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Analysis of financial disparities in municipalities of the department of Cesar, Colombia: a longitudinal study (2019–2023)

Análisis de las disparidades financieras en municipios del departamento del Cesar, Colombia: un estudio longitudinal (2019–2023)

Análise das disparidades financeiras nos municípios do departamento de Cesar, Colômbia: um estudo longitudinal (2019-2023)

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Abstract

Introduction: This study analyzes the evolution of public revenues and expenditures in eight municipalities of the department of Cesar, Colombia, between 2019 and 2023, paying special attention to local fiscal dynamics and their relationship with social indicators such as Unsatisfied Basic Needs (UBN). **Objective**: To analyze financial disparities in municipalities in the department of Cesar. **Methodology**: A descriptive-comparative approach was applied based on the analysis of budget and population data. The sources of income and the destinations of expenditure in each municipality were observed and contrasted throughout the study period. **Results**: Municipalities with larger populations do not always generate more of their own income. Becerril and La Jagua de Ibirico stand out for their income from the exploitation of natural resources, while Agustín Codazzi shows a high dependence on royalties. A positive correlation was found between public social expenditure per capita and tax revenues, and based on the descriptive statistical analysis, it is observed that higher expenditure does not guarantee improvements in the UBN. **Conclusions**: The efficiency and quality of social spending are fundamental, since some municipalities, such as Aguachica and San Alberto, show stability in their financing, while others such as Becerril and Agustín Codazzi present significant variability, which reflects differences in their capacity for self-financing.

Keywords: economic development, income distribution, open data, economy, finance.
JEL: E64; G00; H27; H71; R1.

Resumen

Introducción: Este estudio analiza la evolución de los ingresos y gastos públicos en ocho municipios del departamento del Cesar, en Colombia, entre 2019 y 2023, prestando especial atención a la dinámica fiscal local y su relación con indicadores sociales como las Necesidades Básicas Insatisfechas (NBI). **Objetivo**: Analizar las disparidades financieras en municipios del departamento del Cesar. **Metodología**: Se aplicó un enfoque descriptivo-comparativo basado en el análisis de datos presupuestales y poblacionales. Se observaron y contrastaron las fuentes de ingreso y los destinos del gasto en cada municipio a lo largo del período de estudio. **Resultados**: Los municipios con mayor población no siempre generan más ingresos propios. Becerril y La Jagua de Ibirico sobresalen por sus ingresos provenientes de la explotación de recursos naturales, mientras que Agustín Codazzi evidencia una alta dependencia de las regalías. Se encontró una correlación positiva entre el gasto público social per cápita y los ingresos fiscales, así mismo y con fundamento en el análisis estadístico descriptivo, se observa que un mayor gasto no garantiza mejoras en el NBI. **Conclusiones**: La eficiencia y calidad del gasto social resultan fundamentales, ya que algunos municipios, como Aguachica y San Alberto, muestran estabilidad en su financiación, mientras que otros como Becerril y Agustín Codazzi presentan variabilidad significativa, lo que refleja diferencias en su capacidad de autofinanciamiento.

Palabras clave: desarrollo económico, distribución del ingreso, datos abiertos, economía, finanzas.

JEL: E64; G00; H27; H71; R1.

Resumo

Introdução: Este estudo analisa a evolução das receitas e despesas públicas em oito municípios do departamento de Cesar, na Colômbia, entre 2019 e 2023, prestando especial atenção à dinâmica fiscal local e sua relação com indicadores sociais como as Necessidades Básicas Insatisfeitas (NBI). **Objetivo**: Analisar as disparidades financeiras nos municípios do departamento de Cesar. **Metodologia**: Foi aplicado um enfoque descritivo-comparativo baseado na análise de dados orçamentários e populacionais. Foram observadas e contrastadas as fontes de receita e os destinos da despesa em cada município ao longo do período de estudo. **Resultados**: Os municípios com maior população nem sempre geram mais receitas próprias. Becerril e La Jagua de Ibirico destacam-se por suas receitas provenientes da exploração de recursos naturais, enquanto Agustín Codazzi evidencia uma alta dependência das receitas de

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royalties. Foi encontrada uma correlação positiva entre o gasto público social per capita e as receitas fiscais; da mesma forma, com base na análise estatística descritiva, observa-se que um maior gasto não garante melhorias no NBI. **Conclusões**: A eficiência e a qualidade do gasto social são fundamentais, uma vez que alguns municípios, como Aguachica e San Alberto, apresentam estabilidade em seu financiamento, enquanto outros, como Becerril e Agustín Codazzi, apresentam variabilidade significativa, refletindo diferenças em sua capacidade de autofinanciamento.

Palavras-chave: desenvolvimento econômico, distribuição de renda, dados abertos, economia, finanças.

JEL: E64; G00; H27; H71; R1.

Introduction

Financial disparities between territorial entities are a topic of interest and analysis in the economic and political sphere. In general, municipalities and departments have different levels of financial resources to fulfill their responsibilities and projects; however, there are differences that can be attributed to various factors, such as the capacity to collect taxes and other own revenues, as well as to the allocation of resources by the departmental and national governments (Grupo de Análisis al Financiamiento del Desarrollo Territoriall [GAFDT], 2005).

The history of inequalities, especially in income and expenditure between the central government and subnational governments, is constructed from two concepts: vertical and horizontal inequalities. Vertical inequalities refer to differences in the distribution of resources, income, or power between different hierarchical levels within a social or economic structure (Solís, 2013). In the context of territorial entities, these inequalities can manifest themselves in the way in which the national government distributes resources to regional and local governments, generating significant variations in the availability of funds and opportunities among these entities.

On the other hand, horizontal inequalities are related to the gaps between the spending needs and the fiscal capacity of the different jurisdictions (Martinez & Searle, 2007; Porto &

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Rosales, 2008). This situation occurs in territories with limited fiscal capacity, as a result of factors such as a weaker tax base, lower own revenues or lower economic activity. At the same time, these jurisdictions may have greater spending needs due to a larger population, high poverty rates, or specific infrastructure and public service requirements.

Based on the above, the literature has highlighted the relevance of implementing fiscal discipline actions in local administrations. Pérez et al. (2021) argue that the condition of territorial entities influences the country's fiscal situation. This can be explained by the possibility that fiscal difficulties are transferred between levels of government, in this case, from subnational to the national government (vertical externalities). Second, there are horizontal externalities, which occur when a subnational government's fiscal position affects its peers, either due to trade linkages or geographic proximity.

Studies such as those by Bonet (2004) and Romero and Delgado (2021) conclude that the process of fiscal decentralization in Colombia during the nineties increased regional disparities in income, given the low performance in terms of fiscal capacity and taxation. This was due to the allocation of resources mostly to current spending, rather than infrastructure, which limited the positive impact on regional development. In addition, the lack of adequate redistributive approaches in national transfers, the absence of incentives for efficient use of resources by subnational governments, and their limited institutional capacity also contributed to these disparities.

Another relevant study is that of GAFDT (2005), which identified disparities in the ability to raise resources. This capacity is attributed to economic structures in which larger cities with more robust economies have greater fiscal capacity compared to less developed areas. However, it could also be due to the fact that municipalities are provided with natural resources in different proportions, both in quality and quantity (Guerrero, 2014).

In addition, it was observed that higher social spending compared to investment in infrastructure limits the generation of local income. However, studies such as those by Aschauer (1989), Barro (2001), and the World Bank (2013) argue that, when public spending is directed towards areas that promote economic and social development, this action can activate a positive cycle, in which a more robust economy increases the government's capacity to collect taxes.

However, studies such as those by Bonet and Ayala (2015; 2016) estimate that transfers

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reduce horizontal fiscal disparities in both municipalities and departments, with a more significant effect on municipalities. However, it has been found that the Sistema General de Participaciones (General System of Participations, SGP), contributes to reducing disparities and improving the level of municipal development (Ariza et al., 2023), while the Sistema General de Regalías (General System of Royalties, SGR) tends to increase fiscal inequality.

For their part, authors such as Martínez (2006), Bonet and Meisel (2007), and Betancurt (2002, as cited in Barajas and Casas, 2020) argue that decentralization has failed to reduce inequality in tax revenues, generating significant gaps between territories. This paradoxically contrasts with what Gamarra (2005) and Rentería et al. (2007) have argued, who argue that resources from royalties should improve the quality of life of Colombians and satisfy Unsatisfied Basic Needs (UBN) in education, health, drinking water and sewerage, in addition to reducing infant mortality and investing in other productive and high-impact initiatives in the regions.

Certainly, royalties represent a special component in terms of compensation for the exploitation of resources in the territories, and the department of Cesar, in Colombia, is one of those that receives the highest compensation per capita for the exploitation of hydrocarbons (Observatorio Fiscal de la Pontificia Universidad Javeriana, 2023). Bonet (2007) pointed out that the departmental government's royalties went from representing 8.7% of its total income in 2000 to 25.8% in 2005. During the study period, the department started with a percentage of 23% and by 2023 it reached 46.7%, maintaining an average of 25.5%.

Likewise, it is possible to show that, from the added value of the municipalities, historically there has been a preponderance of primary activities; however, there are exceptions, such as the municipalities of Aguachica, San Alberto and Chiriguaná.

In Bonet's (2007) study, it was already concluded that a large part of the investment boom that the department of Cesar was experiencing was supported (Tables 1 and 3) by external sources (royalties and SGP). Likewise, it was recommended to generate greater local taxation to sustain this pace of investments in the long term, once the department's non-renewable natural resources are exhausted. In addition, and in line with Bonet's (2005) research, it was found, through the estimation of an interregional input-output model, that mining was a sector with very weak linkages with other sectors of the economy.

This work is structured as follows: section II presents the methodology and data sources

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used; section III presents the main findings of the analysis; in section IV the discussion of the results is developed; and, finally, section V presents the conclusions of the study.

Methodology

This study adopts a descriptive and comparative approach that uses administrative data from two main sources. First, the income statements of the territorial entities, obtained from the Consolidador de Hacienda e Información Pública (Consolidator of Finance and Public Information, CHIP), corresponding to the period 2019–2023, are used. Second, population projections and georeferenced frameworks provided by the Departamento Administrativo Nacional de Estadística (National Administrative Department of Statistics, DANE) are used, based on the 2018 national census.
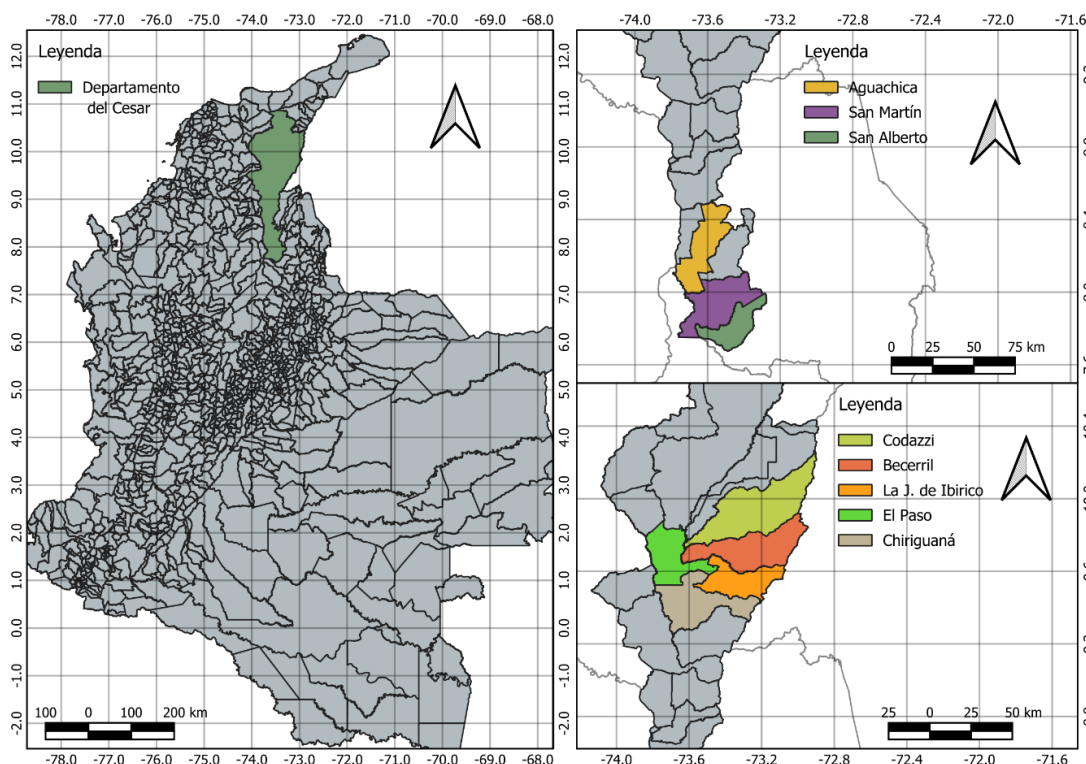
From this information, the degree of inequality in transfers and subsidies is inferred by calculating the Gini index, complemented with other descriptive statistical tools. The territorial entities included in the analysis were selected according to population criteria, prioritizing the municipalities that are part of the old mining corridor of the department, as well as those located in the south of Cesar with the largest number of inhabitants.

Regarding the limitations, it is stated that it works with population assumptions, by adopting the official DANE projections, based on the 2018 census. It should be clarified that the monetary values used in the analysis are presented in their nominal form; that is, they have not been adjusted by deflators, nor transformed at constant prices, but are used as they were originally reported in the financial reports of each year.

In relation to Figure 1, a geographical representation of the department of Cesar is presented, in which the municipalities included in the analysis are identified. On the left side of the map, the department is delimited in its entirety, while on the right side the municipalities selected for the study are specifically highlighted. In the south of the department are Aguachica, San Alberto and San Martín, while in the north-central area are Agustín Codazzi, Becerril, La Jagua de Ibirico, El Paso and Chiriguaná. This figure allows us to visualize the strategic location of each municipality within the regional context.

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Figure 1

Municipalities of the department of Cesar selected

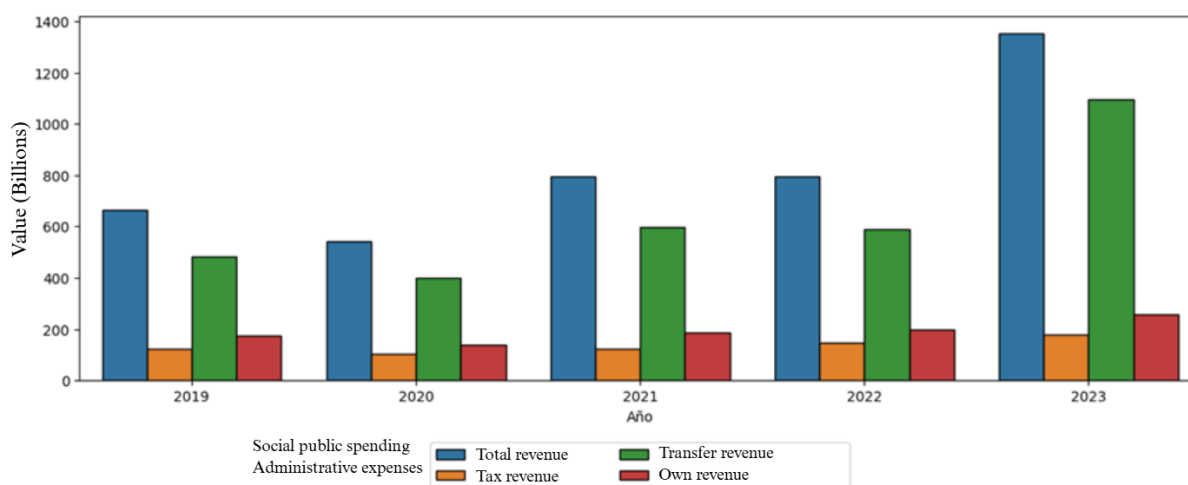*Source:* Authors' elaboration with data from DANE (2018c).

Results

This section presents the main findings of the financial analysis carried out on the selected municipalities of the department of Cesar between 2019 and 2023. The dynamics of public income and expenditure are described and compared, with special emphasis on own, fiscal and royalty revenues, as well as on the structure of administrative and social expenditure. Through different visualizations, it seeks to illustrate the disparities between territories in terms of their capacity to generate revenue and fiscal sustainability. Figure 2 shows the evolution of total revenues and their composition (fiscal, own and transfers) in the set of municipalities analysed; likewise, this information can be evidenced in Annex 1.

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Figure 2

*Income and types of income by all municipalities*

Source: Own elaboration with data from CHIP (2024).

Figure 3 presents in detail the distribution of the types of expenditure in the municipalities analyzed, allowing us to observe not only the magnitude, but also the evolution and relative trend of expenditure on administration and public social expenditure throughout the period studied.

Figure 3

Expenditure and types of expenditure by all municipalities
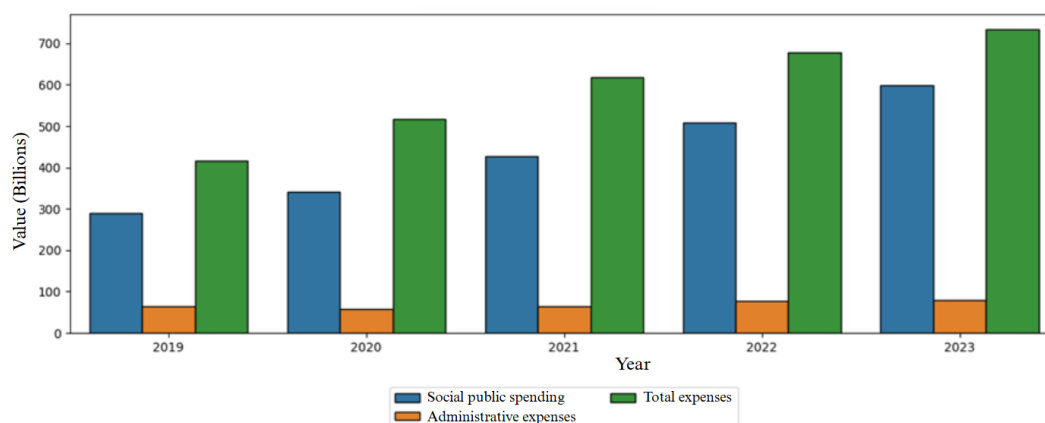
Source: Own elaboration with data from CHIP (2024).

According to Table 1, it is evident that, historically, the territorial entities with the highest generation of own income on average, that is, discounting the items for transfers and subsidies, are the Jagua de Ibirico, Becerril and Aguachica. However, this situation could be

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related to the population size of each municipality, as illustrated in Figure 4, which presents the cumulative population between 2019 and 2023.

Table 1

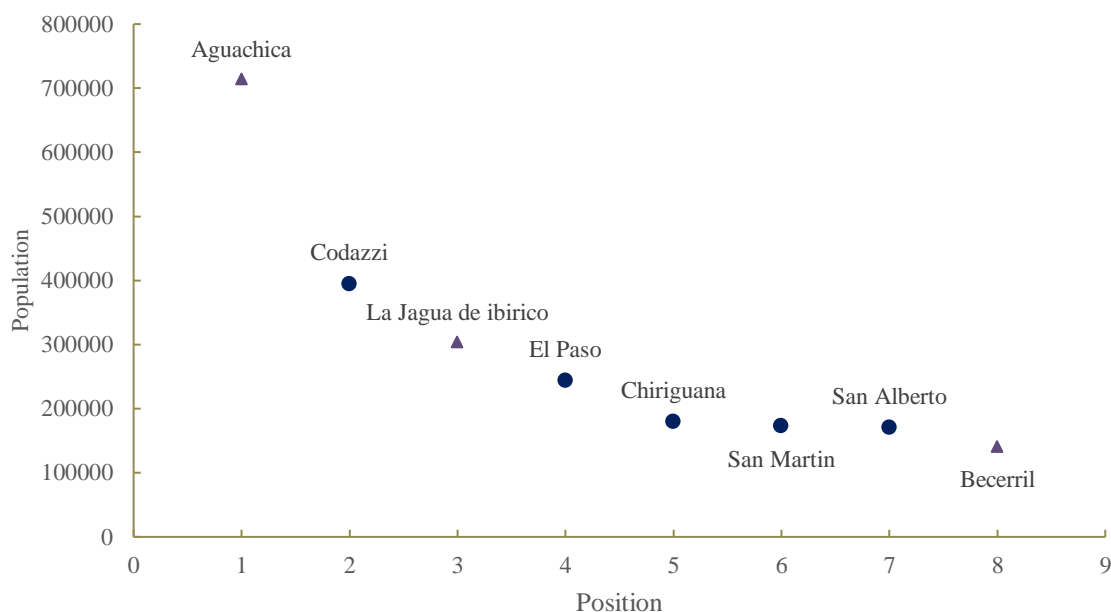*Own income of the municipality and department*

Region	2019	2020	2021	2022	2023
Cesar	300.277.578.874	306.927.363.320	329.303.737.350	393.778.928.975	434.706.207.273
Aguachica	21.237.514.478	21.936.230.770	22.987.936.504	25.684.867.599	29.068.825.991
Chiriguaná	16.493.081.971	16.254.942.193	16.543.418.255	13.383.000.421	13.606.497.002
El Paso	19.127.035.348	16.487.376.032	16.410.139.413	21.545.055.814	3.687.757.775
Becerril	19.222.789.366	8.258.316.804	11.246.467.872	21.661.189.278	64.599.802.148
San Martin	17.085.342.060	13.514.503.081	12.458.967.068	19.965.234.728	32.508.240.691
Agustín Codazzi	6.988.190.763	14.132.092.064	15.797.574.490	24.213.591.639	32.891.448.609
San Alberto	8.405.390.741	6.519.744.429	7.955.216.661	10.448.464.865	14.404.423.060
La Jagua de Ibirico	48.293.777.918	28.142.854.207	70.785.158.808	40.560.278.428	35.552.962.026

Source: Own elaboration with data from CHIP (2024).

Based on the above, it can be seen in Figure 4 that municipalities with larger populations do not necessarily have a greater capacity to generate their own income. A clear example of this is Becerril, which, despite having a relatively low population, has proven to be the municipality with the highest average income during the period 2019 - 2023.

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Figure 4

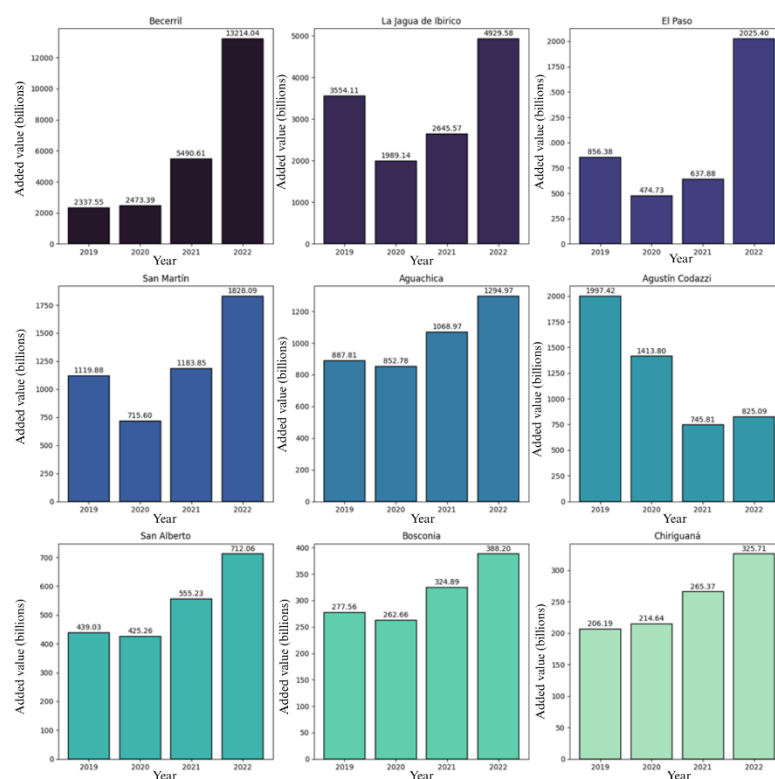*Cumulative population 2019 – 2023 municipalities of the department of Cesar*

Source: Authors' elaboration with data from DANE (2018a).

However, this situation could also be influenced by revenues from taxation for hydrocarbon exploitation, given that these regions have coal mines located in the central area of the department (Gamarra, 2005), also known as the mining corridor.

On the other hand, when looking at the added value of the municipalities, which consists of the greater value created in the production process as a result of the combination of factors and is obtained as the difference between the value of gross production and the intermediate consumption used; in this context, it is evident in Figure 5 that Becerril is the municipality with the highest accumulated value added, standing out for substantial growth, especially in the years 2021 and 2022. For a more detailed analysis, see Annex 2.

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Figure 5

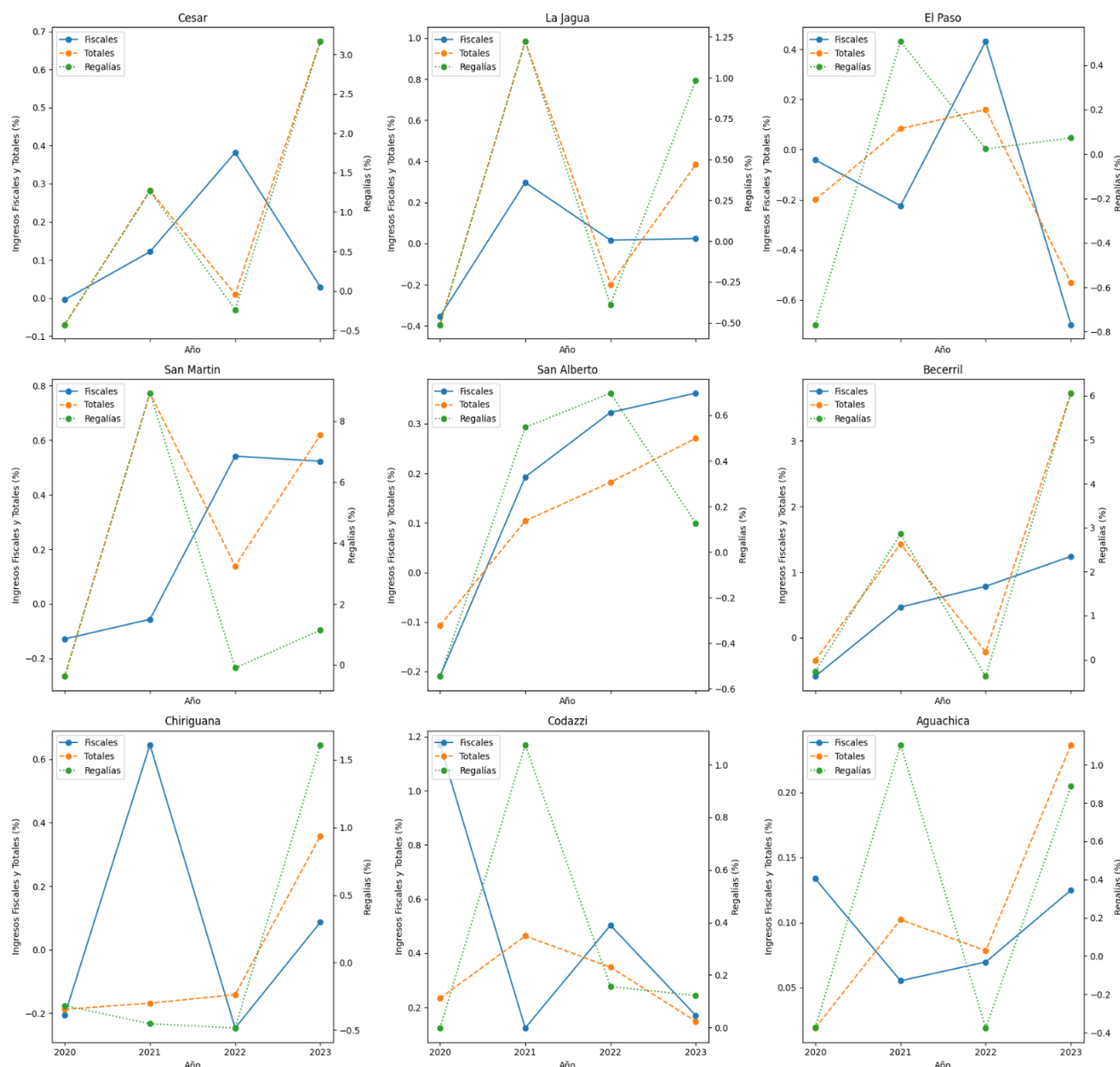*Historical added value of the municipalities*

Source: Authors' elaboration with data from DANE (2022).

La Jagua de Ibirico ranks second after Becerril, with considerable added value and a notable recovery after the fall recorded in 2020. Although it presents a downward trend, Agustín Codazzi retains a relevant position in cumulative terms, followed by San Martín. The case of Aguachica is surprising, which, despite being the most populous municipality in the group analyzed, ranks fifth in total value added.

Figure 6 shows the variations in tax revenues, total revenues, and royalty revenues in several municipalities and in the department of Cesar. In municipalities such as San Martín, an inverse relationship is observed between total revenues and royalties with respect to tax revenues. A similar trend can be seen in the department of Cesar, where, in 2022 and 2023, tax revenues show an inverse variation with respect to total revenues and royalties. In El Paso, the variations in tax revenues are also inverse to those in royalty revenues.

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Figure 6

Relative change in tax revenues, total revenues and royalties

Source: Own elaboration with data from CHIP (2024).

However, there is a visible relationship between total income and royalties in municipalities such as Aguachica, Agustín Codazzi, Becerril, La Jagua de Ibirico and the department of Cesar. In 2023, a particularity is observed in San Alberto, where as revenues from hydrocarbon exploitation decrease, tax and total revenues increase.

According to Figure 7, the accumulation of transfers shows that Becerril and La Jagua de Ibirico have a strong dependence on royalties, while Aguachica presents high transfers from the GSP and the Social Security System. Municipalities such as San Alberto and El Paso

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receive low amounts of royalties, which shows fewer links with extractive activities. For more details, see Annex 3.

Figure 7

Cumulative transfers and subsidies by municipality and by concept
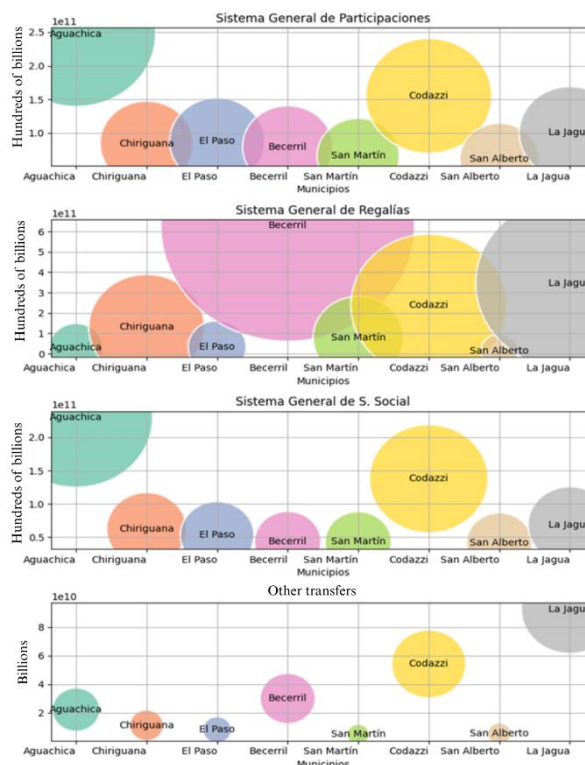
Source: Own elaboration with data from CHIP (2024).

In relation to Table 2, on the dependence of territorial entities with respect to royalty revenues, Becerril exhibits a growing and significant dependence on royalty income, reaching its peak in 2023 with 81%.

Table 2

Level of dependence of territorial entities on royalty revenues

Region	2019	2020	2021	2022	2023
Cesar	23,0%	14,1%	24,9%	18,8%	46,7%
Aguachica	4,8%	3,0%	5,6%	3,3%	5,0%
Chiriguaná	50,2%	42,1%	27,7%	16,6%	32,0%
El Paso	22,6%	6,6%	9,1%	8,0%	18,4%
Becerril	38,6%	43,0%	68,3%	54,2%	81,0%

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| Region	2019	2020	2021	2022	2023
San Martin	7,4%	6,4%	35,6%	28,3%	37,4%
Agustín Codazzi	35,5%	28,7%	40,7%	34,9%	34,1%
San Alberto	9,3%	4,7%	6,6%	9,5%	8,4%
La Jagua de Ibirico	46,7%	37,7%	42,2%	32,2%	46,1%

Source: Own elaboration with data from CHIP (2024).

Agustín Codazzi has a significant dependence on royalties, although with some variations over the years. Its dependence is less pronounced than that of Becerril, but it is still considerable, exceeding 30% in most years. This allows us to infer that these economies are influenced by royalties, which may represent a risk in the event of variations in the international prices of these commodities.

In relation to inequalities, we can bring up the Gini index, which is a measure of income inequality within a population, where a value of 0 represents perfect equality and a value of 1 expresses maximum inequality. When analyzing the index, as illustrated in Figure 8, with respect to municipalities in relation to income from transfers and subsidies (royalties, the GSP and the Social Security System), a relative constancy in the indicator is observed throughout the period studied. This index has remained between 0.39 and 0.43 for the last five years.

Figure 8

Gini index of income from transfers and subsidies
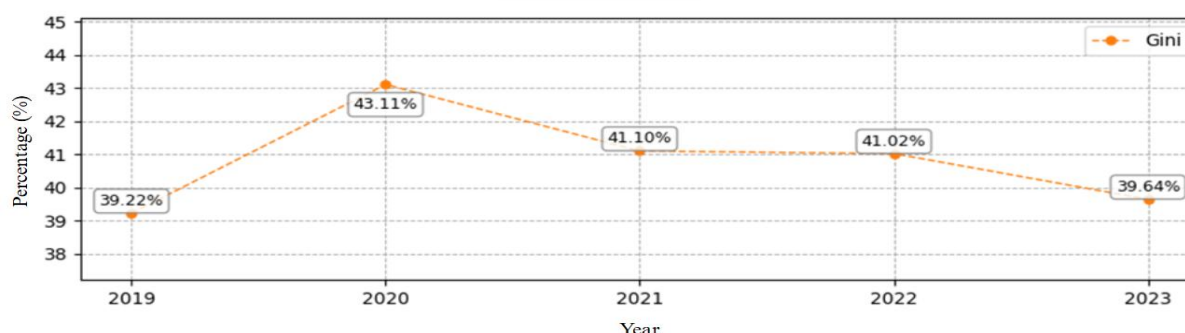
Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

Perfect equality, according to González (2020), represents an ideal situation in which all individuals or territories receive income in equal proportions, which is graphically reflected in the perfect equality line of the Lorenz Curve. When contrasting this line with the real curves observed between 2019 and 2023 in Figure 9, and with the data in Table 4, there is evidence of

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significant inequality in the distribution of tax revenues.

Figure 9

Lorenz curves of transfer and grant receipts
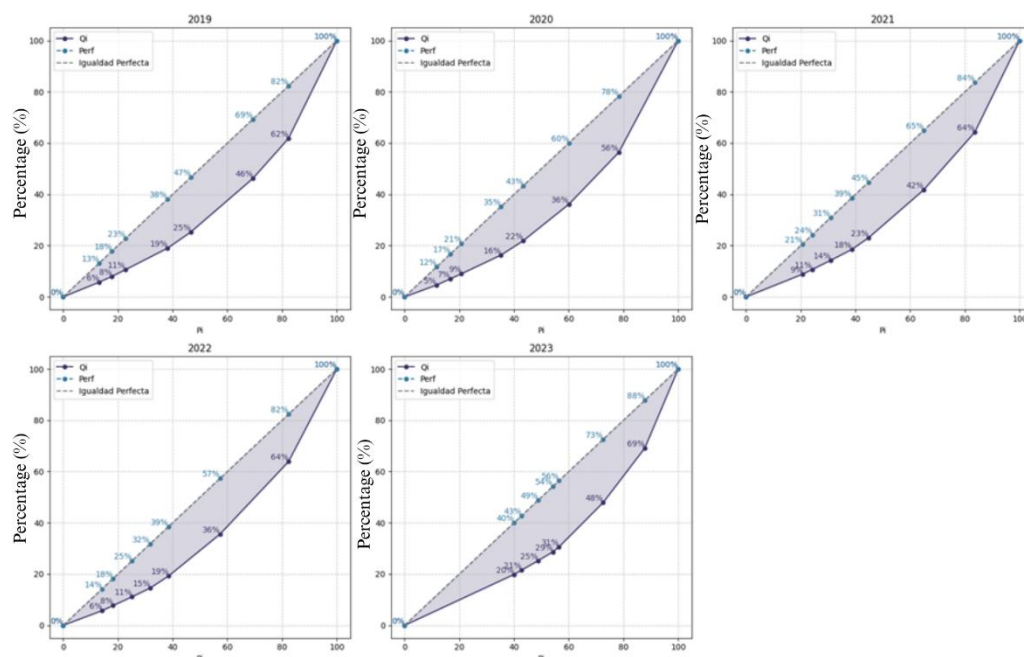
Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).
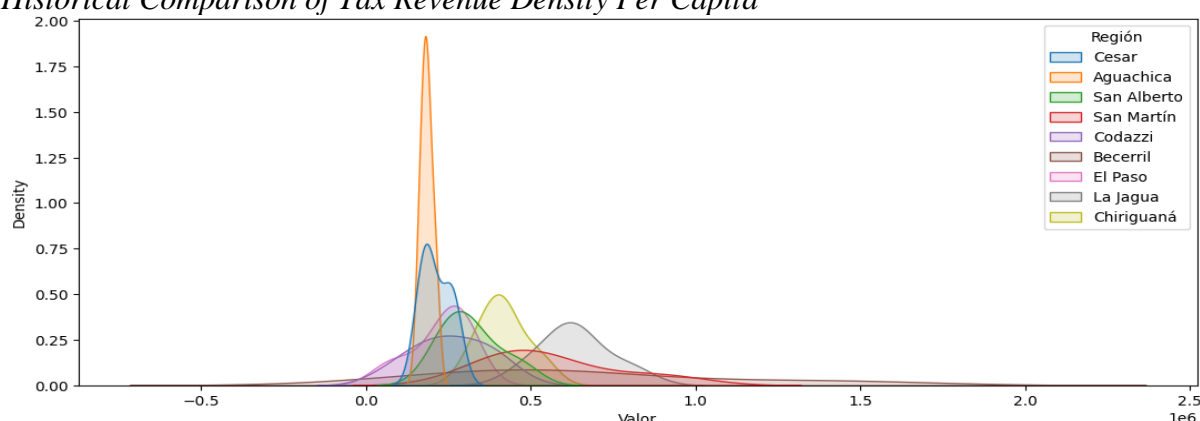
The equimarginality data strengthen this trend, as they show a considerable distance from the ideal distribution. This behavior coincides with what Dahlby and Wilson (1994) propose, who warn that differences in fiscal capacity between territories generate distortions that affect both economic efficiency and interjurisdictional equity.

On the other hand, when analyzing the density of tax revenues per capita in the study period, as illustrated in Figure 10, it can be argued that, in Aguachica, tax revenues per person remain quite stable over time, since they are concentrated in a specific range and with little variation. On the other hand, the department of Cesar has a bimodal density, and municipalities such as Chiriguaná, San Alberto, La Jagua de Ibirico and El Paso show greater volatility in their collection capacity, which indicates that their revenues may fluctuate more. For their part, municipalities such as Becerril and San Martín have a more dispersed distribution, with tax revenues that are distributed over a wide range and with several peaks at different levels.

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Figure 10
Historical Comparison of Tax Revenue Density Per Capita

Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

In terms of correlation of tax revenues and royalties, a more pronounced relationship with royalties is observed in municipalities such as Becerril, San Martín and San Alberto. On the contrary, Chiriguaná shows an inverse relationship; in addition, in terms of total income, municipalities such as El Paso, San Alberto and Aguachica, present correlations below 90%.

Table 3
Correlation of royalty income with respect to total revenue and tax revenue

Region	Tax	Total
Cesar	66,6%	98,4%
Aguachica	56,7%	71,5%
Chiriguaná	-34,8%	98,7%
El Paso	23,5%	38,9%
Becerril	92,4%	99,9%
San Martin	82,4%	97,1%
Agustín Codazzi	90,4%	97,2%
San Alberto	89,8%	87,1%
La Jagua de Ibirico	62,7%	94,0%

Source: Own elaboration with data from CHIP (2024).

When analyzing the values of per capita income in Table 4, it is observed that the municipality with the highest historical tax revenue per capita is Becerril, with 657,622. The second municipality is La Jagua de Ibirico, with an average value of 633,519. In third place is San Martín, with a value of 561,501. The department of Cesar and the municipality of Aguachica are surprising, with respective values of 212,830 and 184,211, the latter two being the regions with the largest population and with the lowest per capita fiscal indicator.

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Table 4

Historical Comparison of Tax Revenue Per Capita

| Region	Concept	2019	2020	2021	2022	2023	Middle
Cesar	Tax	225.567.556.781	224.605.348.733	251.912.632.855	348.151.131.049	358.185.808.970	
	Population	1.247.975	1.290.219	1.322.378	1.349.162	1.373.581	212.830
	Per-capita	180.747	174.083	190.500	258.050	260.768	
La Jagua de Ibirico	Tax	38.585.666.123	24.914.704.832	32.321.348.711	32.857.062.960	33.649.861.772	
	Population	48.620	50.338	51.603	52.623	53.557	633.519
	Per-capita	793.617	494.948	626.346	624.386	628.300	
El Paso	Tax	11.345.904.205	10.878.121.709	8.442.963.943	12.083.183.485	3.655.281.042	
	Population	39.039	40.398	41.378	42.198	42.960	227.076
	Per-capita	290.630	269.274	204.045	286.345	85.086	
San Martin	Tax	14.052.491.505	12.250.943.374	11.562.533.376	17.824.427.898	27.140.875.787	
	Population	27.746	28.718	29.439	30.031	30.559	561.501
	Per-capita	506.469	426.595	392.762	593.534	888.147	
San Alberto	Tax	8.155.843.862	6.446.087.656	7.688.279.783	10.170.563.458	13.851.311.109	
	Population	27.319	28.280	29.008	29.611	30.145	318.896
	Per-capita	298.541	227.938	265.040	343.472	459.490	
Becerril	Tax	14.388.648.345	5.908.794.727	8.663.707.014	15.456.303.863	34.625.911.581	
	Population	22.485	23.265	23.847	24.351	24.797	657.662
	Per-capita	639.922	253.978	363.304	634.730	1.396.375	
Chiriguaná	Tax	12.269.575.317	9.751.082.125	16.042.518.607	12.095.109.105	13.144.198.901	
	Population	28.815	29.804	30.552	31.188	31.771	415.920
	Per-capita	425.805	327.174	525.089	387.813	413.717	
Agustín Codazzi	Tax	6.399.298.709	13.885.218.771	15.603.844.073	23.453.247.559	27.446.552.996	
	Population	63.205	65.428	67.084	68.472	69.759	256.408
	Per-capita	101.247	212.221	232.602	342.523	393.448	
Aguachica	Tax	18.466.308.865	20.934.316.005	22.091.502.812	23.631.062.445	26.583.071.256	
	Population	114.194	118.392	121.581	124.064	126.377	184.211
	Per-capita	161.710	176.822	181.702	190.475	210.347	

Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

Likewise, when comparing tax revenues per capita and the average population, as shown in Figure 11, municipalities such as Becerril and La Jagua de Ibirico are entities with high per capita tax revenues compared to their average population, which implies, in this context, the presence of significant natural resources.

On the other hand, San Alberto and Agustín Codazzi show more moderate incomes, despite having a similar population. On the other hand, municipalities with high populations, such as Aguachica and the department of Cesar, do not necessarily exhibit the highest incomes.

Figure 11

Historical comparison of tax revenues per capita and average population
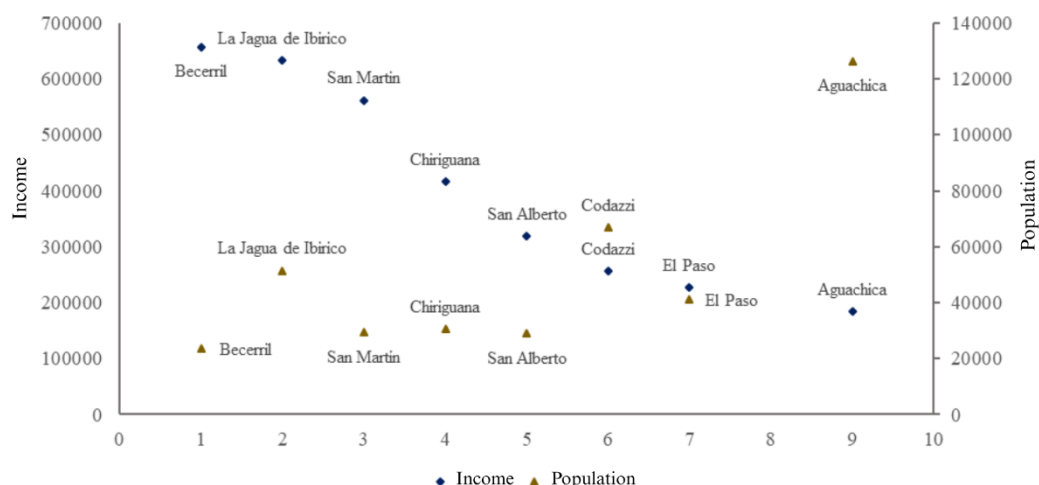
Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

Returning to the Gini index, but for tax revenues, in 2019, inequality in tax revenues was 34.95%, as illustrated in Figure 12. In 2020, inequality increased considerably to 39.01%. In 2021 and 2022, inequality stabilized at around 38%. However, in 2023, it increased again to 39.44%, showing the growing trend of inequality in the distribution of tax revenues.

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Figure 12

Gini index of tax revenue revenues in municipalities
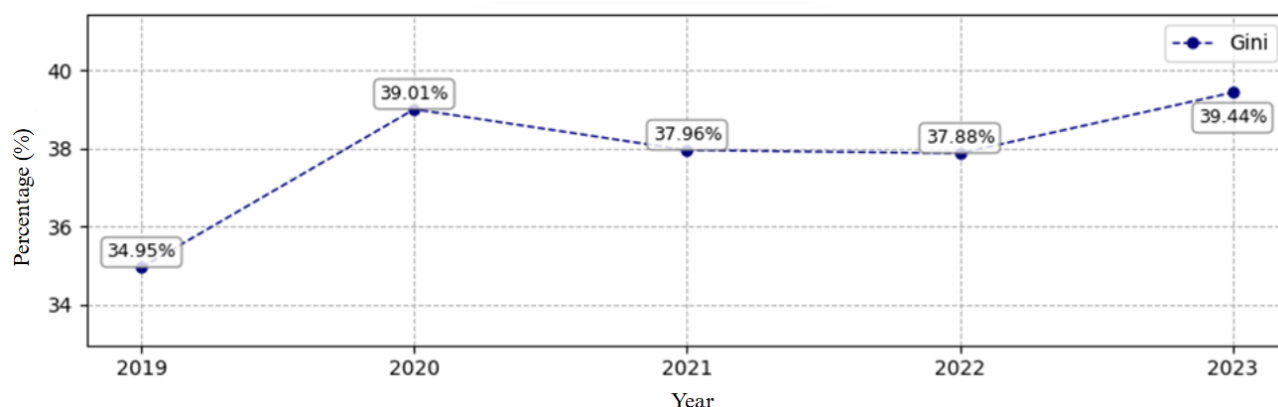
Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

In relation to public social expenditure per capita, shown in Table 5, the municipality with the highest expenditure is Becerril, with an annual average of 1,763,357 pesos. It is followed by San Martín, with a difference of 199,219 pesos less, and in third place is Agustín Codazzi.

On the other hand, municipalities such as Aguachica and the department of Cesar, being among the regions with the largest population, have the lowest average values in terms of public social expenditure per capita.

Table 5

Public social expenditure per capita

Region	2019	2020	2021	2022	2023
Cesar	583.461	448.669	493.939	550.162	559.074
Aguachica	659.424	700.642	697.974	794.568	960.258
Chiriguaná	1.415.113	1.296.139	1.132.011	1.181.993	1.310.006
El Paso	832.155	794.901	744.138	908.015	459.602
Becerril	867.771	1.151.870	1.869.138	1.754.770	3.173.235
San Martin	1.198.356	671.276	1.095.091	1.709.079	3.146.889
Agustín Codazzi	185.321	1.174.966	1.744.642	1.833.717	1.805.477
San Alberto	734.247	636.992	676.599	824.020	1.032.159
La Jagua de Ibirico	1.150.634	910.662	1.213.252	1.719.383	1.574.211

Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

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Table 6 presents a paradox: if we assume a constant level of UBN during the five years analyzed, some regions with high public social expenditure per capita continue to register high levels of UBN, while others with less investment have lower figures; for example, Becerril reports the highest expenditure in 2023; however, it also has the highest index of UBN. In contrast, San Alberto shows the lowest budget allocation, but, at the same time, the lowest value of UBN.

Table 6

Percentage of total people in UBN

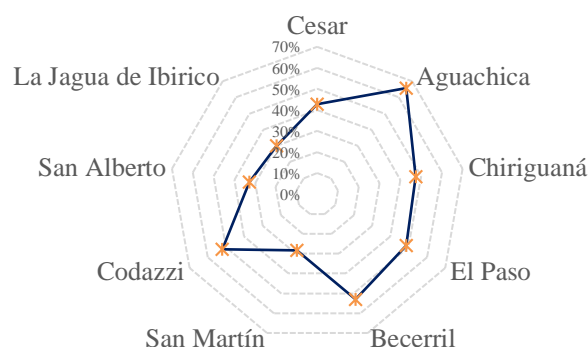| Municipality	UBN
Becerril	35,52%
Agustín Codazzi	28,66%
Chiriguaná	25,45%
San Martin	24,09%
El Paso	22,78%
La Jagua de Ibirico	21,27%
Aguachica	18,79%
San Alberto	13,73%

Source: Taken from DANE (2018b).

On the other hand, in relation to the share of administrative expenses over own income, as shown in Figure 13, the municipality of Aguachica has a higher proportion of its own income destined to cover administrative expenses, with a participation that exceeds 60%. The municipality that follows is Becerril, with a value of 53%, and then Agustín Codazzi, with 52%.

There are municipalities in which this participation has been increasing, which could be due to the decrease in their own revenues, as is the case of the municipality of El Paso. In contrast, in municipalities such as Agustín Codazzi and Becerril, participation has decreased as a result of the increase in their own income.

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Figure 13

Share of administrative expenses in own income – historical average
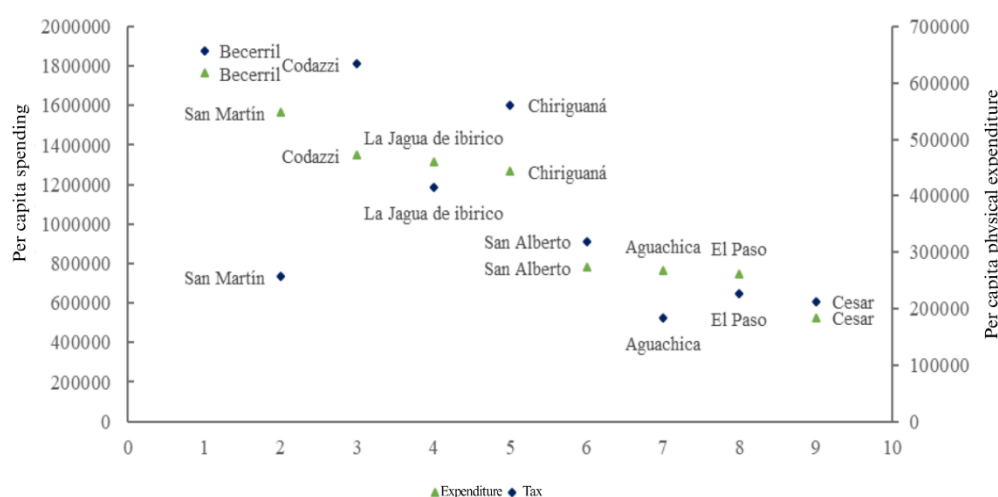

Source: Own elaboration with data from CHIP (2024).

Figure 14 shows the relationship between public social expenditure per capita and tax revenues per capita in various regions. At first glance, a clear trend can be observed: regions that increase their public social spending tend to experience an increase in their tax revenues. This phenomenon can be explained by several factors. Greater investment in public social spending improves the quality of life of citizens, which translates into greater productivity and consumption, and, therefore, an increase in tax revenues

Figure 14

Historical revenue from fiscal means per capita and average public expenditure per capita

Source: Authors' elaboration with data from CHIP (2024) and DANE (2018a).

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Table 7 shows the proportion of tax revenues in relation to public social expenditure during the period analyzed. Some municipalities, such as Aguachica and San Alberto, have maintained a stable and high relationship between tax revenues and social spending. In particular, Aguachica peaked at 64.1% in 2022, implying that the municipality has a remarkable capacity to finance about half of its public social spending with its tax revenues. This contrasts with municipalities such as Becerril and Agustín Codazzi. Becerril, for example, saw a reduction in its share from 73.7% in 2019 to a low of 19.4% in 2021, although it recovered slightly in the following years.

Table 7

Share of tax revenues as a proportion of public social expenditure

Region	2019	2020	2021	2022	2023
Cesar	31,0%	38,8%	38,6%	46,9%	46,6%
Aguachica	45,3%	54,2%	63,9%	64,1%	63,9%
Chiriguaná	30,1%	25,2%	46,4%	32,8%	31,6%
El Paso	34,9%	33,9%	27,4%	31,5%	18,5%
Becerril	73,7%	22,0%	19,4%	36,2%	44,0%
San Martin	42,3%	63,5%	35,9%	34,7%	28,2%
Agustín Codazzi	54,6%	18,1%	13,3%	18,7%	21,8%
San Alberto	40,7%	35,8%	39,2%	41,7%	44,5%
La Jagua de Ibirico	69,0%	54,4%	51,6%	36,3%	39,9%

Source: Own elaboration with data from CHIP (2024).

Figure 15 shows the trend over time in compliance with the legal limit of 80% in operating expenses, established by Law 617 of 2000. In this context, those lines that exceed this threshold indicate non-compliance with the rule by the territorial entities in the respective fiscal periods.

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Figure 15

Compliance with the limits of the operating expenditure of the territorial entities
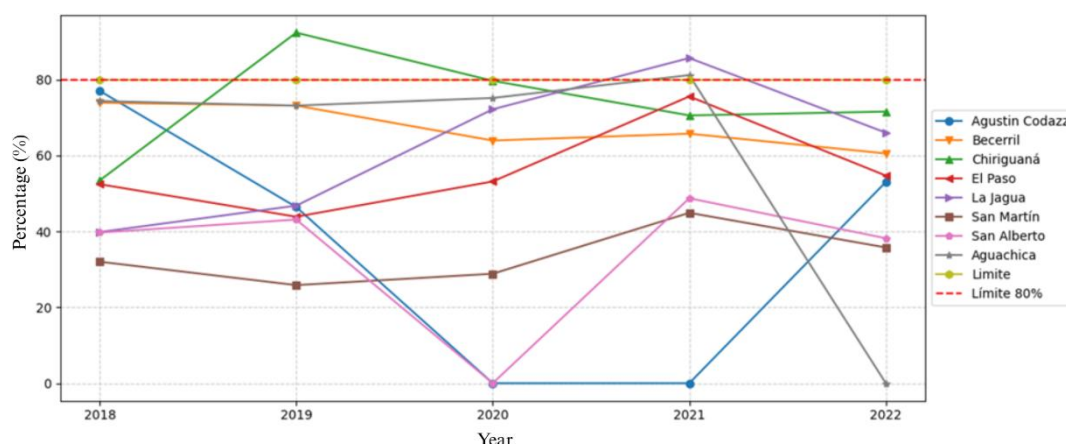
Source: Own elaboration with data from the Office of the Contraloría General de la Nación (2024).

In relation to Table 8 and Figure 15, the Office of the Contraloría General de la Nación (2024) refers to Law 617, which establishes provisions for the rationalization of public spending and the fiscal consolidation of territorial entities; in this case, during each fiscal period, operating expenses may not exceed, as a proportion of their Free Destination Current Income (ICLD), 80% for municipalities in the fourth, fifth and sixth categories.

Table 8

Compliance with operating expense limits

Municipalities	2018	2019	2020	2021	2022	2023
Agustín Codazzi	77%	46,4%	0%	0%	52,9%	39,5%
Becerril	73,8%	73,1%	63,9%	65,7%	60,5%	67,0%
Chiriguaná	53,4%	92,3%	79,6%	70,5%	71,5%	59,9%
El Paso	52,4%	43,8%	53,1%	75,5%	54,6%	54,6%
San Martin	32,0%	25,8%	28,8%	44,8%	35,7%	40,5%
San Alberto	39,6%	43,1%	0%	48,7%	38,1%	36,0%
Aguachica	74,3%	73,1%	75,1%	81,1%	0%	60,6%
La Jagua de Ibirico	39,8%	46,7%	72,1%	85,6%	65,9%	36,4%

Source: Own elaboration with data from the Office of the Contraloría General de la Nación (2024).

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Discussion

The findings of this study confirm the persistence of horizontal fiscal inequalities among the municipalities of the department of Cesar, a phenomenon widely discussed in the literature. As Martinez and Searle (2007) argue, these inequalities arise from the discrepancy between the collection capacity and the spending needs of each jurisdiction. Indeed, the results show that municipalities with larger populations or poverty levels do not necessarily have a greater fiscal capacity, which suggests a dysfunctional allocation of resources in the face of territorial needs.

In line with the analyses of Bonet (2004) and Romero and Delgado (2021), the evidence shows that, after decades of fiscal decentralization, regional disparities in revenues and fiscal capacities not only persist, but in some cases have intensified. This situation is aggravated in municipalities whose economy is limited to primary activities with low added value, reflecting Bonet's (2005) warning about the weak productive links in sectors such as mining. Municipalities such as La Jagua de Ibirico and Becerril, which receive significant income from royalties, do not necessarily have better indicators of fiscal sustainability or economic development, which reinforces the idea that dependence on non-renewable resources can generate a mirage of development.

The results also corroborate the mitigating role of certain transfer systems, such as the GSP, in reducing fiscal disparities, especially in smaller municipalities. This finding is in line with the conclusions of Bonet and Ayala (2015), who identify a more significant impact of the SGP in municipalities than in departments. However, it was identified that SGR tends to concentrate resources in municipalities with extractive activity, which widens the gaps with those territories that lack these resources, in line with the observations of Bonet and Meisel (2007).

A particularly relevant aspect is the evolution of the share of royalties within the income of the department of Cesar. As Bonet (2007) pointed out, this source represented about 25% of departmental revenues in 2005. By 2023, this value rose to 46.7%, confirming the growing dependence on non-renewable resources. This behavior poses serious challenges for financial sustainability, especially considering the World Bank's (2013) warning that the most efficient public spending is that which focuses on productive infrastructure and not only on

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current spending.

Finally, although national transfers have had a softening effect on fiscal inequalities, structural weakness persists in the generation of own income by most municipalities in the department of Cesar. This situation supports the recommendations of Bonet (2007) on the need to strengthen local taxation mechanisms, diversify territorial economies and improve institutional capacity for efficient resource management.

Conclusions

This study showed that the population dimension does not guarantee a greater generation of own tax revenues. Municipalities such as Becerril and La Jagua de Ibirico, despite their smaller population size, stand out for their high income derived from the exploitation of natural resources, accompanied by a marked dependence on royalties. This result exposes the structural vulnerability of several municipalities in the department of Cesar to the volatility of these resources.

There was also a significant inequality in the distribution of tax revenues and transfers, expressed through the Gini indices, which remained between 34% and 41%. The correlation between royalties, tax revenues and public social expenditure varies between municipalities, highlighting cases such as Aguachica and San Alberto, which showed stability in their ability to finance social spending with their own revenues, unlike Becerril and Agustín Codazzi, where significant fluctuations were observed.

These results are relevant in the department of Cesar, characterized by its high dependence on extractive resources and its unequal fiscal structure. In this sense, the research contributes to the academic debate on fiscal equity and spending efficiency in decentralization scenarios, by showing how the concentration of royalties can distort the management capacity of territorial entities and perpetuate structural inequalities.

Among the limitations of the study are the use of data in nominal values without adjustment for inflation, the dependence on population projections based on the 2018 census,

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and the absence of broader socioeconomic control variables (such as education or health indicators).

As lines of future research, it is urged to deepen the analysis of the efficiency of public spending through techniques such as Data Envelopment Analysis (DEA), incorporate deflators to compare in real terms and explore the relationship between the fiscal structure and performance in human development indicators at the municipal level.

Ethical considerations

The present research did not require ethical endorsement because it was based on governmental documents.

Source of funding

The project is not subject to financing from any public or private entity.

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Annexes

Annex 1

Income and expenditure by all municipalities

Concept	2019	2020	2021	2022	2023
Total Revenue	663.712.148.236	544.033.409.175	794.053.933.178	793.477.890.788	1.351.817.884.263
Tax revenues	123.663.736.931	104.969.269.199	122.416.698.319	147.570.960.773	180.097.064.444
Transfer Income	484.625.326.328	397.943.840.370	597.615.169.545	590.838.165.922	1.094.525.945.231
Own income	173.938.464.705	138.760.562.660	186.643.846.139	197.426.917.501	258.828.197.994
Administration Fees	65.399.670.807	58.714.545.649	63.681.586.253	76.621.263.324	79.374.036.246
Total expenses	417.031.488.831	516.871.002.158	617.000.700.741	677.883.249.029	733.476.003.168
Public social expenditure	289.042.597.593	340.499.583.358	426.319.988.841	508.250.841.924	598.944.427.438

Source: Own elaboration with data from CHIP (2024).

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Annex 2

Value added by type of activity

Year	Activity	Aguachica	Chiriguaná	El Paso	Becerril	San Martin	Agustín Codazzi	San Alberto	La Jagua de Ibirico	Total
2019	**Primary[1]**	75	46	243	2338	530	1012	100	1662	6006
	Secondary[2]	165	16	19	15	21	55	137	108	537
	Tertiary[3]	613	153	213	120	164	347	188	219	2017
2020	**Primary**	86	69	597	2193	930	1592	93	3212	8773
	Secondary	165	20	23	17	24	58	149	112	568
	Tertiary	637	158	236	128	165	347	197	230	2099
2021	**Primary**	119	69	366	5338	974	272	152	2237	9526
	Secondary	215	20	22	17	24	73	182	151	704
	Tertiary	735	177	250	136	186	401	221	258	2364
2022	**Primary**	166	346	1703	13028	1587	264	229	4446	21769
	Secondary	272	27	29	23	32	94	227	187	891
	Tertiary	857	193	294	163	210	467	256	297	2737

▪ Billions of pesos.

Source: Authors' elaboration with data from DANE (2022).

Annex 3

Transfers and subsidies accumulated by municipalities

Concept	General System of Participations	General System of Royalties	General System of Social security	Other Transfers
Aguachica	247.107.599.517	28.367.562.134	229.692.272.628	22.231.206.471
Chiriguana	84.477.051.818	130.706.645.948	62.374.747.817	11.214.456.277
El Paso	87.965.393.784	32.877.997.096	53.090.423.207	8.120.642.026
Becerril	79.547.478.099	628.323.639.295	43.275.740.229	29.996.456.269
San Martin	66.220.406.345	79.507.510.411	42.978.343.064	4.904.618.386
Agustín	155.226.329.050	237.727.485.696	137.711.401.015	54.159.304.574

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[1] It includes agriculture, livestock, forestry and fishing activities; and mining and quarrying.

[2] It includes the activities of manufacturing industries and construction.

[3] It includes electricity, gas and water activities; commerce; repair of motor vehicles; transport; accommodation and food services; information and communications; financial and insurance activities; real estate activities; professional, scientific and technical activities; administrative and support services activities; public administration; education; bless you; artistic, entertainment and recreation activities; activities of individual households.

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Concept	General System of Participations	General System of Royalties	General System of Social security	Other Transfers
Codazzi				
San Alberto	61.018.765.539	13.341.175.163	41.762.799.211	5.436.239.894
La Jagua de Ibirico	100.420.098.046	346.290.700.184	68.521.009.035	92.511.928.974

Source: Own elaboration with data from CHIP (2024).

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