 10,17 | 0,869 |
| constante | 10,0236253 | 0,0247589 | 10,95 | 0,346 |
| R2 | | | 0,5795 | |
| Significance | | | F(8,39),=,6,72 | |
| | | | ,Prob>F,=,0,0000 | |
| Observations | | | 48 | |

*Coef.: Coefficient

*Obs.: Observations

According to the result, β_1 has a positive sign indicating that the aligned states received more transfers compared to the states not aligned. However, except for the variable CTS, none of the regression coefficients is individually significant at conventional significance levels of 1% to 5%. Coefficient β_1 is not significant even at a level of 70%.

Final considerations

As discussed earlier, economic literature has long been intrigued by the "coincidences" between economic fluctuations and elections. In this perspective, this paper aims to test the hypotheses of political motivations in voluntary transfers to the states of Brazil: is there evidence of party motivation in the transfer of voluntary resources from the Union to the states and Federal District?

Through the conduction of statistical tests, evidences were found to confirm that the political alignment between state governors and the President of the Republic

contributes to an increase in voluntary transfers to the states during the campaign period, in line with the background literature for this research, and adopting the logic of Cossio [8], Souza [9], Gibson, Calvo and Falleti [4], Ferreira and Bugarin [3], Arretche and Rodden [5], Neto and Simonassi [6].

Despite corroborating both the empirical and theoretical studies, the results raise questions, among which it is worth emphasizing: in addition to the FRL, there is also an electoral law that aims to safeguard the Brazilian electoral process. In this sense, the results presented in this study suggest that there may be the possibility that these legislations are not being fully respected. Thus, there is room for a reflection regarding the effectiveness, both the FRL and the electoral law, in protecting the public treasury for the benefit of a candidate, party or ideology [10-13].

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