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THE EFFECT OF EMANCIPATING MUNICIPALITIES ON LOCAL PUBLIC FINANCES: EVIDENCE FOR BRAZIL

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ABSTRACT

Brazil experienced a wave of new municipalities in the 1990s, where 1,016 local administrations were emancipated. Previous empirical evidence is inconclusive about the efficiency and welfare gains from this decentralization process. This paper aims to investigate the consequences of emancipations on different tax characteristics. We use a quasi-experimental approach based on the Difference-in-Differences' method and compare emancipated municipalities with those that tried and failed to emancipate. The results indicate an increase in expenditures associated with the maintenance of the government structure and capital goods, while social expenditures did not suffer a significant impact. Regarding local tax collection, we did not observe changes in the revenues themselves, but there was an increase in resources from intergovernmental transfers and credit operations. These results suggest that the decentralization shock changed the composition of local spending and brought about greater tax dependence for local governments.

Keywords: Municipal division. Regional Finance. Tax Federalism.

JEL Codes: H72. H77. R51.

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Summary

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1 Introduction

The boundaries and attributions of administrative units within a country are dynamic factors. Territorial and tax competence changes are the result of both complex political processes and historical movements, with the objective of advancing socially supported agendas. Given the post-military regime historical context in Brazil, the promulgation of the 1988 Constitution brought the main references of mechanisms to enter a democratic government.

The intention to generate autonomy was manifested through a strong tax and administrative decentralization, guaranteeing municipalities the right to manage local resources and those coming from federal transfers, making them members of the Brazilian Federation (Gomes and MacDowel, 2000, Tomio, 2002a). This scenario generated incentives for a wave of new municipalities: between 1991 and 2001, 1,070 new municipalities were created, which today represent almost 20% of the 5,570 existing municipalities in the country.

Brazil is one of the world's largest federations. In contrast to its Latin American neighbors, its 5,570 municipalities make it the country with the largest number of subnational governments. Compared to other world federations, it only has fewer subnational units than countries with a large territorial extension (like Russia and the United States) or with an extremely high population concentration (like India). In addition, its average concentration of inhabitants per municipality is also high, in comparison with other Federations (Brazil has 36,400 inhabitants per municipality, against 8,990 in the United States and 5,167 in India[1]).

These data point to a scenario that is favorable for relevant analyses, given the global representativeness that the country has, both in terms of population size and territory, and in terms of Federalism and, to a certain extent, segmentation in public administration.

The motivation for territorial reforms stems from discussions on tax federalism and its relations of revenue collection, provision of public goods and respective gains of scale in these services (Fox and Gurley, 2006, Dollery et al., 2007). Thus, deliberation on improving tax health at regional levels is of paramount importance: understanding the profile of spending, expenditure, and tax indicators can improve the understanding of public finances and generate

[1] Data taken from the 2016 work of the Organization for Economic Cooperation and Development (OECD) on Subnational Governments Around the World

a review of competencies with the intention of increasing the welfare of the population residing in these municipalities.

Studies diverge in their results as to whether there are gains of scale, as shown in the systematic review prepared by Gendzwill, Kurniewick, and Swianiewicz (2020). On the one hand, one can have a decrease in total expenditures (or current and capital expenditures) when the size of the municipality increases, due to gains of scale (Lima and Neto, 2019, Reingewertz, 2012, Fox and Gurley, 2006, Vojnovic, 2000, Blesse and Baskaran, 2016). Or also, spending on administrative costs may decrease, creating room in the budget for other types of investments in public goods (Cobban, 2019, Blesse & Baskaran, 2016; Blom-Hansen et al., 2014, Andrews, 2015, Moisio & Uusitalo, 2013, Swianiewicz & Łukomska, 2019). And, although there is an international trend of joining municipalities in recent decades (Jordahl and Liang, 2009, Hinnerich, 2009, Nakazawa, 2013, Reingewertz, 2012), the Brazilian scenario tends to go against the grain, since there were proposals to create municipalities in 2013 and 2014, but they were vetoed by the Executive Branch.

Brazil is going through a tax crisis that can be exemplified by the high insolvency of its subnational entities[2] and the lack of self-sustainability: more than one third of the municipalities do not generate enough revenue to finance their administrative structure. Not only this, but three out of four municipalities are in a difficult or critical tax situation.[3] This situation has been aggravated by the economic crisis that has been spreading in the country since 2014. Given this context, several studies have sought to investigate the economic effects of municipality creation in Brazil.

Matos and Ponczek (2013) and Dahis and Szerman (2018) present evidence that the emancipation process pointed to results on public goods provision and social indicators. While the first work shows that there was a worsening of social indicators and public services, the second finds the opposite, observing a positive association between the creation of municipalities and socioeconomic outcomes. Lima and Silveira-Neto (2019) also worked with the same experiment and found significant increases in capital and current expenditures of emancipated municipalities, and presented evidence suggesting that increases in capital

[2] https://agenciabrasil.ebc.com.br/economia/noticia/2018-11/divida-de-estados-e-municipios-com-uniao-chega-r-908-bilhoes
[3] Data taken from the Firjan Index of Fiscal Management 2019, prepared by the Federation of Industries of the State of Rio de Janeiro, based on 2018 data submitted by municipalities to the National Treasury

expenditures may be associated with decreasing economies of scale in the provision of public goods.

Therefore, this paper seeks to incorporate new results into the literature by making use of the quasi-natural experiment of the emancipations of Brazilian municipalities and understanding the change in tax profile after the separations, using a Difference-in-Differences model. To reduce endogeneity and isolate the treatment, we compare municipalities with similar characteristics using a quasi-treatment sample.

Our intention is to contribute to the debate regarding state formation, especially at the federative level, and to understand the impacts on public accounts, tax profile and collection efficiency by investigating the effects of secessions on tax indicators. We seek to understand how the Brazilian decentralization shock affected the different economic categories of local public spending (spending on health, education, transportation, services, assistance and social security, housing and urbanism, administrative and legislative) and the different forms of revenue collection (local taxes, intergovernmental transfers, and credit operation revenues). In addition, we also evaluate the impact of emancipations on the budget balance of the affected municipalities.

We observed an increase in per capita spending on administrative and planning expenditures and in the legislative sector, as well as increases in the areas of health, public transportation, sanitation, housing, and urban planning. Spending on education, welfare, and social security were not affected by the process of creating municipalities. In terms of revenue collection, the results were not significant for changes in own revenues, but the revenue from intergovernmental transfers increased. The budget balance also showed a positive result, as did revenues from credit operations. Taken together, the results show that the new municipalities significantly increased their spending on public machinery and capital goods, while some of the social spending remained the same. On the other hand, revenues became dependent on transfers through the FPM (Municipal Participation Fund) and increases in revenues from credit operations were necessary. This new dynamic, probably, is what made the budget balance become positive.

This paper is divided as follows: section 2 deals with the institutional context, bringing the political arrangements and economic outlook of the municipalities; section 3 explains the

methodology; section 4 presents the data and measures used; section 5 expresses the main results obtained; and section 6 concludes with a final discussion and policy implications.

2 Institutional Context

2.1 Characteristics of Brazilian Federalism

The 1988 Constitution created attributions for the Brazilian federative units, specifically, the states and municipalities gained independence in an unprecedented way in the country. The entities received autonomy, both in tax matters and in making decisions about the provision of public goods. This system, also known as tax federalism, is sustained, mainly, by two major reasons that generate this organization in Brazil: (i) the large territorial extension; and (ii) the heterogeneity among the 27 states that constitute its Federation.

The Brazilian Federation is defined by the existence of several types of government, namely, the Union, the Member States and the Municipalities, so that there is a certain hierarchy: whoever inhabits the Federal State must obey the legislation of both the Union, the Member State and the Municipality to which he belongs. Brazilian municipalities are divided into two powers: The Executive and the Legislative, which are the Mayor and the Council, respectively, each with its own specific and independent functions. The mayor is the highest office in the Municipal Executive Branch, democratically elected by a majority vote every four years. The City Council, on the other hand, is the legislative branch, with several representatives proportional to the inhabitants of each municipality, also elected every four years.

The revenues of municipalities come from municipal taxes: the IPTU (Property Tax), the ISS (Service Tax) and the ITBI (Tax on Transmission of Real Estate), the first two being responsible for most of the collection. Another source of revenue for the municipalities are the fees for public services, which are taxes, whose generating factor is configured by a specific state action, referable to the taxpayer (for example, a fee paid to get a passport, or a fee paid to establish a restaurant, etc.).

In addition to their own revenues, municipalities receive FPM (Municipal Participation Fund) allocations, which are intergovernmental transfers, from the Union [4]or the State[5] to the municipalities, non-conditional and without counterpart. It is determined by Decree-Law 1881/81 that the smaller the population of the municipality, the higher the transfer per capita. The municipality can also receive financial compensations, such as *royalties*, which are generated by the exploitation of natural resources.

In contrast, expenditures are mainly directed to local services, such as public transportation, resources for basic and elementary education, health services, land use regulation, and the conservation of history and culture (Tristan, 2003, apud Lima and Neto, 2018). As also mentioned by Mendes (2004), the areas of education and health involve a cooperation of the three levels of government (federal, state, and municipal), with the central government responsible for controlling funding and the sectors that involve economies of scale (such as universities) while state governments provide the service to the population.

Public security is also dealt with in this model, with the federal government curbing crimes of national and international scope through the Federal Police; the states taking care of the daily security of citizens, using the civil and military police; and the larger municipalities collaborating in preventive and daily policing through their municipal guards. Typically, local services (municipal roads, urban planning) remain under the full responsibility of the municipalities.

2.2 The process of creating municipalities in the 1990s

The FPM system, which prioritizes revenues to small municipalities, created incentives for the proliferation of small towns, especially with the institutional adventures that facilitated the emancipation of municipalities. During the time of the military regime, the emancipation process was regulated by the states and, even though it depended on state law, it also obeyed the requirements of a complementary law - among these requirements was the requirement of a minimum population of 10 thousand inhabitants, for example, a rather high number (Brandt, 2010, Ferrari, 2016).

[4] 25% of the Value-Added Tax on Goods and Services (ICMS), 50% of the Motor Vehicles Ownership Tax (IPVA), and 25% of the Tax on Industrialized Products (IPI) that the state receives.
[5] 50% of Rural Territory Tax (ITR), 22.5% of Income Tax (IR) and 22.5% of Tax on Industrialized Products (IPI)

However, as explained by Tomio (2002), since 1988 the process for creating a new municipality has become relatively simple: in a first round, the Legislative Assembly (representatives of the Legislative Branch at the state level) and the federal Executive Branch should approve the holding of a plebiscite of popular consultation. If approved, this plebiscite would be addressed to the population and, if the affected community supported the separation, there would be another round of approval, this time of the emancipation process itself, by the Legislative Assembly, and then, if the Executive did not veto the secession of the municipality, it would be created.

Gomes and Mac Dowell (2000) show the wide creation of municipalities between 1984 and 1997: 1,405 municipalities were created, which represents an increase of 34.3%. Of these 1,405 municipalities, 1,329 (94.5%) have less than 20,000 inhabitants, and can be considered small[6]; 1,095 (78%) of these municipalities are very small, by the same terminology; and 735 (52%) are micro municipalities.

Table 1 shows the progression of municipalities in relation to their population between 1991 and 2010. One can see that there is an increase of small municipalities (below 20 thousand inhabitants), and even more of micro municipalities (up to 5 thousand inhabitants). When observing the data from the 2010 census (table 2), we see that most of these municipalities are concentrated in the South Region, with almost 80% with populations of less than 20 thousand inhabitants; and in the Midwest, with 77% of the population residing in small municipalities. These two regions also have most of their municipalities with up to 5 thousand inhabitants: 36.5% of the municipalities in the South Region are micro municipalities; for the Center-West the number is 30%. Therefore, it is evident that Brazil has a great tendency to form small municipalities.

[6] The measures used by the authors and reproduced here are adaptations of the IBGE, used to stratify the Brazilian municipalities by population size, grouping them into eight ranges: Small Municipalities (0-20 thousand), Very Small Municipalities (0-10 thousand), Micromunicipalities (0-5 thousand); Medium-sized Municipalities (20 thousand-100 thousand); Large Municipalities (100 thousand-1 million), Very Large
Municipalities (500 thousand-1 million), and Megamunicipalities (over 1 million):

Table 1 - Population of Brazilian municipalities throughout the years

Inhabitants	1991	1996	2000	2010
Up to 5,000	739	1046	1328	1301
5,000 to 10,000	*16.46%*	*21.03%*	*24.11%*	*23.38%*
10,000 to 20,000	1058	1149	1309	1212
20,000 to 50,000	*23.56%*	*26.90%*	*25.08%*	*25.18%*
50,000 to 100,000	1296	1338	1381|	1401
100,000 to 500,000	*28.86%*	*26.90%*	*25.08%*	*25.18%*
500,000 to 1 million	932	943	964	1043
	20.75%	*18.96%*	*17.50%*	*18.74%*
Inhabitants	281	290	301	325
Up to 5,000	*6.26%*	*5.83%*	*5.47%*	*5.84%*
5,000 to 10,000	1G0	181	193	245
10,000 to 20,000	*3.56%*	*3.64%*	*3.50%*	*4.40%*
20,000 to 50,000	13	15	18	23
50,000 to 100,000	*0.29%*	*0.30%*	*0.33%*	*0.41%*
100,000 to 500,000	12	12	13	15
	0.27%	0.24%	0.24%	0.27%
Total	4491	4974	5507	5565

Table 2 - Population of Brazilian municipalities according to the 2010 Census, by region

Region/inhabitants	N	NE	CO	SE	S
Up to 5,000	86	241	143	398	433
5,000 to 10,000	81	363	104	391	273
10,000 to 20,000	108	591	112	356	234
20,000 to 50,000	111	428	72	285	147
50,000 to 100,000	43	113	17	99	53
100,000 to 500,000	18	47	14	122	44
500,000 to 1 million	0	*í*	2	12	2
More than 1 million	2	4	2	5	2
Total	449	1794	466	1668	1188

However, in several cases, these municipalities do not have sufficient scale to produce public services. The results of Mattos and Ponczek (2013) suggest the existence of gains of scale in the provision of public goods among municipalities, that is, smaller municipalities, despite receiving more resources *per capita* from government transfers, have greater difficulty in transforming these resources into public goods and services for their populations, jeopardizing their provision. For the new municipalities, the authors found worse indicators in the provision of basic sanitation, an increase in illiteracy, a drop in *per capita* income and in HDI.

More than that, the creation of small municipalities, added to the system of intergovernmental transfers, has generated perverse incentives for revenue collection: currently, 70% of Brazilian municipalities have in intergovernmental transfers received at least 80% of their current revenues (Canzian, 2019). This can be problematic, as this tax model makes funding not come from taxes collected at the local level, breaking the direct link between what citizens pay in taxes and what they receive in public services, not inciting the population to oversee government action. This can also encourage *free rider* behavior, with each of the local governments pressuring the central government for additional transfers, passing on the cost of local public services to the rest of the country.

Gomes and Mac Dowell (2000) try to confirm this hypothesis through some indicators, showing that the emancipation of municipalities: (i) increased the volumes of revenue transfers from large municipalities to small municipalities, discouraging economic activity in large municipalities; (ii) benefited the small portion (not necessarily the poorest) of the population living in small municipalities; and (iii) increased the resources used to pay for legislative spending while reducing, in relative terms, the amount of resources that the public sector made available to apply to social programs and investment.

On the other hand, the creation of municipalities can be advantageous, as put by Tiebout (1956) arguing that, tax decentralization would be a way to induce the consumer of public goods to reveal his preferences through a horizontal competition between local levels. This was empirically noted by Nelson (1992), in which *top-down* reforms in Sweden reduced horizontal competition and increased the influence of institutional factors on local budgets; or also the

theory of Oates (1972) that sees tax federalism to facilitate the observation of local preferences through the proximity of the ruler, drawing attention to the importance of listing externalities of each type of public good. This result could be seen in Ladner et al. (2019), where, using the cases of territorial reforms in Eastern Europe, they argue that more fragmented government can generate a proximity of the ruler with the local population, enhancing the ability to observe their needs and increasing efficiency in the provision of public goods and political *accountability*.

Therefore, there is evidence that the emancipation movement can generate opportunities for local elites to promote *rent-seeking* behavior and inefficiencies in tax collection, making a large part of the municipalities created financially unviable and unable to support themselves. However, there are also studies showing that the secession of subnational units can improve the provision of public goods, increase tax collection, and improve *accountability*. This discussion has regained visibility in the Brazilian political scene, given that in late 2019 a Proposal for Amendment to the Constitution (PEC) of the Federative Pact that provided for the extinction of municipalities with fewer than five ,000 inhabitants and that were not collecting alone 10% of their total income was presented, but it was rejected by the National Congress. It is in this context that our work aims to add: to generate new evidence of the impacts of secession on public accounts and tax health.

3 Methodology

Our intent is to measure the impact of the creation of new municipalities on selected tax indicators. To do this, it would be ideal to find a counterfactual in which the municipality was not divided and observe the progression of the tax profile. However, no such counterfactual exists. Thus, we chose the Differences-in-Differences methodology for panel data from 1991 to 2000, with municipality fixed effects. The Difference-in-Differences (DiD) estimator, as mentioned by Angrist and Pischke, (2008) is the average difference of the variable of interest (in this specific case the tax indicators related to expenditures, collections and budget) over time of municipalities that split compared to those that almost split. The estimator seeks to capture the changes in the treated group (went through a split) with the untreated group (did not

go through a split). Thus, we estimate the following Differences-in-Difference's specification (1) with observations by municipality/year:

$$y_{it} = \gamma Emancip_{it} + \theta x_i t + \mu_i + \lambda_t + \varepsilon_{it}$$

y_{it} assumes the values according to the variable of interest. In the first estimation, it is the logarithm of public expenditures according to the function; in the second estimation, it assumes the values of the logarithms of collections by IPTU, ISS, ITBI, taxes and FPM of municipality i in year t; in the third estimation, it is the budget balance (budget revenues minus budget expenditures) and the logarithm of revenues by credit operation. All these are related to municipality i in year t.

The value of $Emancip_{it}$ is the treatment variable, which assumes one (1) for affected localities in the secession and post-secession years, and zero otherwise. The parameter of interest is γ, which measures the average treatment effect on treated units (ATT). In addition, x_i is a vector of selected control variables that are fixed in time and t is a trend component; μ_i is the fixed county effect, which captures characteristics that do not vary over time across counties; λ_t is the time effect, which controls for characteristics that vary over time and are common to all municipalities; finally, ε_{it} is the error term.

The DiD estimator is appropriate in cases where the treatment group was chosen randomly. More specifically, the required assumption is that the treatment criterion is not correlated with the outcome variables. If the treatment was not given randomly, an auto selection problem arises. Thus, in the specifications, instead of just comparing units that separated with those that did not, we will use a group of municipalities that attempted emancipation but were unsuccessful, calling them "quasi-treatment." This strategy was initially used in the study by Lima and Silveira-Neto (2018) and aims to decrease the endogeneity associated with the treatment variable.

The selection bias issue can be exemplified by the fact that there are similar justifications for an emancipation request, as argued by Bremaeker (1997). The author indicates that one of the reasons most often given by mayors of new municipalities is neglect by the public administration, pointed out by almost two thirds of the respondents as a determinant for requesting separation. In other words, there are circumstances common to the municipalities that wish to secede, and this can generate a problem of self-selection arising from these

characteristic endogeneities: municipalities with emancipation motivations already have different spending profiles from those that never wanted to separate.

In view of this, our intention is to mitigate this problem by performing the analysis with groups that are as similar as possible. We will use the municipalities that tried to emancipate (and failed) in comparison with the units that managed to separate, since the two groups should have similar spending and public administration profiles. In this way, the only difference between the treated and the quasi-treated group would be exactly the treatment, in this case, achieving secession.

To compare these municipalities in different periods, we will use the Minimum Comparable Areas (MCA) as observational units. These are areas with constant boundaries over time: "AMCs do not refer to a political or administrative division, but simply to the aggregate area of the smallest number of municipalities necessary for comparisons to be geographically consistent" (Reis, Pimentel, and Alvarenga 2008). Therefore, if there was a municipality creation, the AMC after the year of creation will be the sum of the territories of the new municipality with the old one; if there was no emancipation, the AMC is the same in both periods.

To have a relevant DiD estimation, it is also important to satisfy the parallel trends hypothesis. We must take into account that the trends (of expenditures and collections, in the case under study) were at least parallel at some level, and that the trend changed after the treatment (the creation of municipalities). This can be seen by a graphical observation of spending trends between municipalities before and after the treatment. [7]

4 Data

The base used is panel data on 4,267 Brazilian municipalities in the form of AMCs between 1991 and 2000. Of these, 652 (15.28%) underwent a secession in their territories. The period was chosen because of two large waves of municipal creation during the decade: in 1993 (266 municipalities) and 1997 (314 municipalities). Besides these, 72 municipalities had changes in the two years.

[7] These results are presented in the Appendix

As for the group of quasi-treaties, there are 325 municipalities that tried to emancipate and were not successful. These data were obtained through the work of Tomio (2002) and records in the Legislative Assembly of the Brazilian states.

The primary database used was obtained from the Ipea Data *website*. The values relative to municipal expenditures disaggregated by economic function are collected from the National Treasury Secretariat (Secretaria do Tesouro Nacional - STN), subordinated to the Ministry of Economy and made available by the research agency. Specifically, we used the expenditures on Administrative and Planning, Legislative, Transportation, Health and Sanitation, Housing and Urbanism, Education, Assistance and Welfare. This classification is presented in more detail in the Appendix, through a table from the Budget Technical Manual of the Federal Budget Secretariat, which breaks down the function and respective sub-functions.

For the municipality's revenue figures, we made use of the IPTU, ISS, ITBI and taxes, in addition to the revenue data through the FPM. The items to calculate the budget deficit were the budget expenditure and budget revenue. And the revenues from credit operations correspond to the resources arising from the placement of public securities in the market, or loans obtained from state or private entities, internal or external.

Finally, control variables were added, taken from the Ipea database. The following statistics were selected: income, illiteracy rate above 25 years old, Economically Active Population (EAP), number of elderlies, urbanization rate, and number of people considered poor. All values were deflated and weighted *per capita in* relation to the population of the AMC.

Table 3 - Data Summary*

	Total Sample		Untreated		Treated		Semi-treated	
	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation	Average	Standard Deviation
Expenditure on Legislative	5.18	1.33	5.36	4.48	3.91	2.87	4.02	3.05
Expenditure on Administrative c Planning	18.76	17.64	19.51	18.27	13.47	11.23	14.23	17.15
Expenditure on Transportation	9.96	13.61	11139	14.15	7.12	8.64	6.75	10.46
Expenditure on Health and Sanitation	13.42	14.70	14.07	15.15	9.03	10.12	9.50	10.91
Expenditure on Housing and Urbanism	0.46	2.91	0.47	3.03	0.42	1.99	0.45	1.93
Expenditure on Education	25.38	18.68	26.42	19.37	18.37	10.81	18.33	13.09
Expenditure on Assistance and Welfare	4.92	6.28	5.14	6.49	3.40	4.33	3.92	4.63
Total Expenditure	95.51	72.64	99.47	75.00	68.78	45.94	70.81	55.34
Total Income	6.27	13.66	6.27	14.26	6.29	9.69	6.96	11.85
Collection with IPTU	1.79	5.93	1.78	6.16	1.80	4.42	1.95	4.61
Income from ISS	1.17	7.46	1.49	7.94	1.38	3.87	1.75	6.33
Income from ITBI	1.68	3.10	1.68	3.25	1.70	2.12	1.71	2.35
Collection with taxes	1.33	2.69	1.32	2.74	1.41	2.40	1.54	2.60
Budgetary Income	99.75	71.41	103.66	71.41	78.16	46.12	81.96	55.78
Income from Credit Operations	0.52	3.01	0.47	2.67	0.79	4.58	0.60	2.14
FPM	11.93	33.85	47.73	35.65	29.68	13.83	30.14	17.59
Income	515.15	308.53	512.03	308.00	532.43	311.11	515.53	306.15
Illiteracy Rate	35.73	17.90	35.97	17.89	34.38	17.91	34.36	19.16
EAP	37.83	6.48	37.84	6.45	37.76	6.67	38.32	6.78
Percentage of Elderly	10.70	4.32	10.84	4.42	9.91	3.58	10.61	4.00
Urbanization Rate	53.75	23.36	53.97	23.40	52.55	23.16	52.53	23.55
Poverty	57.10	23.11	57.13	23.22	56.96	22.52	57.94	22.84

Except for the variables illiteracy rate. EAP. percentage of elderly, urbanization rate, and poverty, which are m percentages, all other values are at the *per capita* level

Source and author elaboration

Table 3 presents descriptive statistics (mean and standard deviation) for the total sample of municipalities and for the treated, untreated and nearly treated sub-samples in the year 1991, before treatment. We can observe that there are notable differences between municipalities that underwent secession and those that had no changes in their boundaries: treated municipalities showed lower levels in FPM expenditures and revenue. Bremaeker's (1993) hypothesis is that the main motivation to secede is the absence of local government participation in the provision of public goods and services, something that can be observed in a brief analysis of the descriptive data.

However, when considering the quasi-treated municipalities, we notice that there is in fact some equivalence between them and the municipalities that managed to separate themselves, especially in the spending profile. The average, for example, of total *per capita* expenditures of the treated AMCs is R$ 39.87, compared to R$ 43.98 of the quasi-treated ones; when compared to the untreated units we observe the value of R$ 70.08, where we can perceive the respective expenditure profiles. Observing the other functions used, we notice that the pattern remains the same.

Thus, our hypothesis of similarity between the spending profile of treated and quasi-treated units seems to be confirmed, achieving the goal of generating groups with analogous characteristics and allowing the closest to an analysis focused on treatment alone.

5 Results

Table 4 below presents the results of model (1), without population control variables. The units of analysis are the quasi-treated AMCs versus the treated ones:

Table 4: Expenditures by Functions

	Expenditures by Function:							
	Total Expenses (D	Administrative (2)	Legislative (3)	Transport (4)	Health (5)	Habitation (6)	Education (7)	Social Security and Assistance (8)
Emancipation	0.050**	0.074**	0.111***	0.185***	0.076**	0.085**	0.011	0.037
	(0.023)	(0.031)	(0.032)	(0.015)	(0.035)	(0.010)	(0.026)	(0.041)
Observation	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6,060
R^2	0.909	0.841	0.782	0.802	0.825	0.712	0.881	0.758
R^2 Adjusted	0.897	0.818	0.752	0.774	0.800	0.672	0.864	0.724
Residual Standard Error (cif = 5320)	0.303	0.444	0.442	0.629	0.493	0.585	0.367	0.583

Note: *p<0.l; **p<0.05; ***p<0.01

In Table 4 we can see that the regressions of the logarithm of total *per capita* expenditures (aggregated by function) were significant and presented, on average, a 5% increase. That is, given an emancipation, it is expected that the new municipality will increase its expenditures by this amount.

When we disaggregate by function, we have that the Administrative/Planning and Legislative functions were significant, with increases of 7.4% and 11.1%, respectively. The Transportation, Health/Sanitation, and Housing/Urbanism functions were also significant, the first increasing 18.5%, the second 7.5%, and the third, 8.5%.

Expenditure on Education and Assistance/Social Security, on the other hand, did not present significant results, indicating that emancipations did not generate changes in the level of expenditure on these functions. This result can be caused by the fact that the obligations of institutional minimums, such as in Education, in which the Constitution requires municipalities to invest at least 25% of their tax and transfer revenues. This may cause the spending profile not to change. The same may be probable in the case of Social Security, since the autonomy of municipalities on this topic is not clear, so that there is only a reproduction of what is already done in the States and at the Federal level (Modesto, 2020).

Table 5 below shows the regressions adding population controls:

Table 5: Expenditure by function with controls

	Expenditure by Function:							
	Total Expenditures	Administrative	Legislative	Transport	Health	Habitation	Education	Social Security and Assistance
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Emancipation	0.049”	0.075”	0.101”*	0.162*”	0.066*	0.077*	0.014	0.028
	(0.022)	(0.030)	(0.031)	(0.015)	(0.035)	(0.041)	(0.025)	(0.040)
log(ren<lapc + 1)	0.012	0.037	-0.191”*	-0.314—	-0.141”	-0.093	o.osr*	-0.088
	(0.034)	(0.016)	(0.046)	(0.081)	(0.059)	(0.067)	(0.039)	(0.068)
log(analf + 1)	0.298—	0.394”*	0.012	-0.109	0.102	-0.150	0.358*”	0.355*
	(0.101)	(0.140)	(0.203)	(0.222)	(0.158)	(0.232)	(0.118)	(0.187)
log(PEA + 1)	0.538—	0.653”*	0.767”*	0.539* **	0.635*”	0.315*	0.498—	0.284*
	(0.082)	(0.127)	(0.150)	(0.183)	(0.120)	(0.167)	(0.099)	(0.164)
log(idos +1)	-0.006	0.080*	0.062	-0.027	0.091*	-0.130*	-0.060*	-0.009
	(0.030)	(0.018)	(0.050)	(0.061)	(0.057)	(0.071)	(0.035)	(0.067)
log(urb + 1)	0.179—	0.132	-0.158	0.168	0.050	0.177	0.244*”	0.365*”
	(0.067)	(0.091)	(0.124)	(0.131)	(0.087)	(0.118)	(0.077)	(0.112)
log(pob + 1)	0.096	-0.089	-0.089	-0.313*”	-0.226*”	0.086	0.217—	-0.284*”
	(0.063)	(0.080)	(0.083)	(0.107)	(0.088)	(0.100)	(0.061)	(0.101)
Observations	6.060	6.060	6.060	6.060	6.060	6.060	6.060	6.060
R^2	0.913	0.844	0.785	0.804	0.827	0.713	0.885	0.760
R2 Adjusted	0.900	0.822	0.755	0.777	0.803	0.673	0.869	0.726
Residual Std. Error (<if = 5311)	0.298	0.439	0.439	0.626	0.490	0.58-1	0.360	0.581
Note:							’pcO.l; ”p<0.05; —pcO.Ol	

We can see that expenditure levels do not change much, and end up orbiting around what was observed in the uncontrolled estimates. Significance levels are also maintained in the Administrative/Planning, Legislative, Transportation, Health/Sanitation, and Housing/Urbanism functions.

Table 6 analyzes the changes in revenue and collection per capita of the municipalities with IPTU, ISS, ITBI, taxes and FPM, in addition to analyzing the total collection, where all estimates were made with the same previous population controls. The results show that there was no difference in the levels of self-collection with taxes and fees. However, the levels of FPM *per capita* receipt rose by about 12%.

Finally, Table 7 brings two more results related to the tax profile of the AMCs. We analyzed the budget balance, (i.e., the result of budgeted expenditures minus budgeted revenues) and the revenues from credit operations, both in *per capita* values. The budget balance showed a positive value of R$ 5.32 per person. The credit revenues, on the other hand, had an increase of approximately 10%.

Table 6: Revenues

	Collection and Revenue:					
	Total Collection	IPTU	ISS	ITBI	Tax	FPM
	(1)	(2)	(3)	(4)	(5)	(6)
Emancipation	-0.006 (0.027)	0.033 (0.023)	-0.015 (0.026)	-0.0001 (0.019)	0.008 (0.026)	0.120— (0.020)
log(rendapc + 1)	-0.735* •* (0.051)	-1.248*** (0.038)	-0.627— (0.044)	-0.435— (0.038)	-0.845* - (0.036)	0.075— (0.024)
log(analf + 1)	-0.246* (0.130)	-1.252— (0.119)	-0.223 (0.145)	-0.288— (0.096)	-0.695* ** (0.145)	0.286— (0.074)
log(PEA + 1)	0.443*** (0.109)	0.347* ** (0.087)	0.168 (0.108)	0.360— (0.073)	0.502— (0.101)	0.557— (0.073)
log(idos + 1)	0.030 (0.041)	0.100— (0.034)	0.001 (0.052)	0.062* (0.032)	0.094 - (0.043)	0.037 (0.025)
log(url) + 1)	0.236* * (0.102)	-0.094 (0.057)	0.207** (0.096)	0.126** (0.051)	-0.067 (0.081)	0.097* (0.054)
log(pob + 1)	-0.183*** (0.056)	-0.693* ** (0.077)	-0.195— (0.071)	-0.238— (0.058)	-0.397— (0.079)	0.049 (0.036)
Observations	7,127	7,127	7,127	7,127	7,127	6.959
R^2	0.897	0.895	0.868	0.843	0.868	0.901
Adjusted R^2	0.885	0.882	0.853	0.825	0.853	0.889
Residual Std. Error	0.432 (df = 6380)	0.383 (df = 6380)	0.395 (df = 6380)	0.315 (df = 6380)	0.381 (df = 6380)	0.264 (df = 6212)
Note:					*p<0.1;	**p<0.05: ***p<0.01

Table 7: Tax Profile

	Indicadores Fiscais:	
	Balanço Orçamentário	Receitas com Operações de Crédito
	(1)	(2)
Emancip	5.318”	0.097”
	(2.125)	(0.046)
log (rend apc + 1)	13.524 —	—0.349* ”
	(1.994)	(0.067)
log(analf + 1)	-30.811	-0.977—
	(18.753)	(0.318)
log(PEA + 1)	-40.480”	0.052
	(18.321)	(0.198)
log(idos + 1)	-0.692	0.056
	(4.780)	(0.096)
log(urb + 1)	15.098	0.220
	(10.127)	(0.137)
log(pob + 1)	25.839”	-0.898”*
	(10.040)	(0.207)
Observations	7.127	7.127
R^2	0.182	0.426
Adjusted R^2	0.087	0.359
Residual Std. Error (df = 6380)	48.252	0.782
Note:		•p<0.1; ”p<0.05; *”p<0.01

6 Final Discussion

When we put the results obtained into perspective, we found that the emancipation of the municipalities generated significant increases in spending related to the functioning of the public sector (administrative and legislative). For transportation, health/sanitation, and housing/urbanism expenditures, we also obtained increases; specifically, the increases in health/sanitation and housing/urbanism were not as large as the increase in expenditures on the Legislative. Transportation spending, on the other hand, was significant and showed a larger increase than the first categories.

We can observe a tendency regarding the provisions of public goods. The newly created municipalities have allocated part of their new budget to spending on public machinery, such as salaries and facilities, and these amounts were higher than the average increase in total expenditures. Expenditure on public goods in categories related to the main infrastructure, such as transport and housing, had equivalent increases, as well as an increase in credit revenues, which are probably related to a demand for new infrastructure arising from emancipation.

In terms of tax collection, none of the values related to own tax collection (IPTU, ISS, ITBI, fees) were relevant. These findings contradict studies that point to an advantage of smaller municipalities in the efficiency of collection, due to the proximity between the local government and the population, and the smaller area to be inspected. However, the amounts received from intergovernmental transfers, referring to the Municipal Participation Fund, showed significant increases. The budget result showed an increase, indicating that revenues exceeded expenditures, something that is probably a consequence of the higher FPM provisions (the transfer increase was 12%, compared to a 5% increase in total expenditures).

Therefore, we observe that the main financial destinations received after the emancipation are related to the FPM. This is a result consistent with the findings of some studies that relate the great dependence that municipalities (especially small ones) have on these transfers to sustain themselves.

Because of this, our deliberation is to draw a tax profile of what happens after an emancipation of a Brazilian municipality. Given the FPM arrangement, most of these new municipalities have small populations, which are sometimes not large enough to provide

considerable increases in public goods, while at the same time increasing their revenues accordingly.

Although an increase in spending on public sector organization was observed, significant revenues were related exclusively to transfers or loans. This relationship may not be beneficial to the tax health of a state that has financial difficulties due to crises that have damaged both the income level and the public deficit over the last few years.

One must wonder whether the current arrangement, of such a sectionalized tax federalism, is in fact beneficial to the populations residing in these municipalities, and whether the public goods, for which the respective governments are responsible, are being provided efficiently.

7 Appendix

Figure 1: Evolution of Expenditure by function in the quasi-treatment sample, by AMC status:

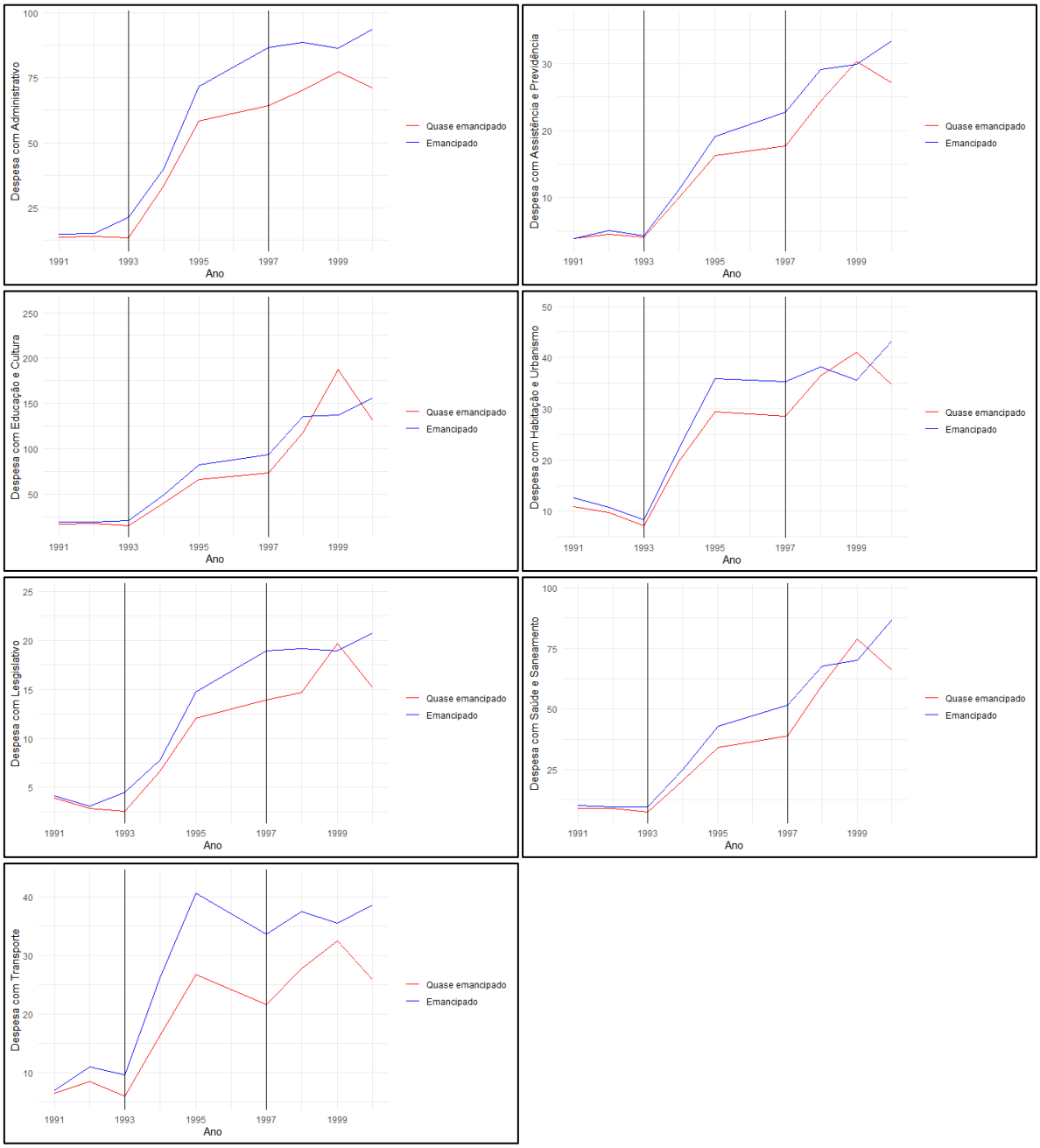

Figure 2: Collection evolution in the quasi-treatment sample, by AMC status:

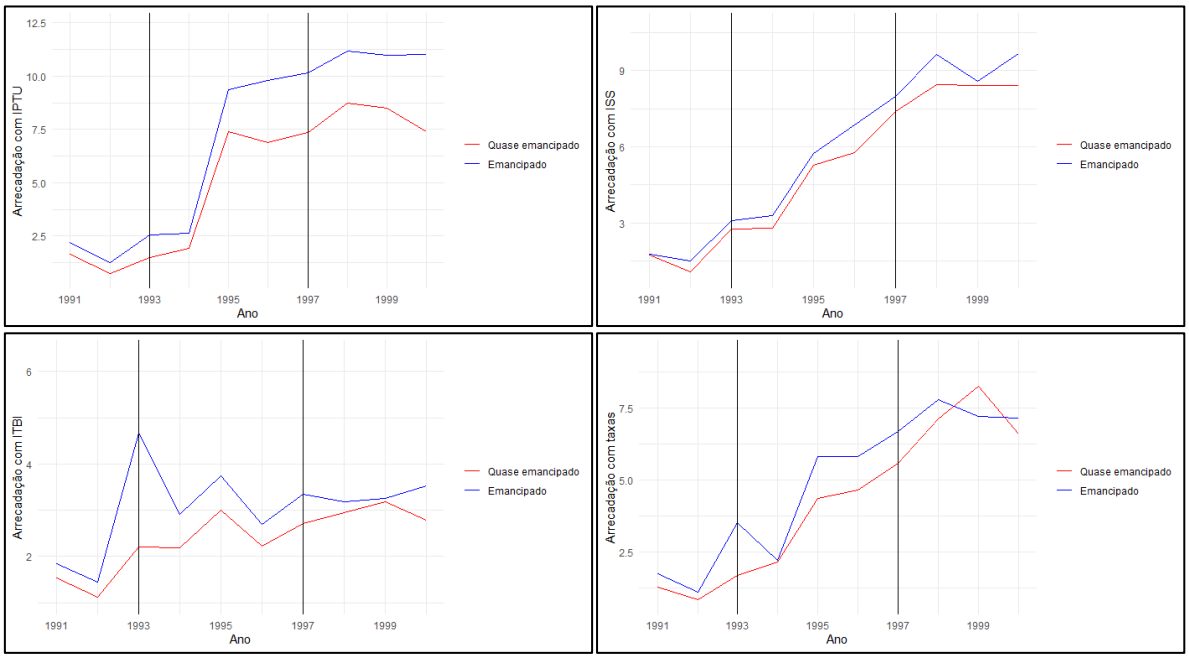

Figure 3: Evolution of the budget deficit and revenues by credit operations in the sample of quasi-treatment, by AMC status:

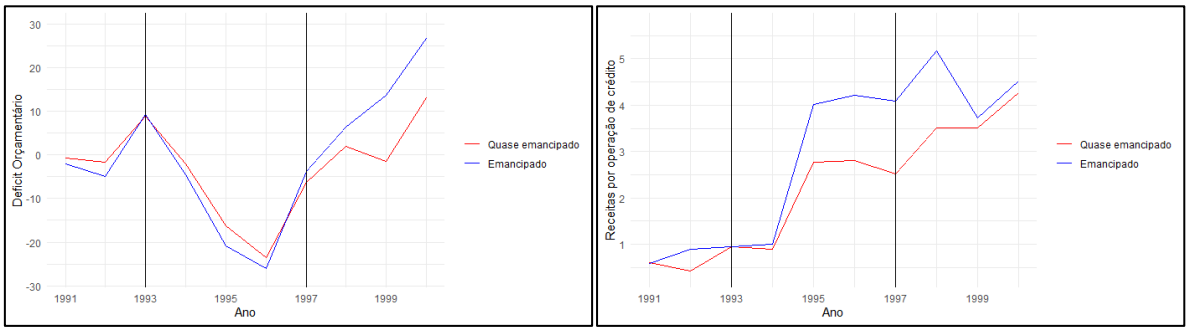

Table X: Classification of Functions and Subfunctions in the 2021 Budget Technical Manual

9.2.2 FUNCTIONAL CLASSIFICATION OF EXPENDITURES
Annex to MOG Ordinance No. 42 of April 14, 1999, published in the DOU of April 15, 1999.

FUNCTIONAL	**1st and 2nd DIGITS (Function)**	**3rd, 4th, and 5th DIGITS (Subfunction)**
01 - Legislative		031 - Legislative Action
		032 - External Control
02 - Judiciary		061 - Judicial Action
		062 - Public Interest Defense in the Judicial Process
03 - Essential to Justice		091 - Defense of the Legal Order
		092 - Judicial and Extrajudicial Representation
04 - Administration		121 - Planning and Budget
		122 - General Administration
		123 - Financial Management
		124 - Internal Control
		125 - Standardization and Inspection
		126 - Information Technology
		127 - Territorial Planning
		128 - Human Resources Training
		129 - Revenue Management
		130 - Concession Management
		131 - Social Communication
05 - National Defense		151 - Air Defense
		152 - Naval Defense
		153 - Land Defense
06 - Public Safety		181 - Policing
		182 - Civil Defense
		183 - Information and Intelligence
07 - External Relations		211 - Diplomatic Relations
		212 - International Cooperation
08 - Social Assistance		241 - Assistance to the Elderly
		242 - Assistance to the Handicapped
		243 - Child and Adolescent Care
		244 - Community Assistance
09 - Social Security		271 - Basic Welfare
		272 - Provident Fund Scheme
		273 - Pension Plan
		274 - Special Welfare
10 - Health		301 - Basic Care
		302 - Hospital and Outpatient Care
		303 - Prophylactic and Therapeutic Support
		304 - Health Surveillance

	305 - Epidemiological Surveillance
	306 - Food and Nutrition
11 - Work	331 - Worker Protection and Benefits
	332 - Labor Relations
	333 - Employability
	334 - Work Incentives
12 - Education	361 - Elementary School
	362 - High School
	363 - Professional Education
	364 - Higher Education
	365 - Early Childhood Education
	366 - Youth and Adult Education
	367 - Special Education
	368 - Basic Education (3) (I)
13 - Culture	391 - Historic, Artistic and Archeological Heritage
	392 - Cultural Dissemination
14 - Citizenship Rights	421 - Custody and Social Reintegration
	422 - Individual, Collective and Diffuse Rights
	423 - Assistance to Indigenous Peoples
15 - Urban Planning	451 - Urban Infrastructure
	452 - Urban Services
	453 - Urban Public Transportation
16 - Housing	481 - Rural Housing
	482 - Urban Housing
17 - Sanitation	511 - Rural Sanitation
	512 - Urban Basic Sanitation
18 - Environmental Management	541 - Preservation and Environmental Conservation
	542 - Environmental Control
	543 - Recovery of Degraded Areas
	544 - Water Resources
	545 - Meteorology
19 - Science and Technology	571 - Scientific Development
	572 - Technology Development and Engineering
	573 - Diffusion of Scientific and Technological Knowledge
20 - Agriculture	601 - Promotion of Crop Production (4) (E)
	602 - Animal Production Promotion (4) (E)
	603 - Plant Health Defense (4) (E)
	604 - Animal Health Defense (4) (E)
	605 - Supply
	606 - Rural Extension
	607 - Irrigation
	608 - Promotion of Agricultural Production (4) (I)
	609 - Agricultural Defense (4)(I)
21 - Agrarian Organization	631 - Agrarian Reform
	632 - Colonization

22 - Industry	661 - Industrial Promotion
	662 - Industrial Production
	663 - Mining
	664 - Industrial Property
	665 - Standardization and Quality
23 - Commerce and Services	691 - Commercial Promotion
	692 - Commercialization
	693 - Foreign Trade
	694 - Financial Services
	695 - Tourism
24 - Communications	721 - Postal Communications
	722 - Telecommunications
25 - Energy	751 - Energy Conservation
	752 - Electric Power
	753 - Mineral Fuels (2) (A)
	754 - Biofuels (2) (A)
26 - Transportation	781 - Air Transport
	782 - Road Transport
	783 - Rail Transport
	784 - Water Transportation
	785 - Special Transports
27 - Sports and Leisure	811 - Performance Sport
	812 - Community Sports
	813 - Leisure
28 - Special Charges	841 - Internal Debt Refinancing
	842 - External Debt Refinancing
	843 - Internal Debt Service
	844 - External Debt Service
	845 - Other Transfers (I) (A)
	846 - Other Special Charges
	847 - Transfers to Basic Education (1) (I)
(*) Inclusions (I), Exclusions (E) or Changes (A) (1) SOF Ordinance No. 37 of August 16, 2007 (DOU of 08/17/2007); (2) SOF Ordinance No. 41 of August 18, 2008 (DOU of 08/19/2008); (3) SOF Ordinance No. 54 of July 4, 2011 (DOU of 07/05/2011); (4) SOF Ordinance No. 67 of July 20, 2012 (DOU of 07/23/2012).	

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