
QUALITY OF PUBLIC SPENDING IN THE COUNTIES OF SANTA CATARINA

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ABSTRACT

The article aims to identify the quality of public spending in the counties of Santa Catarina. The research population comprises the 295 counties in the State of Santa Catarina. The research is descriptive, carried out through a bibliographic and documentary study, with a quantitative approach, with three hypotheses being proposed. Data collection took place from two sources. The first, referring to the result indicators, was carried out in a pre-existing instrument for the Sustainable County Development Indicators System, developed by the Catarinense Federation of Counties. In the second, data collection was carried out on accountability documents of the counties available on the website of the Court of Accounts of the State of Santa Catarina. It concludes by the high number of counties with IQGP below 1,000 in several analyzed functions. Such values represent that these counties were not able to obtain a proportional return, measured in welfare units, from the expenses incurred in the function, measured in input units. It is evident that each county has its own reality and different social, economic and political contexts.

Keywords: Quality. Public spending. Counties.

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QUALIDADE DO GASTO PÚBLICO NOS MUNICÍPIOS DE SANTA CATARINA

RESUMO

O artigo tem como objetivo identificar a qualidade dos gastos públicos dos municípios catarinenses. A população da pesquisa compreende os 295 municípios do Estado de Santa Catarina. A pesquisa é descritiva, realizada por meio de estudo bibliográfico e documental, com abordagem quantitativa, sendo propostas três hipóteses. A coleta dos dados ocorreu em duas fontes. A primeira, referente aos indicadores de resultado realizou-se em instrumento preexistente Sistema de Indicadores de Desenvolvimento Municipal Sustentável, desenvolvido pela Federação Catarinense de Municípios. Na segunda, a coleta dos dados foi realizada em documentos de prestação de contas dos municípios disponíveis no portal do Tribunal de Contas do Estado de Santa Catarina. Conclui-se pela elevada quantidade de municípios com IQGP inferior a 1,000 em diversas funções analisadas. Tais valores representam que esses municípios não conseguiram obter um retorno proporcional, medido em unidades de bem-estar, a partir das despesas realizadas na função, mensuradas em unidades de insumo. É evidente que cada município tem sua realidade e contextos social, econômico e político, distintos.

Palavras-Chave: Qualidade. Gasto público. Municípios.

1 INTRODUCTION

There is a persistent alarm on the unsustainability of the Brazilian federal government accounts (Rezende & Afonso, 1988; Afonso & Senra, 1994; Meirelles, 2002). At the local level, resources mismanagement (Diaz, 2012) and incongruity between the municipalities' revenues and the competencies (Kerbaui, 2001) attributed to them by the 1988 Federal Constitution directly impact the quality of public services. This context, combined with the weaknesses observed in municipalities' managerial capacities (Grin *et al.*, 2018), result in the lack of resources to deliver appropriate services.

The quality of local governments' public spending gained prominence in the literature in Brazil after new institutional arrangements emerged as a result of decentralization, democratization, and federalization processes that occurred in the past few decades. Studies have focused on the efficiency of public spending in relation to the improvement of indicators on economic development and growth (Marques Junior, Oliveira & Jacinto, 2006; Bogoni, Hein & Beuren, 2011; Costa *et al.*, 2012). Also, these new institutional arrangements increased the local governments' responsibility regarding the use of resources to provide quality public goods and services that influence the private sector's productivity and development and the quality of life in the municipalities (Bogoni, Hein & Beuren, 2011).

After the 1988 Constitution, the Brazilian state and local governments were attributed more competencies and receive financial resources via intergovernmental transfers to provide public services, such as health and basic education. According to Afonso and Senra (1994), in the case of municipalities, available revenues (*i.e.*, the municipalities' own revenues plus revenues obtained

from intergovernmental transfers) went from 9% to 15% between 1980 and 1994. However, the percentage of own revenues went from 3% to only 5% in the same period, while local governments have become important actors responsible for the administration and provision of services affecting the citizens' quality of life.

Data from the National Treasury Secretariat concerning 5,109 Brazilian municipalities shows that total municipal revenues in 1998 were BRL 52.1 billion, and BRL 573.1 billion in 2017 (STN, 2008; STN, 2018). On the other hand, the local governments' debts went from BRL 17.8 billion in 1998 to BRL 122.8 billion in 2017 (STN, 2018). Even with significantly larger amounts of revenue, municipalities face difficulties in controlling debts, impacting the provision of quality public services and the capacity to improve local infrastructure.

The strong dependence of Brazilian municipalities from intergovernmental transfers reinforces the importance of analyzing the expenditures of local governments that count on robust indicators of socioeconomic and management results, as in the case of municipalities in Santa Catarina (IPEA; FJP; UNDP, 2013; FIRJAN, 2018; TCE-SC, 2018). Therefore, the research question guiding this study is: What is the quality of public spending of municipalities in the Brazilian state of Santa Catarina?

This study addresses the theoretical-empirical gap highlighted in Soares and Raupp (2020). In their research, the authors noted that the previous literature broadly emphasized expenditures in health and education, suggesting further studies in more specific areas of government spending. Thus, this work uses an expanded sample encompassing all municipalities in one of the Brazilian states and examines the local governments' spending on multiple areas, relating the expenditures with indicators formed of compiled variables. The results aim to increase comprehension and subsidize the discussion on the issue. Finally, this research builds on the work by Soares, Raupp, and Tezza (2019), who also analyze the quality of public spending in municipalities in the State of Santa Catarina. Here, we advance by offering more consistent results since we adopt a longitudinal approach with data from 2012 to 2018, whereas the previous study used data only from 2017.

The analysis of results obtained from local governments' spending can contribute, in managerial terms, to aligning the new needs for providing services to each municipalities' financial capacities. It provides a situational diagnosis of the quality of public spending in the municipalities and demonstrates the use of indicators (well-being index, input index, public spending quality index) in municipalities of different population sizes and in different expenditure areas, which may encourage the monitoring of the quality of local governments' spending.

2 LITERATURE REVIEW

According to Afonso et al. (2005), there are four main channels through which public finances can influence economic growth: institutional structure, tax system, macroeconomic stability, and government spending. Each of them has essential aspects contributing to obtaining a high quality of public finances and, consequently, public spending (Afonso et al., 2005).

As for Busatto (2011), the quality of public spending can be examined from

different perspectives. Its relevance lies in the government's critical role in the economy, positively or negatively interfering in economic development processes and citizens' lives. The author defines the quality of public spending as "a mix of well-distributed budget and application and smart public policies that affect people's lives" and it "depends on two dimensions that have to be addressed on different methods – composition of spending and effectiveness of policies (Idem, p. 10)."

The type of expenditure and its composition (Cândido Junior, 2001; Paternostro, Rajaram & Tiongson, 2007; Busatto, 2011) – beyond the amount spent – substantially affect the outcomes. Therefore, evaluations may indicate that different resource allocations can produce satisfactory results, such as transforming unproductive public expenditures into productive expenditures or inefficient expenditures into efficient expenditures. According to Paiva (2006, p. 343, our translation), "the discussion of the quality of public spending cannot lack the careful evaluation of the public policies they finance – which is why issues of quality of spending and policy evaluation are intimately connected." This demonstrates that understanding the quality of public spending is a complex task and needs to proceed with caution (Afonso, Schuknecht & Tanzi, 2006; Busatto, 2011).

Paternostro, Rajaram, and Tiongson (2007) argue that a simplistic connection between inputs and outcomes is a weakness in the literature. Without a fundamental discussion of the relationship between public spending policies and their direct and indirect effects in the short and long term, the connection between inputs and outcomes is made only subjectively, which can be considered methodologically weak (Paternostro, Rajaram & Tiongson, 2007; Gemmel, Kneller & Sanz, 2009). Perhaps this is one of the reasons why the terms quality and efficiency applied to public spending are commonly used for the same purposes, although they may be fundamentally different approaches.

In the production of goods in general, efficiency is based on the ratio of the number of inputs and products and requires cost estimation, product estimation, and a comparison between the two (Rezende & Afonso, 1988; Afonso & Schuknecht; Tanzi, 2006). As for the production of public goods, there are other challenges such as the measurement of costs in public activity, distinction between government and corporate goals, and the fact that the government must decide what, how much, and how to produce to generate benefits to the population (Afonso *et al.*, 2005; Mattos & Terra, 2015).

Empirical analysis of public expenditure efficiency can facilitate comparing individual results with those of other groups and support technical or allocation adjustment of resources. Afonso, Schuknecht, and Tanzi (2006) compared Brazil with 24 developing countries from different continents and economic and social contexts. In their study, the efficiency level of Brazilian public spending appears as the third-worst. Following this line, Ribeiro (2008) carried out a comparative analysis of the government's performance and efficiency in 17 countries in Latin America, and the results were worrying: Brazil is average for public services evaluation and below average for expenditure efficiency. The author argues that one of the causes can be the high amount of general government expenses.

Analyzing the impacts of public spending, including local governments' spending, is not a simple task. In Brazil, the decentralizing reform and the 1988

Constitution that expanded the responsibilities of state and municipal governments disregarded, at least in part, the importance of the marked social and economic disparities between states, including differences in regions of the same state and between neighboring municipalities (Kerbaui, 2001).

When looking at the literature, Soares and Raupp (2020) pointed out the predominance of quantitative studies that address municipal spending on specific areas, particularly health and education. In general, the studies refer to specific aspects of small regions or case studies examining expenditures of few units of analysis. Thus, it is hard to carry out comparative analysis and identifying local governments' standards and best practices that could be replicated by administrations facing financial challenges (Soares & Raupp, 2020).

In a recent scenario, local governments' public spending research encompasses different perspectives and approaches varying according to objectives and methodologies. There are multiple focuses or conceptions (Table 1), but when it comes to local government's public spending in Brazil, research analyzing the efficiency of spending and investments are dominant in the literature (Soares & Raupp, 2020).

Table 1

The focus of recent research on local government spending

Focus	Authors
Influence of political cycles on public spending	Carvalho and Oliveira (2009), Klein (2010), Cavalcante (2017), Dias, Nossa, and Monte-Mor (2018)
Public sending and local economic growth	Fernandes and Fernandes (2017), Degenhart, Vog0, and Zonatto (2016)
Government costs	Crozatti (2013), Borinelli <i>et al.</i> (2014), Couto <i>et al.</i> (2017), Mauss, Diehl, and Bleil (2015), Libertun and Guerrero (2017)
Managerial performance	Lima and Santos (2009), Souza, Marengo, and Almeida (2014)
Performance indicators and local government spending	Zucatto <i>et al.</i> (2009), Macedo, Cruz, and Ferreira (2011), Santos Filho, Dias Filho, and Fernandes (2012), Mariani <i>et al.</i> (2014), Silva and Borges (2015), Bezerra and Carvalho (2018), Correio and Correio (2019)
Public finances and local governments	Zuccolotto, Abrantes, and Ribeiro (2009), Leite, Lima, and Vasconcelos (2012), Volpe (2013), Gomes, Alfinito, and Albuquerque (2013), Araujo and Siqueira (2016), Cruz <i>et al.</i> (2019)
Financial sustainability	Scatena, Viana, and Tanaka (2009), Macedo, Ferreira, and Cípola (2011)
Transparency and accountability	Marengo and Diehl (2011), Avelino, Bressan, and Cunha (2013), Silva <i>et al.</i> (2019)
Efficiency of government spending	Mattos, Rocha, and Arvate (2011), Rosano-Peña, Albuquerque, and Marcio (2012), Diniz, Macedo, and Corrar (2012), Varela and Pacheco (2012), Medeiros <i>et al.</i> (2013), Silva <i>et al.</i> (2015), Rodrigues (2015), Santos, Freitas, and Flach (2015), Souza, Andrade, and Silva (2015), Mazon, Mascarenhas, and Dallabrida (2015), Dal Magro and Silva (2016), Ázara, Pessanha, and Barbosa Neto (2017), Cabral <i>et al.</i> (2017), Pereira, Vieira, and Madkur (2018), Firmino and Leite Filho (2019), Santos and Rover (2019)

Source: Elaborated by the authors (2021).

It is still possible to group the listed research according to the area of the

government expenses. For example, research by Zucatto et al. (2009), Queiroz et al. (2011), Rosano-Peña, Albuquerque, and Marcio (2012), Diaz (2012), Crozatti (2013), Medeiros et al. (2013), Volpe (2013), Borinelli et al. (2014), Rodrigues (2015), Santos, Freitas, and Flach (2015), Silva et al. (2015), Souza, Andrade, and Silva (2015), Dal Magro and Silva (2016), Araujo and Siqueira (2016), Nascimento, Machado, and Scarpin (2016), Lopo Martinez and Reis (2016), Lourenço et al. (2017), Ázara, Pessanha, and Barbosa Neto (2017), Pereira, Vieira, and Madkur (2018), Silva et al. (2018), Bezerra et al. (2018), Firmino and Leite Filho (2019), Cruz et al. (2019), and Correio and Correio (2019) focus only on the application of resources in education. Research by Scatena, Viena, and Tanaka (2009), Varela and Pacheco (2012), Leite, Lima, and Vasconcelos (2012), Espírito Santo, Fernando, and Bezerra (2012) Queiroz et al. (2013), Politelo, Rigo, and Hein (2014), Mazon, Mascarenhas, and Dallabrida (2015), Soares et al. (2016), Cabral et al. (2017), Mattiazi et al. (2017), and Coelho (2018) emphasize expenditures in health.

The studies by Politelo, Rigo, and Hein (2014), Mazon, Mascarenhas, and Dallabrida (2015), Santos, Freitas, and Flach (2015), and Silva et al. (2017), stand out, as they also studied municipalities in Santa Catarina. In general, these studies have shown that higher expenditures per capita do not necessarily imply greater efficiency, and more resources invested does not automatically lead to greater local development.

Politelo, Rigo, and Hein (2014) analyzed the application of resources, specifically health, in 163 of the 295 municipalities in Santa Catarina. The authors found that only 28% of the municipalities analyzed were considered efficient. Although most of them presented indices above the state average, there is a significant difference in the efficiency scores among municipalities, indicating a potential for improvement, mainly by guiding and adjusting where governments are not as efficient (Politelo, Rigo & Hein, 2014).

Mazon, Mascarenhas, Dallabrida (2015) analyzed the efficient allocation of resources for the area of health in seven municipalities of a region of Santa Catarina in 2010. The municipalities in the region spent more in the area than the averages observed in the state, but there was no reduction in mortality indicators, which may indicate technical inefficiency (Mazon, Mascarenhas & Dallabrida, 2015).

Santos, Freitas, and Flach (2015) evaluated the efficiency of public spending in education in 277 municipalities in Santa Catarina in 2010. For the authors, higher indices of the population's well-being and higher demographic density tend to generate efficiency in applying resources in the area of education. The hypothesis is that more densely populated municipalities tend to have a greater demand for education without applying more resources, which forces municipalities to be more efficient (Santos, Freitas & Flach, 2015).

Silva et al. (2017) analyzed the relationship between intergovernmental transfers and development, the latter observed through the municipal development index IFDM. The authors researched 293 municipalities in Santa Catarina in the period between 2008 and 2011. The study found a relationship between the funds that municipalities receive and local development. However, municipalities that present high revenue did not show the best development indices, which showed that municipalities with greater resources do not necessarily have better development indices. This research differs from the studies mentioned

above that have the same object of investigation, essentially in the sense of expanding the analyzed public spending areas, using a more extended period of observation from 2012 to 2018, and encompassing all 295 municipalities in Santa Catarina. Based on previous research (Araújo, Gonçalves & Machado; 2017; Machado & Guim, 2017; Mazon, Freitas & Colussi, 2021), the hypotheses described were formulated so that the rates and expenses would be different between groups of municipalities according to the population sizes. The hypotheses examined in this research are:

H1: the well-being index is different between groups of municipalities of different population sizes, in each area analyzed;

H2: per capita expenditure is different among the groups of municipalities of different population sizes, in each area;

H3: public spending quality index is different among groups of municipalities of different population sizes in each area.

3 METHODOLOGY

The research examines 295 municipalities in the state of Santa Catarina. Approximately 35.9% of the municipalities have up to 5,000 inhabitants, and 77.3% have less than 20,000 inhabitants (IBGE, 2018). The municipalities Balneário Rincão and Pescaria Brava were excluded from the research because they were created recently and were not entirely included in the system of indicators where the data was collected. This descriptive study adopted literature review and documentary research, using a quantitative approach.

The analysis observed the municipalities' development through time, analyzing data from 2012 to 2018 in a longitudinal approach. The choice of this period is based on a previous analysis of the availability of data regarding indicators of sustainable development of Santa Catarina's municipalities. It coincides with the creation and implementation of the instrument that collects such indicators (FECAM, 2018), which gathers and groups different primary data sources. Therefore, the analysis was carried out from a diachronic perspective, using longitudinal variations of historical evolution. Table 2 shows the two main sources of data.

Table 2
Variables, source of data, and hypotheses

Variables	Source of data	Hypotheses
Well-being Indexes (WBI)	<i>Sistema de Indicadores de Desenvolvimento Municipal Sustentável – SIDEMS</i> (system of indicators of municipalities sustainable development). The system was developed by the Federation of municipalities of the state of Santa Catarina (FECAM). The data was collected from the online portal SIDEMS (indicadores.fecam.org.br) in November 2019.	H ₁
Expenditure per capita	Municipalities' financial reports, submitted to the Court of Accounts of the State of Santa Catarina (TCE-SC) for the years 2012, 2014, 2016 e 2018. The reports are available at http://portaldocidadao.tce.sc.gov.br/homesic.php (Portal do Cidadão)	H ₂

Source: Elaborated by the authors (2021).

The study adopted descriptive statistical techniques to describe and organize the characteristics of the objects of study (Singh, 2007). Because the data did not show normality when submitted to the Kolmogorov-Smirnov normality test, hypotheses H1 and H2 were tested using the non-parametric Kruskal-Wallis test. The significance level considered was 5%, as is the standard used in applied social science research.

The data on government spending was divided by the municipality's population in each year, obtaining the per capita expenditure in each area. This measure prevented disproportionate values in the case of municipalities with large populations, which have notably higher revenues and expenses. A similar procedure was followed to compare groups from the previous phase. Hypothesis H2 was tested using the non-parametric Kruskal-Wallis test (Singh, 2007). The significance level was 5%.

Subsequently, we treated the local government spending per capita results by calculating a standardized score using normal accumulated distribution, as proposed by Brunet, Bertê, and Borges (2008). This technique helps compare the individual values of units in relation to the variation of values obtained for the group in the same analysis period (Brunet, Bertê & Borges, 2008). The standardized score via the normal cumulative distribution function shows that the resulting value of the Input Index of each municipality, in each function, is the value obtained individually from the municipality per capita expenditure subtracted from the average value of the per capita expenditure of the sample and divided by the standard deviation of the expenses per capita of the sample, according to the formula below:

$$\text{Input index} = \frac{\left(\frac{\text{TotalSpending}}{\text{Population}}\right) - \text{avsp}}{\sigma}$$

Where "avsp" is the average spending, and " σ " is the standard deviation of the local governments' spending in each area analyzed. This procedure transformed the per capita expenditure values previously collected into indices, called input indices. Thus, the input index varies between zero and one, where the closer to zero, the lower the spending.

The municipalities were grouped according to their population size (Table 3), and their indices were compared within the same group. The municipalities' population size classification was from the Brazilian Institute of Geography and Statistics (IBGE, 2018). Joinville was the only municipality classified as "very large," i.e., with more than 500,000 inhabitants. For the purposes of this study, Joinville was allocated in the group of "large" municipalities.

Table 3

Number of municipalities according to population size (State of Santa Catarina)

Inhabitants	Number of municipalities	%
Very large (> 500,000)	1	0.34
Large (from 100,001 to 500,000)	12	4.10
Medium-large (from 50,001 to 100,000)	16	5.46
Medium (from 20,001 to 50,000)	38	12.96
Small-medium (from 10,001 to 20,000)	61	20.82
Small (from 5,001 to 10,000)	60	20.48
Very-small (< 5,000)	105	35.84
Total	293	100

Source: IBGE (2018).

The public spending quality index (PSQI) was created from the relationship between the well-being index – based on the municipal sustainable development indicators (IDMS) – and the input index, obtained from the standardization of per capita expenditure in each municipality in each area. The PSQI allows classifying and analyzing the local government's performance compared to the results obtained by the other local governments, beyond the analysis of their individual results (Brunet, Bertê & Borges, 2008). Indices values range from zero to one. Thus, PSQI equal to one (1.000) means a balance between spending and the level of well-being. A PSQI of less than one indicates that the quality of spending is below the municipality's capacity. When the PSQI is higher than one, the spending is probably superior regarding quality and efficiency. Thus, the study advances when facing quality and efficiency of spending beyond the areas of education and health and by covering all municipalities in one state adopting a longitudinal approach to offer consistency to the data.

The analysis of the PSQI results revealed several values in discrepancy with other results, influenced by very low values of input indices. To avoid disproportionate results, the study disregards PSQI that are outliers. The outliers were defined using the interquartile range rule for outliers. Simply put, the interquartile range (IQR) was calculated first, i.e., the first quartile was subtracted from the third quartile. Then, the interquartile range was multiplied by 1.5. Thus, the resulting value of the first quartile was subtracted to find the lower limit and the possible outlier values smaller than the lower limit. Similarly, the resulting value of the third quartile was added to find the upper limit and possible outliers greater than the upper limit. Because in the case of PSQI, the outlier values were all higher, the upper limit was defined based on the interquartile range rule, and values above this limit were disregarded. All outliers and upper limits were properly identified in the analysis of the results for each area. The same procedures of the two previous phases were used to analyze the data and test hypothesis H3. Data normality was also tested, and the results obtained did not indicate a normal data distribution.

4 RESULTS AND DISCUSSION

4.1 Well-Being Index

The well-being index (WBI) aims to characterize the dimensions analyzed in the municipalities through the indicators and variables collected and parameterized by the Federation of Municipalities of Santa Catarina (FECAM). As

this data emerges from different primary sources, the indices seek reliable information and are used as an instrument for governmental planning, social accountability, and managerial control, and monitoring public policies' results within the municipality. The WBI can help identify specific areas that need greater attention from the authorities.

When broadly and comprehensively observing the WBI, the area of culture stands out with the lowest values in all years. Education has the highest WBI, with no value below 0.500 in any municipality in the period analyzed. Second is health, with the vast majority of municipalities presenting high values over the years, although lower, on average than education, and very few present values below 0.500. The WBI for the environment and political-institutional areas show significant heterogeneity in their individual results, varying unevenly within each municipality and each year observed.

Culture presented the lowest means and the highest standard deviations in all analyzed years. The environment area had the second-lowest means and the second-highest standard deviations in all years, following culture. These results indicate that municipalities have difficulties in promoting effective policies or services. However, the mean for the WBI of environment increased from 0.574 in 2012 to 0.629 in 2018, demonstrating a clear improvement in the indicators that make up the index, while the area of culture maintained values considered low (less than 0.465, throughout the period).

The WBI for education presented high mean values (0.755 in 2012 and 0.755 in 2018) and a relatively low standard deviation, which indicates that it maintained good results. This case is similar to health, which had a low standard deviation throughout – 0.687 in 2012 and 0.680 in 2018 – despite having slightly higher average values in 2014 and 2016, 0.703 and 0.707, respectively, according to data in Table 4.

Table 4

Mean and standard deviation of Well-being indexes per year

Area	Statistics	Year			
		2012	2014	2016	2018
Education	Mean	0.775	0.739	0.754	0.755
	Standard deviation	0.061	0.072	0.078	0.076
Health	Mean	0.687	0.703	0.707	0.680
	Standard deviation	0.064	0.066	0.069	0.067
Culture	Mean	0.407	0.409	0.464	0.449
	Standard deviation	0.161	0.168	0.182	0.174
Environment	Mean	0.574	0.609	0.629	0.629
	Standard deviation	0.130	0.131	0.117	0.117
Political-institutional and economic	Mean	0.600	0.640	0.688	0.672
	Standard deviation	0.073	0.091	0.070	0.063

Source: Research data (2020).

Large municipalities (> than 100,001 inhabitants) did not present low WBI (less

than 0.500) for areas education, health, environment, or political-institutional in the four periods analyzed (2012, 2014, 2016, and 2018). Concerning culture, only the municipality of Palhoça had a value considered low (in 2012), and all other municipalities had WBI above 0.600 and mostly had medium and medium-high values. In this sense, the largest municipalities in the state of Santa Catarina obtained a considerable positive prominent position, although they still present opportunities to develop actions to increase the WBI from medium and medium-high to high.

The municipalities with the smallest populations, small-medium, small, and very-small, presented similar WBI for all areas and periods. Education had the highest WBI in the majority of these municipalities, with medium to high indices. Next was health, with a predominance of medium indices and never presenting low values in the period. It was possible to see that the WBI remained predominantly low and medium-low for the area of environment. However, the political-institutional WBI had a notable increase over time, going from a majority of medium-low in 2012 to medium and medium-high in 2018. Culture, on the other hand, resulted in the lowest WBI of all observations.

As education and health are a priority and essential for municipalities, they receive the most substantial resources, including earmarked funds to these areas. On the other hand, culture is not commonly considered a priority by local administrations and consequently counts on fewer resources. In addition, measuring returns or results obtained from expenditures related to culture is considered a challenge. Therefore, local governments prioritize areas with returns citizens perceive more easily, especially close to elections (Carvalho & Oliveira, 2009; Klein, 2010; Cavalcante, 2017; Dias, Nossa & Monte-Mor, 2018).

The results of the Kruskal-Wallis tests also revealed significant differences among the groups of municipalities separated per population size. Simply put, the null hypothesis in each case considers that the groups present similar results. The results showed different WBI among the groups, in all years and in the areas of health, culture, and environment (p-value 0.000). According to these findings, at least one group had a different distribution of WBI for these areas when compared to the other groups. This result did not occur in all years for education, indicating no significant differences among the WBI observed in the groups of municipalities separated per population size (p-value = 0.453 in 2012, 0.602 in 2014, 0.598 in 2016, 0.704 in 2018). As for the area political-institutional and economic, the results show a similarity of distributions among these groups only in 2016 (p-value = 0.101), while in the other three years, there were significant differences in at least one of the groups (p-value <0.05).

We adopted the pairwise group method based on Maxwell (1980) to compare and identify the groups that presented differences. Significant differences were noticed in several comparisons, suggesting that population size influences the WBI (p-value <0.05).

For health, culture, and environment, there were significant differences regarding population size – very-small, small-medium, medium, medium-large, and large – in all years. There is also a difference between small and very-small municipalities for health and culture in 2012 and 2014 and for the culture and political-institutional and economic areas in 2016 and 2018.

Small municipalities (between 5,001 and 10,000 inhabitants) also present

several cases where their results diverged from the other groups. In this regard, the differences among the groups small and small-medium, medium, medium-large, and large stood out for culture and environment, in all years. Such differences are maintained when comparing small-medium municipalities (between 10,001 and 20,000 inhabitants) and medium, medium-large, and large municipalities.

These results show that several expenses could be reassessed and resources better allocated. The findings suggest that municipalities with fewer inhabitants have difficulties presenting similar results to larger municipalities for the indicators observed. The situation becomes even more disturbing, as there are significant differences when comparing very-small, small, and small-medium municipalities (and this does not happen when comparing medium, medium-large, and large municipalities). In addition, it is worth mentioning that these differences were not observed for education in any of the years or any population size, possibly due to the reasons mentioned above.

In this context, the WBI was different among municipalities of different sizes for each area. Therefore, hypothesis H1 (*the well-being index is different between groups of municipalities of different population sizes*) was only rejected for education, in which the results were similar among the groups. For the health, culture, and environment areas, hypothesis H1 was accepted in all the years observed. The political-institutional and economic area showed different WBI among municipalities in 2012, 2014, and 2018, partially rejecting hypothesis H1, as the results did not show significant differences among the groups in 2016.

4.2 Expenditures and Input Index

Analyzing the municipalities' per capita expenditures and their variations in different population sizes can suggest parameters for resource allocation between similar sized municipalities and demonstrate the influence of size on the total amount of expenditure needed by local governments to provide public services. It was observed that between 2012 and 2018, there was an increase in the average per capita expenditure of the groups of municipalities in the following area: education, with increases between 50.2% and 64.6%; health, with increases between 54.9% and 63.6%; and Legislative branch and administration, with increases between 33.9% and 59.3%. However, for the area Housing, urbanism, sanitation, and environmental management, there were variations between 1.4% and 18.7%, well below culture, even with much lower absolute values of expenditure, with variations between -22.6% and 66.1 (Table 5).

Table 5Mean of expenditures per capita (BRL)¹, per area in municipalities (according to population size)

Year	Population size	Area				
		Education	Health	Culture	Housing, urbanism, sanitation, and environmental management	Legislative branch and administration
2012	Large	604.67	607.99	25.00	531.09	320.70
	Medium-large	561.89	444.60	15.69	412.39	250.67
	Medium	601.12	445.72	23.37	414.20	304.29
	Small-medium	617.62	483.65	15.61	369.42	295.09
	Small	654.49	515.52	24.63	260.92	334.57
	Very-small	866.84	819.82	34.87	337.79	652.45
	Large	703.34	747.49	24.72	429.80	426.20
2014	Medium-large	712.58	548.71	18.02	363.74	303.13
	Medium	711.61	558.05	24.91	369.49	345.96
	Small-medium	732.72	590.63	18.68	389.97	355.79
	Small	765.26	598.76	24.55	289.33	415.51
	Very-small	1036.85	989.33	43.93	348.40	801.94
	Large	828.83	859.88	20.40	529.37	443.18
	Medium-large	800.74	636.96	18.16	404.36	343.26
2016	Medium	819.54	625.48	19.26	425.24	367.62
	Small-medium	829.96	651.09	19.92	416.82	384.20
	Small	838.35	668.01	22.22	317.42	453.44
	Very-small	1130.62	1113.75	32.78	441.22	897.26
	Large	935.43	941.90	19.35	539.00	499.19
	Medium-large	925.05	712.73	23.63	451.41	438.26
	Medium	937.95	708.31	23.61	469.04	407.72
2018	Small-medium	971.55	766.67	25.93	407.60	455.18
	Small	983.02	815.77	28.04	309.74	518.80
	Very-small	1316.52	1341.26	53.05	374.40	1039.78
	Small					

Source: Research data (2020).

Note: Absolute values without inflation adjustment.

It is worth highlighting the disparity in the value of the average per capita expenditure in the area legislative branch and administration of municipalities classified as very-small. With a very-small population, it makes sense that the calculation of per capita expenditure results in higher values. The values of these municipalities' legislative branch and administration area are approximately twice as high as the municipalities classified as small.

It is important to emphasize that in the other areas, the expenditure values of very-small municipalities are also higher than the others, which the low population may partially explain. However, it is clear that municipalities with a smaller population have fewer resources to fund their activities. A large part of their resources come from government transfers, mainly from a specific fund managed

at the national level (*Fundo de Participação dos Municípios*) (Massardi & Abrantes, 2016).

Except for municipalities classified as very-small, the average per capita expenditures was relatively similar among the other groups of municipalities, even with significantly different numbers of inhabitants. It may indicate that municipalities with a population below 5,000 inhabitants spend comparatively high amounts in the provision of health and education services, in addition to maintaining their administration structure and operation of the legislative branch. This result corroborates the argument of Libertun and Guerreiro (2017) that municipalities with low population density face financial difficulties providing some basic services due to, among other things, high implementation and maintenance costs. The low average value of expenditure per capita in the area of culture in all groups of municipalities, in all years observed, is another point to be highlighted.

As for the Kruskal-Wallis tests, the results grouped by population size have significant differences in at least one of the groups for all areas and periods (p -value <0.05), except for culture in 2012 and 2016, in which there were no significant differences. This result indicates that municipalities of different population sizes allocated their resources and spent amounts per inhabitant differently over time.

When using the pairwise method between the two smallest groups (very-small and small), the results were significantly different for all areas. The two groups showed differences in all areas, except for the environment. There were significant differences in education, health, and political-institutional and economic areas between very small and medium, medium-large, and large.

As with the WBI analysis, the results of the tests related to per capita expenditures were also different when one of the groups compared was very-small. This result is coherent when associating the average values of per capita expenses in these municipalities. A very clear example of such a difference is the constant value of the statistical test, indicating significant differences between municipalities in the group very-small and municipalities in all the other groups for the area political-institutional and economic.

There were no differences for medium and medium-large municipalities. Large municipalities diverged in the observations of per capita expenditure of medium and medium-large municipalities only in health, remaining with similar values in the other areas. Comparisons between medium, medium-large, and small-medium did not show differences in education, health, culture, and political-institutional and economic areas.

Thus, the statistical tests showed that hypothesis H2 (*per capita expenditure is different among the groups of municipalities of different population sizes*) was accepted for each area in practically all the cases observed. H2 was rejected only for culture in 2012 and 2016, cases in which there were no significant differences between groups (p -value >0.05). These findings suggest that the amounts of per capita expenditures are not homogeneous, considering the groups of municipalities separated according to population size. The divergences in these values were, in general, more noticeable when at least one of the municipalities in the comparison was in the group of very-small municipalities (population of up to 5,000 inhabitants).

After submitted to parameterization via a standardized score for the normal

distribution, the values of per capita expenditure were transformed into input indices used to measure the PSQI. It is not surprising that municipalities with a smaller population have comparatively higher per capita expenditures than the others. However, it may be interesting to investigate, individually and collectively, whether municipalities can carry out these expenditures with quality, to the point of increased WBI proportional to the units of expenditure made, measured by the WBI and input indexes, respectively.

4.3 Public Spending Quality Index

Considering the results of the Kruskal-Wallis test, hypothesis H3 (*public spending quality index is different among groups of municipalities of different population sizes*) was rejected in four of the five areas considered, i.e., the similarity of the PSQI results obtained among the groups separated according to population size was accepted for the areas education, health, environment, and political-institutional and economic. The hypothesis was not rejected for culture in all the years observed since there are differences in the results of PSQI among population sizes ($p\text{-value} < 0.05$).

For education, the number of municipalities with PSQI less than 1,000 was critical. There were 54 municipalities in 2012, 68 in 2014, 63 in 2016, and 66 in 2018. Given that the WBI results were the highest among the areas, it was expected that the PSQI for education would be higher with fewer municipalities below the equilibrium situation. The distribution of PSQI below 1,000 among the groups of municipalities separated by population size and the years shows that the quality of spending on education is independent of size, as observed in Diaz (2012).

The difference between the highest and lowest PSQI values for each group is another point that draws attention. For example, in the case of large municipalities, the difference, in 2014, between São José (5.419) and Itajaí (0.761) is more than seven times, and in the case of small municipalities, Monte Castelo (5.344) and Timbó Grande (0.632) is more than eight times. These differences in PSQI are surprising, considering that they are supposedly municipalities with relatively similar amounts of resources to spend.

The results are in line with research focused on education in the sense that the quality or efficiency of the application of resources does not depend only on the total amount or how much is spent, as there are several municipalities with fewer resources but better results, as shown by Rosano-Peña, Albuquerque, and Marcio (2012), Diaz (2012), Nascimento et al. (2016), Lopo Martinez and Reis (2016), Lourenço et al. (2017), Firmino and Leite Filho (2019).

Regarding health, of the municipalities considered in this analysis, 26.2% had PSQI below 1,000 in 2012, 23.9% in 2014, 26.7% in 2016, and 30.9% in 2018. The increase from 71 municipalities in the first period to 81 in the last period represents an unsatisfactory scenario, given the importance of health service provision. Another result that deserves to be highlighted concerning health is the relative number of large municipalities with PSQI below 1,000. Given the high absolute amounts spent on health and the large portion of the population served by health services, it is understood that these amounts observed are proportionally high.

It is worth noting that many inhabitants of other locations generally use health services in large municipalities due to better infrastructure and quality of

care (Mazon, Mascarenhas & Dallabrida, 2015). The general analysis of the health results of this research corroborates those observed in Varela and Pacheco (2012) and Cabral et al. (2017) in terms of the relatively low number of municipalities with efficient expenditures and that the limited resources of smaller municipalities may be a factor with a strong influence on their spending quality. However, this cannot be singled out as the sole cause of the values found.

Culture presented the lowest WBI values and the lowest per capita expenditure values. Similarly, relatively low PSQI values were also obtained. Thus, despite a significant part of the municipalities with low PSQI values in culture, the municipalities that obtained the highest values deserve even greater emphasis, as they managed to allocate resources with quality.

At least half of the municipalities obtained a PSQI below 1,000, considering all years. The results show high proportions of municipalities with spending quality below the equilibrium situation (67,5%). Some groups had 80% of the municipalities in this situation. In numbers per period, 179 municipalities in 2012 and 2014, 137 in 2016, and 154 in 2018 presented spending quality below the equilibrium situation. As culture is one of the areas where the returns on resources spent are difficult to perceive, it is quite common for managers to allocate resources in other priorities or disregarding this and other social areas completely, as pointed out by Fernandes, Lebarcky, and Fonseca (2011).

The area of environment requires attention since a minimum of 85, and a maximum of 109 municipalities presented PSQI of less than 1,000 during the period analyzed. Except in 2016, the groups of municipalities based on population presented relatively similar results, something around 35% of the municipalities presented PSQI of less than 1,000 for the area. This situation suggests that municipalities of all population sizes find it difficult to spend their resources with quality in the area of environment.

Expenses in the area of environment did not increase significantly during the period. Despite receiving comparatively more resources than before, the municipalities chose to allocate these resources in other areas. Also, the amount that was spent on issues related to the environment, in general, was not able to obtain adequate returns.

The research observed great heterogeneity of expenses in housing, urbanism, sanitation, and environmental management, considered components of the environment area for a considerable portion of the analyzed municipalities. Such variation in expenses can be explained by the lack of long-term municipal planning and lack of concern with the occupation and use of physical spaces in the municipalities, as observed in Santos Filho, Dias Filho, and Fernandes (2012).

In the political-institutional and economic area, there was a considerable number of municipalities with PSQI below the equilibrium situation. At least one in four municipalities had a PSQI lower than 1,000, which makes these results very worrying. Spending quality in this area can have a positive impact on several other areas, directly and indirectly, as this is the function responsible for the municipality's management. However, spending without quality on such an important area, in addition to having a significantly negative effect on the general administration of the municipality, means that resources may be withdrawn from other priority areas such as health or education.

Municipalities in the group very-small were those that proportionally spent more in the area political-institutional. However, a large proportion of these local administrations presented a PSQI below 1,000. The average per capita expenditure is almost twice as high as the average observed in municipalities of the group immediately above (small), suggesting that about one-third of municipalities in the group very-small have spent superfluous amounts in this area, achieving a PSQI below 1,000.

It is important to stress the dependence of smaller municipalities on intergovernmental transfers to maintain their structures and services (Massardi, Abrantes, 2016; Rodrigues et al., 2019) as they have little capacity to generate their own income due to the low population size (Lira, Monteiro & Fadul, 2013). Therefore, it was expected that, among all the municipalities, these would be the ones that would use them with the highest quality and parsimony, avoiding waste and inefficient expenses as much as possible, especially in the area political-institutional and economic. Table 6 presents the synthesis of the hypotheses results.

Table 6
Synthesis of results for the research hypotheses

Area	Year	H1	H2	H3
		Sig	Sig.	Sig.
Education	2012	0,453	0,000	0,742
	2014	0,602	0,000	0,991
	2016	0,598	0,000	0,991
	2018	0,704	0,000	0,999
Health	2012	0,000	0,000	0,798
	2014	0,000	0,000	0,903
	2016	0,000	0,000	0,942
	2018	0,000	0,000	0,997
Culture	2012	0,000	0,132	0,000
	2014	0,000	0,033	0,000
	2016	0,000	0,231	0,000
	2018	0,000	0,001	0,000
Environment	2012	0,000	0,000	0,200
	2014	0,000	0,029	0,383
	2016	0,000	0,006	0,383
	2018	0,000	0,001	0,323
Political-institutional and economic	2012	0,000	0,000	0,981
	2014	0,000	0,000	0,977
	2016	0,101	0,000	0,879
	2018	0,000	0,000	0,934
Result		Not rejected	Rejected only for culture	Not rejected only for culture

Source: Research data (2020).

5 CONCLUSION

This research analyzed the quality of public spending in the municipalities of Santa Catarina. The study was based on the public spending quality index (PSQI) proposed by Brunet, Bertê, and Borges (2007) and measured the quality of spending through the relationship between two other indices: the well-being index (portrays, in general, the provision of public services by local governments); and

the input index (which is the standardization, among groups of municipalities separated according to population-size, of government spending per area).

As for the well-being indices, in general, the highest indices obtained were in education and health, and the lowest in culture. The analysis of well-being indices showed significant differences among the groups of municipalities in the areas of health, culture, and environment for all four years examined, and in the area political-institutional and economic for the years 2012, 2014, and 2018. The only area where there were no differences among the groups of municipalities was education. Therefore, hypothesis H1 (*the well-being index is different between groups of municipalities of different population sizes*) was not rejected when considering the areas of health, culture, environment, and political-institutional and economic, and it was rejected in the case of education.

The use of per capita expenditure revealed the disproportionate average amount of expenditure carried out in the area of legislative branch and administration by very-small municipalities, which was almost twice as large as in the case of small municipalities. Significant differences were pointed out in per capita expenditures between groups of municipalities in the education, health, environment, and political-institutional and economic areas. Regarding hypothesis H2: per capita expenditure is different among the groups of municipalities of different population sizes. It was only rejected in the area of culture in 2012 and 2016, being the only two cases in which the results were similar between groups of municipalities. This result may indicate the influence of population size on establishing priorities for resource allocation in municipalities.

When per capita expenditures were parameterized according to the average variation obtained for the group of municipalities and transformed into input indices, they often resulted in comparatively low values. This fact disproportionately boosted the PSQI in relation to these low input indices, resulting in several outliers disregarded in specific analyses.

The determination of the input indices, prepared from the expenses in each area, facilitated the comparison of expenses incurred by municipalities of similar population sizes. We believe that the differences observed can be examined individually with greater attention in the stages of budget planning in the municipalities, especially those with a small population, in order to adjust the allocation of resources and avoid wasting public resources.

The PSQI revealed significant disparities in the quality of spending among municipalities, even when comparing those within the same group according to population size. The different values obtained by municipalities of the same size suggest that spending quality or efficiency does not depend only on the total amount spent, corroborating previous research (Diaz, 2012; Cavalcante & Lariu, 2012; Queiroz et al., 2013; Politelo, Rigo & Hein, 2014; Mazon, Mascarenhas & Dallabrida, 2015; Santos, Freitas & Flach, 2015; Rodrigues, 2015; Silva et al., 2017).

Although there were differences between the well-being indices and the input indices when they were individualized, the results, when compared, demonstrated similarity between groups of municipalities, regardless of population size. Therefore, regarding hypothesis H3: PSQI is different among groups of municipalities of different population sizes, it was not rejected only in the area of culture. The hypothesis was rejected in the areas of education, health, environment, and political-institutional and economic.

Thus, the research achieved the main objective of identifying the quality of public spending in the municipalities of Santa Catarina. Nevertheless, in this research spending quality relates two other indices, measured and analyzed considering quantitative aspects. As it is a model of analysis, it presents a simplification of reality. The methodology of the PSQI (Brunet, Bertê & Borges, 2007) used here seeks to simplify the complexity involved in defining the results of public spending (Afonso, Schuknecht & Tanzi, 2006; Busatto, 2011), so it is possible to compare the quality of expenditure between relatively similar units of analysis, as in the case of this research, the municipalities of Santa Catarina.

As a suggestion for future research, case studies are recommended to identify factors that may influence the quality of public spending in municipalities. Some aspects not covered by this research, such as the composition of expenditures, the analysis of other expenditures made in the municipalities – for example, those carried out in a cooperative manner or through an agreement by the states or the Union – can bring other findings to advance in theoretical, managerial, and social aspects. We encourage the use of other research methods, such as qualitative or mixed approaches, to complement, deepen and expand the theoretical and empirical field in the discussions on the quality of public spending.

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AUTHORS' CONTRIBUTIONS

Contributions	Jean Robert Soares	Fabiano Maury Raupp	Rafael Tezza
1. Idealization and conception of the research subject and theme	✓	✓	
2. Definition of the research problem	✓	✓	
3. Development of Theoretical Platform	✓	✓	
4. Design of the research methodological approach	✓	✓	✓
5. Data collection	✓		
6. Analyses and interpretations of collected data	✓	✓	✓
7. Research conclusions	✓	✓	
8. Critical review of the manuscript	✓	✓	
9. Final writing of the manuscript, according to the rules established by the Journal.	✓	✓	
10. Research supervision	✓	✓	