

Brazilian Exports: Bibliometric Analysis from 2000 to 2020

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Abstract— *This article aimed to analyze some characteristics of publications on Brazilian exports made available in the SciELO database from 2000 to 2020. Based on a bibliometric research, 64 articles were analyzed that met the search criteria and search filters. The results point to a greater volume of publication in 2011, with the cities of São Paulo and Rio de Janeiro as the main origins of publications in the period. 93.75% of publications originate in public institutions. 32.81% of the articles (21) are of double authorship, 21.87% (14) published with three authors and 15.62% (10) of single authorship. As for the thematic groups, there was a predominance of the “Economy” category, followed by “Agricultural Commodities” and “Services”, confirming the expressive participation of Brazil in the agribusiness segment.*

I. INTRODUCTION

This paper analyzes the behavior of publications on Brazilian exports over the last two decades. The world economy has undergone significant changes in recent decades in response to major market and trade liberalization initiatives in many countries, with an increasing number of companies embracing international expansion through exports (Buckley & Strange, 2015). As the global economy has become more intertwined and interconnected, large companies from developed countries have shaped the globalization trend through their participation in international markets. Primary drivers of their increased participation have been the need to overcome intense domestic competition and exploit additional sales opportunities (Losilla, Engler & Otter, 2019).

Brazil has shown substantial growth in its exports, both quantitatively and qualitatively.

Quantitatively, it is considered the total volume of exported products, although considered, for the most part, products with low added value. Qualitatively, attention is drawn to the opening of new markets, especially in the last decade, serving countries that previously did not trade with the country.

This new configuration has aroused the interest of specialists from the most diverse areas of the market, in addition to growing interest as a research field in the academic environment.

It is known that the country has the great challenge, set for a long time, of enhancing the added value of its products; however, the use of new technologies in all stages of production and services has enabled the national industrial park to increase production capacity and efficiency. The abundance of natural resources gives Brazil an important competitive advantage, attracting the

attention of foreign companies that need these resources to function.

Other quite significant challenges facing Brazil are in the field of legislation. There is an urgent need to reduce the tax burden that weighs on producing companies and direct and indirect consumers, in addition to the high cost of labor that makes investments very unfeasible, increasing the risks considerably. That said, the present research aimed to analyze some characteristics of publications on Brazilian exports made available on the SciELO database from 2000 to 2020.

In addition to this introductory text, the article is structured in 4 more sections. Section 1 presents the theoretical basis; section 2 presents the methodological design of the study; section 3 presents the data and subsequent discussion; section 4 was reserved for the conclusion, followed by the references.

II. THEORETICAL REFERENCE

Identifying the target market is one of the most important steps to export safely and involves issues that go beyond the price charged. The existence of trade barriers, the commercial risk presented by the country, the cost of freight, the prospect of establishing lasting commercial relationships and not just an eventual sale, the conditions that can contribute to consolidating your product and brand in that market, among others, are important aspects to be considered (Watson, 2016).

Knowing the real opportunities is something that can be developed and improved as your business grows; however, this development is unique and is linked to many years of trial and error (Siscomex, 2021). The objectives of market research are: to select markets for the sale of the product; detect trends and expectations; recognize competition; understand and assess opportunities and threats.

In general, there are five basic criteria that should be considered to assist in the selection of potential export markets: 1) geographic factors, for market selection, based on the many similarities between the domestic market and the target market, which makes it possible to expansion with minimal need for adaptation; 2) cultural factors, verifying to what extent the habits of people in the target market differ from the domestic market; 3) economic factors, asking about the economic situation of the target country and the consumer's purchasing power; 4) technological factors, which concerns meeting the technological standards of the target market and adequate design; 5) sociopolitical factors, since, in exports to

countries with which there are trade agreements, one can obtain advantages over competitors (Siscomex, 2021).

International Trade can be understood as the set of operations for the exchange of goods and services between different countries (Fundação Instituto de Administração, 2019). These exchange operations include manufactured goods, commodities, services, labor and even the movement of capital. Furthermore, it generates an increase in international barriers that help to protect the development of local companies and, in this way, contributes a large share of the Gross Domestic Product.

Some regions of the planet have an abundance of natural resources or better climate and soil conditions for certain crops, and there are countries that have specialized labor in a certain segment, while others have a deficit. For this reason, according to Bueno (2022), the main reason that leads countries to trade among themselves is the diversity of production, since no country is self-sufficient in everything it needs, therefore, it exports its main goods and services at the same time, while importing those whose domestic production is insufficient or non-existent.

The performance of a country's international trade can be viewed through its trade balance. This indicator records imports and exports of goods and services. If its balance is positive, it means that the country is exporting more than it is importing. If it is negative, the value of imports certainly exceeds that of exports. Due to the challenges of the Brazilian trade balance, it is argued that "it is necessary to achieve positive results in the trade account through the growth of exports, and not through the fall in imports" (Pinheiro, 2002, p. 7). Thus, Brazil should seek a large enough increase in exports, not only to generate trade balances, but also to enable an increase in imports, which will be necessary in a new cycle of investment and growth, stimulating efficiency, increasing productivity and reducing their external vulnerability in international trade.

Developing countries usually export many products with little added value, as is the case of Brazil, where the main products traded internationally are soy, oil, cellulose and iron ore. Meanwhile, developed countries, such as the United States, Germany and Japan, export products with high added value. The importance of international trade for a country's economy is due to several factors, the main one being the guarantee of selling the surplus production of a given country, while allowing the consumer market to have access to non-industrial goods available locally (Bueno, 2022).

From a historical perspective, for many years, the United States of America was Brazil's main economic partner. In 2000, around 23.9% of exports were destined

for the North American country; However, a new international reality was taking hold, the rise of emerging countries such as China, India, Russia, Brazil, which together with South Africa would become the so-called “BRICS” for having in common the characteristic of an accelerated development tending to present possible positive results compared to developed countries (OEC, 2022).

Between 2000 and 2012, world exports grew by 177%, corresponding to an annual average of 8.9%, with a reduction in absolute value in 2009 (Fligenspan, Cunha, Lélis & Lima, 2015). Exports of products from Brazilian agribusiness, in addition to showing significant growth, in two decades there was a change in the dynamics, especially regarding the countries of destination. Figures 1 and 2 present the volume (%) and the change in the dynamics of Brazilian exports of agricultural products at two different times (2000 and 2019).

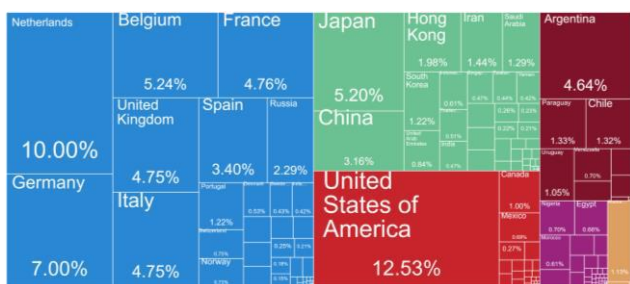


Fig.1. Destination of Brazilian exports of agricultural products – year 2000

Source: Atlas of Economic Complexity (2022).

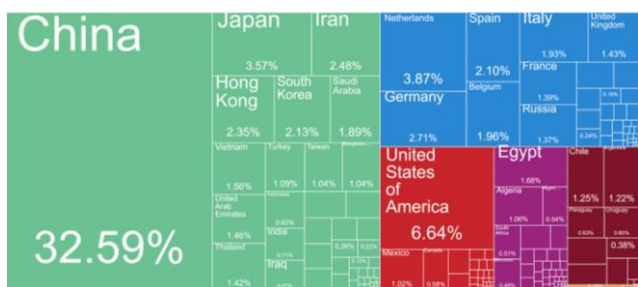


Fig.2. Destination of Brazilian exports of agricultural products – year 2019

Source: Atlas of Economic Complexity (2022).

In two decades, the configuration of Brazilian exports underwent a substantial change. In 2000, China represented 3.16% of Brazilian exports, while in 2019 it corresponds to 1/3 of national exports (32.59%). Another specificity refers to the United States, which presented a decrease of approximately 50% in this period. However, attention should be paid to the fact that these data reflect a

photograph of a given moment in the country's economy, notably with regard to the flow of exports (Negri, 2005).

According to Negri (2005), China, Brazil's main trading partner, was responsible for the movement of US\$ 67 billion in 2019 and should become, still in the first half of the 21st century, the largest economy on the planet. In terms of trade, the country is one of the three largest global players, along with Germany and the United States. In the mid-1980s, China represented around 1% of world exports – equivalent to Brazil's weight – reaching, in 2008, a share of 8.9%. From the beginning of the 1990s, China became the developing nation that absorbed the most foreign direct investment (Cunha, Bichara, Monsueto & Lélis, 2011).

Jenkins (2014) states that the most significant change in the global economy over the past three decades has been the re-emergence of China as an economic power. Its gross domestic product has grown by more than 9% per annum since 1980, and China is now second only to the USA in terms of output. Over the same period, the opening of China has led to a major restructuring of the world economy. Its share of world trade increased from around 1% in 1980 to more than 10% in 2010, when it overtook Germany as the world's leading exporter. The dynamic expansion of the Chinese manufacturing sector into world markets has been a major challenge to other developing countries, particularly those that had developed significant manufactured exports.

In short, the phenomenon of the rise of the Asian country as a world power divides opinions. Cunha, Bichara, Monsueto and Lélis (2011) record that, on the one hand, analysts believe that Chinese growth, intensive in the demand for natural resources, tends to create a window of opportunity for the expansion of exports in the region, as well as for the attracting investments in the infrastructure area; on the other hand, some fear that specialization in the production and export of natural resources, associated with competition from Chinese products in domestic and third markets, pose a serious risk to economies with more mature productive structures.

Commodity refers to primary or semifinished products of the agricultural or mineral sector, standardized worldwide, with prices quoted and negotiated by the main commodity exchanges. Such goods link an entire production chain and agents that make up the global market, present in different nations (Frederico, 2013).

As for the contribution of commodities to the Brazilian economy, Teixeira, Coronel and Oreiro (2021, p. 177) point out that:

As of 2003, Brazil has gone through a growth process heavily influenced by exports, mainly as a result of the rise in the commodity price index.

This scenario put the Brazilian economy on a positive growth trajectory and influenced the improvement in socioeconomic indicators [...].

The country continues to experience sustained growth in the volume of commodity production and exports; the case of the agribusiness segment that has supported the national GDP for some years is emblematic. The Brazil exports low value-added products; however, studies have pointed to a quality exchange, where countries and development export a particular product with high quality in exchange for importing the same product in lower quality (Asche, Bellemare, Roheim, Smith & Tveteras, 2015). Krammer, Strange and Lashitew (2018) shown that political instability and informal competition have strong effects on the export propensity of emerging economy companies, while export intensity depends on the availability of skilled workers and access to external technologies via licensing.

The volume of products exported by the sector showed strong and practically continuous growth over time. Brazilian meat exports to China also increased, especially beef, making the Asian country's share of total Brazilian agribusiness exports reach 33.7%. In addition, soy beans continued to be the main product sent to the country, which purchased 73% of all soy beans exported by Brazil in the same year. China is the main destination for beef (48%) and pork (56%) and the second main destination for poultry meat (21%), being the main buyer of cotton lint, acquiring over 30% of the Brazilian product in 2020 (Cepea, 2020). China also stands out as the largest soy importer in Brazil (Péra, Bartholomeu, Su & Caixeta Filho, 2019).

In the case of cotton, studies show growth in Brazil in terms of export volume, in addition to vigorous growth in competitiveness in the international market. The data show that cotton exports are strongly directed to Asia (Sossa, 2022).

Also, according to Cepea (2020), the year 2020 was extremely favorable to agricultural exports, so that the exported volume of practically all Brazilian agribusiness products grew, except pulp, orange juice and corn, which showed drops of 3%, 10% and 19%, respectively.

The main products exported to Eurozone countries were forest products; coffee; fruit and orange juice. With an approximate share of 7% of total Brazilian commodity exports; the products most traded with the US are similar to the European case, with emphasis on the forestry, fruit, orange juice and sugarcane ethanol sector. On the Other hand, the trade in agricultural commodities—products including cotton, coffee, cocoa, grains, oilseeds, and livestock—is a mainstay of the global economy,

providing food, fuel, and fiber to consumers around the world. The long, complex supply chains that process and transport these products bridge the gap between producers and consumers but are criticized for masking negative socioenvironmental impacts and obfuscating the allocation of responsibility for these impacts. A particular concern for commodities produced in the tropics is habitat destruction—the loss and degradation of forests and other natural ecosystems to expanding agriculture (Ermgassen et al., 2022).

In the current world scenario, international trade plays a fundamental role in the development of countries (Silva; Lunelli; Cleto, 2020, p. 171), it is possible to understand the relevance of exports to the economy, so that in the Brazilian case they have the function to generate foreign exchange that are applied in the purchase of inputs for the industry and in the payment of external commitments (Abreu, 2015).

Since the colonial period, the country has been marked by the exploitation of metals and, in the agricultural area, by the planting of sugarcane and, later, by coffee (Contini, Pena Júnior, Santana & Martha Júnior, 2012). Thus, historically Brazil has a low volume of imports of agricultural products and exports are high, resulting in significant trade balances (Santos, Avelar, Shikida & Carvalho, 2016).

Brazilian agribusiness is the engine for the positive result in the trade balance, with the balance going from “approximately US\$ 11 billion in 1989 to US\$ 77.5 billion in 2011, in nominal values”, according to Contini, Pena Júnior, Santana and Martha Júnior (2012, p. 91-92). In this sense, the importance of commodity exports to the Brazilian economy in recent decades becomes evident (Silva, Lunelli & Cleto, 2020).

According to Abreu (2015, p. 5), “agribusiness exports solidified Brazil's presence in the international food, fiber and bioenergy market and created strong bonds and interdependencies”. Cooperatives have also exerted a strong influence, as they facilitate processes for producers, as they eliminate middlemen and reduce costs, consequently becoming an advantageous way of organizing that, in turn, impacts exports. As an example, between 2006 and 2007, exports from Brazilian cooperatives increased by 16.5%, equivalent to USD 3.3 billion (Araújo & Silva, 2011).

Therefore, “imports and exports provide an expansion of consumer markets and the monetary flow characterized by the inflow and outflow of foreign exchange” (Silva, Lunelli & Cleto, 2020, p. 172). Within this context, according to Contini, Pena Júnior, Santana and Martha Júnior (2012, p. 93) “Brazil has stood out as a

major global player in various agribusiness products, both in production and export”. With this, it can be said that “exports have played a very important role in stimulating the growth of our agriculture, so that their dynamism has supplanted the growth of external and internal demands” (Abreu, 2015, p. 3).

III. METHODOLOGY

Originally, bibliometric analysis started in information sciences (Osareh, 1996). Bibliometric methods provide scholars and researchers with several benefits. The most commonly mentioned advantage of bibliometric approaches is their objectivity (Kücher & Feldbauer-Durstmüller, 2019).

Bibliometric indicators are increasingly being used as a tool for research performance evaluation. These indicators are based on bibliographic databases, which are designed primarily for information retrieval (Hood & Wilson 2003). Bibliometric methods are quantitative by nature, but are used to make pronouncements about qualitative features. This is, in fact, the major purpose of all sorts of bibliometric exercises, to transform something intangible (scientific quality) into a manageable entity (Wallin, 2005). In general, bibliometric methods can be used for performance analysis and scientific mapping (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2011a).

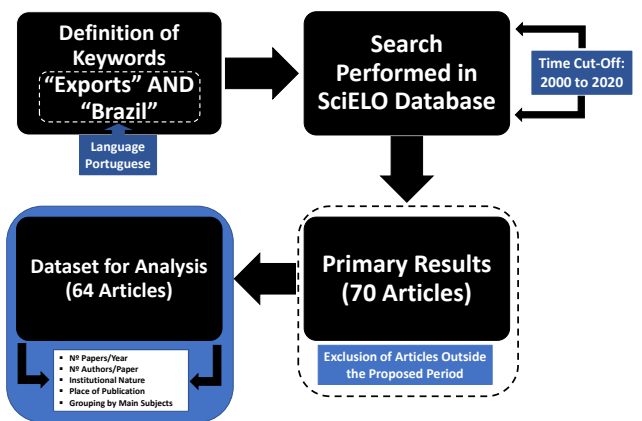


Fig.3. Methodological design of the Research

The present work used the bibliometric method and carried out a descriptive research, whose purpose is to describe the characteristics of a certain population, phenomenon or the establishment of relationships between variables (Gil, 1999). In addition, a qualitative-quantitative analysis was carried out, and according to Malhotra (2001, p.155), “qualitative research provides a better view and understanding of the context of the problem, while quantitative research seeks to quantify the data and apply

some form of statistical analysis”. As for quantitative research, this seeks to identify common characteristics in scientific articles on a certain explored topic (Barros & Lehfeld, 2007). The keywords used in the search were “Export” and “Brazil”. Figure 3 presents the methodological design implemented in the study.

The time frame adopted was the period from 2000 to 2020. Other filters applied were the type of document in the article format and the language Portuguese. The search resulted in 70 articles, of which 6 were excluded because they were outside the proposed period for the research, leaving 64 documents to be analyzed. The set of documents extracted from the SciELO database in March 2022 was analyzed with the following information: number of articles per year; institutional nature; place of publication; number of authors per article and grouping by subject.

As support for operationalization, systematization of information, organization and presentation of results, Google Sheets software was used.

IV. DATA ANALYSIS AND DISCUSSION

The total number of articles published in the period under analysis is distributed over the years in a very heterogeneous way. Two opposite poles can be observed: the year 2002 with 0 publications and the year 2011 with 10 publications. Figure 4 shows the distribution of the number of articles over the years.

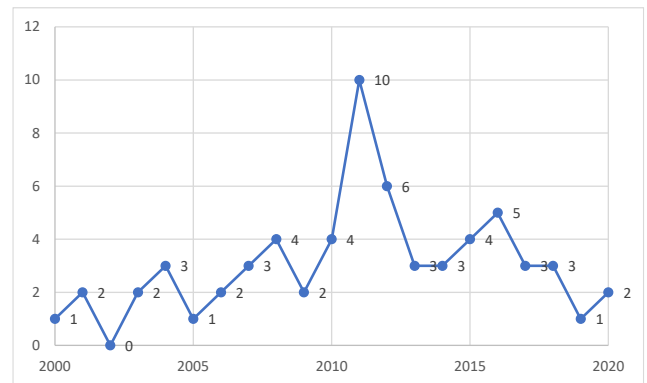


Fig.4. Articles published by year in the period (2000-2020)

Source: Research data.

Taking this asymmetry into account, the arithmetic average of publications was approximately 6 articles (5.82) per year, which is not very representative since there are strong outliers. Thus, it was decided to calculate the median value, obtaining a value of 3 for this measure. Of the 21 years analyzed, 9 are below the median, 6 are above the median and 6 are above the median. Of the set of articles analyzed (64), approximately

1/3, equivalent to 32.81% were prepared with double authorship (2 authors), followed by 14 with three authors (21.87%) and 10 with single authorship (15, 62%). Table 1 systematizes this information for better visualization.

Table 1. Number of articles and number of authors

n° Authors	n° Articles	%
1	10	15,62
2	21	32,81
3	14	21,87
4	9	14,06
5	5	7,82
6	2	3,13
7	1	1,56
8	2	3,13
Total	64	100,0

Articles with 4, 5, 6, 7 and 8 authors added together (19) reach 29.7% of the total published, still below the first place with double authorship (21 articles).

As for the nature of the institutions of origin of the publications, 60 (93.75%) come from public institutions and only 4 (6.25%) from private institutions, which are close to the parameters published by the Brazilian Academy of Sciences, which points out that 95% of publications originate from federal and state public universities (ABC, 2019). Table 2 summarizes this information.

Table 2. Number of publications by institutional nature

Institution	Number of Publications	%
Public	60	93,75
Private	4	6,25
TOTAL	64	100,0

As for the place of publication, 28 articles have the state of São Paulo as their origin, equivalent to 43.75%, followed by the state of Rio de Janeiro with 14 articles, corresponding to 21.87% and the state of Minas Gerais with 10 articles. (15.62%). Table 3 presents this information systematically.

Table 3. Number of articles published by municipality and Federation Unit (FU)

Counties	FU	Number of Articles
Belo Horizonte	MG	3
Botucatu	SP	1
Brasília	DF	1
Campinas	SP	3
Curitiba	PR	2
Fortaleza	CE	1
Goiânia	GO	1
Guarulhos	SP	1
Jaboticabal	SP	7
Lavras	MG	2
Manaus	AM	3
Manguinhos	RJ	1
Maringá	PR	1
Niterói	RJ	2
Piracicaba	SP	4
Recife	PE	1
Ribeirão Preto	SP	1
Rio de Janeiro	RJ	11
Salvador	BA	1
Santa Maria	RS	1
São Paulo	SP	11
Viçosa	MG	5
Total		64

The city of São Paulo, capital of the state, leads with 11 publications, followed by the cities of Jaboticabal (7) and Piracicaba (4). Similarly, in the state of Rio de Janeiro, the state capital, the municipality of Rio de Janeiro, tops the list, originating 11 articles, followed by the municipality of Niterói with 2 articles.

The articles were classified into 10 groups according to the theme of each paper: Agribusiness; Agricultural Commodities; Environmental Commodities; Mineral Commodities; Services; Economy; Fruit growing; weapons; Deforestation and Others. Figure 4 presents the results found in this grouping.

The “Economy” group leads with 13 publications, corresponding to 20.31% of the total; followed by the “Agricultural Commodities” and “Services” groups with

11 publications each, equivalent to 17.18%. The third place is occupied by the groups “Agribusiness” and “Fruticulture”, each with 8 publications, equivalent to 12.5%. However, for the purposes of analysis, one can consider the combination of the Agribusiness and Fruticulture groups, which would bring together 16 publications, comprising 25% of the total publications.

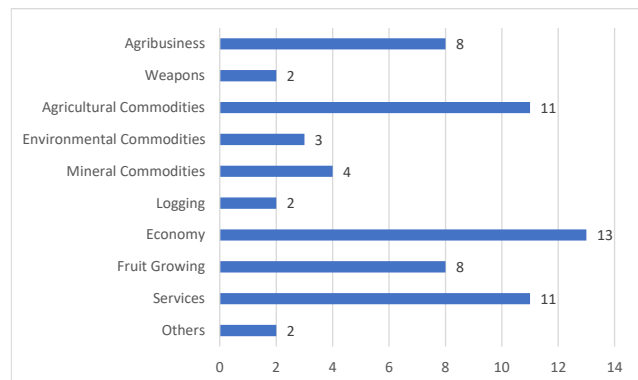


Fig.5. Grouping of articles by themes

The publications included in the “Economy” group included studies on foreign trade, exports, impacts of bilateral trade, international market trends, economic and industrial growth, among other similar topics.

As for the “Agricultural Commodities” group, topics such as technology and internet services, IT outsourcing, accounting, energy policy in Brazil, strategic planning of cargo flow, among others, were addressed. The “Services” group addressed more expressively the production of sugar, coffee, cotton, potatoes and eucalyptus.

The “Agribusiness” and “Fruticulture” groups addressed issues such as the management of phytosanitary products (pesticides), food production in general, with emphasis on chicken meat and potato production (Agribusiness) and the potential for fruit exports in general, diseases in citrus and product-specific diseases (Fruticulture). The “Mineral Commodities” group addressed topics such as cellulose, ethanol and aluminum production. “Environmental Commodities” focused on topics such as wood and water. The weapons group discussed the export of equipment for military use. “Deforestation” limited itself to discussing the degradation of pastures and deforestation. Finally, the “Others” group, which included studies on contemporary art exhibitions and the presence of salmonella in equine meat in northeastern Brazil.

V. CONCLUSION

The study aimed to analyze some characteristics of publications on Brazilian exports made available in the

SciELO database from 2000 to 2020. After applying the search criteria and filters established for the collection, the search resulted in 64 articles that were analyzed in order to meet the research objective.

The year 2011 had the highest number of publications of the entire period, a period that coincided with the economic crisis of the European Union, a moment of direct interference in exports to Europe, a moment in which Brazil's commercial partnership with Asian countries gained strength, especially China, which continues to be the main destination for Brazilian products, followed by the United States.

Commodity exports, which in Brazil represent more than 60% of exported goods, are a predominant feature in underdeveloped countries, which provide low value-added products, while developed countries mainly export highly technological products. On the other hand, it is known that agribusiness has a significant share of the national GDP, with Brazil being one of the largest producers of agro-industrial products (Nyssen, Oliveira & Carraro, 2021; De-Carli & Oliveira, 2021).

The main limitation of this research resides in the fact that it uses a single database to collect documents, in addition to the restriction to only publications in Portuguese. As a suggestion for a future research agenda, the search scope can be expanded, including international journal indexing bases, in addition to the inclusion of theses and dissertations that often do not become articles published in journals/periodicals.

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