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THE IMPACT OF SOCIOECONOMIC INDICATORS ON THE DEGREE OF BUDGET EFFICIENCY

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ABSTRACT

Studies have shown that budget effectiveness is influenced by the socioeconomic indicators of a locality, such as income, health, education and population size. In this context, budget effectiveness is understood with a measure that shows whether an organization has achieved its objectives, goals and results. Thus, the present study aimed to verify the relationship between the budget effectiveness of the 223 municipalities of the State of Paraíba and the socioeconomic conditions portrayed by the social and economic indicators in the period from 2005 to 2013. As an early answer to the research question two hypotheses were formulated: H1: socioeconomic indicators positively influence municipal budget effectiveness; And H2: the larger municipalities present a greater degree of budgetary efficiency when compared to smaller municipalities. The hypothesis test was performed through balanced panel data analysis with fixed effects and correlation analysis between model variables. The results showed that municipal budget effectiveness is positively influenced by socioeconomic indicators, confirming hypothesis 1. However, hypothesis 2 was rejected. In sum, the study found that social indicators of education and health promote the budgetary effectiveness of local governments.

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1 INTRODUCTION

The control and planning of activities made by the public entities must be integrated to allow the government to reach the efficacy at the budget's execution. For this, the managers need to guide their actions based on the working programs established on the public budget, as well as being actions followed by the society. The public budget can be defined as an instrument for the forecast of revenues and fixation of expenses. The revenues earned and expenses paid have the goal to ensure the continuity, efficiency, effectiveness, efficacy and the economy of the services provided to the State (Carvalho, 2007). The budget is an important mechanism for the planning and control of the activities performed by the public entities.

In this context, it is noticed the importance of the budgetary execution supported on the planning and control instruments so the public administration be allowed to reach a higher budgetary efficiency. Castro (2006) relates the efficacy as something that worries about the purposes, aiming the achievement of goals. Interpreting this concept, it is possible to understand the efficacy as the achievement of goals that were planned on the budget.

The society is inserted in this approach according to the service of its needs on the health, education, leisure, safety and transportation areas, among others. So, the efficient budget promotes improvements on the rights that were assured to the community, positively impacting the socioeconomics indicators of a location.

The economic and social indicators enable the evaluation of the society's situations and improvement. The comprehension about its meanings and limitations is essential (Moldau, 1998). Therefore, study these indicators under the budgetary efficacy might be crucial for the comprehension about the planning and execution structures for the government actions.

The social and economic indexes can have significant reflexes in this planning, considering that the public administration will be supporting the citizens' concerns. Faced with this, the main areas for this research is about the indicators that reflect realizations on the education, health and on the community's income, followed by socioeconomic indicators. For Lima and Diniz (2016), the socioeconomic indicators briefly point out the social and economic needs indicators for a society. These indicators can be pointed as, for instance, the income, health and education, indicating the topics where the government should pay more attention.

The budgetary efficacy benefits two important stakeholders from the governmental environment: the society and the government, each one them with their own peculiarities, but with this interest merging for a common objective, which is the implementation of the governmental law previewed on the budget. According to Freeman (2010), stakeholder might be classified as individuals that might affect the achievement of organizational goals, in other words, a group of people interested in the same business. Thus, the compatible and incompatible interests from the stakeholder's need be reconciled so the organizational goals can be achieved,

In this sense, Boaventura, Cardoso, Silva and Silva (2009) sign that among the contributions of the stakeholder's theory, it is emphasized the administrative attitude of the organization, which becomes more strategic and brings benefits for the entity. In the vision of Donaldson and Preston (1995), the stakeholder's theory is founded in ethical basis. It allows to identify the role and importance of each stakeholder.

In this scenery, the pillars of this theory are fundamental on the governmental area, considering that the managers' interests shouldn't prevail over the population well-being. Therefore, the community should know what is the State's acting, in which the citizens' interests must be considered. So, the citizens need to be stimulated to effectively participate in the elaboration, follow-up and evaluation of public policies (Borges & Pereira, 2014).

In this context, it is important to emphasize that the society is becoming each time more demanding and more participative over the last decades. On the educational area, as stated by Lück (2000), the society is more demanding because they acknowledge that the education constitutes a great value for the social development. Nogueira (2004) states that in a participative democracy, it is essential to have the presence of citizens that are capable to

collaborate for the improvement of the public management. For this, the rulers must expose clear decisions and guidance, besides pointing out paths and possibilities to the social actors.

Thus, to allow an efficient advance on the public management efficacy, according to Litpvsky and MacGillivray (2007), there must be a mutual collaboration between the development actors: rulers and ruled, distributing responsibilities so that there can't be substantial results. In this sense, Brazil has been presenting an improvement on the social participation in what concerns the charge of efficacy and transparency of the public accounts. However, the inclusion of the poor people remains a challenge (Litpvsky and Macgillivray, 2007).

Based in this theoretical approach, the following questioning for the investigation was raised: which is the relation between the budgetary efficacy in the cities of Paraíba and their socioeconomic conditions?

Aiming the anticipation of an answer to the formulated questioning, the following hypothesis were defined: H_1: the socioeconomic indicators have a positive influence over the municipal budgetary efficacy and H_2: the bigger cities presented a higher degree of the budgetary efficacy when compared with the smaller cities.

Thus, the main goal of the current study consisted on the verification of the relation between the budgetary efficacy in the cities of Paraíba and the socioeconomic conditions retracted by the social and economic indicators.

The current research aims to contribute with knowledges about the budgetary efficacy for the accounting science, as well as to support the municipal management. This way, the research justify itself by the importance that a coherent budgetary management can bring to the State, from the social, economic and organizational control perspective. It presents the benefits that might be reflected on the population's socioeconomic conditions.

This article starts with this introduction. The theoretical framework is presented on the second topic. Up next, it is presented the methodological aspects and the results of analysis. Finally, we have the presentation of the final considerations.

2 THEORETICAL FRAMEWORK

In this theoretical framework, the budgetary efficacy is approached, as well as its relation with the socioeconomic indicators and the stakeholder's theory.

2.1 Budgetary efficacy

The conception of budget-program has support on the Federative Republic of Brazil Constitution (1988), under Law n° 101 (2000), on Law n° 4.320 (1964), Decree-Law n° 200 (1967). The foundations of the budget-program are centered on the link between the budget and planning, aiming to check this instrument, besides the control function, the management function. This marks the transition from the traditional budget to the modern budget. Carvalho (2007) verifies the advantages on the usage of the budget-program. He explains the government's working benefits, his projects and activities, objectives, goals, costs and results, which generates a higher public transparency.

According to Giacomoni (2012), the budget-program was based on the performance budget experienced by the USA and that began to be disseminated through the world in the 50's, especially through initiatives of the United Nations Organization (ONU). It suffered modifications during its implementation in Brazil. However, it was only in 1974 that the Brazilian government included the programmatic classification by the need of information over the government's programming and also by the integration of planning and budget (Kashiwakura, 1997).

This way, it is comprehended that a budget planned coherently, in a way that the goals are achieved by the integration of the government and society, the socioeconomic conditions of the cities tend to improve, supporting the budgetary efficacy. The efficacy issue is centered on the products that the governments offers to the community, in the outputs. These, according with Lima and Diniz (2016), can be viewed as physical unities of the assets and services that are result from the productive process, emphasizing the difficulties to identify them.

Thus, the efficacy is a measure which a company can use to achieve its goals and other results, in other words, is the relation between expected results and assets' outposts and information (Controller General of the Union [CGU] 2009). The relation between the efficacy and the budget-program is found on the satisfaction of the citizens' needs in what concerns the assets and public services, mainly on the focus about results, if the execution of the budget-program attends to the population's needs (Koscianski, 2003).

But the provision of services can't be made in whatever form. The quality of services must be inherent to its provision. With this, when all of the real needs are placed in the city's budgetary planning and the objectives are attended, it is possible to comprehend that the budgetary efficacy was reached. As stated by Bezerra (2013), the efficacy occurs on the moment when the predefined goals are reached.

The Brazilian budgetary planning is made through the instruments known as Multi-Annual Plan (PPA), Budgetary Guidelines Law (LDO) and Annual Budgetary Law (LOA), all of them forecast on the Federative Republic of Brazil Constitution (1988), as well as on the Fiscal Responsibility (LRF) (2000). According to Carvalho (2007), the PPA is the medium-term strategic planning; the LDO is the tactical planning. It represents the guidelines for the LOA elaboration, it makes the connection between the PPA and LOA; and the LOA represents that operational planning of the public management, because it implements the goals that were established on the PPA.

This way, these planning instruments, aligned to the social needs, promote the identification of the society's priorities that matches the government's priorities, which are: ensure a higher transparency, integrate the planning to the budget, balance revenues and expenses, promote a proper budgetary execution, present health, educational, safety and social assistance improvements, and, essentially, to reach the budgetary efficacy.

However, if the allocations initially planned on the budgetary law aren't enough or aren't forecast, the manager might legally open an additional credit to include new expenses or to reinforce the existing ones (Carvalho, 2007). Such procedure might harm the budgetary efficacy if the coverage resources are insufficient. In this sense, Santana, Pessoa, Cabral, Santos and Diniz (2007) believe that the alteration in the cities' budget counter the theoretical housing of the planning and budget, because, if the planning the way to forecast the expenses that'll be performed in a certain period, the additional credits would only be necessary in the event of an extreme urgency. Thus, if the manager does not open additional credits during the exercise, the budgetary efficacy won't be much negatively impacted.

Therefore, it is necessary that the planning and budgetary execution be integrated so the efficacy can be achieved, attending the population's needs and contributing for an improvement of the health and educational actions, and leveraging the city's community income.

2.2 Socioeconomic indicators and budgetary efficacy

The social indicators are important to measure the profile of a city's reality. It allows the tracking of more accurate public policies (Jannuzzi, 2012). Lima and Diniz (2016) denote that these indicators are composed by social and economic variables and that they measure the population's needs. They can be, for instance, the income, unemployment, transportation, natality and mortality indexes, analphabetism indexes, etc.

Jannuzzi (2002) conceptualizes the social indicator as a quantitative measure that theoretically interests to academic researches and, in a programmatic way, supports the formulation of policies. Aristigueta, Cooksy and Nelson (2001) argue that the States sees the social indicators as a fundamental governance tool and as strategies for the management of results. The authors (2001) bring the social indicators as signs of social and economic health.

According to Jannuzzi (2002), for this indicator being present in academic researches, it is strictly important that it is noticed a series of requirements, such as sensibility to the public policies and disaggregation in geographic and historical terms, so that may have possible comparisons over time. Thus, the socioeconomic diagnosis presented by these indicators become relevant, valid and reliable to provide a continuous allocation of resources and implementation of public policies.

Several researches used the socioeconomic indicators, relating them with the budgetary efficacy and, mainly, associating them to the public transparency. Aristigueta *et al*. (2001) analyzed the role performed by the social indicators over a system of guided results in a

Delaware study case. They determined that these indicators are useful to control the performance of institutions, as well as the families', children and community's well-being measurement. This way, they provide information about the society, its needs and satisfaction.

In what concerns the budgetary efficacy performed by Santana *et al*. (2007) verifies that the Paraíba cities weren't impacted by the LRF (2000) in the period immediately prior and posterior to the law's implementation; however, when compared with the previous years, it was verified the statistic significance between the budgetary efficacy and the expenses fixed and executed, in other words, the LRF positively influenced on the improvement of the public planning.

Queiroz, Nobre, Silva and Araújo (2013) studied the information advancement level in cities of Rio Grande do Norte, including the population's quantity. The study determined a weak relation between the city's size and the advancement level. Besides, Queiroz *et al*. (2013) used socioeconomic variables. They determined that the cities with a higher level of the socioeconomic development tends to disclose more information.

Poker, Nunes and Nunes (2013) can sustain the use of two variables highlighted in this article: income and education. In their research, the authors allowed the conclusion that the public policies must develop a higher investment in education and, for this, they used the income factor in their empiric tests. Besides, Poker *et al*. (2013) clarify that there's a relative inefficiency of the cities with a higher rural area, which indicates the need for specific public policies.

Neves, Diniz and Martins (2015) connect the public transparency and the IDHM as a proxy of the socioeconomic condition. They point out that there's the relation between the socioeconomic indicator and the public transparency level, in other words, cities with better socioeconomic indicators tend to present a higher transparency about the management.

Wright and Paulo (2014) sustain the use of the income and educational variables, which are also evident in this research. These authors studied the determinant fiscal transparency elements in the Brazilian cities, proving that the variables of age, education and income presented a correlation with the transparency variable.

Oliveira and Passador (2014) made an analysis about the utilization of health on the evaluation of the allocation of the cities' resources. They found out that the cities that spends more resources in basic attention have a higher level of performance on the system. Besides, they determined that the cities with higher populations have worse results in the health area, because the access to these services is harmed by the high demand.

Most of the researches made using the socioeconomic indicators compare them with the public transparency, but are useful to support this research since this dimension is an assumption of the budgetary efficacy.

Among the main indicators used in this research, the ones that stand out among the others are the ones about the education, income and health. To represent one of the indicators, it'll be used the Municipal Development Index FIRJAN (IFDM) on the consolidated level, such as the notes discriminated by employment and income, education and health. it is about a system that annually follows the economic development of all Brazilian cities in the three aforementioned areas.

The public management is supported by these indicators that determine the demands and diagnosis the economic and social situation of the community (Varela, 2004). Therefore, the information generated from the socioeconomic indicators support the government health analysis and from the society's needs.

2.3 Stakeholders theory and budgetary efficacy

The stakeholder's theory showed up for the first time due the dissatisfaction arisen by the fact that the efficacy's financial criteria being unilateral (Gomes, 2006). The efficacy can't be measured to satisfy only one of the interested parties, but must satisfy all agents that compose an organization.

The stakeholders represent several parties involved in a business relationship, in other words, they are the individuals interested in certain actions. Due the management's difficulties to identify each stakeholder, to allow all interested parties to feel satisfied in any kind of negotiations in which They are inserted, the defenders of the stakeholder's theory, such as Donaldson and Preston (1995), identify the importance of this theory within this context.

In what concerns the efficacy, the stakeholder's theory can be highlighted as the perspicacity to serve, to ensure the satisfaction not only for the shareholders, but for all the ones that have a bond with the organization. Within the public-sector scope, it is possible to define stakeholders as government and population. However, as much as the government as the people that compose a community present needs, desires and differentiated desires. Besides, other components are encompassed on the government and society context, which increase the complexity of the stakeholder's management, such as suppliers, financial institutions and shareholders.

That's why there's a difficulty to make a proper management about the stakeholders. According to Bandeira-de-Melo, Marcon and Alberton (2005), the empiric verification of this management is still scarce on the literature. Due differentiated demands, the govern must analyze which are the key and common aspects for the society.

The managers are afflicted by several difficulties to manage the public services. A way to observe the society needs is the quantitative verification of the social indicators, extracting the needed information to allow an improvement on the budgetary planning elaboration. This is a way to dialog with the society's stakeholders, evincing a guide of the organizations and institutions where they act, showing general dispositions such as the usage of space, degree of influence of the organizations and the routine difficulties (Santos, 2008).

However, considering the difficulty to identify the population's needs, the managers need the popular participation since it is believed that this participation has a higher capacity to identify the citizens' needs. This becomes even more clear in demographic countries where the government have expectations about the increase and expansion of programs, such as health, education and income distribution (Khan & Hildreth, 2002).

With this analysis it is possible to infer a strengthening of the relationship between the stakeholders, consolidating the public interest on areas such as education, health, safety and infrastructure. Government and society, through mutual interests, must reach a consensus about the real needs of a city to redirect the basic attention to those purposes, making the stakeholders keep a relationship that benefits the society's socioeconomic condition, which tends to the budgetary efficacy.

3 METHODOLOGY

In this section, it'll be presented the methodological procedures: universe and data, research model and hypothesis, and definition of the model's variables.

3.1 Universe and research data

For the achievement of goals of this research, it was collected data referring to 223 cities of Paraíba in the period from 2005 to 2013. Due the access' difficulties and due the fact these are the most recent years with data available, the temporal universe was useful to determine the advances or setbacks on the budgetary execution in relation to the efficacy aspects and its impacts on the socioeconomic indicators.

The data were collected on the sites of the Brazilian Institute of Geography and Research [IBGE] at the SAGRES basis (System of Following-up of the Society's Resources Management) in Paraíba's Court of Auditors and on the FIRJAN index site.

3.2 Research model and hypothesis

To answer the question initially made by the research, it was developed a regression model accordingly with the following equation:

$$GEO_t = \beta_0 + \beta_1 SAUDE_{it} + \beta_2 EmpRenda_{it} + \beta_3 EDUC_{it} + \beta_4 HABM_{it} + \mu \quad (1)$$

Where:
β_0 – is the model constant;
GEO – Budgetary efficacy degree;
SAUDE – FIRJAN index of the municipal health development;
EmpRenda – employment and income;
EDUC – FIRJAN index of the municipal education development;

HABM – number of inhabitants in the city;
μ – is the error term.

In face of the model exposed, the study formulated the following hypothesis, with the goal to verify if the socioeconomic indicators are capable to impact the budgetary efficacy in the cities of Paraíba.

H_1: the socioeconomic indicators have a positive impact on the municipal budgetary efficacy.

This hypothesis was formulated considering that the relationship between the cities and its socioeconomic indicators translates an opportunity to observe the budgetary behavior in face of the social issues, such as the lack of financial resources (Bárbara & Rodrigues, 2005).

H_2: the bigger cities present a higher degree of budgetary efficacy when compared with smaller cities.

This hypothesis was formulated considering that the cities with a higher population, the collection of taxes tends to be higher, according to Mendes, Miranda and Cossio (2008), when they explain that a higher economic development tends to express the higher capability of collection. Besides, the needs of expenditure are influenced by the population's size and growth.

3.3 Definition of the model's variables

According to the model developed on the equation1 above, the following table describes the dependent variable – budgetary efficacy degree – and the respective independent variables, represented by social and economic variables.

Table 1
Description of the variables used on the research model

VARIABLES	ABBREVIATION	OPERATIONAL DEFINITION	JUSTIFICATION
Degree of budget efficiency	GEO	This variable will be measured with the following equation 2, using data extracted from the SAGRES site of the Court of Auditors in Paraíba.	The use of this variable is supported in the studies performed by Santana *et al.* (2007) and it is useful to reduce possible inconsistencies on the monetary variations over time; that's why it is important to measure in indexes. The ideal efficacy degree is 1. It'll be assigned a good budgetary efficacy degree for the cities that presents a GEO between 0,9 to 1,10.
Number of inhabitants in the city;	HABM	The number of inhabitants was collected at the IBGE site bases on the 2010 census and on the estimative of the other years studied in this research (2005, 2006, 2007, 2008, 2009, 2011, 2012 and 2013).	it is believed that the bigger cities presented a higher budgetary efficacy, as sustained on the works made by Queiroz *et al.* (2013) and Oliveira & Passador (2014).
Employment and income	EmpRenda	For this variable, the FIRJAN index was used as proxy, since it contains the years proposed by this study. The note for this index is assigned in the following way: using the formal generation of employment and the capacity to absorb local labor, the income generation and its distribution on the city's job market. It was assigned the weight of 25% in each concept. The formula is presented according to the equation 3 below.	it is assumed that higher the budgetary efficacy, higher will be the citizens' income, as sustained by the studies performed by Queiroz *et al.* (2013), Poker *et al.* (2013), Neves *et al.* (2015) and Wright e Paulo (2014).

Continue

Table 1 (continued)

VARIABLES	ABBREVIATION	OPERATIONAL DEFINITION	JUSTIFICATION
Education	EDUC	For this variable, the FIRJAN index was used as proxy, since it contains the years proposed by this study. The note for this index is assigned by the following way, with the weights indicated after each item: using the registrations on the child education – 20%: the abandonment on the elementary school – 15%: distortion in the age-grade on the elementary school – 15%: the average of daily hours of classes on the elementary school – 15%: and the IDEB result on the elementary school – 25%. The formula is presented according to the equation 4 below.	it is comprehended that higher the budgetary efficacy, higher will be the cities' education level, as sustained by the studies performed by Queiroz *et al.* (2013), Neves *et al.* (2015), Costa (2012) and Wright e Paulo (2014).
Health	HEALTH	For this variable, the FIRJAN index was used as proxy, since it contains the years proposed by this study. The note for this index is assigned by the following way: using the number of prenatal consultations, the deceases obtained due non-resolved issues, the children deceases due avoidable causes and the sensible hospitalization to basic attention. It was assigned the weight of 25% in each concept. The formula is presented according to the equation 5 below.	it is expected that higher the budgetary efficacy, higher will be the education level, as sustained by the studies performed by Queiroz *et al.* (2013), Neves *et al.* (2015) and Oliveira e Passador (2014).

Note. Source: Own elaboration (2016).

Budgetary Efficiency Degree (GEO) – is the variable that depend on the research, represented by a measured proxy according to the following equation, according with Santana *et al.* (2007). For the utilization of the GEO value, it was considered the result's module.

$$GEO\ i = 1 - \frac{DOR\ i - DOF\ i}{DOF\ i} \quad (2)$$

Where:
GEO = Degree of budget efficiency;
DOR = Performed budgetary expenses;
DOF = Fixed budgetary expenses.

Employment and income (EmpRenda) – this variable has the Labor Department as source. Two dimensions are used: the employment, which analyzes the generation of employments and the capacity to absorb labor; and the income, which evaluate the income generation and its distribution on the city's job market. Each dimension represents 50% of the Employment&Income index, whose goal is to capture the economic situation as a characteristic of the cities' job market Thus, this variable is measured by the following equation:

$$\begin{aligned} EmpRenda_{it} = {} & \gamma\ Geração\ de\ Emprego + \\ & + \gamma\ Capacidade\ de\ absorção\ da\ Mão - de - Obra \\ & + \gamma\ Geração\ de\ Renda \\ & + \gamma\ Distribuição\ no\ mercado\ de\ trabalho \end{aligned} \quad (3)$$

FIRJAN index about the municipal education development (IFD – Education) – this variable considers six indicators, as described on board 1. This index has the purpose to capture the child education offer, as well as the quality on the education provided in public and private schools. It was assigned the weight of 80% for the elementary school among five

indicators: 55% for middle-indicators and 25% for ending-indicators. The child education Thus, this variable is measured by the following equation:

$$\begin{gathered} EDUC_{it} = \gamma\ Matrículas\ na\ educação\ infantil + \\ + \gamma\ Abandono\ no\ ensino\ fundamental \\ + \gamma\ Distorção\ idade - série\ no\ ensino\ fundamental \\ + \gamma\ Docentes\ com\ ensino\ superior\ no\ ensino\ fundamental \\ + \gamma\ Média\ de\ horas\ aula\ diárias\ no\ ensino\ fundamental \\ + \gamma\ Resultado\ do\ IDEB\ no\ ensino\ fundamental \end{gathered} \quad (4)$$

FIRJAN index on municipal health development (IFDM – Health) – this variable is focused on the basic health. It contemplates four indicators, which have a weight of 25%, according to what is described on table 1. Thus, this variable is measured by the following equation:

$$\begin{gathered} SAUDE_{it} = \gamma\ Número\ de\ consultas\ pré - natal + \\ + \gamma\ Óbitos\ obtidos\ por\ causas\ mal - definidas \\ + \gamma\ Óbitos\ infantis\ por\ causas\ evitáveis \\ + \gamma\ Internação\ sensível\ à\ atenção\ básica \end{gathered} \quad (5)$$

it is important to emphasize that the FIRJAN index about employment and income, health and education allows to precisely find out if the improvements in a city are resulting from the good practices of public policies of if they occurred due a drop in other cities.

This index varies from 0 (minimal) to 1 point (maximum). Closer to 1, higher the location's development, as presented on table 2:

Table 2
Parameters for the IFDM interpretation

INDEX VARIATION	CLASSIFICATION
From 0 to 0.4	Low development
From 0.4 to 0.6	Regular development
From 0.6 to 0.8	Moderate development
From 0.8 to 1	High development

Note. Source: Index portal FIRJAN (2015).

4 RESULTS

As defined on the methodology, the research universe consists from the 223 cities of Paraíba state. From those, 14 did not presented all information in different years. Due this, these cities, which did not present complete data for all years and for all variables, were removed from the sample and, thus, remained 209 cities on the study.

It was used the data analysis in a balanced panel with fixed effects, since to the contrary of pooled, it considers the heterogeneity of the cities that might influence the variable dependent on the study, in other words, it considers the cities' specifications over time, the impact caused by the variables on the period analyzed. This way, the variables omission problems are avoided, which leads to more consistent and efficient estimators.

The HABM variable presents outliers, since there are cities with a big population and other with few inhabitants. It shows the discrepancy between the cities of Paraíba. By presenting a big disparity on the HABM variable, showing an abnormal distribution, the natural logarithm was applied for this variable, now denominated as InHABM. It was also decided to apply a natural logarithm o the SAUDE variable, because it was noticed the importance of a better way to adjust the variables to the model.

Despite the high number of observations, 1.881 observations, assuming the normality of data, it was applied the normality tests of Shapiro-Wilk and Shapiro-Francia. It was noticed that only the EDUC variable present a normality on the data, according to the table 3 below.

Table 3
Shapiro-Wilk and Shapiro-Francia normality tests on the periods from 2005 to 2013.

Variable	Shapiro-Wilk	Shapiro-Francia
GEO	0.00014	0.00022
lnHABM	0.00000	0.00001
EDUC	0.17773	0.25202
EmpRenda	0.00000	0.00001
lnSAUDE	0.00000	0.00001

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

Up next, it was performed the variables' descriptive statistics, described on table 4. The GEO variable, according to the presented model, is the dependent variable, explained by the other independent variables. EDUC, EmpRenda, lnSAUDE and lnHABM as a control variable.

Table 4
Descriptive statistics of the model on the period from 2005 to 2013.

Statistics	GEO	lnHABM	EDUC	EmpRenda	lnSAUDE
Average	1.127092	9.051869	0.5415434	0.4027247	-0.5692249
Standard deviation	0.1935049	0.9167358	0.1005181	0.0873441	0.277974
Notes	1,881	1,881	1,881	1,881	1,881
Minimum	0.3941116	7.24065	0.246868	0.1439972	-2.59083
Maximum	1.713902	13.55367	0.8817995	0.8827442	-0.1046459
Asymmetry	-0.0687741	1.210343	0.0371865	1.123141	-1.111657
Kurtosis	3.138443	6.068068	2.911983	7.023269	5.381835

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

The GEO variable presents and average of 1,12, surpassing the value of 1. it is noticed that, in general, the Paraíba cities use less resources than what is scheduled at LOA. Analyzing the GEO minimal (0,39) and the maximum (1,71), it is noticed that the cities of Paraíba that presented values lower than 1 uses more resources than what was previously established, in other words, they use more additional credits. They compromise the budgetary efficacy. In the counterpart, the cities with values above 1 tends to be less effective, because they do not use the minimal resources that were previously established.

The GEO variable, due the fact it presents a kurtosis of 3,13, a value next to 3, identifies that the cities of Paraíba, in average, presents a normality in the data. The EDUC variable, in the kurtosis analysis, shows almost the same behavior adopted by the GEO. The EmpRenda and lnSAUDE variables present an abnormal distribution. They identify the differences between the income and health in the cities of Paraíba, as well as the lnHABM variable, which shows the difference on the number of inhabitants in the cities of Paraíba, which might compromise the budgetary efficacy.

Soon after the descriptive analysis, it was performed the correlation tests described on table 5, which shows the Pearson and Spearman correlations between the model's variable and their respective significances. The values above the 1.0000 diagonal refers to Pearson's correlation and the values below this diagonal are from Spearman's correlation for the research's variables.

Table 5
Pearson and Spearman correlation for the study variables in the period from 2005 to 2013.

	GEO	*lnHABM*	*EDUC*	*EmpRenda*	*lnSAUDE*
GEO	**1.0000**	-0.1472***	0.3216***	-0.0087	0.1992***
		0.0000	0.0000	0.7066	0.0000
lnHABM	-0.1444***	**1.0000**	-0.0582***	0.3559***	0.0139
	0.0000		0.0116	0.0000	0.5480
EDUC	0.3195***	-0.0794***	**1.0000**	0.0450**	0.4422***
	0.0000	0.0000		0.0511	0.0000
EmpRenda	-0.0085	0.1657***	0.0421**	**1.0000**	0.1798***
	0.7136	0.0000	0.0680		0.0000
lnSAUDE	0.2057***	-0.0372*	0.4554***	0.1471***	**1.0000**
	0.0000	0.1069	0.0000	0.0000	

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.
Legend: Significance * = 10%; ** = 5%; *** = 1%.

By Pearson's correlation, it is noticed that almost all variables from the model, lnHABM, EDUCA and SAUDE presented a strong significance, at the level of 1% with the GEO dependent. Only the EmpRenda variable did not had any significance with GEO. Equally, when observed on table 5, the values obtained by Spearman's correlation, it is noticed that the only variable that did not presented a significance with GEO was EmpRenda.

On table 5, it is observed that the lnHABM variable, despite its significance, present a negative correlation value with the GEO variable. It indicates that cities with a big population presents a lower degree of budgetary efficacy. This makes hypothesis 2, which states that the higher cities present a higher budgetary efficacy degree compared to smaller cities, does not be accepted, since GEO and lnHABM are inversely proportional. This differ from the studies performed by Poker *et al.* (2013) and Neves *et al.* (2015) and corroborate with the studied performed by Oliveira e Passador (2014) and Queiroz *et al.* (2013).

Furthermore, it is important to emphasize that smaller cities seem to not dispose from the same efficacy in what concerns the planning and incorporation of new practices that higher cities present difficulties to make a proper budget elaboration (Santana *et al*., 2007).

Table 5 also shows a significant and negative relation between the EDUC and lnHABM variables. It shows that the cities that present a higher population have lower educational indicators. This does not repeat when we observe the EmpRend variable, because it present better results in cities with a higher population.

Analyzing the EDUC and lnSAUDE variable, which presented a significance at the 1% level with GEO, besides the positive correlation, it is deduced that the educational and health social indicators positively influence the budgetary efficacy, not rejecting, thus, hypothesis number 1. However, the EmpRenda variable, besides the fact it does not have any kind of significance with GEO, the correlation is negative and evince that the cities of Paraíba presents different types of income and that higher the employment and income index, lower the budgetary degree will be.

Still, with the relation of correlations between the variables, it is necessary to emphasize that the EDU and EmpRenda expresses significant and positive correlations with the lnSAUDE

variable. They reveal that the cities which present good educational and employment indicators present better results in the health area.

For the choice of data in panels with fixed effects, it was performed the Hausman test, presented on table 6, which considers that all invariable characteristics over time are unique for each individual, in other words, they do not relate with the characteristics from other individuals. In the current study, this shows that each city has own characteristics and that it does not depends from other cities. So, the estimate to capture the heterogeneity of the cities in what is constant, in other words, the difference of city from city that do not vary over time, such as some environmental factors that tend to be unchanged. As observed on table 6, the result prob>chi2 was lower than 5%. it is noticed that working with a panel with fixed effects is more proper for this study.

Table 6
Hausman's test for the period from 2005 to 2013.

Statistics	Fixed effects	Random effects	Difference	Standard error of the difference
EDUC	0.7683925	0.6965754	0.0718172	0.0244958
EmpRenda	0.090302	0.0461549	0.0441471	0.0310782
lnSAUDE	0.0537956	0.0560105	-0.0022149	0.0096662
lnHABM	-0.0099448	-0.0185237	0.0085789	0.0038336
chi2(4)=34.89		Prob>chi2 =0.0000		

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

To give a bigger strength for the choice of data in panel with fixed effects, it was performed Chow's test. It was noticed that the fixed effects are the most appropriate for the studied model as it is presented on table 7, where Prob>F = 0,0000, in other words, is lower than 5%.

After the verification by Hausman's test from the best model to be worked, and to give a bigger strength for the choice of data in panel with fixed effects, it was performed Chow's test. It was noticed that the fixed effects are the most appropriate for the studied model as it is presented on table 7, where Prob>F = 0,0000, in other words, is lower than 5%.

It was followed with the analysis of the empiric model application, presented on equation 1 of the methodological procedures. Table 7 shows the regression results from the module.

Table 7
Coefficients and statistics obtained from the regression model

GEO	Coefficient	Standard deviation	*t*	*p-value*	95% Confidence	Range
EDUC	0.7683925	0.0560911	13.70	0.000	0.6583763	0.8784088
EmpRenda	0.090302	0.064895	1.39	0.164	-0.0369823	0.2175863
lnSAUDE	0.0537956	0.0211523	2.54	0.011	0.0123078	0.0952833
lnHABM	-0.0099448	0.0069263	-1.44	0.151	-0.02353	0.0036404
__cons	0.7952478	0.0777055	10.23	0.000	0.6428373	0.9476583
F (208, 1668)	5.13			Prob>F	0.0000	
sigma_u	0.11724016	sigma_e	0.1500173	rho	0.37906673	

Note. Source: Own elaboration (2016) with the data extracted from SAGRES, IBGE and FIRJAN.

Analyzing the regression presented on table 7, it is verified that the EmpRenda and lnHABM variables weren't significant. However, the other variables were significant, so they explain the behavior of the dependent variable and confirm hypothesis 1, that the socioeconomic indicators positively influence the municipal budgetary efficacy, equally conforming the findings in the study performed by Neves *et al.* (2015) and Wright e Paulo (2014).

The control variable lnHABM, which represents the number of inhabitants, present an inverse relation with the GEO dependent variable, noticing the negative sign of the coefficient,

indicating that the number of inhabitants of a certain city has a negative influence on the budgetary efficacy degree, in other words, the cities with a bigger population present a lower GEO.

Besides, it is noticed that the EDUC and InSAUDE variables are significant at the 1% and 5% levels, respectively, with the GEO and present positive correlations. This conducts the interference that good educational and health indicators provide high degrees of the budgetary efficacy. Therefore, the budgetary efficacy is reflected in these social indicators.

5 CONCLUSIONS

This study tried to verify if the budgetary efficacy degree is influenced by the socioeconomic indicators, adopting them as unities of analysis in the cities of Paraíba. For this, the proxies used for education, income and health were the grades assigned by the FIRJAN index during the period from 2005 to 2013. Besides, the population size was also considered important to measure the budgetary degree efficacy.

The results obtained revealed that most of cities present a good efficacy degree, with the GEO between 0,9 and 1,1. With the GEO presenting an average of 1,12, it is deduced that the cities use less resources than what would be ideal.

Referring to the correlation between the variables, it is noticed that the health and education variables present a strong relation with the GEO. They indicate that the expenditures in these two segments demand more public expenses. Besides, the inhabitants number also presented a correlation with the GEO, but it was negative. it is noticed that the population number inversely influences the budgetary efficacy degree. The EmpRenda variable does not present a significance and, besides, it shows a negative correlation. So, it is concluded that the cities with more jobs and a higher income has a low degree of budgetary efficacy.

The regression results show the non-significance of the EmpRenda and InHABM variables with the GEO, while the other variables were significant. Therefore, it was confirmed the hypothesis that the budgetary efficacy is positively influenced by the socioeconomic indicators, corroborating the works performed by Neves *et al.* (2015) and Wright e Paulo (2014).

However, hypothesis 2 states that the bigger cities present a higher degree of budgetary efficacy compared to smaller cities, was rejected, because the InHABM variable, besides not being significant with the GEO, has a negative coefficient, confirming the study performed by Queiroz *et al.* (2013), when finding few relations between the population size and the evincing degree, more precisely, public transparency.

For future researches, it is suggested the use of other proxy for the proposed variables, as well as the other unities of analysis. Besides, other way to measure the budgetary degree might reflect the results obtained.

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