DISCUSSION PAPER

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CONTENTS

ABSTRACT

In this article, we discuss the current pattern of territorial reconfiguration of the Brazilian industry, its current forms, and motivations in order to problematize some of the most significant challenges of the current regional issue. We have brought new evidence of how it keeps deconcentrating in the context of the persistent decline in the industrial participation in the national economy. We resumed the analysis on the micro-regional scale that showed the following results.

1) Relevant industrial agglomerations (RIAs) continue to flourish in all regions of the country.
2) Their preferred place is no longer the polygonal area of Diniz-Crocco (1996).
3) In terms of industrial job creation, the new RIAs for the period 1995-2015 generated more jobs than those established before 1995.

Keywords: industry and territory; territorial reconfiguration; industrial dynamism; regional development.

SINOPSE

Discutimos, neste texto, o padrão atual de reconfiguração territorial da indústria, suas formas atuais e suas motivações, de maneira a problematizar alguns dos desafios mais significativos da questão regional brasileira atual. Trouxemos novas evidências de como ele se mantém desconcentrando em contexto de persistente declínio da participação industrial na economia nacional. Retomamos a análise na escala microrregional, que mostrou os resultados resumidos a seguir.

1) Aglomerações industriais relevantes (AIRs) continuam florescendo em todas as regiões do país.
2) Seu lugar preferencial não é mais a área poligonal de Diniz-Crocco (1996).
3) Em termos de geração de empregos industriais, as novas AIRs do período 1995-2015 geraram mais empregos que as já estabelecidas antes de 1995.

Palavras-chave: indústria e território; reconfiguração territorial; dinâmica industrial; desenvolvimento regional.

1 INTRODUCTION[1]

This article discusses the current pattern of territorial reconfiguration in the industrial sector, its current forms, and motivations to point out some of the most significant challenges of actual Brazilian regional experience. Regional deconcentration in industry sector is relatively recent in the country, occurring just in the 1970s and 1980s. It came at a time of expansion and diversification of its productive branches when the industry was a dynamic engine of the Brazilian economy. However, since the 1990s the scenario has changed: the regional deconcentration process has persisted at a slower pace but associated with a persistent decline of the industry's share in the national economy embedded in the context of a significant reduction in its intra-sectoral diversification.

Significant economic and regulatory transformations in the world economy since the 1990s – commonly understood by globalization – led to changes in the macroeconomic regime as well as in the Brazilian institutional environment, redefining itself into a deeper financial and commercial openness. In this new context, the national economy has faced fierce competition from external partners at a much more significant level. The industrial sector with relatively low structural competitiveness capacity in most of its branches began a long-time trajectory of low production growth, permanent declines in average productivity, and an increase in imported components in total production.

Even facing a debilitating framework stablished for the post-1990 period, the regional deconcentration of the sector has not been paralysed. In fact, a notorious point of the recent period is that the industry's territory has been expanding simultaneously with the loss of relevance of the industrial sector in the composition of national economy as whole. Since then, the territory became a crucial asset for the expansion of certain productive activities very present in the regions of lower level of development: those directly linked to the natural resource base and those intensive in relatively low labor costs.

One first aim is to investigate the industry existing potential to lead regions to a higher level of sectoral differentiation, by increasing their added value, and regional per capita incomes. For that an analysis is focused on whether changes in the structure of its groups of activities are more in line with natural-resource specialization type or, on the contrary, if they are mostly in the direction

1. This study was undertook in the context of the Project Territories of Industry in Brazil in the 21st Century (*Territórios da Indústria no Brasil do Século XXI*) sponsored by Dirur/Ipea. It refers to a revised version of an article published with the same title presented to the XVI International Seminar of Latinamerican Researchers in Globalizatin and Territory (XVI Seminario Internacional de la Red Iberoamericana de Investigadores sobre Globalización y Territorio) held in Blumenau, Santa Catarina, Brazil, November 25-27, 2020.

of product differentiation, economies of scale and incorporation of technological innovation. In this sense, the ongoing regional industry deconcentration process expresses what types of locational preferences in the country?

In addition, it is explored the combination of macro and microregional territorial scales directly related to processes, forms, and characteristics of regional industry's location for the post-1990 deindustrialization. Public policies implemented by several federal governments are briefly investigated as possible sources of territorial reconfiguration. In particular, one tries to identify and discuss alternative vectors of regional policy applied to prevent or modify trends associated to deindustrialization and regressive specialization; or even to induce structural changes in regions with lower industrial tradition. By bringing up such policy instruments, it is suggested that further analysis needs to be made on perceived government's limitations.

2 THEORETICAL AND CONCEPTUAL REFERENCES

The industrial sector has been treated in the debate of national and regional development strategies as crucial for productive modernization, ensuring diversification of social added value, and obtaining high incomes. Since the inaugural reflections of the structural change' thinkers as Myrdal (1957), Hirschman (1961), Furtado (1961) and Kaldor (1970), alongside recent authors such as Rodrik (2007), Stiglitz (2015), Bresser-Pereira, Nassif and Feijó (2016) and Nassif et al. (2020), discussions and recommendations on strategies are deeply concerned to social and economic transition paths designed to reduce the presence of low productivity sectors with low wages (agriculture) towards a situation in which high productivity and high wages sectors (mainly in the industry) are predominant.

A decisive point of the debate on sectoral modernization is that within the industry – based more than any other type of activity on the so-called economies of scale – the rate of evolution of production becomes permanently higher than the rate observed in activities that suffer intrinsic limitations of scale (agriculture and services in general). In an analogous reasoning, countries, or regions whose industries flourish and consolidate tend to establish a higher rate of economic growth than those without such activities (Kaldor, 1970).

For similar reasons, contemporary authors in the regional debate (within the nation) understand industrialization as a crucial measure to overcome regional disparities. In Brazil, in addition to Furtado (1959), who had a referential role in the proposition of overcoming the absolute and relative decline of lagged regions through industrialization, Cano (1985; 2012), Diniz (1993; 2019), and Brandão (2019a) have warned about the relevance of a robust industrial sector in

development strategies. Going further, it has been of great concern to see how the weakening of the industry and its intersectoral and interregional connections are affecting the course of the regional deconcentration process.

If during the period 1930-1980 the industry commanded the growth of the Brazilian economy, producing extensive incentives of differentiation for sectoral and regional modernization, since the 1990s the channels for growth transmission throughout other sectors became increasingly reduced. The economy has entered into a path of low growth in per capita income. Associated with that, expansionary cycles have become much more unstable and shorter. The industry, the flagship of the productive dynamics, became incapable of technological renewal, several industrial branches disappeared from the country. It is feared that the country could be stuck in the middle-income trap since its industrial structure has not been able to put itself on a path of diversification towards activities of increasing incomes.

It has been widely observed, with apprehension, over the 1990-2018 years, the consolidation of a vector of industrial deconcentration associated with the weakening of this sector in the national productive structure. This phenomenum resulted, on the one hand, from the orientation of the Brazilian economic integration to international financial and productive markets in the mid-1990s. The adoption of an overvalued exchange rate regime and high interest rates to encourage the entry of foreign capital, measures implemented to facilitate imports and hamper exports, contributed to harming industry.

On the other hand, also operating against the industry, the international demand upsurge for national agromineral commodities from mid-2000s to this day. The so-called external drive has been encouraging – through the appreciation of the terms of exchange – the transfer of productive resources from industrial activities to agriculture and extraction of ores (sectors with increasing external demand), facilitating the national imports of inputs and final goods, and for these reasons weakening domestic demand for industrial goods (Macedo, 2010; Pinto, 2013). Although we agree with the importance of the external cycle, through exchange rate appreciation and facilitations to increase the imported components, for weakening the industry, it should be recorded the existence of public policy efforts to create a vector of resistance in the industry to maintain the level of activity and employment, even if the regressive tendency was not completely overcome.

Our argument, still little treated by recent literature, states that some efforts carried out by successive federal administrations, through 2003-2015, tried to change the negative path observed. Firstly, by stimulating the expansion and reinforcement of sectors specialized in intermediate, durable and non-durable goods. Secondly, large federal investments federal investments for infra-structure and oil and gas chain were decisive for regional deconcentration of industry. In the

first case, because it allowed regions in which the labor cost proved to be advantageous become more competitive in the production of these goods. In the second case, because a significant amount of federal investment for North, Northeast, and Midwest regions contributed to speed up their GDP growth rates, either directly by the amount of public expenditure realized, or indirectly by the attraction of private businesses created by the new public infra-structure.

In sum, territorial deconcentration of the industry was benefited not only from the market forces – the rising in the production of commodities in natural resource abundant regions (Amazon and Midwest) – but also from governmental decisions – public investments in infrastructure as well as public funding for private branches of industry linked to durable and non-durable consumer goods or industry groups based on natural resources and low-cost labor. In both strategies the less developed regions benefited most by private and public investments.

3 INDUSTRY AND TERRITORY IN BRAZIL: HISTORICAL PATTERNS AND NEW TRAJECTORIES FOR 1995/2018 PERIOD

Historically, Brazilian industrial development can be traced in association with territorial disparities as follows. The first moment, 1930/1970 decades, when accelerating industrial growth rates were accompanied by increasing regional disparities. The state of São Paulo (Southeast region) became the epicenter of modern industry and concentrated 39.4% of the national Gross Domestic Product (GDP) in 1970 and 56.4% of the national Value of Industrial Transformation (VIT) (IBGE).

In a subsequent phase, during the 1970's and 1990's, there was a substantial decreasing in São Paulo's share in the national industry sector. Rising urban agglomeration costs and diseconomies in São Paulo associated with investments made by the federal government infra-structure in the poorest regions – especially in the Amazon, Midwest, and Northeast regions – resulted in reduction of regional imbalances (Cano, 1985).

Onwards the 2000s, the expanding global demand for agricultural and mineral commodities had been much more relevant impacts on these activities than on industrial ones. The external vector, with a shift in the exchange rate in favor of commodities, undoubtedly stimulated a reconversion towards activities related to natural resources and with small benefits to the industrial park (Macedo, 2010; Pinto, 2013; Sampaio, 2015; Monteiro Neto and Silva, 2018; Negreiros and Monteiro Neto, 2019). In view of these constraints, one can ask how exactly industrial activity behaved along the territory and the central characteristics of the ongoing territorial reconfiguration process. Let us look at the development of such issues.

3.1 Industrial sector is not the same anymore: is small and less robust

Over the decade, changes in the industrial sector were directed to the loss of structural competitiveness and reduction of the relative weight of the industry in the Brazilian economy. We observed that the Gross Value Added (GVA) of manufacturing sector was reduced to just under half of what it was in the early 1990s: it went down from 30.1% of the total national GVA in 1990 to 25.2% in 2000, to 15.0% in 2010 and reached 12.4% in 2017.[2]

Specific defining characteristics of sectoral regressivity accompanied the phenomenon of deindustrialization.[3] Some "diseases" affected the industry over 1990-2015, which, in summary, can be understood by the predominance of the following conditions: i) existence of low growth rates for the VIT; ii) low levels of productivity; iii) an increase in the imported component in the gross value of production; and iv) the loosening of links among intersectoral chains (Mollo and Takasago, 2019; Monteiro Neto and Silva, 2018; Sarti and Hiratuka, 2017; Morceiro, 2016; De Negri and Cavalcante, 2014; Galeano and Feijó, 2013; Cano, 2012).

Data organized in table 1 are revealing of this ongoing process. The growth rate of the VIT for the whole industry (manufacturing and extraction branches), across 1996/2018, was only 1.6% annually in the period. In the manufacturing sector it was even lower, of 1.1% annually. The average labor productivity (VIT divided by the Employed Population – EP) in manufacturing fell down in the same period to 90% in 2015 relatively to the level achieved in 1996 and, eventually reaching only 86% in 2018 than it had been in 1996. The high growth of extractive activities, impacted by the expansion of global demand for its products, has not proved to be strong enough to cause driving effects on the rest of the industry. The 9.8% annual pace of extractive activities between 1996/2018, for example, did not affect the manufacturing industry, an activity that remained at very low rates in this period.

2. Available at: <https://bit.ly/3NNXPg6>.

3. Studies conducted by Cano (2012), Sampaio (2015) and Severian (2021), among others, have converged to the similar results that signaled to the loss of industrial productive density. In terms of diversification and tecnological advancements based on typpologies of industrial activities – high technology, medium-high, medium-low and low – both studies observed persistent loss in the level of technological improvements. Severian (2021) has shown that the two groups of high and medium-high technology together have lost their share relative to the total of the industry from 30.1% in 2010 to 25.5% in 2018. For its turn the low technology group of activities increased its share from 42.2% to 46.3% in those same years.

TABLE 1

Evolution in VIT, average productivity (VIT/EP) and industry sectoral composition (1996-2018)

Types of industrial activity	VIT growth rates				Productivity per person (VIT/EP) number-index (1996 = 100)				VIT (%) relative composition – industry by competitive factor			
	1996-2018	1996-2005	2006-2015	2016-2018	1996	2005	2015	2018	1996	2005	2015	2018
Total	**1.6**	**1.5**	**2.3**	**0.4**	**100**	**90**	**98**	**96**	**100**	**100**	**100**	**100**
Extractive	9.8	17.7	5.3	11.8	100	238	256	326	2.3	8.6	10.8	12.5
Manufacturing	1.1	0.8	1.9	-0.9	100	85	90	86	97.7	91.4	89.2	87.5
Industry groups by competitive factor												
Natural resources	3.5	4.4	3.6	1.3	100	119	135	138	34.3	44.2	50.3	52.0
Labour	0.0	-1.8	3.3	-3.8	100	69	83	78	14.3	10.6	11.3	10.2
Escale	0.3	0.6	-0.1	2.4	100	88	84	84	35.6	32.6	25.9	26.8
Differentiated	-2.0	-2.2	-1.5	-3.3	100	70	67	60	13.4	9.6	7.0	6.0
Science based	5.0	4.6	8.8	-4.3	100	77	78	44	2.3	3.0	5.6	4.9

Sources: Raw data: VIT and employed persons (EP) available in Annual Industrial Production Report (Relatório da Produção Industrial Annual – PIA). National Statistics by IBGE. Deflator: Agreggate Price Index, Getulio Vargas Foundation (IPA-FGV).

Obs.: Year 2015 = 100.

Analyzing the industry by a competitive factor typology adopted by OECD (1987), according to which activities are characterized in 5 groups: resource-intensive, labor-intensive, scale-intensive, industries with differentiated technologies and science-based technologies,[4] we can see that the industry groups more linked to the availability of natural resources and labor than to technological evolution or higher added value have gained prominence in the composition of the industrial sector: the first two groups together have gone up from 48.6% in 1996 to 61.6% of the total in 2015 and continue to expand in the recession, up to 62.2% in 2018.

Industries based on scale and advanced technologies, on the contrary, had their share reduced from 35.6% in 1996 to 26.8% of the total in 2018. Here is also more evident the absence or the limitation of intersectoral multiplier effects in the recent industrial cycle. Growth in natural resource-related activities, with rates close to 4% annually in the 1996-2005 and 2006-2015

4. See concept and application of this typology in Borbély (2004), and Monteiro Neto and Silva (2018).

subperiods, does not reverberate over industries of scale or differentiated technologies that remained presenting low or negative rates.

3.2 Regional deconcentration: macro and micro-regional patterns

The ongoing re-structuring of groups of industries is consolidating mostly extractive, natural resources and labor-intensive activities in the regions with the lowest per capita income. These are the ones capable to obtain advantages from the new context. This statement has been valid for macro and micro regions representing changes in diverse territorial scales. Of course, on the micro-regional scale, empirical evidence has shown a higher significant degree of diversity for industrial localization.

Paying attention to the industrial dynamics for macro-regions and state economies, an outstanding mark of the deconcentration process is that the regional composition of the VIT has lost 8.0 percentage points in the most industrialized region, the Southeast; otherwise, the gains were transmitted for all the others. The two most industrialized regions, Southeast and South, which accounted for 85.6% of the national VTI in 1996, went down to 80.1% in 2015 and finally to 77.4% in 2018 (table 2).

The deconcentration path remained steady until 2015 and lost power from then on, in the context of economic crisis, when the movements of gains and losses became very unstable. The observed movements over 1996-2015 are relevant for our analysis because they comprise a period of expansion of national economic activity when new production plants were settled in less industrialized regions. The post-2015 economic recession, however, tends to suggest that percentage share attributed for each region has changed mainly due to the ups and downs in the idle productive capacity in each regional industrial park, that is, in response to the impact of the crisis on the prevailing level of activity.

In the Southeast region, the relative decline of the industry in São Paulo (SP) with additional gains for Rio de Janeiro (RJ), Minas Gerais (MG) and Espírito Santo (ES) is evidenced. In the case of RJ and ES, the oil and gas extraction and refining industry were largely responsible for the expansion of activities in the period, related to investments made by Petrobras and private companies in the coastal oil basins. After 2015, consolidated the scenario of shrinking global demand for oil and the interruption of government investments planned for the area, the two state economies begin to suffer from a decline in oil activities. It was not the case for the economy of the state of Minas Gerais, which has its economy linked to minerals (iron and related materials) in its central-south

area (around its capital Belo Horizonte) and to exportable grains in the Triangulo Mineiro micro-region. This state saw its participation in the national VIT to increase in the crisis as a result from the stimulus of growing world demand (Monteiro Neto and Silva, 2018; Brandão, 2019b).

In the South region, the states of Paraná and Santa Catarina showed gains in their relative position, but the state of Rio Grande do Sul suffered retreat. In this region, economic activities are very diversified with branches of industries in the production of capital goods, durable (automotive), non-durable (beverages) and grains and meat processing for export. This last activity has been assuming an increasing role in the productive agenda of the states of Paraná and Santa Catarina allowing its participation in the national VIT to expand considerably.

TABLE 2
Regional composition of the VIT, chosen years over the 1996-2018 period
(In %)

Region/state	Share of VIT							
	1996	2000	2005	2010	2015	2016	2017	2018
North	**4.5**	**4.6**	**6.0**	**6.9**	**6.5**	**6.4**	**7.1**	**6.4**
Rondônia	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2
Acre	0.1	0.1	0.4	0.0	0.0	0.0	0.0	0.0
Amazonas	3.3	3.1	3.6	3.6	3.4	3.3	3.3	2.5
Roraima	0.3	0.5	0.8	0.0	0.0	0.0	0.0	0.0
Pará	0.7	0.8	0.9	2.9	2.6	2.6	3.4	3.5
Amapá	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
Tocantins	0.0	0.0	0.2	0.1	0.1	0.1	0.2	0.1
Northeast	**7.7**	**9.3**	**10.1**	**9.3**	**10.8**	**10.6**	**10.1**	**10.4**
Maranhão	0.3	0.4	0.3	0.4	0.7	0.6	0.6	0.7
Piauí	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1
Ceará	1.3	1.6	1.4	1.3	1.5	1.5	1.5	1.5
Rio Grande do Norte	0.3	0.3	0.3	0.6	0.8	0.7	0.7	0.7
Paraíba	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Pernambuco	1.6	1.1	1.1	1.5	1.9	2.0	2.1	2.1
Alagoas	0.7	0.7	0.7	0.4	0.4	0.4	0.3	0.3
Sergipe	0.3	0.5	0.6	0.4	0.4	0.4	0.4	0.3
Bahia	2.7	4.2	5.4	4.2	4.5	4.5	4.1	4.5

(Continues)

(Continued)

Region/state	Share of VIT							
	1996	2000	2005	2010	2015	2016	2017	2018
Southeast	**67.6**	**64.1**	**61.0**	**60.9**	**59.7**	**58.2**	**59.3**	**58.2**
Minas Gerais	9.8	10.3	12.1	11.8	10.6	10.2	11.3	11.5
Espírito Santo	1.1	1.6	1.5	2.5	3.0	2.4	2.3	2.6
Rio de Janeiro	7.9	7.6	7.3	10.4	11.0	10.5	10.8	11.7
São Paulo	48.8	44.5	40.0	36.2	35.1	35.0	35.0	32.4
South	**18.0**	**19.9**	**19.4**	**18.4**	**20.4**	**20.3**	**20.1**	**19.5**
Paraná	5.2	5.9	6.4	6.9	7.3	7.4	7.4	7.2
Santa Catarina	4.4	4.4	4.4	4.7	5.7	5.6	5.6	5.3
Rio Grande do Sul	8.4	9.7	8.6	6.8	7.5	7.3	7.0	7.1
Midwest	**2.2**	**2.2**	**3.6**	**4.5**	**6.0**	**6.0**	**5.7**	**5.5**
Mato Grosso do Sul	0.4	0.3	0.5	0.8	1.4	1.5	1.4	1.5
Mato Grosso	0.6	0.6	1.3	1.2	1.5	1.4	1.3	1.3
Goiás	1.1	1.0	1.5	2.2	2.8	2.9	2.7	2.4
Distrito Federal	0.2	0.3	0.2	0.3	0.3	0.3	0.2	0.2
Brazil	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**	**100,0**

Source: PIA/IBGE. National Statistics.

Obs.: Nominal values deflated by the Aggregate Price Index for industrial goods (IPA-OG). Getulio Vargas Foundation (FGV).

The Midwest region became the preferred location to expanding the country's exportable grains and meat frontier. Both grain and meat production and its industrial processing for export have been determinants to the increase in size of the regional economy relative to the national one. In the state of Goiás, initiatives of productive diversification, in addition to agro-industrial commodities, have resulted in the attraction of automobile assembly enterprises to the municipality of Catalão and pharmaceutical industries to the industrial area of Anápolis-Goiânia.

For the Northeast region, the highlights are the industrial expansion in Pernambuco – with the beginning of implementation in 2009 of a Petrobras oil refinery and a shipyard in the industrial pole of SUAPE (southern coast of the state) as well as the FIAT/JEEP car factory on the north coast (municipality of Goiana) (Guimarães and Santos, 2018). Additionally, new vectors of intra-regional expansion were consolidated in Rio Grande do Norte by expanding Petrobras oil activities. Also, in the state of Maranhão, investments planned to increase the iron ore production in the coastal area (near the capital São Luís) associated with rising grain production for export in its southern part of the state (near Piauí and Tocantins). The other states of the region maintain their industrial

production structure linked to intermediary goods (Bahia, Alagoas, and Sergipe) and non-durables (Ceará and Paraíba) destined mainly to the domestic market.

Finally, in the North (or Amazon) region, the expansion of ore production from the state of Pará for export has surpassed any other, an activity that boosted the increase in the state VIT relative to the national in the period. The industrial pole of Manaus in the state of Amazonas, although characterized as one of the most important industrial areas of the country, has suffered from loss of competitiveness and technological renewal in the industry installed there so that its participation in the national VIT has diminished recently.

3.3 Micro-regional scale of analysis: investigating RIAs

For detailed understanding of economic dynamics from now on we begin to put some light on the well-known geographic micro-regions used to planning purposes by the statistics national office (IBGE). Because they are defined according to certain criteria of socio-spatial homogeneity, they allow the observation of productive transformations in clusters of contiguous municipalities. A specialized branch of the literature on the role of industry in regional development, such as Diniz (1993) and Diniz and Crocco (1996), used micro-regions to evaluate of the dynamics of industrial employment in the national territory. More specifically, these works proposed the concept of RIA, understood as one micro-region with at least 10,000 industrial jobs.

These studies indicated a renewed perspective for Brazilian industrial dynamics when identifying the existence for 1970-1991 period: on the one hand, of a very dynamic industrial fabric which expanded from 33 RIAs in the country in 1970 to 90 in 1991; and on the other hand, a process of "concentrated deconcentration" defined by a preferred area for industry location called then "industrial polygon", located predominantly in the Southeast and South regions, which contained almost all national RIAs in that period.

In the recent period, 1995-2018, according to data speacially collected for this study on industrial employment (Annual Report on Social Information/Rais, Ministry of Economy), the RIAs maintained their path of expansion and consolidation throughout the national territory. From a total of 85 in 1995 their expansion was significant until at least 2015 when it reached 160 units and dropped down to 154 in 2018. Formal employment in the sector increased significantly from 3.9 million in 1995 to 6.6 million in 2010 and finally showed a further decline at the end of the period, reaching 5.8 million in 2018. The dynamics of RIAs is defined by an initial phase of acceleration either in industrial

employment, or in the number of agglomerations (RIAs). A decreasing pattern then appeared just after 2015 in the beggining of a pronounced economic recession (table 3).[5]

TABLE 3

Brazil and regions: employment and number of RIAs[1] (1995-2018)

RIAs	1995	2000	2005	2010	2015	2018
Employment (in thousands)	3,897	3,815	5,049	6,573	6,260	5,808
Number of RIAs						
North	2	3	3	3	3	3
Northeast	13	15	21	26	27	23
Southeast	44	48	60	68	72	69
South	22	28	35	43	45	46
Midwest	4	5	7	10	13	13
Brazil	**85**	**99**	**126**	**150**	**160**	**154**

Source: Rais/National Secretary of Work and Employment/Ministry of Economy. Available at: <https://bit.ly/3DIxUBQ>.
Note: [1] One RIA is an official geographical micro-region, stablished by IBGE for statistical purposes, with at least 10,000 industrial jobs.

As for the "polygonal area", it was recognized that the direction for industry deconcentration had moved from its epicenter – the metropolitan region of São Paulo (MRSP) and the economy of the state of São Paulo – towards firstly the states of the Southeast region itself and secondly to the Southern region of the country. In fact, the deconcentration was restricted to a part of the territory bounded by an imaginary polygonal area that had as its northern boundary the metropolitan region of Belo Horizonte (MRBH), passing through the MRSP was directed to the MR of Curitiba, Florianópolis and its limit to the south in the MR of Porto Alegre (MRPOA), then it came back (the polygon) to the west passing through the micro-regions of Maringá and Cascavel (in the state of Paraná), and then to the RIA of Uberlândia in Minas Gerais and finally ended in MRBH.

In recent years covered by this study, we noticed that the deconcentration process maintained its locational preference in the polygon area (Southeast and South regions) with immediate spread in the proximity of the Midwest region and the emergence of new RIAs in the Northeast region (more on the coastal area than in its countryside). RIAs location can be seen in maps 1A and 1B and reveals

5. Diniz and Mendes (2021) in a very recent study have shown the growth of industrial aglomerations covering the years 2000-2018 with slightly different numbers of that we achieved. Although, we all agree in terms of trajectories and general conclusions.

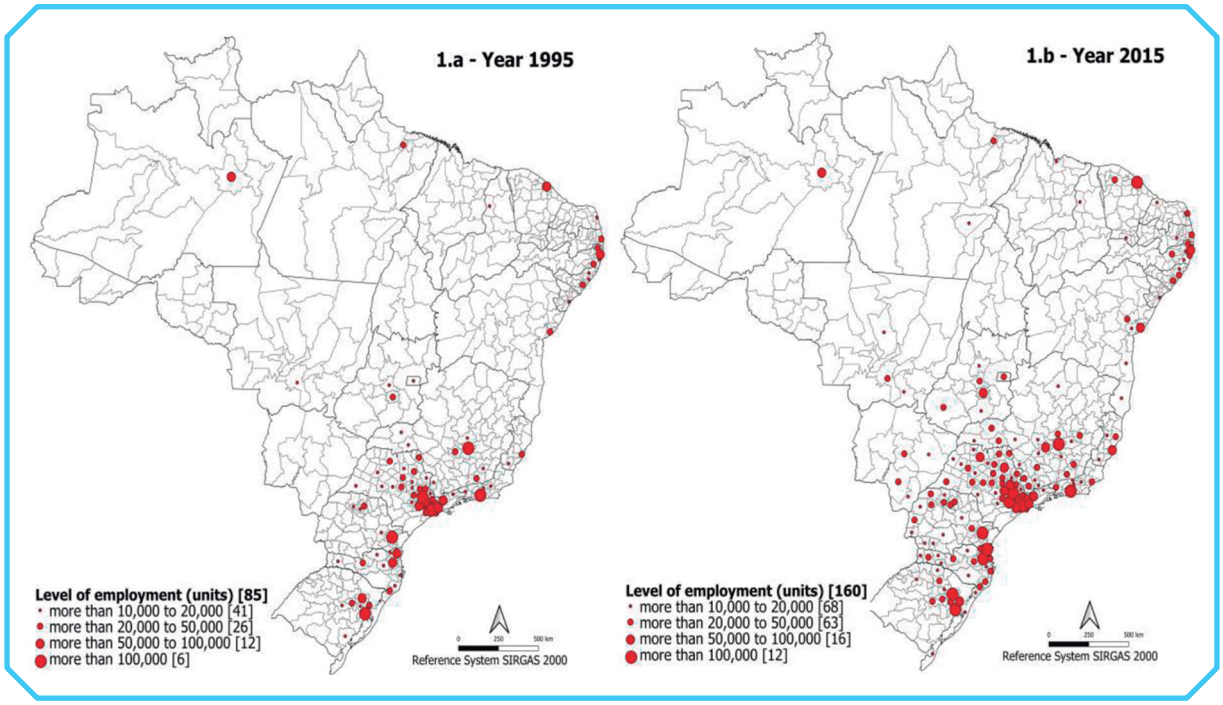
the reinforcement of the polygonal area in which industrial agglomerations prefer to locate. Expanding agglomeration economies in the Southeast and South regions, the path for industry deconcentration has been moving towards contiguous territories of the Midwest region.

In the Amazon region, the enormous existing distances among municipalities and micro-regions associated to low numbers of inhabitants are still reasons for not attracting industrial production. The regional metropolises of Manaus (AM) and Belém (PA) remain as RIAs, and only Parauapebas' RIA (PA), specialized in the extraction and processing of iron ores for Vale do Rio do Doce Company, became a novelty in that region after 1995. Even after six decades of financial incentives designed to foster regional development, little results were stablished regarding the other state capitals of the region, that is, the states of Amapá, Roraima, Acre and Rondônia. In fact, there are structural difficulties for the consolidation of industrial agglomerations aiming at the exploration of the regional market.

MAP 1

RIA by level of employment

1A – 1995 1B – 2015



Authors' elaboration.

Publisher's note: Map displayed in low resolution and whose layout and texts could not be formatted and proofread due to the technical characteristics of the original files.

In the Northeast region, the RIAs remain to be predominantly located in their coastal area reinforcing the agglomeration field of their metropolises or state capitals. There was a strengthening of the position

of the metropolises of Fortaleza and Recife by the expansion of its immediate agglomeration field: the RIA of Fortaleza with the proximity of Pacajus, and Recife also expanded with the connection of the RIAs of Goiana and Itamaracá (north coast), Suape (south coast) and Vitória de Santo Antão (west of the Recife metropolitan region). In the state of Ceará, two agglomerations have appeared in the interior of the state, Sobral and Cariri, with employment levels between 10,000 and 20,000 units and are focused on the industry of clothing, footwear and leather to meet the demand of the national market. In Bahia, the RIAs of Salvador and Feira de Santana maintained a consolidated position in the presence of new coastal agglomerations in Santo Antônio de Jesus, Ilhéus-Itabuna and Porto Seguro. In Rio Grande do Norte, the RIA of its capital, Natal, was consolidated in support of the new agglomeration of Macaíba in the metropolitan area, making this an area with even more relevant agglomeration economies. In the state's countryside the RIA of Mossoró gained prominence by the expansion of the activities of extraction and processing of sea salt, oil extraction activities and irrigated fruit production.

It is worth mentioning, finally, that before 1995 some state capitals in the Northeast region did not fall into the RIA category, but from then on, they became industrial agglomerations: they were on this list Maceió, Aracaju and Teresina. In 2015 all the capitals of the states of the region have an industrial employment level above 10,000 units and became RIAs.

One relevant aspect to the understanding of the territorial dynamics of the industry in this recent period is closely related to the direction taken by the smallest group of RIAs in terms of jobs. We performed a cut out of the RIAs according to size in 2 categories: i) with industrial employment level between 10,000 and up to 50,000 units; and ii) more than 50,000 units. The first group increased numerically from 66 to 132 between 1995 and 2015 and increased its share of total industrial employment of RIAs from 32.9% to 44.6% in the same years. With a larger size of jobs and more consolidated agglomerations, the second group also increased its number of agglomerations, from 19 to 29 units, but lost relative position from 67.1% to 55.4%. Therefore, the dynamism and vigor of the industry has been revealed in territories that are still under-consolidated and with a small level of employment.

In this perspective, it is revealed the existence of close correspondence with the industrial activities that most expanded those directly based on natural resources and labor intensive, moving to the agglomerations that present relatively lower location costs (land, infrastructure, and labor) compared to those observed in the metropolises of southeastern Brazil. The preference for location in RIAs of smaller job sizes also applies to the typology of agglomerations associated to their sizes of population.

The additional investigation of RIAs in 3 types of population sizes – from 100,000 to 499,900; from 500,000 to 999,900, and AIRs with more than 1 million inhabitants – says this (table 4): the first group accounted for 24.7% (941,600) of industrial employment in 2000 and 30.3% in 2015 (1.9 million). Its gross value added (GVA) went from 15.6% to 23.3% over 2000 and 2015. The second largest group

presented the following proportions for employment and GVA, respectively: for industrial employment, 18.2% in 2000 and 22.0% in 2015, for GVA, 14.6% in 2000 and 17.9% in 2015. The last and largest population group: in employment, 57.2% in 2000 and 47.6% in 2015 and in the GVA, decreased from 69.8% in 2000 to 58.8% in 2015. The group of RIAs with up to 500,000 inhabitants – which represents the small and medium-sized urban localities defined by reduced economies of scale – was precisely the one in which their participation in employment and added value in all agglomerations experienced expansion, with the other 2 groups of AIRs losing participation.

TABLE 4

Population, employment, and industrial gross value added, in RIAs[1]

Year	RIAs' population by size	Number of RIAs	Population	Employment	GVA in the industry (R$ of 2015)
			Absolute values		
2000	From 100 thousand to 499,9 thousand/inhab	55	17,105,777	941,601	108,040,557
	From 500 thousand to 999,9 thousand/inhab	24	16,566,677	692,824	101,235,732
	More than 1 million inhab	20	61,007,729	2,180,885	482,989,692
	Total	99	94,680,183	3,815,310	692,265,981
2015	From 100 thousand to 499,9 thousand/inhab	96	27,228,507	1,898,956	218,291,096
	From 500 thousand to 999,9 thousand/inhab	35	24,193,147	1,379,199	167,800,838
	More than 1 million inhab	29	83,913,861	2,982,381	550,005,951
	Total	**160**	**135,335,515**	**6,260,536**	**936,097,885**
			%		
2000	From 100 thousand to 499,9 thousand/inhab	556	18.1	24.7	15.6
	From 500 thousand to 999,9 thousand/inhab	24.2	17.5	18.2	14.6
	More than 1 million inhab	20.2	64.4	57.2	69.8
	Total	**100.0**	**100.0**	**100.0**	**100.0**

(Continues)

(Continued)

Year	RIAs' population by size	Number of RIAs	Population	Employment	GVA in the industry (R$ of 2015)
2015	From 100 thousand to 499,9 thousand/inhab	60.0	20.1	30.3	23.3
	From 500 thousand to 999,9 thousand/inhab	21.9	17.9	22.0	17.9
	More than 1 million inhab	18.1	62.0	47.6	58.8
	Total	**100.0**	**100.0**	**100.0**	**100.0**

Sources: Population and GVA, from IBGE, national statistics; Industrial Employment from Annual Report of Socioeconomic Statistics.

Note: RIAs – Relevant Industrial Agglomerations.

Another important feature observed in the study was the strong creation of industrial jobs in the new RIAs. The role or function of the new industrial agglomerations arising in these two decades (1995-2015) can be appreciated if we carry out a separation between what is "new" and what is "old" in RIAs. We noticed, for example, that the effort to consolidate industrial activities in regions of attention of Brazilian regional policy (North, Northeast, and Midwest) was very positive for the total generation of employment, indicating, moreover, the relative specialization in labor-intensive activities. Table 5 shows the number of RIAs and employment existing in 1995 by group of macroregions – on one side, Southeast and South (more industrialized) and on the other, North, Northeast, and Midwest (less industrialized). As a starting point, we point out that the first group of macro-regions had a total of 66 RIAs and 3.4 million industrial jobs that year. The second group of macro-regions, in turn, generated 514,000 jobs in 19 RIAs.

We found that over the period 1995/2015, in the Southeast/South regions, 1,684,400 new industrial jobs were created: 803.3 thousand (47.7%) of them were generated in the same 66 RIAs already existing in 1995 and 881.1 thousand (52.3%) were created by the new 51 RIAs that emerged in the period. In the second group of regions (NO/NE/MW), the total number of new jobs was 678,500 units. The 19 RIAs that already existed in 1995 accounted for 305,100 jobs (44.9%) and the set of 24 new RIAs that were established after 1995 created 373,400 industrial jobs (55.1%). In both macro-regions groups the number of jobs in the new RIAs (arising post-1995) was slightly higher than the number of new jobs generated by the old RIAs (already existing in 1995). This is undoubtedly a relevant result because it brings more elements to the confirmation that industrial activity has found its best location in new territories not yet explored and has been trying to escape the consolidated agglomerations.

TABLE 5
Industrial employment in old and new RIAs (1995-2015)

Regions	Number of RIAs and employments in 1995 (85 units)	Number of new RIAs and new employments created after 1995 and until 2015 (160 RIAs)	
		New jobs in existing RIAs prior to 1995 (old RIAs)	New jobs in the new RIAs after 1995 (new RIAs)
Southeast/South	66 RIAs 3,4 million of jobs	66 RIAs 803,3 thousand new jobs (72.4%)	51 RIAs 881,1 thousand new jobs (70.2%)
North/Northeast/Midwest	19 RIAs 514,1 thousand of jobs	19 RIAs 305,1 thousand new jobs (27.6%)	24 RIAs 373,4 thousand new jobs (29.7%)
Brazil	**3,9 million of jobs**	**1,1 million new jobs (100%)**	**1,2 million new jobs (100%)**

Source: Rais/National Secretary of Work and Employment/Ministry of Economy. Available at: <https://bit.ly/3DIxUBQ>.

The total amount of new jobs created in the Southeast/South regions, of 1,6 million, corresponded to only 49.5% of the total prevailing in these regions, of 3,4 million already existing in 1995. However, in the other 3 regions (NO/NE/MW) the 678,500 total new jobs created corresponded to a proportion of 131.9% of the amount already existing in 1995 (514,000 jobs), i.e. the volume of new jobs created (for all RIAs in regional policy regions) was higher than the amount of employment in 1995.

In general, data used have shown that the current process of industrial activities deconcentration was not able to break the past pattern of locational preference in the so-called industrial polygon of the Southeast and South regions. This happens because the sectors that command it are, preferably, those related to the availability of farmland, raw materials, and low labor costs. All of them unable to generate an agglomeration field for economies of scale and scope in size enough to rival that already consolidated in the country.

4 PUBLIC POLICIES FOR TERRITORIAL PURPOSES: AIMING AT DECONCENTRATION

We saw earlier that industrial activity had shown more positive signs in the 2007/2015 sub-period than in the previous 1996-2006 (table 1). This behavior was true, in extractive and transformation sectors, for the growth rates of the VIT, but also for the recovery of labor productivity

levels. However, the recovery marks were captured mostly by industries intensive in natural resources and labor, in detriment of scale-intensive and differentiated technology activities.

Authors such as Macedo (2010) and Pinto (2013), among others, have strongly pointed out the relevance of export-oriented activities as reconfigurators of territorial activities in favour of agricultural and mineral commodity producing regions (markedly, Midwest and North).

It is stated the importance of the external vector in the definition of certain territories of deconcentration. However, we further affirm that public policies carried out counter-reaction efforts in this same period aimed at changing and mitigating unwanted processes. We suggest the Brazilian government tried to counter and stop the most visible effects of this declining industry's trajectory. Doing so, it is relevant to refer to such a discussion because it contributes to evaluating public policy options set in progress at that time. In particular, those policies with more evident territorial impacts.

To understand many of the governmental actions carried out it is necessary to recognize that the temporal dimension of investments made and programs under implementation tends to have effects and results in the medium and long term, and therefore, not immediately realized after their implementation. On the one hand, government-funded infra-structure projects tend to have a long stage of construction (such as hydroelectric plants, airports, metropolitan road rings, subways, etc.). In another tuning point, private investments motivated or not to meet the world's demand for grains, meat and ores tend to have a shorter or medium-term finalization time horizon. As a general rule, the private sector is more in a hurry than governments to complete and put their investment projects into operation. It is proper to the logic of the market to seek to monetize the resources applied in a short period of time.

Considering in more depth this temporal dimension of government actions vis-à-vis those of the private sector, we organize information about government intentions and achievements and their effective and probable territorial impacts. In the post-2007 period after creating the Growth Acceleration Program-GAP (in Portuguese, Programa de Aceleração do Crescimento-PAC), the federal government organized a bold portfolio of investments for various sectors and economic activities in the country. The planned investments, initially amounting R$ 500 billion in 4 years, should be able to mobilize robust counterparts from the private sector in the national effort to overcome infrastructure bottlenecks and resume industrial expansion.

The GAP was organized in three investment blocks: logistics infrastructure (construction and expansion of highways, railways, ports, airports, and waterways); energy infrastructure (generation and transmission of electricity, production, exploration and transportation of oil,

natural gas and renewable fuels) and social and urban infrastructure (sanitation, housing, subways, urban trains, universalization of the Light for All program and water resources) (Brandão, 2019b). At the end of the GAP's first round, throughout the 2007-2010 planning period, the federal government relaunched the program with increased budget appropriations and new investment projects for the 2011-2014 period. Due to fiscal crises, relocations were made over the period with cutting of resources in ongoing investment projects and eliminating several of the previously planned projects.

Firstly, let us consider the infrastructure projects with the most relevant regional impacts initiated in the period: the construction of hydroelectric plants in Santo Antonio and Jirau (both in Rondônia), Teles Pires (MT and PA), Estreito (MA and TO), Foz do Chapecó (SC and RS) and Belo Monte in Altamira, Pará; the Transnordestina railway between Pernambuco and Ceará; and the transposition of the São Francisco River. The construction of hydroelectric plants involves the mobilization of very high amounts of resources, in particular, large projects such as Santo Antônio and Jirau and Belo Monte involved very considerable expenses in the initial phase of construction, however, their impact on the surrounding economy tends to be small. Few sectoral interconnections have been produced with these major works. In the operating phase, when the demand for labor is very low, the plants tend to function as regional enclaves with little spread effects in the regional economy. In the other case, related to the construction of the railroad and the transposition of the São Francisco River in the Northeast, there is an expectation that the interregional reverberations will be much higher: this is because the works permeate several units of the federation and municipalities benefiting them. So far these projects have not yet been completed and have suffered from successive interruptions due to budgetary constraints.

Secondly, the government had began huge amount of investments for direct realization through its state-owned companies, such as the petrochemical complex of Rio de Janeiro (Comperj), the Abreu e Lima refinery of Petrobras and the shipyard in Suape (PE), or indirectly through financing facilitations such as wind farms in several states of the Northeast region (BA, PE, CE and PI), automotive (Fiat/Jeep) in Pernambuco, steel works in the industrial port of Pecém in Ceará. Part of these investments has been cancelled or reduced, especially with regard to petrochemicals. Comperj (in Rio de Janeiro) spending is almost still. As for the Abreu e Lima refinery in Pernambuco that has suffered delays in investment plans and the droplet slate is being finalized. It was expected to be finalized in 2015. At that time the prevailing discussion was about its privatization amid a high degree of idleness of the plant due to the fallingd demand for oil derivatives. Likewise, the shipyard has been completely decommissioned and is waiting for potential buyers. These two projects amounted since their construction spending close to

R$ 15 billion in 2015, which found many difficulties in this context of economic recession to make them viable.

Investments in wind energy are still being made and are already part of the productive structure of regions such as Southeast and Northeast. In particular, in the latter, the advances were so significant that, in addition to supplying its own demand electricity, the region became a supplier to the national system. The volumes of resources planned for this sector should reach to R$ 35 billion for the whole country, according to Brandão (2019b). In this case, the plants once built have limited local impact on jobs and taxes. The equipment and technology of the sector can be produced in the country, however, respond to external imperatives of technological control, making the intersectoral multiplier still very low.

In addition, from the situation observed in the wind sector, investments in the automotive project were bold with new plants and/or automakers in developed regions of São Paulo (Chery, Honda, Hyundai and Toyota), Rio de Janeiro (Nissan, Jaguar Land Rover), Santa Catarina (BMW), Paraná (Audi-VW) and also in regions recognized by having only traditional industry such as Pernambuco (Jeep Bahia (JAC Motors) and Goiás (Hyundai-CAOA and Mitsubishi). The automotive production park has become one of the most important among developing economies, but the recession that began in 2015 resulted in a sharp fall in production. In early 2021 the Ford company decided unexpectedly to cancel its production operations in the country and close units in 3 states: Camaçari (BA), Taubaté (SP) and Horizonte (CE).

In the case of the steel processing industry in the state of Ceará, the investment was completed by the private sector, in part with public credit from BNDES and Banco do Nordeste do Brasil (BNB). The plant is already in operation occupying almost half of the area of the Pecém Industrial Complex. The multiplier effects of such investments are not immediate and only expand as new suppliers decide by proximity to location, this is truer for the automobile than for the steel industry. The latter carries out a very early stage of processing of crude iron ore from Maranhão and exports the steel ingot to South Korea and Europe.

Thirdly, the direction indicated by the financing of BNDES and regional public banks (BNB and BASA) in the territory is undoubtedly an explanatory element for the regional vectors consolidated by the industry. Let us initially see that the articulation, not always properly coordinated, of public policy instruments was available to economic activity in the territory of regions targeted by regional policies (NO, NE and MW) in the 1995/2015 period. Resources that have impacts on the structure and level of both private consumption and investment demand.

There are three macroeconomic modalities of expenditures, as presented in the following.

1) Direct federal public spending.
2) Federal public financing to the private enterprise through regional banks (credit of constitutional financing funds and BNDES resources).
3) Resources of direct social transfers to people in the form of the Bolsa Família Program and the Benefits of Continued Provision (table 6).

The first modality increases the regional demand for investment by the effect of public spending on the private sector; the second modality acts directly to finance the private demand for business investment; and the third modality corresponds to public resources that become a demand for private consumption of families. As we know, the temporality to perform the expenditure in each modality is different. The demand for consumption of households is short-term and takes place as soon as the government makes monetary transfers. In this case, resources turn into private sector demand, as wage payments.

The federal government's investment expenditures, in turn, will have an amplified regional impact if they are more targeted at activities that require local or regional inputs, goods and labor. For example, the construction of an oil refinery tends to produce substantial income leaks by purchasing specialized equipment and services abroad (outside the country or outside the region where the project takes place) because a considerable part of its equipment and machinery is produced outside the country. As a general rule, the time to complete a public investment is in the medium and long term, especially if it concerns logistics, transport or communications infrastructure.

TABLE 6

North, Northeast and Midwest regions: types and amounts of public resources with regional impacts – accumulated values (2000-2015)

Region	Public investment, from the federal budget (A)	Federal banking credit to the private investment			Social programs to citizens[1] (E)	Total amount of mobilized public resources (A + D + E) = (F)	Anual average of mobilized resources
		Regional constitutional funds (B)	Disbursements from BNDES (C)	Subtotal (B + C) = (D)			
NE (R$ 1 billion)	209.2	156.5	278.6	435.1	209.2	853.5	53.3
%	24.5	18.3	32.6	50.9	24.5	100	
NO (R$ 1 billion)	89.8	53.3	150.3	203.6	82.5	375.9	23.5
%	23.9	14.1	39.9	54.1	21.9	100	
MW (R$ 1 billion)	74.2	75.5	217.3	292.8	87.0	454.0	28,4
%	16.3	16.6	47.9	64.5	19.2	100	
Total (R$ 1 billion)	**373.2**	**285.3**	**646.2**	**931.5**	**378.7**	**1,683.4**	**105.2**
%	**22.2**	**16.9**	**38.4**	**55.3**	**22.5**	**100**	

Sources: Federal Investment: National Budget Secretary, Ministry of Economy (formely Ministry of Planning); Constitutional Funds: Ministry of Regional Development; BNDES disbursements: BNDES annual reports; Bolsa Família Program: Ministry of Social Development; Social Retirement Benefits (BPC): Ministry of Economy.

Note: [1] As social programs to citizens, were considered: Bolsa Família Program (PBF in Portuguese) and Social Retirement Benefits (BPC in Portuguese). The last one was first implemented in 2004, therefore, data applied covered the 2004-2015 period.

Finally, the government's role in providing credit to the regional private sector aims to increase demand for investment from the private sector itself, which means that the multiplier effect here can also partly (or largely) dissipate outside the region in the purchase of capital goods; its temporality is also medium and long term. Construction of a new factory takes time to complete and go into operation.

For these mentioned reasons, the government action to operate multiplier effects in the territory must necessarily coordinate and anticipate the desired movements so that types of spending could generate dynamic sectoral and regional spread effects. This leads us to reflect that several investment projects planned and initiated by the government, characterized by their high scale of resources and their long-term execution, do not have shown, at the present, their full potential for modification of regional economic structures. Several of them were actually interrupted in their construction phase resulting a waste of productive resources. Others, completed amid the recent

recession (2015-2020), are operating idle capacity and, at this time, prevented from fulfilling their greatest regional expansionary effects.

Aware of this temporal dimension of the completion of a given planned investment, we can evaluate the potential impacts of investment projects from successive and non-coincident waves of completion, beginning of activities and generation of multiplier effects.

The amounts effectively realized by government action in the 2000-2015 period were quite significant (R$ 1,7 trillion) and suggest that the government reached some relevant territorial marks. Elements of consideration about productive equipment (public and private) implemented in regions of special interest to Brazilian regional policy. In the three regions, the sum of credit to private investment plus investment expenditure by the federal government – which can be understood as a proxy variable of total regional demand for investment – was at the average level of 75% of the three modalities of resources investigated (sum of items A + D in the table 6). This robust level of regional aggregate demand for investment contributes to the expectation of effective transformation in the prevailing productive structure and for the feasibility of a future trajectory of deconcentration. Its multiplier effect, which was not elevated during its implementation, would begin to act after the full completion of the investment. Unfortunately, this began to occur amid the economic crisis and the slowdown of the projects started. The potential for expanding territorial impacts in target regions was prematurely limited.

The government action, hardly implemented over 2007-2015, aimed to generate longlasting spreading impacts on Brazilian territory, particularly in the Northeast and North regions, began to suffer from a solution of continuity resulted from the economic crisis and fiscal disarrangements. The vector of deconcentration that this effort intended to generate was weakened, but it can still be appropriately redeemed if federal planning is interested in completing the most relevant projects.

5 CONCLUDING REMARKS: HETEROGENEOUS AND LIMITED TERRITORIAL DECONCENTRATION IN THE INDUSTRIAL SECTOR

During the period analyzed it was confirmed the weakening of national industrial capacity. Significant decrease in the share of the high multiplier effect sectors – scale intensive, differentiated, and science-based ones – in the national industry. On the other side, sectors linked to the basis of natural resources and extractive activities increased relative to the national economy. The latter found a favorable environment for its expansion due to the international boom for the country's agricultural and mineral commodities.

Undoubtedly, the negative transformations that the Brazilian industry is going through require careful reflection on its causes. This sectors' generalized loss of power signals the presence of very significant side-effects on regional development. Economic growth in areas of regional policy attention show a path of decreasing yields associated with loss of structural competitiveness. It was point out that the mentioned panorama of regression has walked alongside the continuity of regional deconcentration of industrial activity in these years 1995 to 2018. Observing the VIT its composition was altered by the loss of presence of the Southeast region.

At the micro-regional scale, the results obtained offered a renewed analytical perspective. Using the concept of relevant industrial agglomerations (AIRs), the study concluded that the emerging industrial territories were charachterized: i) by the presence of medium-sized agglomerations with industrial jobs ranging from 10,000 to 50,000 units – which increased their position in total employment from 32.9% to 44.6% between 1995 and 2015; and ii) to be in population groups of up to 500,000 inhabitants – a group that now represents 15.6% to 23.3% of the GVA of the industry between 2000 and 2015 – now in the more developed regions of the Southeast and South, also, however, on a smaller scale, in those regions affected by the regional policy, North, Northeast and Midwest.

Beside the territorial path stimulated by the force of agromineral commodities, which led to the dispersion of industrial activity to small industrial agglomerations farther from the large metropolitan agglomerations of the Southeast, the government's action pursued, through the planning of actions under the GAP program, favored decentralization of industrial plants and major infrastructure works outside the metropolitan areas and developed. As long as the projects in progress could be totally implemented, intersectoral and regional multiplier effects could generate the expected changes in the regional economies.

From a regional policy point of view, a very practical and worrying issue arises in the face of the weakening of industrial value added: the general collection of taxes on industrialized goods (the IPI) – responsible for the funding of constitutional funding funds (FCFs), central elements to finance enterprises in the regions – should present a curve of decline or fragile expansion in the coming years, thus compromising the available resources for the national regional policy. A problem that the national social and political institutions should not refuse to face.

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