The dynamics of industrial employment in Mato Grosso do Sul (2009-2019)

A dinâmica do emprego industrial no Mato Grosso do Sul (2009-2019)

Alesandro Ramos da Silva[1i], https://orcid.org/0000-0002-5489-5298; **Odirlei Fernando Dal Moro[2ii],** https://orcid.org/0000-0002-8877-4769; **Moisés Centenaro[3iii],** https://orcid.org/0000-0003-2299-9102; **Rosele Marques Vieira[4iv],** https://orcid.org/0000-0001-9217-665X

1. Universidade Estadual de Mato Grosso do Sul (UEMS). Brasil. E-mail: alesandroramos@gmail.com
2. Universidade Federal de Mato Grosso do Sul (UFMS). Brasil. E-mail: odirlei.moro@ufms.b
3. Universidade Estadual de Mato Grosso do Sul (UEMS). Brasil. E-mail: m.centenaro@uems.br
4. Universidade Estadual de Mato Grosso do Sul (UEMS). Brasil. E-mail: roseleuems@gmail.com

Abstract
This study aims to analyze the concentration of industrial employment in Mato Grosso do Sul between 2009-2019. In specific and methodological terms, the Location Quotient (QL), Redistribution Coefficient (CR), Location Coefficient (CL), and Relative Employment Participation (PR) of the industrial sector in Mato Grosso do Sul in the 2009-2019 period were used to analyze the dynamics of that segment. This study is justified by the lack of publications using the mentioned methods in the industrial sector and the state of Mato Grosso do Sul, updated for the 2009-2019 period. Furthermore, in addition to being one of the UN's sustainable development goals (ninth), the industrial segment represents a significant production chain capable of generating employment and income. The results show that the Pantanal, Bodoquena, and Aquidauana regions remain the most prominent in mineral extraction, unlike the manufacturing industry, which has greater sprawl in the state.
Keywords: industrial economics; annual list of social information; location quotient; redistribution coefficient; location coefficient.

Resumo
O objetivo deste artigo é analisar a concentração do emprego industrial no Mato Grosso do Sul entre 2009-2019. Em termos específicos e metodológicos utilizou-se o Quociente Locacional (QL), Coeficiente de Redistribuição (CR), Coeficiente Localização (CL) e Participação Relativa do Emprego (PR) do setor industrial no Mato Grosso de Sul no período 2009-2019, com vistas a analisar a dinâmica do referido segmento. Dentre outras razões, o presente trabalho justifica-se por não há publicações utilizando os mencionados métodos, ao setor industrial e ao estado de Mato Grosso do Sul, atualizados para o período 2009-2019. Ademais, além de ser um dos objetivos de desenvolvimento sustentável da ONU (nono), o segmento industrial representa uma cadeia produtiva significativa, capaz de gerar emprego e renda. Os resultados encontrados mostram a região do Pantanal, Bodoquena e Aquidauana permanecem como as de maior destaque na extrativa mineral, diferentemente da indústria de transformação que possui maior espraiamento no estado.
Palavras-chave: economia industrial; relação anual de informações sociais; quociente locacional; coeficiente de redistribuição; coeficiente localização.

p. 1

Alesandro Ramos da Silva, Odirlei Fernando Dal Moro, Moisés Centenaro e Rosele Marques Vieira

1 Introduction

Industrialization is undeniably an extensive subject. However, it is difficult to approach the subject in Brazil without mentioning the contributions of Mello (1998) and Furtado (2020), first published in 1982 and 1959, respectively. In this field, the contributions of Tavares (1972) and Serra (1982) stand out, these being only some of the works addressing industrialization in Brazil.

Even though industrialization did not exactly start in 1930, it was from that decade on that there was a greater industrial impulse in Brazil. According to Fochezatto (2010), although the Brazilian economy in the 1930-1980 period had industrialization as its main characteristic, from the 1980s on, another sector started to gain greater notoriety: services. Some authors, such as Oreiro and Feijó (2010), go as far as to suggest that Brazil has been going through a deindustrialization process by not having the industry as the main development focus.

Regarding Brazilian industrialization, Tavares (1972) points out that in addition to income concentration, it caused a centralization in a few sectors and regions. In other words, a large part of the Brazilian regions was, for various reasons, excluded from this process. In this context of lack of synchrony in the Brazilian industrial development, Zamberlan et al. (2010) state that the state of Mato Grosso do Sul acted as a supplier of raw materials and food to the large industrial centers, a reality similar to that of other inland regions. In this regard, Santos and Missio (2021) analyze the industrial dynamics in Mato Grosso do Sul starting with the phases before 1930 when the state was not yet politically divided from Mato Grosso, and cattle breeding and the mate herb characterized the economy.

Given the above, explaining whether Brazil is going through a deindustrialization or a reintegration process in a new international economic conjuncture is one of the paths to be investigated. Undeniably, the industrial sector involves a very broad production chain while connecting with numerous sectors, apparently generating higher value-added jobs and several indirect jobs.

Therefore, this study aims to analyze the specialization and concentration of industrial employment in Mato Grosso do Sul from 2009 to 2019. We chose these two specific years because they were more stable periods compared to 2010 and 2020, the initial idea for this study and subsequent phases used. The justifications include: (i) 2010 was characterized by a significant growth rate in the Brazilian economy, unlike 2020, when the Covid-19 pandemic

had the opposite effect. Thus, because these are two atypical years (2010 and 2020) with very different events, we decided to analyze the years immediately before: 2009 and 2019.

In specific terms, we seek: (i) to present a literature review on industrialization in the state of Mato Grosso do Sul, especially around the studies that used the same methodology presented here, and (ii) to discuss the results via Location Quotient (LQ), Redistribution Coefficient (RC), Location Coefficient (LC) and Relative Employment Participation (RP), which is the methodology employed here. By doing so, we expect to offer an analysis of the dynamics of the industrial sector capable of suggesting public policies aimed at development.

Even though studies on industrialization are recurrent in Brazil, this study is justified because it focuses on Mato Grosso do Sul, a state still in the industrial development process. Furthermore, reminding Tavares (1972), Brazilian industrialization was characterized by regional, sectorial, and income concentration, and the state of Mato Grosso do Sul played a supporting role in the Brazilian industrialization process, being a mere supplier of food and raw materials, a reality similar to that of other inland regions in the country. Therefore, there was no relatively synchronous industrial development in Brazil. Nevertheless, the industrialization theme relates to the ninth UN sustainable development goal: "Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation" (ONU, 2021).

Thus, to fulfill the proposed objective and within the methodology presented, this study is divided into three parts, in addition to this introduction and the final considerations. The first part discusses the literature surrounding the topic. The second part presents the methodology. Finally, the third part analyzes the results and presents the discussion.

2 Literature review

This section aims to expose academic papers that used the same method employed here and those that proposed reflections on industrialization in the state of Mato Grosso do Sul. Certainly, the theme is extensive and has countless contributions that could be used in this study. Unfortunately, however, there is no condition or space to list and discuss all of them.

Nonetheless, the joint use of indicators, such as the Location Quotient (LQ), Redistribution Coefficient (RC), Location Coefficient (LC), and Relative Employment Participation (RP) of a specific sector, presented in Haddad (1989), is not uncommon in academic papers, especially when applied to themes related to the industry. Such methods allow the analysis, for example, of the dynamics of the employment location given the sector

surveyed. In this regard, the contributions of Mattei and Mattei (2017) and Bernardo and Farinha (2019) are worth mentioning.

The first study focused on analyzing the economic activities in the South region of Brazil, indicating the most outstanding specializations of each state and studying several economic sectors within the same geographical region. Meanwhile, Bernardo and Farinha (2019) centered on analyzing employment in the tourism sector in Mato Grosso do Sul, focusing on only one economic sector and one specific region, allowing better data detailing. Dalle Tese and Mattei (2020) and Medeiros (2014) are also examples of studies that have applied the methodology employed here to study regional economic development.

Specifically dealing with the issue of Brazilian industrialization, Tavares (1972) points out that it led to a sectorial, regional, and income concentration. In Silva and Silva Filho (2017), in line with the statements of Tavares (1972), such industrial aggregation is one of the factors that provide regional inequalities. Moreover, even if they have provided a small movement of deconcentration, development policies have not yet resulted in structural changes in the Brazilian economy. Furthermore, the authors affirm that the coffee economy in São Paulo created the basis for the industrial concentration in the Southeast, with the participation of the State in making infrastructure, transportation, and communications feasible.

To Gomes (2016), the state of Mato Grosso do Sul did not participate directly in Brazilian industrialization, which occurred more intensely between 1930 and 1980. Instead, it was a supporting player in the supply of raw materials and food. Zamberlan et al. (2010) also pointed it out. However, from the 2000s on, the industrial dynamics in Mato Grosso do Sul became more intense than in the previous decades due to the fiscal incentives and federal policies implemented. Notwithstanding, based on Santos and Missio (2021), following the example of the Superintendence for the Development of the Northeast (SUDENE) and the Superintendence for the Development of the Amazon (SUDAM), the Superintendence for the Development of the Midwest (SUDECO) also contributed to the development of Mato Grosso do Sul.

A historical review of the economic dynamics of Mato Grosso do Sul before its industrialization can hardly ignore the extractivism, cattle breeding, mate herb, and defense services, the latter mainly after the Paraguay War (Zamberlan et al., 2010). Regarding the industrialization in Mato Grosso do Sul, it is worth noting that it occurred late compared to the Southeast. Nevertheless, when performed, it focused on low-tech segments such as non-metallic minerals, construction, food, and beverages (Zamberlan et al., 2010).

Zamberlan et al. (2010) add that the low demographic density, both to comprise a consumer market and to offer labor, and the insufficient financial capital, capable of being directed to industrial activities, also constitute factors that hindered a more accelerated industrial development in the Midwest. Mato Grosso do Sul is included in this context.

From the 1980s on, the state entered a relatively faster process of industrialization, similar to what happened in the Southeast at the end of the 19th century, characterized by simple, small industries with used and sometimes antiquated equipment, low technology, and generally aligned to the needs of the existing activities. After that, agribusiness began to characterize the industrialization process in Mato Grosso do Sul through soybean crushers, meat packing plants, dairies, starch mills, sugar and ethanol plants, and mills (Zamberlan et al., 2010).

According to Paz, Zamberlan, & Lamberti (2017), between 2002 and 2013, the Mato Grosso do Sul industry moved to a larger share: from 16.7% in 2002 to 22.1% in 2013, which was led by agribusiness. The authors also observed that 71 of the 79 municipalities in Mato Grosso do Sul had some fiscal incentives, usually reduction/exemption of IPTU (Urban Property Tax) and/or ISSQN (Tax On Services of Any Nature) and land donations to attract industries. For 2014, the top four municipalities with the highest tax exemptions were Campo Grande, Três Lagoas, Dourados, and Paranaíba.

Therefore, Brazilian industrialization is still characterized by regional disparities, for which there are many explanations. However, based on the statements of Zamberlan et al. (2010), factors such as insufficient skilled labor, especially in an increasingly technological industry, have hindered the attraction of industries to the state of Mato Grosso do Sul. It is probably the reality of other regions, which infers the need for an educational "revolution" more technological and decentralized.

In Santos and Missio (2021), industrial development in Mato Grosso do Sul is partly associated with public policies directed at infrastructure. They mention the case of the Ferronorte, the Brazil-Bolivia gas pipeline, and the Tietê-Paraná waterway. Furthermore, the authors highlight the importance of the Superintendence for the Development of the Midwest (SUDECO) in creating regional poles, specifically in Corumbá, Campo Grande, and Dourados.

Such a "more planned" model lost relevance in the 1970s, 1980s, and 1990s, periods respectively associated with the international oil crisis, uncontrolled inflation, and the implementation of a neoliberal agenda that did not contemplate a national development project

through significant state participation. This economic orientation influenced the states to adopt the so-called "fiscal war" based on fiscal incentives to attract industries (Santos & Missio, 2021).

3 Materials and methods

In order to measure the concentration of industrial jobs in the state of Mato Grosso do Sul, the database of the Ministry of Economy (2021) was consulted. Once the link has been accessed, the login must be made by entering a username and password. [1]When accessing the BI system *(Business Intelligence)*, we selected the information from the table for the current year up to 2002. The data used in this study covers the period between 2009 and 2019, as these are times without major economic shocks, such as 2010 and 2020. The first is characterized by a 7.5% economic growth, the highest since 1980, and the second was negatively impacted by the Coronavirus pandemic. Therefore, we chose to analyze 2009 and 2019 from a comparative perspective.

This study aimed to obtain the definition of concentration measures by micro-region of the state of Mato Grosso do Sul by extracting data from the following activities: Manufacturing Industries and Extractive Industries. According to the National Classification of Economic Activities, version 2.0 (CNAE 2.0[2]).

This data was organized to generate a table in which the municipalities comprise the rows. The micro-regions comprise the sub-lines, the "CNAE 2.0 Section" piece comprises the columns, and the analyzed years comprise the sub-columns. There is also a column with the sum of jobs in the selected classes and years. Moreover, the total employment per municipality and year is shown, covering all formal jobs in the respective municipalities. This table can be found in this study's Appendix I.

Regarding the methods applied, it is noteworthy that several authors who have studied aspects related to Regional Development have used such measures. Haddad (1989) and Mattei and Mattei (2017), whose studies use locational measures, stand out. Therefore, based on the authors, we use Locational Measures such as Location Quotient (LQ), Redistribution Coefficient (RC), Location Coefficient (LC), and Relative Employment Participation (RP). Thus, we seek to measure the concentration of formal jobs in the Manufacturing and Extractive

---

[1]The *"basic" login* with the password "12345678" is provided to access the system. See Ministry of Economy (2021).
[2]National Classification of Economic Activities, version 2.0, defined by IBGE (Brazilian Institute of Geography and Statistics) through Resolution Concla 01/2006, published in the Official Gazette on 09/05/2006.

Industries in Mato Grosso do Sul. Given the data research, we used locational measures, such as those shown below.

First, there is the Location Quotient (LQ), shown in Equation 1.

$$\mathbf{LQ} = \frac{Eij}{Ei} / \frac{Ej}{E} \tag{1}$$

Where: Eij comprises the employment of the industrial sector in municipality **j**.

Ei Total employment in the industrial sector in the state of Mato Grosso do Sul.

Ej Total employment of municipality j.

E Total employment in the state of Mato Grosso do Sul.

Then, there is the Redistribution Coefficient (RC), which relates the percentage distribution of the base variable in the same sector in two time periods. This measure verifies whether some pattern of spatial concentration or dispersion is prevailing for the activity over time (HADDAD, 1989; LIMA et al., 2006). Equation 2 shows the Redistribution Coefficient (RC).

$$\boldsymbol{RC} = \sum_j \left[\left(\frac{E_{ij}^{t1}}{\Sigma_j E_{ij}} \right) \left(\frac{E_{ij}^{t0}}{\Sigma_j E_{ij}} \right) \right] / 2 \tag{2}$$

Where: E_{ij}^{tx} corresponds to the jobs in the industrial sector in the municipality **j** in the years **0** and **1**.

$\Sigma_j E_{ij}$ corresponds to industry employment in the whole state of Mato Grosso do Sul. **T0** corresponds to 2009, and **T1** to 2019.

Meanwhile, according to HADDAD (1989), the Location Coefficient (LC) relates the percentage distribution of the base variable in a given sector among the municipalities or micro-regions with the percentage distribution of the base variable in the state as a whole.

Equation 3 shows the Location Coefficient (LC).

$$\boldsymbol{LC} = \Sigma_j \left| \left(\left(E_{ij} / \Sigma_j E_{ij} \right) - \left(\Sigma_i E_{ij} / E \right) \right) / 2 \right| \tag{3}$$

Where: **CL**= 0 means that the sector **i** will be regionally distributed in the same way as the set of all sectors.

CL=1 means that sector **i** shows a more intense pattern of regional concentration than the set of all sectors.

E_{ij} Comprises the employment of the industrial sector in the municipality **j**.

$\Sigma_j E_{ij}$ corresponds to industry employment in the whole state of Mato Grosso do Sul. **T0** corresponds to 2009, and **T1** to 2019.

Therefore, according to Matei and Matei (2017, p. 9), results closer to 0 denote significant dispersion of economic sectors. In contrast, values close to 1 indicate a significant concentration. They are widely used to compare concentrations between regions in sectors.

Relative Employment Participation (RP) corresponds to the relative participation of employment in the sector under analysis in Mato Grosso do Sul, as shown in Equation 4 - Relative Employment Participation.

$$RP = \Sigma_j E_{ij}/Et \qquad (4)$$

Where: **Et** corresponds to employment in the sectors analyzed in Brazil. Moreover, according to Bernardo and Farinha (2018), the higher the score, the higher employment participation in the analyzed sector.

3 Results and discussions

This section's main objective is to present the results and discussions of the research based on the methodology used. However, it is worth noting that Zamberlan et al. (2010) have already applied such a method specifically aimed at industrial employment. The authors calculated the Location Quotient of the Mato Grosso do Sul Industry having Brazil as a reference unit, considering five-year time intervals between 1985 and 2005, whose data were replicated here (Table 1). Nevertheless, it is worth recalling that this study aims to analyze the concentration of industrial employment in Mato Grosso do Sul between 2009 and 2019. Therefore, in a period not covered by Zamberlan et al. (2010). Furthermore, this study is different because it analyzes the extractive and manufacturing industries in the micro-regions of the state of Mato Grosso do Sul compared to the state itself, which allows for a more regionalized analysis.

Table 1: Location Quotients of the Mato Grosso do Sul Industry compared to Brazil (1985 to 2005)[3]

Industrial Sectors/Years	1985	1990	1995	2000	2005
Mineral extraction	1.46	2.99	1.56	1.02	1.08
Non-metallic mineral products industry	1.23	1.12	1.2	1.07	1.09
Metallurgical industry	0.34	0.48	0.27	0.31	0.43
Mechanical industry	0.17	0.26	0.38	0.2	0.34
Electrical and communications equipment industry	0.67	0.13	0.2	0.05	0.11
Transport equipment industry	0.08	0.08	0.21	0.14	0.11
Wood and furniture industry	2.89	1.89	1.16	1.16	0.8
Paper, cardboard, publishing, and printing industry	0.57	0.65	0.53	0.74	0.66
Rubber, tobacco, leather, fur, similar, and other industries	0.22	0.28	0.57	0.96	0.75
Chemical industry of pharmaceutical, veterinary, and perfumery products	1.14	0.76	0.2	0.18	0.30
Textile clothing and fabrics industry	0.1	0.13	0.19	0.28	0.66
Shoe industry	0.07	0.15	0.04	0.15	0.44
Food, beverage, and ethanol industry	1.76	2.00	2.4	2.73	2.29
Construction	2.28	2.15	1.67	1.39	1.38

Source: Zamberlan et al. (2010).

The analyses carried out by Zamberlan et al. (2010), shown in Table 1, allow us to conclude that only: (i) the food products, beverages, and ethanol industries; (ii) construction; and (iii) mineral extraction and the non-metallic mineral products industry stand out in Mato Grosso do Sul when compared to Brazil, in 2015. Thus, we can see that industrial jobs are still concentrated in Brazil.

The research conducted in this study analyzes the period between 2009 and 2019 and aggregates the industry into two sectors: extractive and manufacturing. Furthermore, in order to offer a more regionalized analysis, we sought to verify the micro-regions compared to the state, which is the reference economy (Table 2).

Table 2: Number of jobs in Mato Grosso do Sul micro-regions: Extractive and Manufacturing Industry (2009-2019)

Micro-region	Extractive industry		Manufacturing industry		Total	
	2019	2009	2019	2009	2019	2009
Alto Taquari	31	28	3,785	2,204	3,816	2,232
Aquidauana	70	68	1,383	744	1,453	812
Baixo Pantanal	1,210	1,010	1,003	672	2,213	1,682
Bodoquena	486	201	1,177	521	1,663	722
Campo Grande	318	196	21,823	19,620	22,141	19,816
Cassilândia	45	36	2,740	1,660	2,785	1,696
Dourados	95	125	21,425	21,252	21,520	21,377
Iguatemi	68	67	12,328	8,835	12,396	8,902
Nova Andradina	13	5	7,153	5,112	7,166	5,117
Paranaíba	27	6	6,876	3,650	6,903	3,656

---

[3] The table mentioned above, from Zamberlan et al. (2010), is shown in its entirety because it offers an understanding of the dynamics of the Mato Grosso do Sul industry between 1985 and 2005, which is important for the understanding of the phases before this study's focus.

Micro-region	Extractive industry		Manufacturing industry		Total	
	2019	2009	2019	2009	2019	2009
Três Lagoas	123	76	11,026	8,384	11,149	8,460
Total	2,486	1,818	90,719	72,654	93,205	74,472

Source: Prepared by the authors based on the Ministry of Economy (2021).

Between 2009 and 2019, the Manufacturing industry in Mato Grosso do Sul concentrated more formal jobs than the Extractive industry in most micro-regions (Table 2), except for the Baixo Pantanal micro-region, which suggests that its geographic peculiarities contribute to providing it with greater prominence.

Furthermore, regarding the Extractive industry, in 2009, the Baixo Pantanal region represented 55.6% of all jobs in the sector in the state. Meanwhile, in 2019 this percentage dropped to 48.7%, which suggests a drop only in terms of participation but not in absolute numbers (Table 2). Regarding the Manufacturing industry, the micro-region of Campo Grande concentrated 27% in 2009 and 24.1% in 2019. This industry's three largest micro-regions (Campo Grande, Dourados, and Iguatemi and Três Lagoas) combined accounted for 80.0% of all formal jobs in the segment in 2009. In 2019 this percentage was 73.4%, which also, like the case of the extractive industry for Baixo Pantanal, did not represent a drop in absolute numbers.

3.1 Analysis of the Location Quotient (LQ)

Table 3 shows the values of the Location Quotient, both for the Extractive and Manufacturing industries, considering the eleven micro-regions of Mato Grosso do Sul for 2009 and 2019. Regarding the extractive industry, it is clear, as mentioned above, that the Baixo Pantanal micro-region stands out, followed by the Bodoquena micro-region. Aquidauana also appears, but with less prominence.

In other words, the Extractive industry in Mato Grosso do Sul, based on the Location Quotient, stands out in the Northwest region of the state, unlike the Manufacturing industry, in which the three micro-regions mentioned (Baixo Pantanal, Aquidauana, and Bodoquena) are not so prominent.

Table 3: Location quotient in the micro-regions of Mato Grosso do Sul: Extractive and Manufacturing Industries (2009-2019)

Micro-region	Extractive Industries		Manufacturing Industries	
	LQ 2019	LQ 2009	LQ 2019	LQ 2009
Alto Taquari	0.30457	0.51388	1.01906	1.01216
Aquidauana	1.80622	3.43046	0.97791	0.93918
Baixo Pantanal	20.4994	24.5977	0.46565	0.40952
Bodoquena	10.9568	11.404	0.72715	0.73966
Campo Grande	0.53848	0.40517	1.01265	1.01488

Micro-region	Extractive Industries		Manufacturing Industries	
	LQ 2019	LQ 2009	LQ 2019	LQ 2009
Cassilândia	0.60579	0.86951	1.0108	1.00327
Dourados	0.16551	0.23953	1.02287	1.01903
Iguatemi	0.20567	0.30831	1.02177	1.01731
Nova Andradina	0.06801	0.04003	1.02554	1.02402
Paranaíba	0.14664	0.06723	1.02339	1.02334
Três Lagoas	0.41363	0.368	1.01607	1.01581

Source: Prepared by the authors based on the Ministry of Economy (2021).

Such level of specialization in the extractive industry, mainly in the micro-regions of Baixo Pantanal and Bodoquena, is evidenced in the Report on Mining in Mato Grosso do Sul CFEM 2019/ SEMAGRO-MS, when the State Department of Environment, Economic Development, Production, and Family Farming outlines the Mining profile in the State of Mato Grosso do Sul. Among other information, they highlight the main municipalities that have revenue in the mineral extraction activity, which are Corumbá (R$ 23,866,316.76) and Ladário (R$ 8,626,870.17), belonging to the micro-region of Baixo Pantanal, and Bela Vista (R$ 2,136,724.26), located in the micro-region of Bodoquena.

Regarding the manufacturing industry, the data analyzed here suggest a certain degree of specialization in all the micro-regions of the state, except in the micro-regions of Aquidauana, Baixo Pantanal, and Bodoquena. In this industrial activity sector, it is also observed that, although as pointed out in Table 1, there has been an increase of approximately twenty thousand jobs, there is very little change in the degree of specialization in the various micro-regions of the state of Mato Grosso do Sul, which denotes an equanimous growth in the number of formal jobs among the micro-regions.

Regarding the manufacturing industry, we observed, both in 2009 and 2019, a similar pattern of behavior among the micro-regions. In other words, there were no substantial changes among them, denoting that the production pattern in the state remained with practically the same model.

3.2 Analysis of the Redistribution Coefficient (RC)

Table 4 comprises the redistribution coefficient values for each economic sector in the state of Mato Grosso do Sul between 2009 and 2019.

Table 4: Redistribution coefficient of Mato Grosso do Sul: Extractive and Manufacturing Industries (2009-2019)

Economic Sector	Redistribution Coefficient
Extractive Industries	0.002003
Manufacturing Industries	0.06708

Source: Prepared by the authors based on the Ministry of Economy (2021).

According to Matei and Matei (2017) and Haddad (1989), the Redistribution Coefficient relates the percentage distribution of employment in the same economic sector over two time periods and examines whether there is any pattern of concentration or spatial dispersion over the period studied. Moreover, according to the same authors and in line with Lima et al. (2006), Redistribution Coefficients with values close to 0 indicate significant changes in the spatial pattern of location for that activity, and values close to 1 denote a significant redistribution.

Therefore, from the analysis of the redistribution coefficients shown in Table 3, we observe that in both economic sectors, extractive and manufacturing industries, their values are very close to 0, which indicates that there was no change in the spatial pattern of location of activities between 2009 and 2009 in the state of Mato Grosso do Sul.

3.3 Analysis of the Location Coefficient (LC)

In the following, Table 5 shows the location coefficient for the economic sectors, extractive industry, and manufacturing industry in 2009 and 2019. Matei and Matei (2017) clarify that such a measure determines regions' concentration patterns in certain activities.

Table 5: Mato Grosso do Sul Location Coefficient: Extractive and Manufacturing Industries (2009-2019)

Economic Sectors	2019	2009
Extractive industry	0.95886	0.96359
Manufacturing industry	0.90875	1.0966

Source: Prepared by the authors based on the Ministry of Economy (2021).

An analysis of Table 5 shows a concentration of formal jobs in the manufacturing industry in 2009. In other words, in 2009, there was a concentration of formal jobs in this sector within the state of Mato Grosso do Sul.

3.4 Relative Employment Participation

Finally, Table 6 shows the relative employment participation of the economic sectors studied compared to the total employment registered in the state of Mato Grosso do Sul during the 2019 and 2009 periods.

Table 6: Mato Grosso do Sul Location Coefficient: Extractive and Manufacturing Industries (2009-2019)

Economic Sector	2019	2009
Extractive industry	0.37%	0.35%
Manufacturing industry	13.65%	13.88%
Total	14.02%	14.23%

Source: Prepared by the authors based on the Ministry of Economy (2021).

It is clear from the data illustrated in Table 5 that the participation of the economic sectors, extractive industry, and manufacturing industry has remained stable in the phases studied, noting that the extractive industry, which has the lowest participation, was around 0.37%. While the manufacturing industry in both analyzed phases presented a relative employment participation of around 14%.

4 Final considerations

This study aimed to analyze the concentration of industrial employment in Mato Grosso do Sul in 2009-2019, justified by the fact that these are periods without major economic shocks, unlike 2010 and 2020. The first is due to the expressive growth rate, and the second is due to the Covid-19 pandemic, with economic effects contrary to 2010, especially regarding growth and employment.

This study proposes a regionalized analysis focused on the state of Mato Grosso do Sul, but without losing sight of the national dynamics. Therefore, industrialization occurred late in Mato Grosso do Sul and other Brazilian inland states. Moving into the state, it is evident that many municipalities still need significant industrial development. In other words, national disparities also repeat themselves in the state.

Da análise dos empregos nos setores da indústria extrativa e indústria de transformação, objetos de estudo deste artigo observou-se o acréscimo no número de empregos formais em ambos os setores econômicos. It is worth noting that the relative employment participation of these two sectors contributes to the generation of 14% of the formal jobs in the state of Mato Grosso do Sul. It should be noted that in this study, it was not possible to analyze the indirect jobs arising from these activities or the informal ones, nor even the impact of these activities in each micro-region.

Furthermore, despite the delay in industrialization, Mato Grosso do Sul has been gaining space as a generator of employment and income, expanding the supply of formal jobs. However, it is questionable whether this movement is perennial, especially in a scenario of services protagonism, resumption of agricultural activity as a generator of foreign exchange to the country, and industry within a process of increasing mechanization.

This question, among others, can be the object of studies, thus broadening the vision regarding the role of the extractive and manufacturing industry in the economy of Mato Grosso do Sul. Finally, we expect this study to provide subsidies for defining public policies to develop

the state via industrialization while recognizing the limitations imposed by space and methodology. In any case, the industrial development in Mato Grosso do Sul repeats what happened nationally: the concentration of industrial development in a few municipalities.

References

Bernardo, L. V. M., & Farinha, M. J. U. S. (2019). Análise do emprego turístico de Mato Grosso do Sul com o uso de medidas locacionais-2006 a 2013. *Interações (Campo Grande)*, *20*, 679-690.

Cruz, B. D. O., & Santos, I. R. S. D. (2011). Dinâmica do emprego industrial no Brasil entre 1990 e 2009: uma visão regional da desindustrialização.

Dalle Tese, Diogo; Mattei, Taíse Fátima. Medidas de localização e especialização para as mesorregiões de Santa Catarina. Revista Brasileira de Desenvolvimento Regional, v. 7, n. 2, p. 195-220, 2020.

Fochezatto, A. (2010). Desenvolvimento regional: recomendações para um novo paradigma produtivo. Três décadas de economia gaúcha. O ambiente regional.

Furtado, C. (2020). Formação econômica do Brasil. Companhia das Letras.

Gomes, T. N. (2016). A dimensão espacial do processo de reestruturação da indústria no Mato Grosso do Sul de 2000 a 2014.

Haddad, P. R., Ferreira, C. D. C., Boisier, S., & ANDRADE, T. A. (1989). *Economia regional: teorias e métodos de análise* (pp. 225-248). Fortaleza: BNB/ETENE.

Mattei, T. F., & Mattei, T. S. (2017). Métodos de Análise Regional: um estudo de localização e especialização para a Região Sul do Brasil. *Revista Paranaense de Desenvolvimento*, *38*(133), 227-243.

Medeiros, M. Z. D. (2014). Desenvolvimento regional da microrregião de Criciúma: um estudo sobre o desenvolvimento industrial.

Mello, J. M. C. (1998). O capitalismo tardio. São Paulo: Brasiliense, 1998.

Mesquita, F. N. (2014). Políticas públicas, produção de celulose e dinâmica territorial: o caso da microrregião de Três Lagoas, Mato Grosso do Sul.

Ministério da Economia. Relação Anual de Informações Sociais – RAIS. Disponível em: <https://bi.mte.gov.br/bgcaged/rais.php>. Acesso em: 19 out. 2021.

ONU, Organizações das Nações Unidas. Objetivos de desenvolvimento sustentável. Disponível em: https://odsbrasil.gov.br/. Acesso em: 29 out. 2021.

Paz, P. P., & Lamberti, E. (2020). A lógica industrial de Mato Grosso do Sul: algumas reflexões a partir dos incentivos fiscais. *ENTRE-LUGAR*, *11*(22), 169-196.

Pereira, R. C. O., & Gomes, C. A. (2004). O recente processo de industrialização de Três Lagoas-MS. *Econ. Pesqui., Araçatuba*, *6*, 50-65.

Santos, K. F., & Missio, F. J. (2021). Políticas Públicas de desenvolvimento regional em Mato Grosso do Sul. *Nova Economia*, *30*, 921-950.

Serra, J. (1982). Ciclos e mudanças estruturais na economia brasileira de após-guerra. *Brazilian Journal of Political Economy*, *2*(2).

Silva, J. C. M. da, & da Silva Filho, L. A. (2017). Panorama da Indústria nas Macrorregiões Brasileiras: Análise a Partir de Medidas Regionais e de Localização. *Revista portuguesa de estudos regionais*, (45), 27-47.

Tavares, M. D. C. (1972). Da substituição de importações ao capitalismo financeiro: ensaios sobre economia brasileira. *Biblioteca de ciências sociais. Economia Biblioteca de ciências socias (Zahar Editores)*.

Zamberlan, C. O., Nogueról, L. P. F., Sonaglio, C. M., & Zamberlan, J. F. (2010). Análise da industrialização sul-mato-grossense em face da industrialização brasileira. *Revista Brasileira de Gestão e Desenvolvimento Regional*, *6* (3)

---

[i] Atualmente é Analista de Tecnologia da Informação na Secretaria de Fazenda do Estado do estado de Mato Grosso do Sul e Mestrando no programa de Mestrado em Desenvolvimento Regional e de Sistemas Produtivos na Universidade Estadual de Mato Grosso do Sul, UEMS. Graduado em Tecnologia em Redes de Computadores (2005) / UNIDERP - Campo Grande - MS. Especialista em Projeto Implantação e Administração de Redes de computadores (2008) / UNIDERP - Campo Grande – MS.

[ii] Doutor em Teoria Econômica pela UEM - Universidade Estadual de Maringá - Maringá - PR (2018) e professor do curso de Administração da UFMS, campus de Paranaíba - MS. Possui graduação em Ciências Econômicas (2008) e Mestrado em Teoria Econômica pela Universidade Estadual de Maringá Maringá - PR (2014). Atua nas áreas de Economia Brasileira, Economia Política, Teoria dos Jogos, Economia Monetária, Mercado de Capitais e Desenvolvimento Econômico. É um dos autores do livro A dinâmica da dívida externa brasileira: de devedor externo a credor internacional (1964-2014), publicado pela Eduem em 2017. Atualmente, é mestrando em Desenvolvimento Regional e de Sistemas Produtivos, pela Universidade Estadual de Mato Grosso do Sul (UEMS) - Ponta Porã - MS, bem como coordenador do curso de Administração da UFMS-CPAR e da pós-graduação lato sensu em Gestão Estratégica de Organizações, oferecida pela UFMS.

[iii] Graduação em Administração pela Faculdade de Ciências Administrativas de Ponta Porã - MS (1994), Especialização em Planejamento Educacional, pela Universidade Salgado de Oliveira (1996). Mestrado em Produção e Gestão Agroindústrial pela Universidade Anhanguera - Uniderp - Campo Grande - MS (2005) e Doutorado em Administração pela Universidade do Vale do Rio dos Sinos - São Leopoldo - RS (2012). Atualmente professor de ensino superior nível V da Universidade Estadual de Mato Grosso do Sul - UEMS - Ponta Porã - MS. Tem experiência na área Agronegócios, Cooperativismo, Empreendedorismo e Desenvolvimento Regional.

[iv] Possui graduação em Ciências Econômicas pela Universidade Federal de Santa Maria - Santa Maria -RS (1996), mestrado em Engenharia de Produção pela Universidade Federal de Santa Maria - Santa Maria -RS(1999) e doutorado em Economia do desenvolvimento pela Universidade Federal do Rio Grande do Sul - RS (2012). Atualmente é professora efetiva da Universidade Estadual de Mato Grosso do Sul(UEMS) - Ponta Porã - MS, atuando nos cursos de graduação em Economia, Administração Pública(EAD) e no Programa de Pós-graduação em Desenvolvimento Regional e de Sistemas Produtivos (PPGDRS). Tem experiência na área de Economia, com ênfase em desenvolvimento. Atuando principalmente nos seguintes temas: mercado de trabalho, desenvolvimento e crescimento econômico, desenvolvimento regional/local, faixa de fronteira, métodos de análise regional(estrutural-diferencial e medidas regionais).

---

p. 15