DECENTRALIZATION OF BUDGET EXPENDITURE EXECUTION AND ITS EFFECT ON MUNICIPAL SPENDING

Dinah Vieira dos Santos[1]
Patrícia de Souza Costa[2]
Ricardo Rocha de Azevedo[3]

Resumo

Objective: The research aimed to investigate the effect of purchasing decentralization on municipal spending, through the theoretical lens of Public Choice Theory.
Method: The analysis was developed using quantile regression performed with data obtained from an electronic questionnaire, analyzed together with data from city halls from 2013 to 2018, considering expenditures with different pressures and budget constraints.
Results or Discussion: The results indicate that in areas with enough linkages, decentralization lowers spending; in areas with insufficient linkages and high social pressure, it presented the opposite result, an increase, with no effect in areas without linkages and low pressure. Through the adopted theoretical lens, the decisions in the public sector does not necessarily follow a logic of well-being, but are influenced by other factors, such as self-interest of the actors. However, the decision does not depend solely on individual aspects and can be influenced also by organizational aspects, such as the decentralization of the implementation of budget expenditure.
Contributions: The results bring three contributions. First, by discussing the effect of practices that are in use in governments, often automatically, it allows for greater reflection on the decisions of the organization of these practices. Second, it draws attention to the effects caused by the budget linkage, which should be considered by the surveys, given the specificities of each linkage. Third, even when having autonomy over purchases, managers of decentralized units tend to seek efficiency only when the resources allocated to their areas are sufficient. Thus, the research suggests the existence of an effect organizational moderator in the search for maximization.

Keywords: decentralization, public spending, budget linkages, public choice.

[1] dinahvs29@gmail.com. Universidade Federal de Uberlândia, Uberlândia-MG. Brazil. https://orcid.org/0000-0001-7502-8559
[2] patricia.costa@ufu.br. Universidade Federal de Santa Catarina, Florianópolis-SC. Brazil. https://orcid.org/0000-0001-5087-1419
[3] ricardo.azevedo@ufu.br. Universidade Federal de Uberlândia, Uberlândia-MG. Brasil. Brazil. https://orcid.org/0000-0001-6302-0760

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1 INTRODUCTION

The control of public spending has been one of the most recurrent themes in the literature, which has been approached from different perspectives and theoretical currents. The search for the necessary balance of public accounts (IMF, 2018) involves understanding the causes associated with the public spending, focusing on the processes, the design of public policies, organizations or actors.

Through the theoretical lens of Public Choice Theory, decisions taken within the State do not necessarily follow a logic of pursuit of well -being (Ostrom & Ostrom, 197 1; 2010; Pereira, 1997), but are influenced by other elements, such as the self-interest of decision-making actors. These actors might be politicians or the bureaucracy itself in the exercise of its attributions. Among the set of decisions that actors have at their disposal, the decision on how to carry out public spending is one of the most relevant. Through this lens, faced with a list of possibilities, delineated by the type of good/service managed and by the decision rules adopted, the agent will choose the option that is most aligned with their individual interests (Mueller, 2003).

Despite the discussion of the existence of self-interest of the actors in this theoretical lens, we argue that the decision does not depend solely on individual aspects (Bowling, Cho, & Wright, 2004). The organizational aspects can influence how decisions are made and how the actions are performed by the actors. This is because actors, even if they have some decision autonomy given by their role in the organization, may be influenced by other mechanisms such as hierarchy, amount of available information, rules and restrictions for spending, transparency or accountability of the process (Mueller, 2003).

Among the organizational aspects that can influence behavior, there is the level of decentralization of spending decisions that the actor has at his disposal. In general, decentralization has been researched from the perspective of fiscal federalism, being associated with greater rationalization and efficiency of the State's actions (Ckagnazaroff & Mota, 2003).

The decentralization in the public sector has been discussed in different aspects such as political, administrative and fiscal, and in different contexts (internal relations, external and intergovernmental) (Pimenta, 1995). Regarding spending, decentralization has been widely explored in the literature on public procurement (Baldi & Vannoni, 2015; Brezovnik, Oplotnik, & Vojinov ić, 2015), since procurement, a step in the budget expenditure execution process (Giacomoni, 2019), is considered a strategic activity for the control of public spending (Oliveira, Diniz, Bispo, Lima, & Santos, 2017).

In this literature, the authors discuss the advantages and the disadvantages of centralization/decentralization (Aboelazm & Afandy, 2018;. Brezovnik et al, 2015), the effect of them on the cost of acquisition (Baldi & Vannoni, 2015; Chiappinelli, 2020; Oliveira et al., 2017), but without directly relating them to public spending. There are also discussions about the environmental factors that affect the structuring and performance in procurement, such as corruption and governance quality (Baldi & Vannoni, 2015; Silva & Barki, 2014) and staff quality (Chiappinelli, 2020) in a generic way, without, however, exploring the perspective of the public agent that operates this centralization/decentralization.

Aiming to relate decentralization of shopping to the level of spending of governments, analyzing from the perspective of the public official that operates as well as their motivations and preferences when they have to decide on purchases, the objective of this research is: to investigate the effect of decentralization of purchases, stage of the expenditure execution process, on municipal expenditure.

Along with decentralization, this study analyzes the process of budget expenditure execution considering the reality of the public sector, with a look both at stages of public expenditure, namely commitment, settlement and payment (Giacomoni, 2019), as well as the effects caused by the expenditure linkages.

This study is relevant because it investigates the decentralization of purchases and its effect on spending, from the role of public agents in this process, also considering the context in which they operate; it also investigates the stages of expenditure execution as a source of power to influence the level of executed expenditure; and it results in an overview of the occurrence of intragovernmental decentralization of the expenditure execution process, an area that is still little explored in the literature on decentralization of the public sector.

Furthermore, it contributes to the following literatures: of public choice, by empirically investigating the influence of the agent's performance in the execution of government spending, highlighting the environmental characteristics that favor self-interested behavior; of public purchases, when discussing the decentralization of purchases, from the perspective of the agent that operates it and directly relating it to spending; and budgetary decentralization, by showing the effect of decentralization of commitment, settlement and payment on expenditure. It also contributes to government practice, by providing subsidies for public organizations to assess the convenience of decentralizing the expenditure execution process.

2 THEORY OF PUBLIC CHOICE

Public Choice Theory seeks to explain the collective choices of the State based on the performance of public agents involved in the process of producing these choices (Orchard & Stretton, 1997). From this perspective, the State is "the set of processes", or "the machine", which allows public policies to be offered to society (Buchanan & Tullock, 1962, p.13) and these policies, although they affect the community, reflect the individual preferences of public agents with the power to influence government decision-making (Ostrom & Ostrom, 1971).

The variables observed by the Public Choice Theory are the individual, or public agent, the various goods and services offered by the State, and the rules/structures of governmental decision (Ostrom & Ostrom, 1971). The individual is the basic unit of analysis, and the theory assumes that they are rational, self-interested and public budget maximizers (Mueller, 2003).

Through this theoretical lens, the public agent is endowed with rationality and aware of the possibilities they have, acting strategically with actions that will make them reach their goals. The selfishness attributed refers to the assumption that public agents decide in a self-interested way, seeking to maximize their individual utilities (Pereira, 1997). As a result, agents are considered budget maximizers because they seek to gain advantages, going beyond pecuniary advantages, seeking power and autonomy, as a result of the increase in the budgets they manage (Mueller, 2003).

However, public agents do not always know all the available options to choose from, which makes it impossible for them to decide in a complete and rational way (Pereira, 1997). Nor does their attributed selfishness prevent them from acting altruistically (Downs, 1964); it just means that each individual has their own preferences in front of a list of possibilities of choice and these preferences may or may not be aligned with the objective of efficiently serving the collectivity (Ostrom & Ostrom, 1971).

The action of agents can occur in several ways. The possibilities of choice to achieve budget maximization depend on the type of good/service managed and the type of decision structure that delimit the participation of public agents in the government decision-making process (Ostrom & Ostrom, 1971). For example, they may seek to meet this self-preference by increasing the size (volume of managed demand

or number of employees) of the government agencies they manage, whenever there is a possibility to do so (Niskanen, 1971).

Some goods/services offered by the State to society may have variable demand, such as services of a social nature, for instance, social and health care. Other goods/services may have a demand that is more easily controlled, such as, for example, the demand for education (Mueller, 2003).

Others, on the other hand, can generate little negative externality, if the State decides to reduce the application of resources in the production of these goods/services. This diversity of goods/services generates different possibilities of action, affecting the list of choices that a public agent has to influence the governmental decision process (Ostrom & Ostrom, 1971).

The decision structure adopted in the organization of the State also affects the list of choices available to public agents. Decision-making rules define which agents will be able to participate in the public choice production process and how this participation will be (Ostrom & Ostrom, 1971).

Decision-making autonomy can be more or less decentralized in governments. The need for distribution of autonomy arises as the structure of the State increases in size and complexity, making concentrated decision-making inefficient, due to the high level of informational distortion between those who decide and those who carry out the decision (Downs, 1964). Decentralization would be an alternative to mitigate the problem of informational asymmetry, as it makes it possible to identify and hold the agents that influence the governmental decision-making process accountable (Niskanen, 1971).

It is noteworthy that the asymmetric possession of information is only a source of power to influence when the context is one of uncertainty (Mueller, 2003). This is the case of budget distribution among specialized government units, since the financing government unit does not know all the information, such as the actual demand and the cost of goods/services managed by the specialized units. It is this scenario of uncertainty, generally associated with informational asymmetry, that makes it possible for public agents who manage the specialized units to use the privileged information they have to influence the budget distribution process (Mueller, 2003).

Public Choice Theory has been widely used for empirical analysis in Brazil, serving as a theoretical lens mainly to investigate the how the transparency of spending is organized (Baldissera, Asta & Casagrande, 2020), how the allocation of resources in the budget occurs (Costa, Freire, Gartner, Clemente, 2013), or the political direction of public spending, with opportunistic behavior of the governments (Vicente & Nascimento, 2012).

The opportunistic behavior of both the bureaucratic team and the politicians is favored by the difficulty of voters, who would be the most interested party, in observing their decisions and actions, whose asymmetry favors maintenance (Ferreira & Bugarin, 2007). Theoretically, the individual voter's cost of obtaining complete information and exercising a controlling role exceeds the individual benefits he would obtain, so the politician is not punished and is usually reappointed.

3 DECENTRALIZATION IN THE PUBLIC SECTOR AND BUDGETARY LINKAGES

Decentralization in the public sector is considered a movement in search of efficiency and effectiveness of public management (Ckagnazaroff & Mota, 2003). Discussions on the subject encompass several perspectives, such as political, fiscal, administrative (Medina, 1987), and are also focused on different contexts, especially in the intergovernmental relationship, such as decentralization between levels of government in a country (Pimenta, 1995).

From a political perspective, decentralization is discussed in terms of distribution of power to decide which demands of society will be met or prioritized in government management (Medina, 1987). From a fiscal perspective, it is about the autonomy to manage own revenues and the types of expenses delegated to subnational levels of government (Sacchi & Salotti, 2016).

From an administrative perspective, it is about the decentralization of the management of activities/functions in the public sector. This can be achieved through the creation of specialized administrative units to manage the production of specific public goods/services, such as the creation of a specialized unit to manage health promotion for a local population (Medina, 1987). It can also materialize in the decentralization of the management of technical activities, such as the management of public procurement (Brezovnik et al., 2015).

The decision for decentralization may be guided by the search for efficiency in the execution of complex tasks/activities (Brezovnik et al., 2015). The autonomy granted with decentralization can only be procedural, but it can also culminate in real autonomy to influence processes within public organizations (Mueller, 2003).

The activities can be partially decentralized in organizations, especially when considering the public sector environment, which is more complex due to the requirements to comply with specific stages in the execution of their operations, as is the case of public spending, which requires a sequence of steps for its implementation.

The results of the effects of decentralization on expenditures do not yet fully converge in the literature, possibly due to the influence of other moderating factors that go beyond the decentralization decision.

Purchasing activity has been analyzed in terms of its form or level of organization (centralized to decentralized), and associated to the cost of public procurement (Baldi & Vannoni, 2015). This activity is considered centralized when there is a central body or sector responsible for the different steps (purchase decision, selection of suppliers, negotiation of prices and purchasing conditions) for all local government units (Baldi & Vannoni, 2015). It is considered decentralized whenever a non-central (local) unit can independently decide on its own acquisitions (Brezovnik et al., 2015).

The centralized purchasing activity has been associated to greater control of public spending, as it reduces the cost of structuring, concentrates spending decisions and allows for the exploitation of economies of scale (Aboelazm & Afandy, 2018). It is also associated to greater qualification of the workforce, which can be useful to avoid failures in the acquisition process and waste of public resources (Aboelazm & Afandy, 2018). On the other hand, decentralized activity has been associated to greater agility and greater specialization of the team, since the decentralized acquisition process tends to be simpler than a large-scale acquisition process and specialization facilitates the alignment of purchases carried out to the specific objectives of each governmental unit (Aboelazm & Afandy, 2018).

In environments prone to high corruption and with low quality of processes, decentralized purchasing units paid 60% more than centralized units in Italy (Baldi & Vannoni, 2015). On the other hand, Chiappinelli (2020), observing the case of decentralization of purchases in public institutions also in Italy, found that the performance of decentralized purchases is not inferior to centralization, and when carried out by government units with unqualified staff, it led to worse performances. Thus, it is highlighted that the economy is not always verified with the centralization of the purchasing unit, as was the case with the decentralization of purchases in public institutions also in Italy.

In a federal university with multi-campi in Brazil, decentralization did not result in lower cost in the acquisition of consumables; on the contrary, centralization was more economical due to the gain of

scale (Oliveira et al., 2017). Silva and Barki (2014), on the other hand, investigating a shared purchasing process (price records), concluded that shared purchases led to a decrease in the cost of acquisitions due to economies of scale.

It can be seen, therefore, that the organization of the purchasing activity has the potential to affect the cost of acquisitions in public spending, although there is still no convergence in the results. Furthermore, the results of these studies showed that contextual factors influence the performance of decentralized purchasing management, indicating that it is relevant to consider them in investigations, prompting further research.

This research analyzes the decentralization of the operationalization of the purchasing process in Brazil, which is intrinsically related to the stages of public expenditure (commitments, settlement and payment), and which, together, are part of the budgetary and financial execution process of public expenditure (Giacomoni, 2019). The procurement activity and these stages must be covered to carry out public expenditure and the competence to operate these stages can be delegated/decentralized to government units belonging to a federated entity.

It is possible that a local unit has autonomy to carry out the expenditure stages (commitment, settlement and payment), which makes it necessary to understand the influence of these stages. Regarding the purchasing activity, from the perspective of Public Choice Theory, it is possible that managers use the autonomy over purchasing received in decentralization to press for more budget, especially when considering the existence of incrementalism in the public budget (Davis, Dempster & Wildavsky, 1966).

The incremental effect on the budget considers that the calculation of the estimated budget for X2 is heavily based on the execution in X1 plus a non-substantial variation that follows the variation in revenue forecast for a given financial year (Davis et al., 1966). As public resources are limited, there is a dispute over the budget between government units, especially among those who do not have guaranteed resources. There is also a difficulty in rationally reviewing and deciding on all available spending options, especially due to time constraints. Therefore, governments end up opting for the incremental resource allocation model (Davis et al., 1966), in response to the complexity of this process (Rickards, 1984).

In this context, managers would be interested in spending the entire budget allocated to the units they manage so that, in the following year, the budget to be received is equal to or greater than the budget spent in the year, avoiding its reduction (Davis et al., 1966). In the context of this research, managers may be interested in taking advantage of greater purchasing autonomy to increase the cost of acquisitions, in order to spend the entire available budget, aiming to pressure the central unit for more budget in the following year.

Rickards (1984) demonstrated that the tax capacity (available resources) of cities influenced the allocation preferences of managers in the municipal budgets of German cities. Municipalities with limited collection capacity are more concerned with consolidating public policies that have already been established than with thinking of new alternatives for applying the resource. On the other hand, cities with greater tax capacity are able to meet existing commitments and therefore can evaluate alternative expenditures.

In this sense, it is possible that managers of government units with autonomy over procurement deal with different budget realities and that these realities also offer them a different list of choices, thus affecting their strategic preferences in relation to the management of the procurement activity and to the budget.

Among the contextual characteristics that can generate effects on expenditure, the mechanism for linkage revenues stands out, which marks the Brazilian national scenario, given the high proportion of existing earmarks (Thomas, 2006). Resource allocations in Brazil are mainly operationalized in the form of mandatory intergovernmental transfers linked to specific expenditures (Baião, Cunha, & Souza, 2017) and also through the establishment of minimum percentages on revenues to be applied in specific areas.

The way in which the linking of resources to specific purposes is developed by legislation can generate effects, such as unnecessary expenses to comply with limits such as health and education, and a reduction in incentives for the economy, especially when the link is temporarily mandatory (Azevedo, Leroy & Pigatto, 2020).

The different linkages have different characteristics, such as specific allocation to a given expense, different funding sources with percentages of application on certain revenues or full allocation from transfers received (Thomas, 2006; Azevedo, Leroy & Pigatto, 2020). This generates "spending spaces" that have different characteristics, because while one sector or area has sufficiency (or even excess) of resources, another is underfunded.

For example, Arretche and Vazquez (2009), analyzing the spending behavior of different municipal areas of action, demonstrated that education and health are prioritized areas in the distribution of public resources due to the budgetary revenue links allocated to them, while others deal with the uncertainty of their budgets. The areas of education and health rely on the linkage of resources through binding mandatory intergovernmental transfers and at minimum percentages of 25% and 15%, respectively (Baião et al., 2017). On the other hand, the social assistance area receives resources from mandatory linked transfers, but there is no minimum percentage of application. The areas of sport and leisure and urbanism are public policies formulated and managed exclusively by municipalities in Brazil, for which no mandatory resource allocations were established (Avarte & Biderman, 2004).

Budgetary constraints may or may not be sufficient to cover the cost of demand for certain public services. For example, on average, Brazilian capitals spent, in 2019, around 25.8% of their budgets on education, which is a percentage of execution very close to the existing resource allocation for the area (25%) (Pinho, 2019). Therefore, it indicates that the demand for expenditure in this area is equivalent to the amount of resource guaranteed to it through the linkages.

To support the assumption that there are different budget realities to which managers are subject, Table 1 presents the characteristics of funding and pressures that the areas are subject, adopting as examples the areas of education, health, social assistance, sport and leisure and urbanism, which were selected for having distinct characteristics.

Table 1 - Characteristics of resources and spending demands, by area

Areas	Linkages	Resources sufficiency	Demand management	Pressure over expenditures
Education	High	High	Predictable	Political and legal: fear of accounts disapproval
Health	Medium	Low	Unpredictable	High social pressure
Social assistance	Low	Low	Unpredictable	Medium social pressure
Sports, leisure and	Inexistente	Baixa	Previsível	Pressão social baixa
Urbanism	Non-existent	Low	Predictable	Low social pressure

Source: Elaborated by the authors.

In a context of relative certainty regarding the budget and its sufficiency to cover the expenses already established, it is possible to conceive that managers feel safe to evaluate alternative purchasing options and have different preferences for maximizing the budget. They may prefer, for example, to

reduce the cost of acquisitions so that their purchasing management is considered efficient. Thus, the first research hypothesis arises:

H1: In areas where the allocation of budgetary resources is high and sufficient to maintain them, the decentralization of purchases negatively affects the level of executed expenditure.

However, this should not be the reality in all areas of government action. For example, spending on health services, in 2019, far exceeded the minimum application percentage of 15% of municipal revenue. The average spending on health in capitals was 21.6% in 2019 (Pinho, 2019). It indicates, therefore, that the linking of existing resources to the area does not guarantee the totality of the expenditures carried out by it and that there is a force (social pressure) that leads municipalities to spend more than the existing legal obligation.

In areas where resource allocations are insufficient to cover established expenses, the environment is one of uncertainty and managers must respond to this uncertainty by operating the purchasing activity in order to increase the cost of acquisitions, to ensure the budget for the following year. Furthermore, if the demand for the good/service is unpredictable and there is social pressure to apply more resources in the area, managers may find it easier to justify the increase in the cost of acquisitions, due to the inherent informational asymmetry. In this sense, a second research hypothesis is established:

H2: In areas where the allocation of budgetary resources is insufficient to finance their maintenance, but which have social pressures to maintain expenditures, the decentralization of purchases positively affects the level of executed expenditures.

Still, it is necessary to consider that most areas of government action in Brazil do not have the guarantee of linked resources, since the establishment of mandatory budget links occurs only for some areas (Baião et al., 2017). In this case, the portion of the budget that will be allocated to areas without linkages is determined at the discretion of the municipal governments (Avarte & Biderman, 2004), which are only subordinated to the political negotiation of demand with local citizens.

Therefore, in these areas, even if managers have greater autonomy over purchases and are interested in increasing the cost of acquisitions to guarantee their budgets, it is likely that they will not be able to do so, as with predictable/negotiable demand and low social pressure to apply more resources, they will not be able to justify substantial increases in the price of acquisitions. Thus, the third research hypothesis is:

H3: In areas where the budget allocation is non-existent and subject to bargaining for resources, whose social pressure to spend is low, decentralization of purchases has no effect on executed expenditure.

4 METHODOLOGICAL PROCEDURES

This study adopted a quantitative analysis to investigate the effect of the decentralization of the activity of (1) purchases, and, in a complementary way, of the operationalization of the stages of public expenditure, namely (2) commitment, (3) settlement and (4) payment, in the level of expenditure of five areas of municipal action, for a period of six financial years (2013 to 2018).

The selection of the period was due to the fact that they are years when there is standardized information on the budget execution of the municipalities in the database of the Accounting and Tax Information System of the Brazilian Public Sector [SICONFI] (2019). Furthermore, as the process of computerization of the public sector is recent in Brazil, a shorter period of time increased the chances of obtaining complete data for the other variables that made up the quantitative analysis.

The selected steps make up the budgetary and financial expenditure execution process (Giacomoni, 2019) and the selected areas, due to their different characteristics (Table 1), are detailed in Table 2, regarding the type of expense managed by them.

Table 2 – Type of expense managed by area

Area	Expenses
Social Assistance	Assistance to the elderly, the disabled, children and adolescents, and community assistance.
Health	Primary care, hospital and outpatient care, prophylactic and therapeutic support, health surveillance, epidemiological surveillance and food and nutrition.
Education	Elementary, secondary, professional, higher education, children's, special and basic education, and adult education.
Urbanism	Urban infrastructure, urban services and urban public transport.
Sports and leisure	Performance sport, community sport and leisure.

Source: Elaborated by the authors.

The data that make up the research were obtained from different sources. To obtain information about the organization of the decision structure adopted by the municipalities to execute the expenditure, an electronic questionnaire was developed based on the literature review and adapted to the research problem under investigation. The questionnaire was submitted and approved by the Ethics Committee for Research with Human Beings at the Federal University of Uberlândia. It was also submitted to a pre-test with 10 municipalities to test the suitability of the instrument (Yin, 2001).

The application took place from September to November 2019. E-mails with the questionnaire link were sent to the electronic addresses of municipal accountants in the database of the Information System on Public Health Budgets [SIOPS] (2019). 351 returns were obtained. Afterwards, the collected data went through a validation process, through which 36 returns were considered invalid (repeated answers) and 25, inconsistent (contradictory answers); leaving 290 valid answers.

The other survey data are information on budget execution of municipalities and variables associated with spending in the literature on decentralization in the public sector. Information on budget execution was collected in the SICONFI database (2019). The other variables were collected from the databases of the Brazilian Institute of Geography and Statistics [IBGE] (2019) and the Superior Electoral Court [TSE] (2019).

5.1 Specification of the econometric model

The econometric model specified in Equation 1 was tested individually in each of the five areas of government action analyzed (education, health, social assistance, sport and leisure and urbanism), given the characteristics presented in Table 1.

$$DLpc(fun)_{it}=\alpha_i+y.DESC1_1+y.DESC2_2+y.DESC3_3+y.DESC4_4+\beta_1\ POPln_{it}+\beta_2\ POPdens_{it}+\beta_3\ PIBpc_{it}+\beta_4\ RBpc_{it}+\beta_5\ SF_{it}+\beta_6\ RECdepend_{it}+\beta_7\ AUTOorc+y.AEL_5+y.ANOdesc_6+y.CAP_7+y.UF_8+\mu_i \quad (1)$$

The dependent variable analyzed is public spending in each area, and the independent variable of interest is the decentralization of purchases, commitment, settlement and payment, from which information was collected through an electronic questionnaire. Control variables are economic, demographic, political, and fiscal variables commonly related to spending in the public sector decentralization literature. They were added to the model to control effects exogenous to decentralization.

Table 3 presents a summary of all the variables that made up the estimated model (Equation 1), their descriptions, measurement method, justifications for inclusion and expected signs.

Tabela 3 – Variáveis do modelo econométrico

Name	Description	Mensuration	Justification
Dependent variable			
DLpc(fun)	Expense settled per capita	Expenditure settled ÷ absolute population	Measure for level of public spending (Arretche & Vazquez, 2009).
Independent variable			
DESC1	Purchases decentralization	Dummy (1) for decentralized; (0) for centralized.	Decentralization measure, prepared similarly to Baldi and Vannoni (2015).
Control variables			
DESC2	Commitment decentralization	Dummy (1) for decentralized; (0) for centralized.	Decentralization measure, prepared similarly to Baldi and Vannoni (2015).
DESC3	Settlement decentralization		
DESC4	Payment decentralization		
POPln	Natural logarithm of population	ln (population)	Control of structural differences between municipalities (Arretche & Vazquez, 2009; Morais, Sarmento, Diniz, & Queiroz, 2018).
POPdens	Demographic density	Absolute population ÷ territory (km^2)	Control of the possibility of exploring economies of scale in the provision of public goods and services (Asatryan, Feld, & Geys, 2015; Sacchi & Salotti, 2016).
PIBpc	Gross domestic product per capita	PIB/absolute population	Control of socioeconomic inequalities (Arretche & Vazquez, 2009) and determinant of demand for public goods and services (Sacchi & Salotti, 2016).
RBpc	Gross revenue per capita	Gross revenue ÷ absolute population	Controlling the difference in budget available to spend (Arretche & Vazquez, 2009).
SF	Fiscal status indicator	Net consolidated debt ÷ Net current revenue	Control of the stock of debts that compromise the budget availability for the year (Sacchi & Salotti, 2016).
RECdepend	Dependence on intergovernmental transfers	Tax revenue ÷ Current transfers received	Control of the effects of the difference in the self-financing capacity of municipalities (Azevedo & Cabello, 2020; Dantas, Diniz & Lima, 2019).
AUTOorc	Balance reserve automation	Grade between 0 and 10, where 0 - is not automatic and 10 - is automatic.	Control of the difference in the degree of automation of the expenditure budget execution process in the municipalities.
AEL	Election year	Dummy (1) for election year; (0) if not.	Political control (Morais et al., 2018).
ANOdesc	Decentralization year	Dummy (1) for activities decentralization year; (0) if not.	Control of changes in the decision structure on activities during the period under review.
CAP	Capital	Dummy (1) for capitals; (0) if not.	Control of the difference in infrastructure between municipalities.
UF	Federation unity	Dummy (1) for reference unity; (0) for others.	Control of the effects of the difference in external control exercised by the Courts of Auditors (Lino & Aquino, 2018).

Source: Elaborated by the authors.

5.2 Data Treatment

The assumptions of multiple linear regression (MRL), such as homoscedasticity of residuals, linearity of coefficients, absence of serial self-correlation in residuals, multicollinearity between independent variables and normality of residuals are not necessary for estimations with quantile regression (QR). Thus, the tests of multicollinearity, heteroskedasticity, presence of outliers and normality of residuals are indicated for the option between RLM or QR (Greene, 2003).

Due to the non-normality of the residuals, a common problem for public sector financial data, the estimation was carried out using quantile regression (Duarte, Girão & Paulo, 2017). This is a semiparametric method in which the estimators are calculated by the median, a measure less sensitive to extreme values

(Koenker & Bassett, 1978), and, for this reason, it has presented more robust results in the face of problems of heteroscedasticity and non-normality of residuals (Duarte et al., 2017; Koenker & Bassett, 1978).

5.3 Characterization of respondents and municipalities

The 290 valid returns received in response to the questionnaire represent the municipalities that make up the sample of this research. Respondents to the questionnaire were mostly employees who have been working in the public sector for a long time, linked to city halls through a competitive examination (186 respondents) or commissioned position (51 respondents) and with averages of 20.09 and 19.04 years of experience in the public sector, respectively.

Most (76.55%) of respondents work in the Financial Department of the municipalities and 75.86% have an accounting function. Most have some academic background in accounting or administration, at the technical level (58 and 23 respondents), undergraduate (199 and 49 respondents) or postgraduate (112 and 99 respondents), respectively. These characteristics increase the chances that employees are better informed about the dynamics of expenditure execution in the municipalities.

Table 4 - Characterization of Municipalities

	Sample (n=290)				All municipalities (n=5570)			
	Average	D.P	Min.	Max.	Average	D.P	Min.	Max.
Population (a thousand inhabitants)	39.97	138.9	1.32	2.145	37.43	220	0.79	12.200
PIB per capita (R$ thousand)	29.06	25.77	5.16	300.64	21.99	20.95	3.29	344.85
Revenue per capita (R$ thousando)	4.36	2.38	1.65	19.21	3.90	2.11	0.01	37.32
Dependency on Transfers	0.12	0.13	0.01	0.95	0.10	0.17	0.00	7.31
Area (Km^2/1000)	0.98	1.92	0.00	17.31	1.53	5.61	0.00	159.53

Notes: (1) Abbreviations (M = Average; D.P = Standard Deviation; Min. = minimum; Max. = maximum); (2) Dependency on transfers = Tributes ÷ Transfers revenue; (3) All values are from 2018, except PIB per capita, that is from 2017.
Source: Elaborated by the authors, based on IBGE (2019) and SICONFI (2019) data.

The sample municipalities represent about 5.20% of the 5,570 Brazilian municipalities and were not identified to maintain the confidentiality of the information collected through the electronic questionnaire. In a comparison of the values presented in Table 4, it can be seen that the socioeconomic and budgetary reality of the municipalities in the sample is higher than the average of other Brazilian municipalities, with a GDP above the national average and higher per capita income. However, as the discrepancies are not high, these data can be considered representative for carrying out an exploratory research.

5 RESULTS

The results indicate that the areas of health, social assistance and education are the ones with the highest percentages of decentralization of activities. On the other hand, urbanism and sport and leisure are the least decentralized areas in the sample municipalities (Table 5).

Education, health and social assistance are public policies regulated nationally and considered essential to the population. These characteristics increase the complexity and social and political pressure in the management of these areas, leading municipalities to opt for decentralization, in search of greater control over expenditures. Nationally regulated policies are subject to greater political and budgetary control (Arretche & Vazquez, 2009) and poor management of these services can generate directly ob-

servable negative externalities, in addition to having risks of disapproval of accounts by mayors. As for policies that have less complexity and externalities, and are regulated within each municipality (Avarte & Biderman, 2004), as they are not essential, any mismanagement may go unnoticed for a longer time, if compared to previous policies.

Table 5 - Decentralization of activities by area

	Compras		Empenho		Liquidação		Pagamento	
Educação	(n=283)	(%)	(n=283)	(%)	(n=283)	(%)	(n=283)	(%)
Descentralizada	45	15,9	37	13,07	39	13,78	36	12,72
Saúde	(n=288)	(%)	(n=288)	(%)	(n=288)	(%)	(n=288)	(%)
Descentralizada	65	22,57	69	23,96	71	24,65	69	23,96
Assistência Social	(n=282)	(%)	(n=282)	(%)	(n=282)	(%)	(n=282)	(%)
Descentralizada	51	18,09	48	17,02	49	17,38	51	18,09
Desporto e Lazer	(n=275)	(%)	(n=275)	(%)	(n=275)	(%)	(n=275)	(%)
Descentralizada	26	9,45	19	6,91	19	6,91	15	5,45
Urbanismo	(n=278)	(%)	(n=278)	(%)	(n=278)	(%)	(n=278)	(%)
Descentralizada	26	9,35	20	7,19	21	7,55	15	5,4

Notes: (1) Abbreviation (n = municipalities number). (2) Symbol (% = percentage).
Source: Research data.

There is a proximity in decentralization between the stages of expenditure execution, when observed by area (Table 5). For example, for the health area, decentralization is very close between purchases (22.57%), commitment (23.96%), settlement (24.65%) and payment (23.96%). Therefore, partial decentralization, although possible, does not seem to be a reality.

The area of education has the highest average per capita expenditure among the areas analyzed, followed by the areas of health, urbanism, social assistance and sport and leisure, in that order (Table 6), which clearly indicates the effect of the existence of linked resources to the area. Education and health are consolidated as priority public policies (Arretche & Vazquez, 2009), to which a greater portion of the budget is allocated, made possible mainly by the linkage of existing resources (Baião et al., 2017; Azevedo, Leroy & Pigatto, 2019).

The high standard deviation in each area demonstrates the heterogeneity of the sample and the presence of outliers, which is due to the disparity in per capita spending among the municipalities in the federation.

Table 6 - Descriptive analysis of the dependent variable by area - public spending

Area	N	Average	Standard Deviation	Minimum	Maximum
Education	1,699	808,22	305,31	183,52	2,526,02
Health	1,699	713,41	325,38	6,02	2,687,54
Social Assistance	1,696	116,96	76,70	0,04	541,38
Sport and Leisure	1,662	29,70	35,30	0,00	515,85
Urbanism	1,656	234,14	193,94	0,05	1,959,82

Notes: (1) The expenses concern settled expenditures, per capita, in reais. (2) Period: 2013 to 2018.
Source: Research data.

The model estimated using quantile regression was a good predictor of per capita expenditure, as it made it possible to evidence the effect of decentralization of the expenditure execution stages on area expenditure, and the variables included in the model were adequate to perform its estimation, if considering the satisfactory pseudo R-sq of the regressions (Table 7).

Decentralization of purchases (DESC 1) was significant only in the areas of education and health, decreasing spending on education and increasing spending on health (Table 8). In education, an area in which a large volume of resources is operated (Table 6), it is possible that economies of scale are being exploited in decentralized purchases (Aboelazm & Afandy, 2018), leading to a decrease in spending.

Taking advantage of the leverages of decentralization in this area was made possible by the stability in the education budget, guaranteed by sufficient linkages, as expected (H1). With sufficient resources and autonomy over purchases, area managers were able to think of optimal spending alternatives, eliminating excess spending above the established minimum percentage (25%). This result is aligned with that evidenced by Rickards (1984), in relation to the managers' choices in a context of budget incrementalism.

Table 7 - Regression results by area

Expense Area	Education	Health	Social Assistance	Sport and Leisure	Urbanism
Purchases Decentralization	-37,94**	19,50*	-2,91	5,16	-6,22
	(18,75)	(10,14)	(2,65)	(4,17)	(18,94)
Commitment Decentralization	-77,06***	-41,47***	-3,17	-4,23	16,11
	(29,29)	(14,38)	(3,88)	(6,35)	(20,56)
Settlement Decentralization	-20,88	23,21*	9,15**	0,72	38,11
	(27,49)	(12,88)	(3,8)	(8,41)	(34,67)
Payment Decentralization	88,20***	-11,3	7,75	-2,57	-87,85***
	(22,87)	(10,78)	(4,8)	(9,24)	(31,49)
Decentralization year	25,48	29,60***	0,37	-1,03	12,34
	(20,86)	(9,19)	(2,88)	(4,35)	(18,8)
Capital	-27,28	-96,99	9,16	-26,77**	349,89***
	(44,57)	(91,92)	(10,6)	(11,98)	(60,95)
Balance reserve automation	-2,33*	-2,07**	0,08	0,36***	-0,49
	(1,3)	(0,86)	(0,26)	(0,14)	(0,93)
Absolute population	-74,03***	-17,54**	-13,28***	-1,06	-30,77***
	(9,31)	(7,79)	(2,01)	(1,00)	(8,52)
Demographic density	0,14***	0,13**	0,01	0,00	0,16***
	(0,04)	(0,06)	(0,01)	(0,01)	(0,03)
PIB †	0,00***	0,00***	0,00	0,00***	0,00*
	(0,00)	(0,00)	(0,00)	(0,00)	(0,00)
Fiscal status indicator	0,80**	1,64***	0,01	0,00	0,04
	(0,36)	(0,29)	(0,07)	(0,02)	(0,23)
Municipal election year	-4,31	-18,01**	-4,00*	-0,83	13,71
	(10,81)	(7,26)	(2,21)	(0,97)	(8,55)
Dependency on transfers	311,26***	61,40	-44,12**	-7,98	335,70***
	(81,28)	(91,11)	(19,64)	(10,07)	(77,84)
Gross revenue †	0,10***	0,16***	0,03***	0,01***	0,02***
	(0,01)	(0,01)	(0,00)	(0,00)	(0,01)
Constant	1223,21***	209,34**	156,47***	18,41	360,12***
	(114,24)	(98,95)	(22,99)	(16,33)	(91,66)
N	1046	1066	1041	996	1002
Pseudo R-sq	0,48	0,57	0,46	0,26	0,22

*Notes: (1) Dependent variable = settled expenditure per capita. by area. (2) Abbreviations (N = number of observations; Pseudo R-sq = Model determination coefficient); (3) Symbol († = per capita). (4) Standard errors in parentheses. (5) * = p<0,1 ** = p<0,05 *** = p<0,01. (6) Inclusion of dummies for control by state.*
Source: Research data.

From the perspective of Public Choice Theory, this result explains that managers (public agents) may have different motivations for the search for maximizing the budget they manage, as found by Bowling

et al. (2004). It is also confirmed that altruistic or non-selfish motivations can guide the performance of public managers, as long as they are inserted in a context of non-conflict (Pereira, 1997).

In the case of health, an area with insufficient resources, whose demand is unpredictable and the pressure to spend is high, managers used greater autonomy over purchases and the inherent informational asymmetry to increase the cost of acquisitions, increasing the level of expenditure of the area, as expected (H2). In this context, both uncertainty and the asymmetric possession of information are present, which allowed managers to influence (Mueller, 2003) on the level of executed expenditure, based on their autonomy over purchases. Therefore, in environments of uncertainty and informational asymmetry, selfish motivation prevailed over altruism (Pereira, 1997), confirming the managers' preference for budget maximization in these contexts.

For the other areas, the decentralization of purchases did not affect the expenditure executed. The non-effect of decentralization on spending in the areas of urbanism and sport and leisure was expected (H3). Although the environment is one of uncertainty regarding the budget for subordinate units, central management has relative control over the demand and need for budget in these areas. Therefore, without uncertainty (for central management), it was not possible for managers to influence the decision process, as predicted by (Mueller, 2003).

This result demonstrated that the type of good/service observed reduced the public manager's possibilities of choice to operate his preferences (Ostrom & Ostrom, 1971). In this specific case, factors exogenous to decision rules (predictable demand, low social pressure) reinforced the concentration of decision-making power in the central management body, even though the area managers could decide on purchases. Therefore, the decentralization of an activity, by itself, was not enough to guarantee real autonomy over it.

In social assistance, from a theoretical point of view and due to the characteristics of the area (Table 8), managers have incentives and legitimacy to spend more. However, the result of the estimation demonstrates that the decentralization of purchases did not affect spending. This is an indication that other factors may be operating, limiting managers' choices.

Table 8 - Compared results of decentralization of purchases on expenditure

Area	Linkages	Resources sufficiency	Demand	Pressure over expenses	Hypotheses	
					Predicted	Verified
Education	High	High	Predictable	Political and legal	H1: (-)	(-)
Health	Average	Low	Unpredictable	Social	H2: (+)	(+)
Social Assistance	Low	Low	Unpredictable	Social		
Sport and Leisure	Non-existent	Bargain	Predictable	Low	H3: (S/E)	(S/E)
Urbanism	Non-existent	Bargain	Predictable	Low		

Notas. (S/E) = Sem efeito.

The justification for this phenomenon may lie in the prioritization of public policies at the national level (Arretche & Vazquez, 2009). What differentiates social assistance from other areas with related resources (education and health) is the fact that the law does not establish a minimum percentage of application of resources for it. Existing links are discretionary (Baião et al., 2017).

It is understood that the non-establishment of the minimum indicates the non-prioritization of this policy as a national political project, even though it is described as an essential service in the Brazilian Federal Constitution. This fact reflects in low levels of expenditure in the area, which, in the sample of this

research, actually carried out less expenditure than the urban planning area (Table 6), an area considered non-priority (Arretche & Vazquez, 2009).

Thus, even though there is high demand for the service and social pressure to spend, if the policy is not a priority (no mandatory budget linkages), the central management of municipalities has greater freedom not to allocate resources in the area, having only to bear the political cost of non-allocation.

This result also demonstrates that, if the policy is not a priority at the national level, the power to decide on expenditures remains concentrated in the central management of the municipalities, as also observed by Arretche and Vazquez (2009). And in these cases, even though a portion of autonomy is delegated to subordinate municipal units, managers will not be able to project their self-interested preferences in the expenditure execution process.

Complementarily, in this research, it was found that the decentralization of the stages of public expenditure affected the level of per capita expenditure in the areas (Table 7), but with different effects, depending on each stage and each area observed. DESC 2 (commitment) affected spending on education and health, reducing spending on these areas. DESC 3 (settlement) affected spending on health and social assistance, increasing their spending. Finally, DESC 4 (payment) affected spending on education and urbanism, increasing spending on the first and decreasing spending on the second.

From the perspective of the Public Choice Theory, these results indicate that the settlement and payment decentralizations generated potential for increased spending, but only in areas whose management is complex, such as education, health and social assistance, in which the uncertainty and informational asymmetry are present in management.

For areas with less complex management, such as urbanism, central management more easily controls the information arising from the provision of the service. In this case of less informational asymmetry, the decentralization of payment actually reduced the expenditure executed, probably due to the efficiency gains promoted by the decentralization (Ckagnazaroff & Mota, 2003).

These results demonstrate that studying decentralization in the public sector, from the perspective of Public Choice Theory, which is the self-interested agent, limited by the possibilities of choice he has, adds to the construction of understanding about the real contribution of public agents to the increase government spending.

6 FINAL CONSIDERATIONS

This research analyzed the effect of decentralizing the execution of budget expenditure on municipal public spending, based on the observation of the performance of managers in the face of greater autonomy in this process. From the perspective of Public Choice Theory and its assumptions about the public agent (self-interested and budget maximizer), decentralization was observed for areas of government action with different characteristics that shape the list of possibilities that managers have to influence the takeover decision on spending.

The complexity in the management of the areas led the municipalities to decentralize the execution of expenditure to their secretariats, however, the results showed the existence of effects on this type of decision.

The survey results bring three main contributions. First, discussing the effect of practices that are in use in governments (decentralization of the stages of public expenditure), often automatically, allows

to generate greater reflection on the decisions of the organization of these practices. Second, it draws the attention of the literature to the effects caused by the budget linkage in the national scenario, which should be considered when conducting research on public expenditure, given the specificities of each linkage.

Third, even when they have autonomy over purchases, managers of decentralized units tend to seek efficiency only when the resources allocated to their areas are sufficient. Therefore, although Public Choice Theory presupposes self-interest and preference for budget maximization, organizational characteristics can affect managers' spending decisions. So, the research proposes the existence of a moderating effect in the search for maximization, contributing to this literature.

When the environment was of uncertainty regarding the budget and the amount of demand and there was high social/political pressure to offer the service, managers used greater autonomy over purchases to increase the level of expenditure executed, in order to ensure that their budgets did not decrease in the following year, as a result of low budget execution in the current year. Therefore, the preference of managers to maximize the budget was confirmed whenever the environment is one of uncertainty and there is asymmetrical possession of information that enables managers to justify the increase in expenditure.

When the environment was uncertain about the budget, but the amount of demand and the social/political pressure to offer the service was controlled by the central management of the municipality, the managers were not able to use their autonomy over purchases to increase expenses. This is because, despite the uncertainty – which leads managers to prefer to increase expenditures to maximize their budgets – the predictable demand and low social pressure increase central management's control over area expenditures. With low informational asymmetry, decentralized managers cannot justify increased expenses.

Discussions open space for future research. Research with qualitative approaches can deepen the analysis, investigating how the decentralization of expenditure stages affects managers' perception of autonomy over budget execution in their areas and what possibilities of choice arise from this decentralization. Different control mechanisms may be in use by governments to control undesirable effects of decentralization, in an environment permeated by decisions that may be self-interested. Research can investigate these mechanisms, proposing a typology of expenditure control.

Going beyond the effects on the volume of expenditures, future research can contribute to the literature that discusses the quality of expenditures, investigating the effects of decentralization. Although the literature already shows that the effects of self-interest and political direction of decisions in the public sector are moderated by greater transparency together with the active participation of society (Baldissera, Asta & Casagrande 2020), in general, research analyzes external effects, with public data. Thus, research can internally observe the process flows of public organizations, seeking to identify other mechanisms that can moderate these effects, such as integrated systems or the way in which the budget review is carried out.

Finally, the role of leadership has been recurrently discussed in the literature. Research can contribute by analyzing the relationship between spending decentralization and the profile of leaders in this activity.

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