

20  
24



# Brazil Innovation and Development Index

*Guiding strategies for competitiveness.*

*An initiative of the National Institute of Industrial Property.*

**20  
24**

1st Edition



**Brazil  
Innovation and  
Development  
Index**

*Guiding strategies for competitiveness.*

*An initiative of the National Institute of Industrial Property.*



Ministry of Development, Industry, Trade and Services (MDIC)  
Brazilian National Institute of Industrial Property (INPI)  
Executive Directory (DIREX)  
Economic Affairs Advisory (AECON)

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## About the Brazil Innovation and Development Index (IBID)

Brazil is a continent-sized country with remarkable diversity and heterogeneity throughout its vast territory. This regional plurality is often portrayed through various economic, demographic, social, environmental and cultural indicators found in the literature and in the National Statistical System. It is with the motivation of portraying the country with information that is fundamental to understanding its reality in the field of innovation that the Brazilian National Institute of Industrial Property – INPI, through its Economic Affairs Advisory – AECON, presents the **1<sup>st</sup> edition of the Brazil Innovation and Development Index (IBID)**.

The INPI's institutional mission is to drive innovation through industrial property. Inspired by it and recognizing the role of innovation as a driver of economic development, the Brazil Innovation and Development Index (IBID) constitutes a complete and current map of innovation in Brazil, revealing the performance of local science, technology and innovation (ST&I) ecosystems from different perspectives.

By meeting the needs of the most diverse segments of civil society, as well as federal, state and municipal government bodies, the IBID has the following roles:

- To portray the innovation scenario in Brazil by means of an official benchmark indicator, highlighting potential and challenges from a regional perspective;
- To provide detailed metrics on the innovation performance of Brazil's 27 Federation Units (UF) and 5 Regions (GR); and
- To identify the national and regional innovation leaders, classifying the UFs based on criteria that include the results of the innovation process and the factors that influence it.

Innovation is, by itself, a specific policy goal within the framework of the United Nations' Sustainable Development Goals (SDGs), as well as being essential for facilitating the achievement of all the others. In this sense, effective public policies and corporate strategies in the area of innovation require solid economic, scientific and social indicators.

The IBID makes it possible to identify – within each of its 7 pillars of innovation and 21 associated dimensions – the potential and challenges of each UF and macro-region in Brazil, as well as the different factors that influenced their classification in the different rankings for each theme analyzed. Therefore, it is a powerful tool for guiding

public and private action, supporting the development of policies and projects based on evidence.

Thus, more than a simple measuring instrument, the information gathered in the IBID – an official indicator of innovation in Brazil – supports the decision-making process of companies and governments, making it possible to channel efforts into initiatives that actually boost economic development and social well-being through innovation.

## Structure

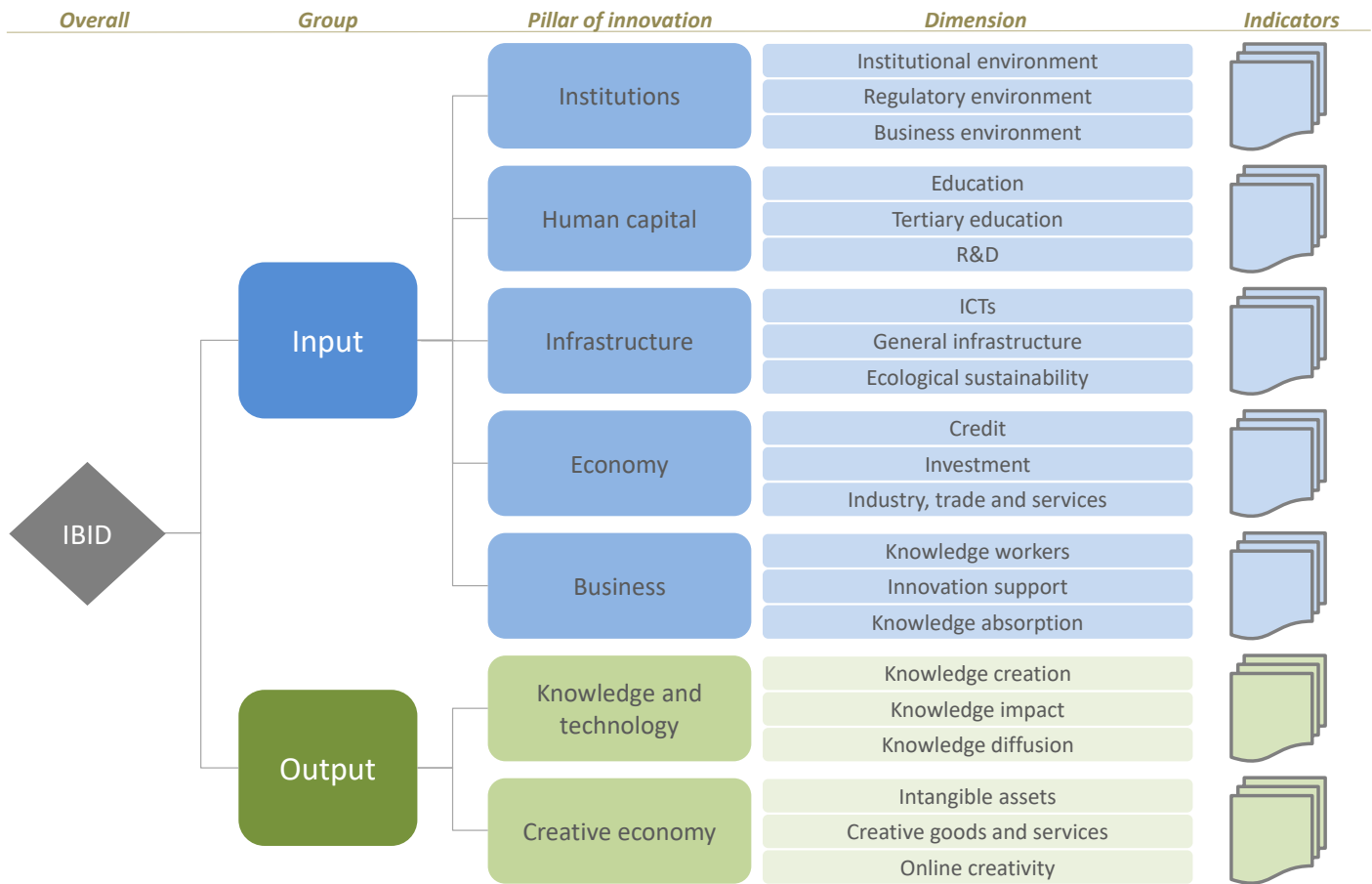
The IBID follows the methodology and strictly has the structure as the Global Innovation Index (GII) of the World Intellectual Property Organization – WIPO. Published since 2007, the GI is the world's benchmark indicator, ranking 132 countries based on their economic potential and bottlenecks associated with the innovation process. Every year, the GI classifies countries through different thematic rankings related to contextual conditions or the result of innovation itself.

### Brazil's performance in the Global Innovation Index

In the most recent edition of the GI, released in 2023, Brazil is in 49<sup>th</sup> place in the global innovation ranking, standing out positively for its performance in recent years. The country climbed 5 positions compared to 2022 and 17 compared to 2019. This trajectory has placed Brazil as a regional leader (for Latin America and the Caribbean) and 6<sup>th</sup> out of 33 countries with a similar level of economic development (upper-middle income).

The IBID is subdivided into two groups. The first sub-index comprises the context or boundary conditions that make a UF or a region more or less favorable to innovation. The second sub-index represents the innovation itself, i.e. the product or result of the innovation process. These two major groups are broken down into seven pillars of innovation, which are linked to 21 dimensions and 74 indicators obtained from official sources and/or publically available (Figure 1).

Figure 1. IBID's classification structure



Source: INPI, Economic Affairs Office.

Just as the results of the GII for the different groups, pillars and dimensions help to identify Brazil's challenges and potential compared to other countries on the international scenario, the same logic applies to the analysis between the UFs and macro-regions in the domestic context. IBID's importance, therefore, is based on an environment of growing interest and demand for synthetic indices that complement the global vision contained in the GII, the so-called subnational innovation indices.



## What is the IBID

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Benchmark indicator: multidimensional index ranging from 0 to 1, aggregating a set of indicators of different natures and scales

Level of geographical disaggregation: BR (1), GR (5) and UF (27)

Level of disclosure: Overall (1), Group (2), Pillar (7) and Dimension (21)

Investigation unit: statistical indicators (74)

Frequency of disclosure: annual (t)

Reference periods: most recent data up to the previous year (t-1).

## About the publication

This report summarizes the results of the IBID 2024, which are organized as follows:

- *Section 1: Overview.* Through comparative rankings and correlation with economic variables, it outlines a general scenario of innovation in Brazil, identifying the national/regional leaders and the main challenges and potential of the states.
- *Section 2: Perspective by theme.* Diagnoses from a thematic perspective, considering the performance of states and regions in seven pillars of innovation: Institutions; Human capital; Infrastructure; Economy; Business; Knowledge and technology; and Creative economy.
- *Section 3: Geographic perspective.* Diagnoses from a territorial perspective, focusing on the individual performance of each region, as well as the UFs that make them up.
- *Schedules.* Details the 74 indicators contained in the IBI and the methodology on which it is based.



The detailed results of the IBID are tabulated in the publication's Complete Tables, a database available on the INPI Portal.

Click [here](#) to access INPI Data.

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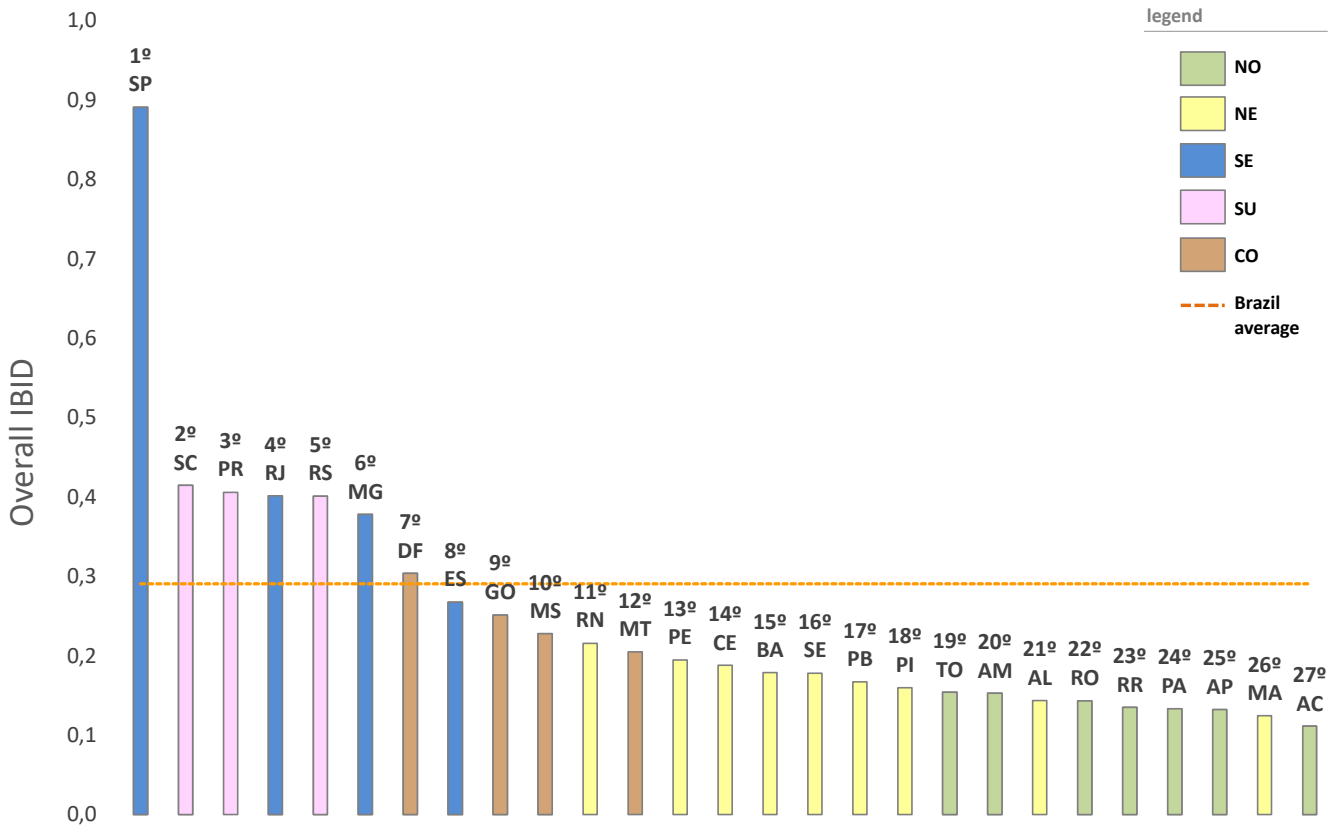
**Schedule 2.** Glossary of Brazil Innovation and Development Index (IBID) indicators.

Available at: <<https://www.gov.br/inpi/pt-br/inpi-data/estudos>>.

# 1. Overview<sup>1</sup>

*São Paulo, Santa Catarina, Paraná, Rio de Janeiro and Rio Grande do Sul are the most innovative economies in Brazil* (Figure 2 and Figure 3)

Figure 2. 2024 overall ranking

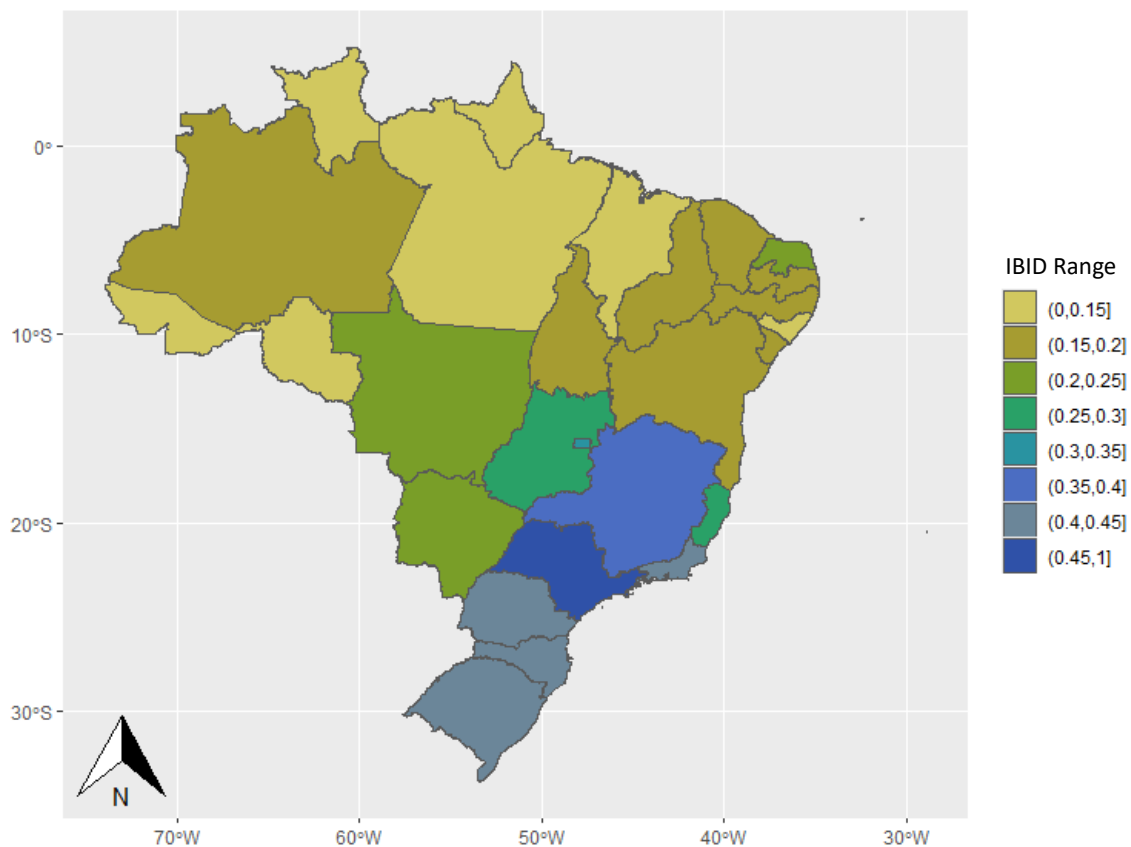


Source: INPI, Economic Affairs Advisory.

<sup>1</sup> The full list of Federation Units (UFs), regions to which they belong and related acronyms can be found in the Annexes.

- São Paulo is undoubtedly the national champion in innovation, with a score more than double that obtained by Santa Catarina, which occupies 2<sup>nd</sup> place in the overall ranking. Paraná (3<sup>rd</sup> place), Rio de Janeiro (4<sup>th</sup>) and Rio Grande do Sul (5<sup>th</sup>) are among the five most innovative economies in Brazil.
- Minas Gerais (6<sup>th</sup>) is close to the top five, followed by the Federal District (7<sup>th</sup>) among the states whose IBID is higher than the national average.
- The Southeast and South regions concentrate innovation in the country. Seven of the top eight positions in the overall ranking are held by all the states that make up these two regions.
- On the other hand, the states of the North and Northeast regions are concentrated at the bottom of the overall ranking. The last fifteen places are held by states from both regions.
- The states of the Midwest occupy an intermediate position in the overall IBID ranking.

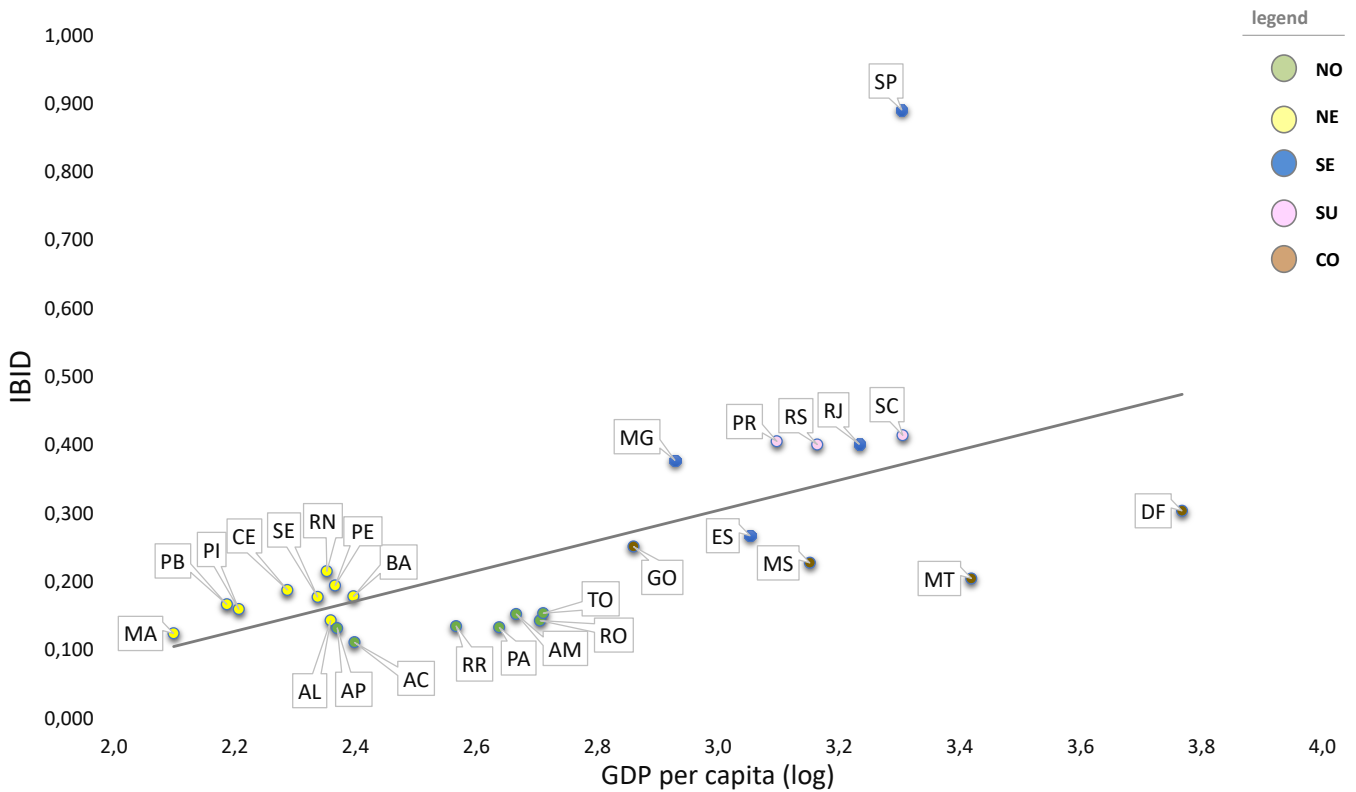
Figure 3. IBID – Brazil Map 2024



Source: INPI, Economic Affairs Office.

*Northeastern economies perform better than expected in terms of innovation in relation to level of income (Figure 4)*

Figure 4. IBID vs. GDP per capita: Performance in relation to income level

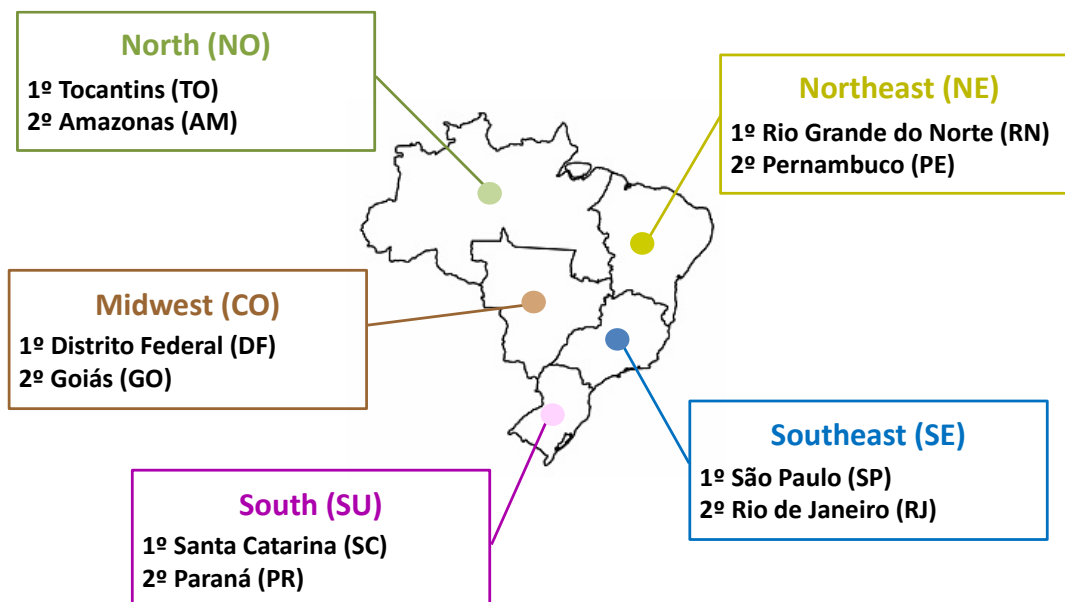


Source: INPI, Economic Affairs Advisory.

- In total, 14 out of 27 states recorded innovation results above the expectations for their level of economic development (measured by GDP per capita) – these are the so-called IBID innovation exponents.
- With the exception of the state of Alagoas (21<sup>st</sup> place), the states of the Northeast belong to the group of economies with innovation performance above that expected for their level of income.
- Among the innovation exponents, in addition to the Northeastern states, São Paulo, Santa Catarina, Paraná, Rio de Janeiro, Rio Grande do Sul and Minas Gerais – precisely the economies that make up the list of the most innovative in the country – stand out for having IBID scores higher than expected in terms of GDP per capita.
- On the other hand, 13 economies scored below expectations in terms of innovation, the majority belonging to the North (7) and Midwest (4) regions.

*São Paulo, Santa Catarina, the Federal District, Rio Grande do Norte and Tocantins are the IBID regional leaders (Figure 5)*

*Figure 5. Regional leaders in innovation according to the IBID: most innovative economies by region*

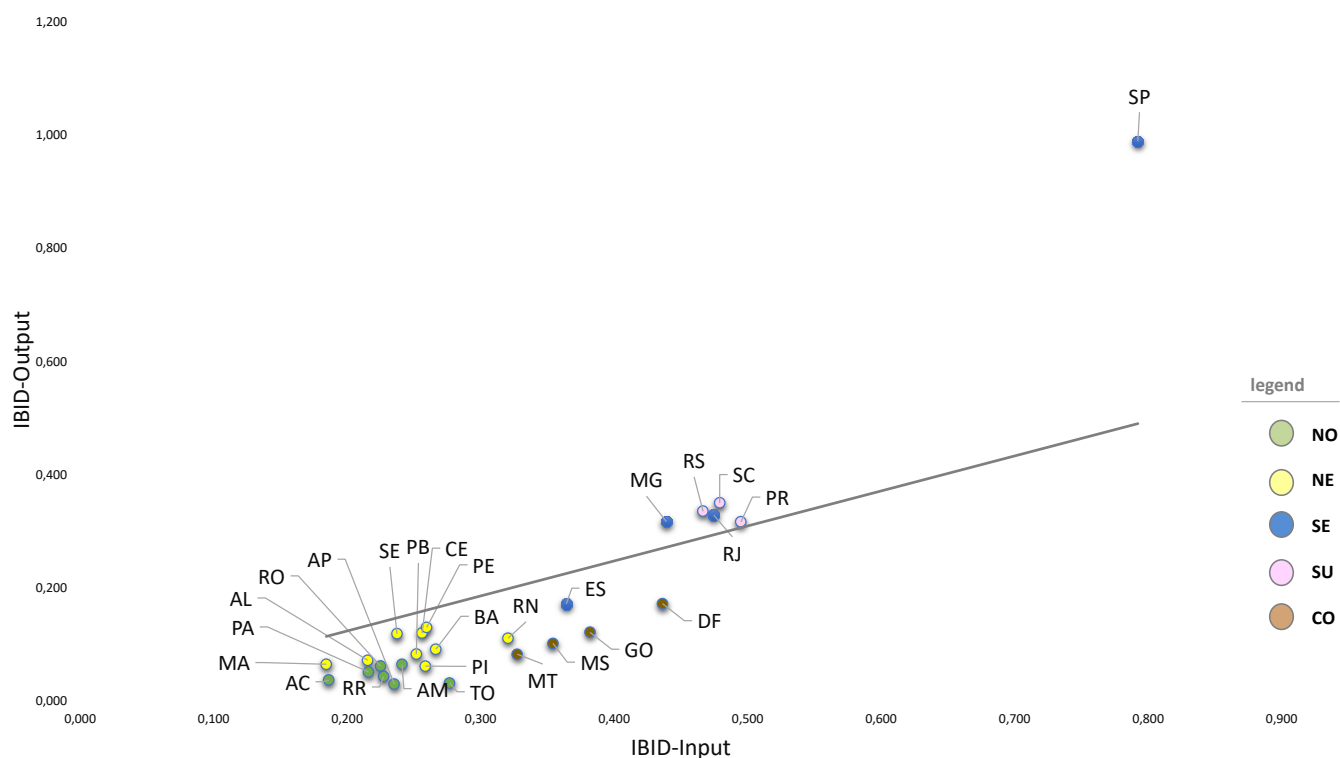


Source: INPI, Economic Affairs Advisory.

- In the Southeast, São Paulo (1<sup>st</sup> place), the national champion, and Rio de Janeiro (4<sup>th</sup>) lead regional innovation.
- In the South, Santa Catarina (2<sup>nd</sup>) leads, followed by Paraná (3<sup>rd</sup>).
- In the Midwest, the Federal District (7<sup>th</sup>) occupies the top regional position, followed by Goiás (9<sup>th</sup>).
- In the Northeast, the leaders are Rio Grande do Norte (11<sup>th</sup>) and Pernambuco (13<sup>th</sup>).
- In the North, Tocantins (19<sup>th</sup>) and Amazonas (20<sup>th</sup>) are the regional leaders.

*Southern states are more efficient at converting their inputs into innovation products*  
(Figure 6)

Figure 6. IBID-Input vs. IBID-Output: contextual conditions and innovation results



Source: INPI, Economic Affairs Advisory.

- The states in the South and Southeast regions, with the exception of Espírito Santo (8<sup>th</sup>), have a greater relative capacity to translate investments into tangible innovation products.
- Among the most efficient states in leveraging contextual conditions into concrete results in terms of innovation are São Paulo (1<sup>st</sup>), Santa Catarina (2<sup>nd</sup>), Paraná (3<sup>rd</sup>), Rio Grande do Sul (5<sup>th</sup>), Minas Gerais (6<sup>th</sup>) and Rio de Janeiro (4<sup>th</sup>).
- On the other hand, the UFs in the North, Northeast and Midwest regions struggle to translate inputs into innovation products, affecting their overall performance in the IBID.

*São Paulo, the Federal District, Paraná and Ceará have the best scores in specific innovation indicators (Figure 7)*

*Figure 7. UFs with the most IBID indicators in 1st place in the specific rankings*

UF	Input	Output	TOTAL
São Paulo (SP)	19	21	40
Federal District (DF)	6	0	6
Paraná (PR)	3	1	4
Ceará (CE)	3	1	4
Santa Catarina (SC)	3	0	3
Goiás (GO)	3	0	3
Piauí (PI)	3	0	3
Rio Grande do Norte (RN)	2	0	2
Amapá (AP)	2	0	2
Rio Grande do Sul (RS)	1	1	2
Rio de Janeiro (RJ)	0	1	1
Espírito Santo (ES)	1	0	1
Maranhão (MA)	1	0	1
Amazonas (AM)	1	0	1
Rondônia (RO)	1	0	1
<b>TOTAL</b>	<b>49</b>	<b>25</b>	<b>74</b>

Source: INPI, Economic Affairs Advisory.

- Of the 27 states, 15 lead the nation in at least one specific IBID innovation indicator.
- São Paulo has the best performance in the largest number of IBID innovation indicators, ranking first nationally in 40 of the 74 indicators.
- Behind São Paulo and far away is the Federal District, with the highest national score in 6 of the 74 indicators, with the best performance in schooling, internet access and the proportion of masters and doctors, among others.
- Tied in 3<sup>rd</sup> place on the list, with the highest scores in 4 of the 74 indicators, are Paraná – which leads, for example, in the quality of high schools, the student-teacher ratio and deposits of geographical indications – and Ceará, which stands out in transparency in public management, the quality of primary education and the degree of diversification of high-tech exports, among others.



The national leaders in innovation (the top 5) show solid performance in most of the seven pillars (Figure 8)

Figure 8. IBDI 2024: overall ranking and by pillar

	UF	IBID	Institutions	Human capital	Infrastructure	Economy	Business	Knowledge and technology	Creative economy
1	SP	0,891	1	1	1	1	1	1	1
2	SC	0,415	2	7	3	5	5	3	3
3	PR	0,406	5	4	5	3	4	5	4
4	RJ	0,402	9	2	4	8	6	6	2
5	RS	0,401	6	5	6	10	2	2	5
6	MG	0,378	3	6	8	7	7	4	6
7	DF	0,304	11	3	2	27	3	7	8
8	ES	0,268	4	10	7	22	9	10	7
9	GO	0,252	10	9	9	4	12	12	10
10	MS	0,228	8	8	10	14	11	16	13
11	RN	0,216	19	20	11	2	8	9	17
12	MT	0,205	7	14	14	6	17	22	16
13	PE	0,195	17	16	15	23	14	13	9
14	CE	0,188	22	13	24	12	20	8	14
15	BA	0,179	16	23	13	9	24	24	12
16	SE	0,178	26	19	16	15	15	11	11
17	PB	0,167	21	18	21	17	10	23	15
18	PI	0,160	14	22	17	11	19	21	20
19	TO	0,154	12	17	20	13	18	27	21
20	AM	0,153	25	12	23	24	13	15	24
21	AL	0,143	15	27	18	20	26	14	23
22	RO	0,143	13	21	25	16	25	17	22
23	RR	0,135	27	11	19	18	21	19	25
24	PA	0,133	18	25	22	21	23	26	18
25	AP	0,132	20	15	12	26	22	25	26
26	MA	0,125	23	26	26	19	27	18	19
27	AC	0,111	24	24	27	25	16	20	27

legend

- NO
- NE
- SE
- SU
- CO
- Brazil avg.
- N Top 5
- N Last 5

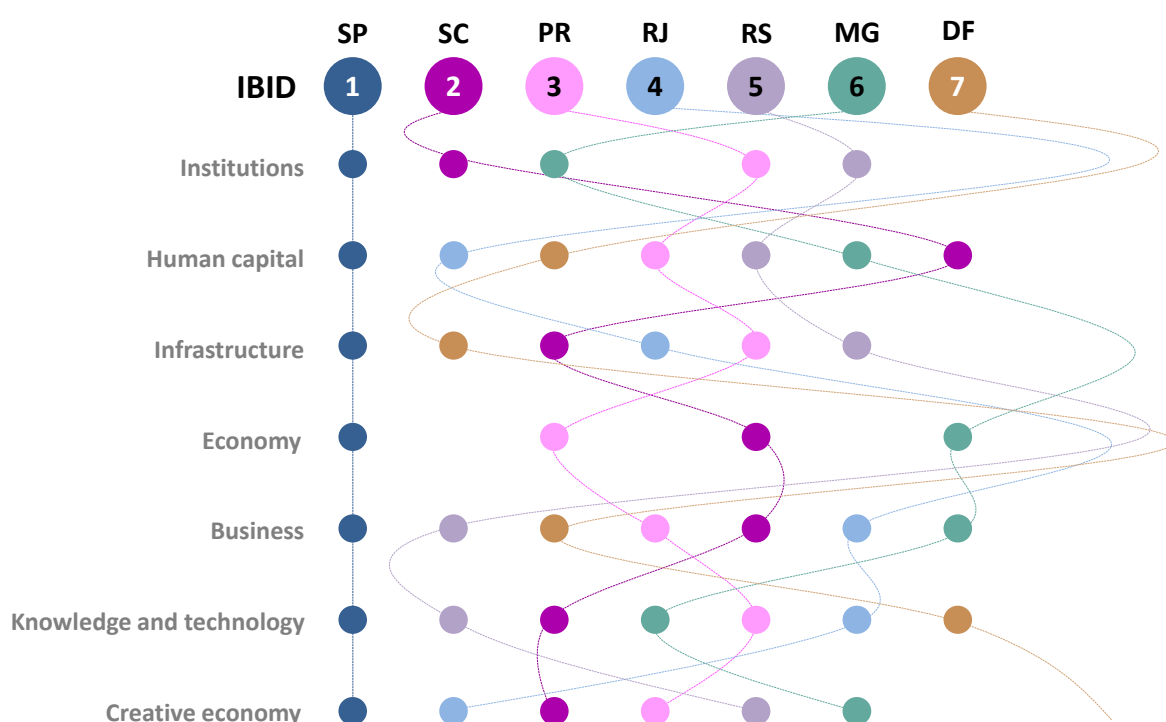
Source: INPI, Economic Affairs Advisory.

- São Paulo (1<sup>st</sup>) is the leader in all seven innovation pillars.
- Santa Catarina (2<sup>nd</sup>) and Paraná (3<sup>rd</sup>) show a balanced performance. Paraná is in the top 5 for all pillars, but Santa Catarina is not in the top 5 only for the Human Capital pillar.
- Rio de Janeiro (4<sup>th</sup>) and Rio Grande do Sul (5<sup>th</sup>) are among the five most innovative economies in Brazil due to their performance in some specific pillars. Rio de Janeiro is the national runner-up for Human Capital and Creative Economy, as is Rio Grande do Sul for Business and Knowledge and Technology.

- Some UFs lower down in the overall ranking stand out in specific innovation pillars. This is the case, for example, of Minas Gerais (6<sup>th</sup>) for Institutions and Knowledge and Technology; the Federal District (7<sup>th</sup>) for Human Capital, Infrastructure and Business; Espírito Santo (8<sup>th</sup>) for Institutions; and Goiás (9<sup>th</sup>) and Rio Grande do Norte (11<sup>th</sup>) for Economy.
- On the other hand, the distribution of the UFs with the worst individual scores in the pillars is heterogeneous throughout the overall ranking, which indicates the existence of specific bottlenecks that compromise the performance of these economies in the overall IBID ranking.
- The last places in the ranking, for example, are within the Legal Amazon. This demonstrates the need for strategic actions to enable this region to catch up economically.

*The average national performance does not provide a complete picture of innovation in the country, given the different regional challenges and potential (Figure 9)*

*Figure 9. Most innovative UFs in Brazil in 2024: dynamics and profile of local innovation systems according to IBID pillars*



Source: INPI, Economic Affairs Advisory.

- Although São Paulo leads the ranking in all the pillars, the innovation scenario in the other UFs, even those with an overall score higher than the country's average, reveals different regional challenges and potential. This can be seen in the greater volatility of the other economies in the specific thematic rankings.
- The dynamics and profile of the local ST&I ecosystems, according to the IBID pillars, of the 7 economies with performance above the national average shows that Brazil's regional heterogeneity is also considerable in the field of innovation.

## 2. Perspective by theme

Why create a benchmark innovation index for Brazil? There are several reasons that help answer this question.

Firstly, innovation is key to economic progress and the competitiveness of economies, regardless of their level of income. For this reason, fostering innovation is one of the United Nations' 17 SDGs. Secondly, the definition of innovation has been broadened: it is no longer restricted to R&D laboratories and published scientific articles. Innovation is now considered to be more general and horizontal in nature. Finally, but above all, recognizing and celebrating the role of innovation in enabling economies to leapfrog stages in their development process is fundamental to ensuring that it takes place in a socially inclusive, environmentally sustainable and territorially integrated manner.

In its 1<sup>st</sup> edition, the IBID helps to create an environment in which innovation factors are under continuous evaluation. It provides a fundamental tool for decision-makers and a rich database of detailed metrics for refining public policies and business strategies in the field of innovation.

Therefore, the main objective of creating a multidimensional index that consolidates 74 indicators into 7 pillars and 21 dimensions is to allow general comparison and that of each area between the country's 5 macro-regions and 27 UFs. Evaluating the performance of the UF in relation to its peers and to that of its region makes it possible, on the one hand, to highlight the areas with the greatest gaps in relation to national standards and, on the other, to identify the potential and solutions experienced by other territories.

The IBID results are analyzed below from a thematic perspective, considering the performance of the states and regions in seven pillars of innovation – 'Institutions', 'Human capital', 'Infrastructure', 'Economy', 'Business', 'Knowledge and technology' and 'Creative economy' - and in the dimensions associated with each of them.



The detailed results of the IBID are tabulated in the publication's **Complete Tables**, a database available on the INPI Portal.

Click [here](#) to access INPI Data.

## 2.1 Institutions

Developing an institutional macro-environment with operational stability that attracts and stimulates business, offering legal certainty, fiscal quality and good governance, is essential for encouraging entrepreneurship and innovation. The IBID sub-index for the innovation pillar ‘Institutions’ is divided into 3 dimensions – ‘Institutional environment’, ‘Regulatory environment’ and ‘Business environment’ – and consists of 12 indicators (Figure 10).

Figure 10. IBID: structure of the ‘Institutions’ innovation pillar

Pillar	Dimensions	Indicators
Institutions	Institutional environment	Commuting time to work (Brazilian Institute of Geography and Statistics – IBGE)
		Homicide rate per 100,000 inhabitants (DataSUS)
		Quality of municipal fiscal management (Federation of Industries of the State of Rio de Janeiro – FIRJAN)
	Regulatory environment	Quality of state accounting and fiscal information (National Treasury)
		Efficiency of the Judiciary Branch (Brazilian National Council of Justice (CNJ))
		Informality rate (IBGE)
		Transparency index (Comptroller General of Brazil (CGU))
	Business environment	Default rate (Serasa)
		Number of high-growth companies (IBGE)
		Business turnover (IBGE)
		Entrepreneurship (IBGE)
		Unemployment rate (IBGE)

Source: INPI, Economic Affairs Advisory.

*São Paulo, Santa Catarina, Minas Gerais, Espírito Santo and Paraná have the best scores in 'Institutions' (Figure 11)*

- São Paulo (1<sup>st</sup>) has the best performance in 'Institutions' (boosted by its scores in 'Regulatory environment' and 'Business environment'), followed by Santa Catarina (2<sup>nd</sup>), which leads in 'Institutional environment', and Minas Gerais (3<sup>rd</sup>), which is the national runner-up in this same dimension.
- Espírito Santo (4<sup>th</sup>) stands out in 'Institutional environment' and 'Regulatory environment', while Paraná (5<sup>th</sup>) has the best relative performance in 'Institutional environment' and 'Business environment'.
- Some UFs lower down in the overall ranking stand out in specific dimensions. This is the case of Rio Grande do Sul (6<sup>th</sup>) in 'Regulatory environment'; Mato Grosso (7<sup>th</sup>) in 'Business environment'; and the Federal District (11<sup>th</sup>) in 'Institutional environment'.
- On the other hand, the states of the North and Northeast regions are concentrated at the bottom of the overall ranking of the pillar. The last sixteen places are held by the states in both regions.

Figure 11. IBID 2024: ranking of the 'Institutions' pillar and by associated dimensions

	UF	IBID - Institutions	Institutional environment	Regulatory environment	Business environment
1	SP	0,800	6	1	1
2	SC	0,765	1	5	2
3	MG	0,666	2	4	5
4	ES	0,658	4	2	10
5	PR	0,649	3	7	4
6	RS	0,636	7	3	8
7	MT	0,590	8	19	3
8	MS	0,579	11	8	9
9	RJ	0,578	13	6	7
10	GO	0,552	9	20	6
11	DF	0,540	5	11	13
12	TO	0,479	10	22	14
13	RO	0,429	12	25	11
14	PI	0,418	14	13	27
15	AL	0,418	17	10	25
16	BA	0,418	25	9	17
17	PE	0,411	18	12	20
18	PA	0,407	24	18	16
19	RN	0,395	20	14	24
20	AP	0,393	21	15	22
21	PB	0,386	19	16	23
22	CE	0,382	23	21	18
23	MA	0,375	26	17	19
24	AC	0,374	15	23	21
25	AM	0,349	16	26	15
26	SE	0,318	22	24	26
27	RR	0,229	27	27	12

Legend

- NO
- NE
- SE
- SU
- CO
- Brazil avg.
- N Top 5
- N Last 5

Fonte: INPI, AECON.

## 2.2 Human capital

Access to quality education and the scale of research and development (R&D) activity in an economy are the main determinants of its capacity for innovation. The IBID sub-index that assesses economies' stock of 'Human capital' is divided into 3 dimensions – 'Education', 'Tertiary education' and 'R&D' - and is made up of 11 indicators (Figure 12).

Figure 12. IBID: structure of the 'Human capital' innovation pillar

Pillar	Dimensions	Indicators
Human capital	Education	Index of Basic Education Development (IDEB) in the final years of primary education (National Institute for Education Studies and Research – INEP)
		IDEB in high school (INEP)
		Enrollments in technical professional education in high school (INEP)
		Average schooling of the adult population (IBGE)
		High school net attendance rate (IBGE)
	Tertiary education	Student-teacher ratio in primary education (INEP)
		Adult population with at least a college degree (IBGE)
		People enrolled and graduates with a college degree in STEM (INEP)
	R&D	Public investment in R&D (Ministry of Science, Technology, and Innovation – MCTI)
		Offer of postgraduate programs of excellence (Coordination for Improvement of Higher Education Personnel – CAPES)
		Research grants and research promotion (CAPES)

Source: INPI, Economic Affairs Advisory.

*São Paulo, Rio de Janeiro, the Federal District, Paraná and Rio Grande do Sul stand out in 'Human capital'* (Figure 13)

- São Paulo (1<sup>st</sup>) has the best score in 'Human capital' (leading in 'Tertiary education' and 'R&D'), followed by Rio de Janeiro (2<sup>nd</sup>), which stands out in 'R&D', and the Federal District (3<sup>rd</sup>), which has the best relative performance in 'Education' (where it is the national leader) and 'Tertiary education'.
- Paraná (4<sup>th</sup>) has a solid and balanced performance in all three dimensions, while Rio Grande do Sul (5<sup>th</sup>) stands out in 'R&D'.
- On the other hand, the states of the North and Northeast regions are concentrated at the bottom of the overall ranking of the pillar. The last thirteen places are held by states from both regions.
- Except for the Federal District, the states of the Midwest occupy an intermediate position in the overall pillar ranking.

Figure 13. IBID 2024: ranking of the 'Human capital' pillar and by associated dimensions

	UF	IBID – Human capital	Education	Tertiary education	R&D
1	SP	0,852	2	1	1
2	RJ	0,551	3	3	2
3	DF	0,544	1	2	6
4	PR	0,450	4	4	4
5	RS	0,413	5	7	3
6	MG	0,386	8	5	5
7	SC	0,332	9	6	7
8	MS	0,268	10	8	14
9	GO	0,266	7	10	16
10	ES	0,264	6	11	17
11	RR	0,231	11	14	18
12	AM	0,222	12	15	13
13	CE	0,211	14	19	12
14	MT	0,206	13	12	21
15	AP	0,205	16	9	23
16	PE	0,194	17	18	9
17	TO	0,187	15	13	26
18	PB	0,139	22	24	11
19	SE	0,135	19	21	20
20	RN	0,128	24	20	10
21	RO	0,120	18	23	25
22	PI	0,115	21	17	22
23	BA	0,114	26	25	8
24	AC	0,114	20	16	27
25	PA	0,094	27	22	15
26	MA	0,087	23	27	19
27	AL	0,063	25	26	24

legend

- NO
- NE
- SE
- SU
- CO
- Brazil avg.
- N Top 5
- N Last 5

Fonte: INPI, AECON.



## 2.3 Infrastructure

Quality infrastructure in communication, transportation and energy facilitates the production and exchange of goods, services and ideas, improves access to markets and reduces transaction costs, stimulating the efficiency and sustainability of the innovation system. The IBID sub-index for the 'Infrastructure' innovation pillar is divided into 3 dimensions – 'Information and communication technologies (ICTs)', 'General infrastructure' and 'Ecological sustainability' – and comprises 12 indicators (Figure 14).

Figure 14. IBID: structure of the 'Infrastructure' innovation pillar

Pillar	Dimensions	Indicators
Infrastructure	ICTs	Percentage of the population with Internet access (IBGE)
		Percentage of the population with access to a cell phone for personal use (IBGE)
		Percentage of the population with broadband Internet connection at home (IBGE)
		Broadband Internet speed (Portal Minha Conexão)
	General infrastructure	Accessibility to the airline market (National Civil Aviation Agency of Brazil – ANAC)
		Percentage of the population with access to electricity (IBGE)
		Per capita consumption of electricity (Energy Research Company – EPE)
		Road quality (National Confederation of Transportation (CNT))
	Ecological sustainability	Average duration of electricity supply interruptions (Brazilian Electricity Regulatory Agency – ANEEL)
		CO2 emissions per capita (System for Estimating Greenhouse Gas Emissions and Removals (SEEG))
		National companies certified in environmental management (ISO 14001) (National Institute of Metrology, Standardization and Industrial Quality – INMETRO)
		Solar and wind power generation capacity (EPE)

Source: INPI, Economic Affairs Advisory.

São Paulo, Federal District, Santa Catarina, Rio de Janeiro and Paraná had the best performance in 'Infrastructure' (Figure 15)

- São Paulo (1<sup>st</sup>) has the highest score in 'Infrastructure' (leading in the 'General infrastructure' and 'Ecological sustainability' dimensions), followed by the Federal District (2<sup>nd</sup>), which leads in 'ICTs', and Santa Catarina (3<sup>rd</sup>), which is the national runner-up in 'General infrastructure'.
- Rio de Janeiro (4<sup>th</sup>) stands out in 'ICTs', while Paraná (5<sup>th</sup>) has the best relative performance in 'General infrastructure'.
- Some UFs lower down in the overall ranking stand out in specific dimensions. This is the case of Espírito Santo (7<sup>th</sup>) and Minas Gerais (8<sup>th</sup>) in 'General infrastructure' and Goiás (9<sup>th</sup>) and Mato Grosso do Sul (10<sup>th</sup>) in 'ICTs'.
- Four states in the Northeast region stand out in 'Ecological sustainability': Rio Grande do Norte (11<sup>th</sup>), Bahia (13<sup>th</sup>) and Piauí (17<sup>th</sup>), which, in this order, are behind São Paulo in this specific dimension, as well as Ceará (24<sup>th</sup>).

Figure 15. IBID 2024: ranking of the 'Infrastructure' pillar and by associated dimensions

	UF	IBID – Infrastructure	ICTs	General infrastructure	Ecological sustainability
1	SP	0,784	4	1	1
2	DF	0,639	1	7	14
3	SC	0,635	6	2	8
4	RJ	0,596	2	8	5
5	PR	0,582	10	3	10
6	RS	0,553	7	6	13
7	ES	0,552	9	5	18
8	MG	0,547	11	4	12
9	GO	0,546	3	10	20
10	MS	0,520	5	11	21
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11	RN	0,457	16	19	2
12	AP	0,427	12	21	15
13	BA	0,416	21	14	3
14	MT	0,399	8	9	27
15	PE	0,387	17	17	11
16	SE	0,372	18	16	17
17	PI	0,371	19	23	4
18	AL	0,362	24	12	16
19	RR	0,354	13	24	22
20	TO	0,346	15	15	24
21	PB	0,338	25	18	9
22	PA	0,325	22	13	23
23	AM	0,319	20	26	7
24	CE	0,312	26	22	6
25	RO	0,287	14	20	26
26	MA	0,218	27	25	19
27	AC	0,203	23	27	25

legend

- NO
- NE
- SE
- SU
- CO
- Brazil avg.
- N Top 5
- N Last 5

Fonte: INPI, AECON.

## 2.4 Economy

Market scale, the availability of credit and an economic environment that supports and stimulates investment are fundamental for companies to prosper and for innovation to take place. The IBID sub-index for the innovation pillar 'Economy' has 3 dimensions structured around market conditions and the total level of transactions – 'Credit', 'Investment' and 'Industry, trade and services' – and comprises 9 indicators (Figure 16).

Figure 16. IBID: structure of the 'Economy' innovation pillar

Pillar	Dimensions	Indicators
Economy	Credit	Volume of credit as a proportion of GDP (Central Bank)
		Financing of investments in innovation by the Brazilian National Bank for Economic and Social Development – BNDES (BNDES)
		Public expenditure on science and technology (S&T) in per capita terms (National Treasury)
	Investment	Investment rate (Gross Fixed Capital Formation (GFCF/GDP) (IBGE)
		BNDES direct disbursements per capita (BNDES)
		Gross Domestic Product (GDP) (IBGE)
	Industry, trade and services	Tax simplicity index (National Treasury)
		Gini index for the distribution of gross value added by economic activity (IBGE)
		Gross added value of processing industries (IBGE)

Source: INPI, Economic Affairs Advisory.

São Paulo, Rio Grande do Norte, Paraná, Goiás and Santa Catarina recorded the best scores in 'Economy' (Figure 17)

- São Paulo (1<sup>st</sup>) registers the best performance in 'Economy' (driven by its scores in 'Investment' and 'Industry, trade and services'), followed by Rio Grande do Norte (2<sup>nd</sup>), which leads in 'Credit', and Paraná (3<sup>rd</sup>), which stands out in 'Investment'.
- Goiás (4<sup>th</sup>) ranks well in 'Credit' and 'Investment', while Santa Catarina (5<sup>th</sup>) has the best relative performance in 'Investment'.
- Some UFs lower down in the overall ranking stand out in specific dimensions. This is the case of Mato Grosso (6<sup>th</sup>) in 'Credit'; Minas Gerais (7<sup>th</sup>), Rio de Janeiro (8<sup>th</sup>) and Rio Grande do Sul (10<sup>th</sup>) in 'Industry, trade and services'; and Ceará (12<sup>th</sup>) in 'Investment'.

Figure 17. IBID 2024: ranking of the 'Economy' pillar and by associated dimensions

	UF	IBID – Economy	Credit	Investment	Industry, trade and services
1	SP	0,714	4	1	1
2	RN	0,456	1	12	21
3	PR	0,414	5	3	5
4	GO	0,411	2	2	8
5	SC	0,359	12	4	6
6	MT	0,351	3	6	14
7	MG	0,345	18	13	2
8	RJ	0,345	17	8	3
9	BA	0,330	8	11	7
10	RS	0,313	15	16	4
11	PI	0,300	9	14	10
12	CE	0,297	20	5	11
13	TO	0,283	11	10	25
14	MS	0,268	7	20	19
15	SE	0,266	19	7	22
16	RO	0,252	6	23	23
17	PB	0,248	10	21	18
18	RR	0,247	21	9	27
19	MA	0,228	13	22	16
20	AL	0,200	23	19	20
21	PA	0,200	26	17	9
22	ES	0,196	25	18	15
23	PE	0,193	22	24	13
24	AM	0,192	27	15	17
25	AC	0,148	14	25	24
26	AP	0,088	16	27	26
27	DF	0,071	24	26	12

Legend

- NO
- NE
- SE
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- N Top 5
- N Last 5

Fonte: INPI, AECON.

## 2.5 Business

The last pillar of context seeks to assess the level of business sophistication and the extent to which companies are inducing and focused on innovation activity, including the capacity of the market to absorb highly skilled professionals and technicians. The IBID sub-index for the 'Business' innovation pillar is divided into 3 dimensions – 'Knowledge workers', 'Innovation support' and 'Knowledge absorption' - and is made up of 5 indicators (Fig.18).

Figure 18. IBID: structure of the 'Business' innovation pillar

Pillar	Dimensions	Indicators
<b>Business</b>	Knowledge workers	<ul style="list-style-type: none"> <li>Number of masters and doctors (Center for Management and Strategic Studies – CGEE)</li> <li>Labor force employed with a college degree (IBGE)</li> </ul>
	Innovation support	<ul style="list-style-type: none"> <li>Number of technology parks (MCTI)</li> <li>Gross added value of scientific and technical activities (IBGE)</li> </ul>
	Knowledge absorption	<ul style="list-style-type: none"> <li>Imports of high and medium-high technological intensity (Ministry of Development Industry and Foreign Trade – MDIC)</li> </ul>

Source: INPI, Economic Affairs Advisory.

*São Paulo, Rio Grande do Sul, Federal District, Paraná and Santa Catarina stand out in 'Business' (Figure 19)*

- São Paulo (1<sup>st</sup>) registers the best score in 'Business' (leading in 'Innovation support' and 'Knowledge absorption'), followed by Rio Grande do Sul (2<sup>nd</sup>), which has the greatest relative prominence in 'Innovation support', and the Federal District (3<sup>rd</sup>), which has the best performance in 'Knowledge workers' (where it is the national leader).
- Paraná (4<sup>th</sup>) has a solid and balanced performance in all three dimensions, while Santa Catarina (5<sup>th</sup>) stands out in 'Innovation support' and 'Knowledge absorption'.
- Some UFs lower down in the overall ranking stand out in specific dimensions. This is the case of Rio de Janeiro (6<sup>th</sup>) in 'Knowledge workers' (national runner-up) and 'Knowledge absorption'; and Minas Gerais (7<sup>th</sup>), which performs well in the latter dimension and in 'Innovation support'. Except for the Federal District, the states of the Midwest occupy an intermediate position in the overall pillar ranking.

*Figure 19. IBID 2024: ranking of the 'Business' pillar and by associated dimensions*

	UF	IBID – Business	Knowledge workers	Innovation support	Knowledge absorption
1	SP	0,811	5	1	1
2	RS	0,418	3	2	7
3	DF	0,387	1	7	11
4	PR	0,379	4	3	3
5	SC	0,305	7	4	2
6	RJ	0,302	2	6	4
7	MG	0,252	11	5	5
8	RN	0,166	6	16	20
9	ES	0,150	10	17	8
10	PB	0,148	9	12	22
11	MS	0,136	8	21	17
12	GO	0,134	15	11	9
13	AM	0,124	21	20	6
14	PE	0,112	17	8	12
15	SE	0,095	14	15	24
16	AC	0,091	12	25	26
17	MT	0,090	20	18	10
18	TO	0,089	13	24	23
19	PI	0,089	18	10	18
20	CE	0,080	22	13	15
21	RR	0,076	16	26	25
22	AP	0,063	19	27	27
23	PA	0,055	23	14	14
24	BA	0,054	26	9	13
25	RO	0,036	25	19	19
26	AL	0,033	24	23	21
27	MA	0,014	27	22	16

legend

- NO
- NE
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Fonte: INPI, AECON.

## 2.6 Knowledge and technology

This pillar covers all the variables that are traditionally considered to be the result of inventions and/or innovations. It refers to the creation of knowledge and technological dissemination, including indicators that measure the outcome and impact of inventive and innovative activities, such as patents, technology transfer, startups and scientific production. The IBID sub-index for the 'Knowledge and technology' innovation pillar is divided into 3 dimensions – 'Knowledge creation', 'Knowledge impact' and 'Knowledge dissemination' – and brings together the largest number of specific indicators: 14 (Figure 20).

Figure 20. IBID: structure of the 'Knowledge and technology' innovation pillar

Pillar	Dimensions	Indicators
<b>Knowledge and technology</b>	<b>Knowledge creation</b>	Bibliographic scientific production in technology areas (CAPES)
		Scientific impact of publications (CWTS Leiden Ranking)
		Invention Patent (IP) filings per capita (INPI)
		Utility Model (MU) filings per capita (INPI)
		Patents in force per capita (INPI)
	<b>Knowledge impact</b>	Number of startups (ABStartups)
		Number of innovative companies (IBGE)
		Patent filings in agribusiness per capita (INPI)
		Patent filings in health per capita (INPI)
		Patent filings in biotechnology per capita (INPI)
	<b>Knowledge dissemination</b>	National companies certified in quality management (ISO 9001) (INMETRO)
		Exports of high and medium technological intensity (MDIC)
		Degree of diversification of high and medium-high technological intensity exports (MDIC)
		Technology Transfer Agreements annotated per capita (INPI)

Source: INPI, Economic Affairs Advisory.

*São Paulo, Rio Grande do Sul, Santa Catarina, Minas Gerais and Paraná register the best scores in 'Knowledge and technology' (Figure 21)*

- The 7 UFs with the highest inventive and innovative capacity according to the ranking of the 'Knowledge and technology' pillar are, with a few changes of position, strictly the same as those leading the overall IBID ranking.
- São Paulo (1<sup>st</sup>) records the best performance in 'Knowledge and technology', leading in all three dimensions, followed by Rio Grande do Sul (2<sup>nd</sup>), which has the best result in 'Knowledge creation' (where it also ranks second nationally), and Santa Catarina (3<sup>rd</sup>), which is second in 'Knowledge dissemination'.
- Minas Gerais (4<sup>th</sup>) stands out in 'Knowledge dissemination' and 'Knowledge impact'. Paraná (5<sup>th</sup>) has a good relative performance in the latter dimension and in 'Knowledge creation'.

*Figure 21. IBID 2024: ranking of the 'Knowledge and technology' pillar and by associated dimensions*

	UF	IBID – Knowledge and technology	Knowledge creation	Knowledge impact	Knowledge dissemination
1	SP	0,995	1	1	1
2	RS	0,329	2	4	4
3	SC	0,311	3	5	2
4	MG	0,297	5	2	3
5	PR	0,284	4	3	5
6	RJ	0,217	6	6	6
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7	DF	0,122	7	12	14
8	CE	0,116	14	10	7
9	RN	0,116	9	13	10
10	ES	0,113	11	15	9
11	SE	0,101	13	7	16
12	GO	0,098	12	17	13
13	PE	0,094	10	9	22
14	AL	0,093	22	14	8
15	AM	0,086	20	16	11
16	MS	0,078	15	18	19
17	RO	0,072	26	25	12
18	MA	0,069	19	19	18
19	RR	0,067	24	27	15
20	AC	0,066	25	24	17
21	PI	0,062	21	20	21
22	MT	0,059	18	21	20
23	PB	0,058	8	11	25
24	BA	0,055	16	8	24
25	AP	0,048	27	22	23
26	PA	0,016	17	23	26
27	TO	0,003	23	26	27

legend

- NO
- NE
- SE
- SU
- CO
- Brazil avg.
- N Top 5
- N Last 5

Fonte: INPI, AECON.



## 2.7 Creative economy

This pillar assesses the role of creativity in innovation, signaling the ability to create disruptive businesses. It covers indicators for trademarks and other industrial property assets related to adding value and creativity to an economy, as well as the digital environment that drives it. The IBID sub-index for the innovation pillar ‘Creative economy’ is divided into 3 dimensions – ‘Intangible assets’, ‘Creative goods and services’ and ‘Online creativity’ – and comprises 11 indicators (Figure 22).

Figure 22. IBID: structure of the ‘Creative economy’ innovation pillar

Pillar	Dimensions	Indicators
Creative economy	Intangible assets	Trademark filings per capita (INPI)
		Industrial design filings per capita (INPI)
		Trademarks in force per capita (INPI)
		Share of total Geographical Indication filings (INPI)
		Gross added value of arts and culture activities (IBGE)
	Creative goods and services	Employment in creative sectors (ESPM)
		Creative industries (ESPM)
		Wages in creative sectors (ESPM)
	Online creativity	Number of accesses to the Internet (Brazilian National Telecommunications Agency – ANATEL)
		Computer software filings (INPI)
		Value of e-commerce (MDIC)

Source: INPI, Economic Affairs Advisory.

*São Paulo, Rio de Janeiro, Santa Catarina, Paraná and Rio Grande do Sul stand out in 'Creative Economy' (Figure 23)*

- The 8 UFs with the highest creativity for innovation according to the ranking of the 'Creative economy' pillar are, with a few changes in places, strictly the same as those leading the overall IBID ranking.
- São Paulo (1<sup>st</sup>) registers the best score in 'Creative economy' (leading in all dimensions), followed by Rio de Janeiro (2<sup>nd</sup>), which stands out in 'Creative goods and services', and Santa Catarina (3<sup>rd</sup>), which has the best relative performance in 'Intangible assets' (in which it is the national runner-up).
- Paraná (4<sup>th</sup>) has outstanding performance in 'Intangible assets' and 'Online creativity', second only to São Paulo in this dimension.
- Rio Grande do Sul (5<sup>th</sup>) and Minas Gerais (6<sup>th</sup>) have a solid and balanced performance in all three dimensions.

*Figure 23. IBID 2024: ranking of the 'Creative economy' pillar and by associated dimensions*

	UF	IBID – Creative economy	Intangible assets	Creative goods and services	Online creativity
1	SP	0,984	1	1	1
2	RJ	0,440	6	2	4
3	SC	0,389	2	3	7
4	PR	0,349	3	7	2
5	RS	0,342	5	4	5
6	MG	0,337	4	5	3
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7	ES	0,230	9	6	8
8	DF	0,222	8	8	6
9	PE	0,165	13	9	10
10	GO	0,145	7	12	14
11	SE	0,136	23	10	12
12	BA	0,128	12	13	15
13	MS	0,125	14	11	16
14	CE	0,123	10	14	13
15	PB	0,106	15	18	9
16	MT	0,106	11	15	17
17	RN	0,106	17	16	11
18	PA	0,086	19	17	18
19	MA	0,061	24	20	21
20	PI	0,061	25	21	19
21	TO	0,060	18	19	24
22	RO	0,051	20	22	25
23	AL	0,050	21	23	20
24	AM	0,043	22	24	22
25	RR	0,019	26	25	27
26	AP	0,011	16	27	23
27	AC	0,008	27	26	26

legend

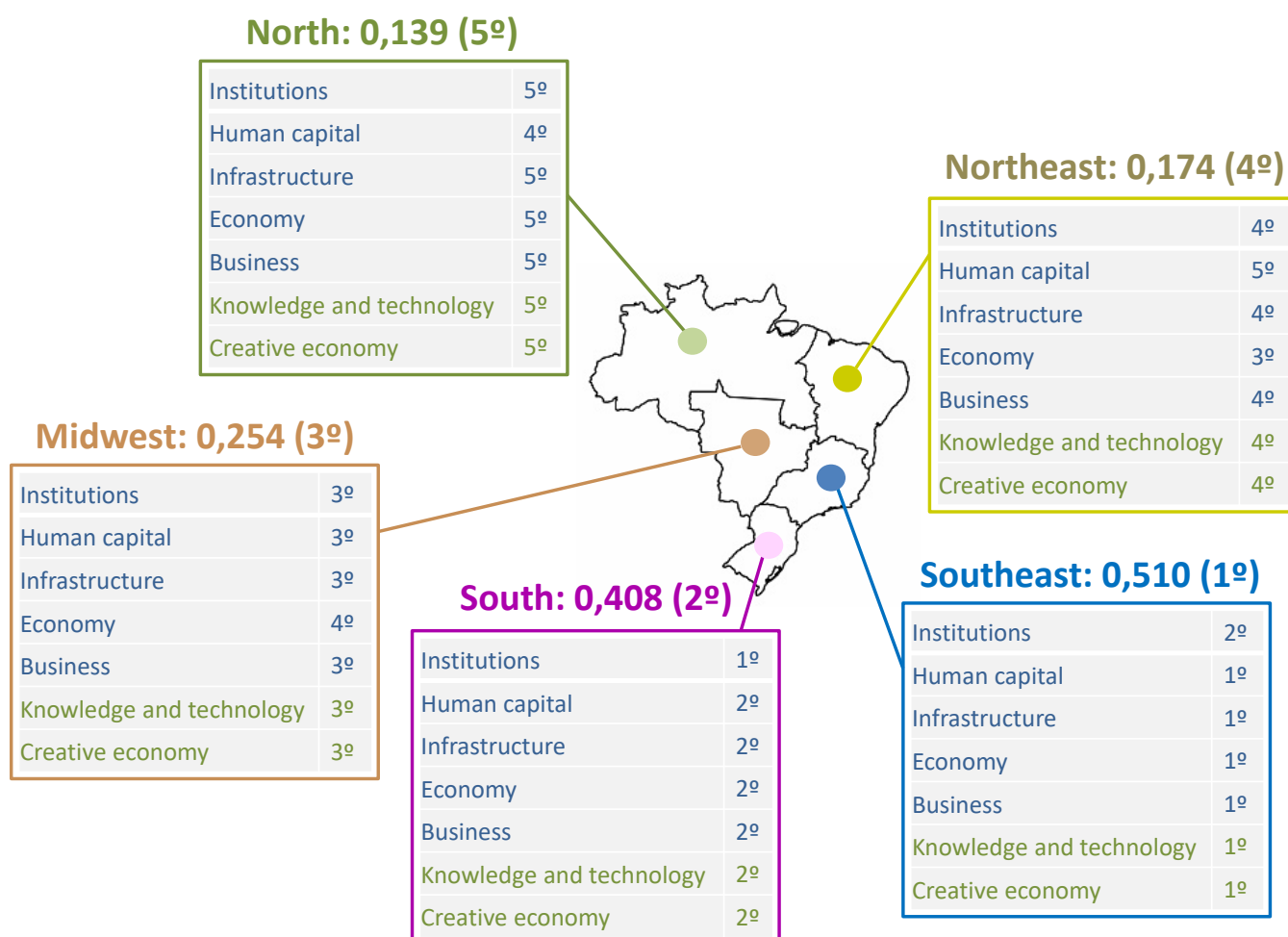
- NO
- NE
- SE
- SU
- CO
- Brazil avg.
- N Top 5
- N Last 5

Fonte: INPI, AECON.

### 3. Geographic perspective

In 2024, the overall IBID ranking for the regions – based on the average weighted score, by GDP per capita, of the IBID of all the UFs that make up a region – shows the Southeast (SE) as the most innovative in Brazil (driven by the performance of São Paulo, the national leader), followed by the South (SU), which 3 states are among the 5 most innovative ones in the country. The Southeast leads in all innovation pillars, except for ‘Institutions’, for which the South is in first place (Figure 24).

Figure 24. IBID 2024: overall performance and by pillar of innovation - Regions



Source: INPI, Economic Affairs Office.

The Midwest (CO) is third in the overall regional ranking and by pillar of innovation, with the exception of 'Economy', where it is the Northeast (NE). Although in 3<sup>rd</sup> place in 'Economy', the Northeast is last in the regional ranking in the 'Human Capital' pillar, making the region the penultimate in the country in the field of innovation. The 5<sup>th</sup> (and last) place is held by the North (NO), which concentrates the largest number of economies among those with the worst overall ranking. There are 4 northern states in the bottom 5 places of the ranking.



The detailed results of the IBID are tabulated in the publication's Complete Tables, a database available on the INPI Portal.

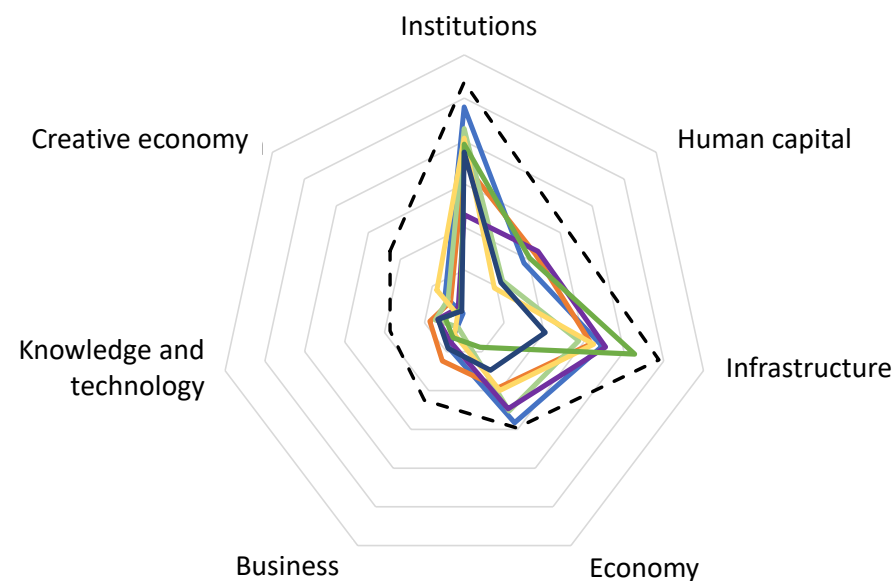
Click [here](#) to access INPI Data.

### 3.1 North

The North has the largest number of economies among those in the last places in the IBID's overall ranking. There are 4 northern states in the bottom 5 places of the ranking. All 7 states in the region are among the bottom 9 places in Brazil. Tocantins (19<sup>th</sup>) is the regional leader (with the best relative performance in 'Institutions' and 'Economy'), just ahead of Amazonas (20<sup>th</sup>) (which stands out comparatively in 'Knowledge and technology' and 'Business') (Figure 25).

Figure 25. IBID 2024: North Region summary

Rank	State	IBID	IBID-Input	Rank	IBID-Output	Rank
19	TO	0,154	0,277	13	0,031	26
20	AM	0,153	0,241	19	0,065	20
22	RO	0,143	0,225	23	0,062	21
23	RR	0,135	0,227	22	0,043	24
24	PA	0,133	0,216	24	0,051	23
25	AP	0,132	0,235	21	0,029	27
27	AC	0,111	0,186	26	0,037	25
<b>North</b>		<b>0,139</b>	<b>0,231</b>		<b>0,046</b>	



— TO — AM — RO — RR — PA — AP — AC - - - Brazil avg.

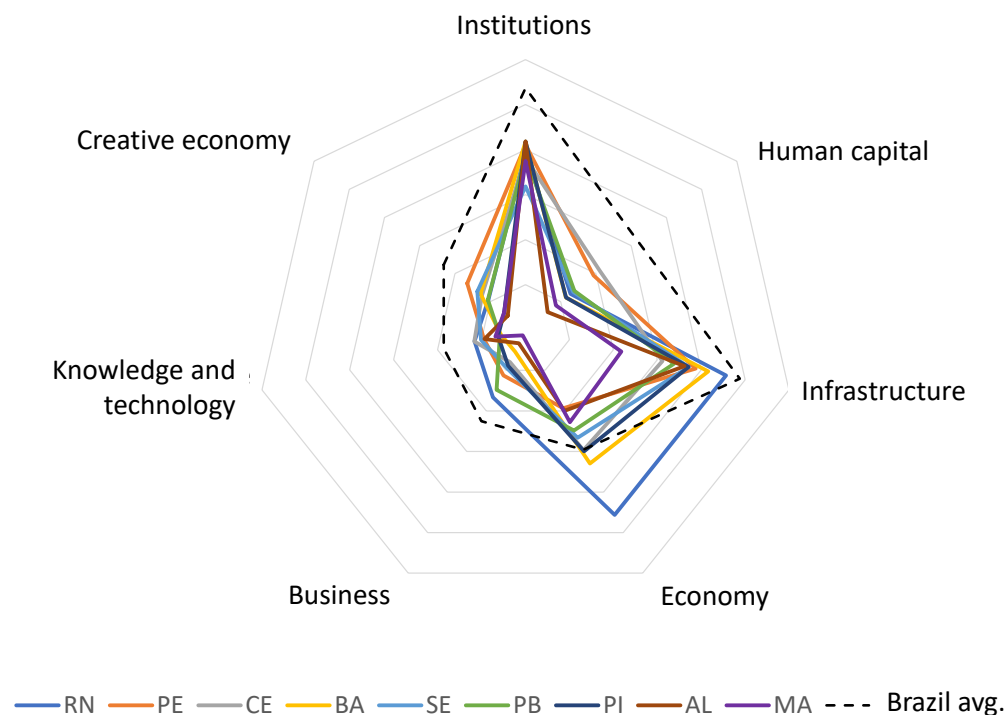
Source: INPI, Economic Affairs Advisory.

### 3.2 Northeast

The Northeastern states are concentrated in the lower half of the IBID’s overall ranking. Of the 9 states in the macro-region, 8 are in the last 15 places of the ranking. Rio Grande do Norte (11<sup>th</sup>), a national highlight in ‘Economy’ (driven by the ‘Credit’ dimension) and with good regional performance in ‘Infrastructure’, ‘Knowledge and technology’ and ‘Business’ – is the most innovative state in the Northeast. Pernambuco (13<sup>th</sup>), the regional runner-up, had the best performance, in relative terms, in ‘Creative economy’. Ceará (14<sup>th</sup>) stands out regionally in ‘Knowledge and technology’, while Bahia (15<sup>th</sup>) registers the best relative performance in ‘Economy’ (Figure 26).

Figure 26. IBID 2024: Northeast Region summary

Rank	State	IBID	IBID-Input	Rank	IBID-Output	Rank
11	RN	0,216	0,321	12	0,111	13
13	PE	0,195	0,260	15	0,130	9
14	CE	0,188	0,256	17	0,120	11
15	BA	0,179	0,266	14	0,091	15
16	SE	0,178	0,237	20	0,119	12
17	PB	0,167	0,252	18	0,082	16
18	PI	0,160	0,259	16	0,061	22
21	AL	0,143	0,215	25	0,072	18
26	MA	0,125	0,184	27	0,065	19
<b>Northeast</b>		<b>0,174</b>	<b>0,252</b>		<b>0,096</b>	

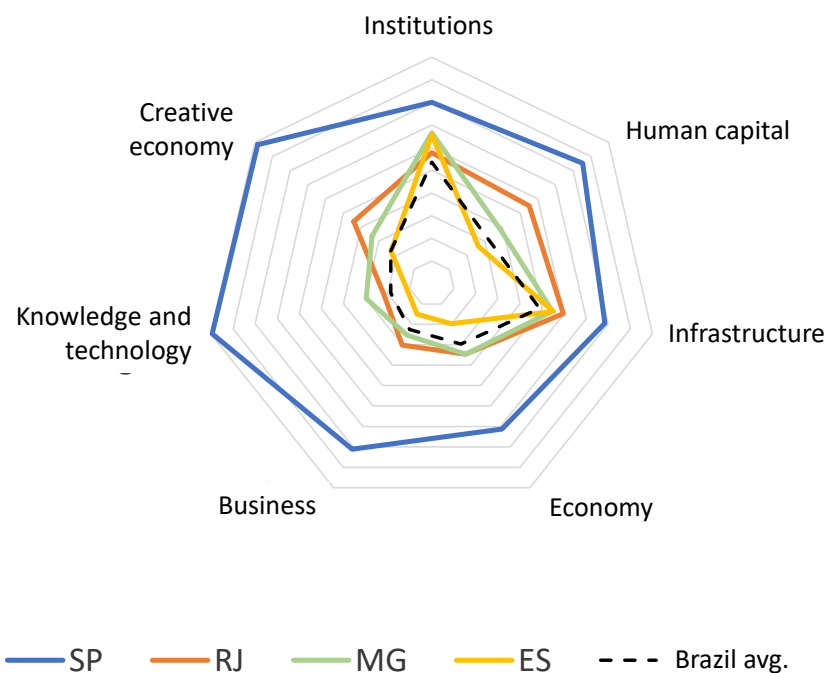


### 3.3 Southeast

Thanks largely to São Paulo (1<sup>st</sup>) – the national leader in the overall IBID ranking and in the specific rankings for the seven pillars of innovation – the Southeast Region is the most innovative in Brazil. Rio de Janeiro (4<sup>th</sup>) stands out in relation to the national average in the ‘Human capital’ and ‘Creative economy’ pillars, while Minas Gerais (6<sup>th</sup>) has the best relative score in ‘Knowledge and technology’. Espírito Santo (8<sup>th</sup>) has an outstanding position in ‘Institutions’. Among the 27 states of Brazil, São Paulo is the only one to have an IBID related to the ‘Result’ of innovation at a higher level than the ‘Context’, meaning that the macro-region, compared to the others, registers the two sub-indices with values that are relatively close to each other (Figure 27).

Figure 27. IBID 2024: Southeast Region summary

Rank	State	IBID	IBID-Input	Rank	IBID-Output	Rank
1	SP	0,891	0,792	1	0,990	1
4	RJ	0,402	0,475	4	0,329	4
6	MG	0,378	0,439	6	0,317	5
8	ES	0,268	0,364	9	0,171	8
<b>Southeast</b>		<b>0,510</b>	<b>0,536</b>		<b>0,485</b>	



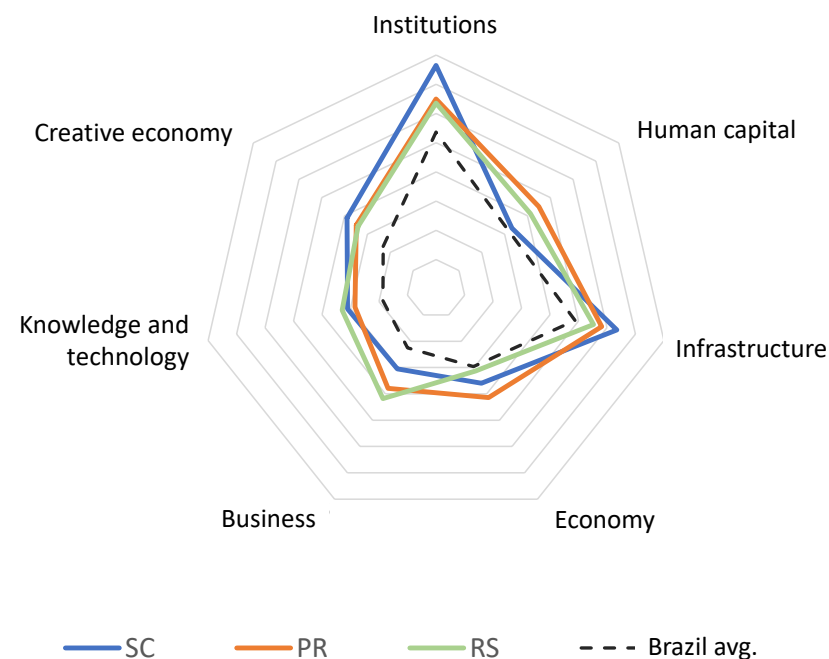
Source: INPI, Economic Affairs Advisory.

### 3.4 South

The South has the highest number of innovation leaders among the 5 best-ranked states. The 3 states that make up the Region are among the five most innovative economies in Brazil. The South states perform close to or above the national average for the seven pillars of innovation. Santa Catarina (2<sup>nd</sup>) scores highly in 'Institutions', 'Creative economy' and 'Knowledge and technology'. Paraná (3<sup>rd</sup>), in addition to performing well in these pillars, has an outstanding position in 'Business' and 'Human capital'. Rio Grande do Sul (5<sup>th</sup>), on the other hand, is the best-ranked state in the region for 'Knowledge and technology' and 'Business'. The IBID figures show that, in the case of the South states, the good conditions for innovation (measured by the IBID-Context sub-index) boost the generation of products and results in this field (portrayed by the IBID-Result) (Figure 28).

Figure 28. IBID 2024: South Region summary

Rank	State	IBID	IBID-Input	Rank	IBID-Output	Rank
2	SC	0,415	0,479	3	0,350	2
3	PR	0,406	0,495	2	0,317	6
5	RS	0,401	0,466	5	0,335	3
<b>South</b>		<b>0,480</b>	<b>0,480</b>		<b>0,335</b>	



Source: INPI, Economic Affairs Advisory.

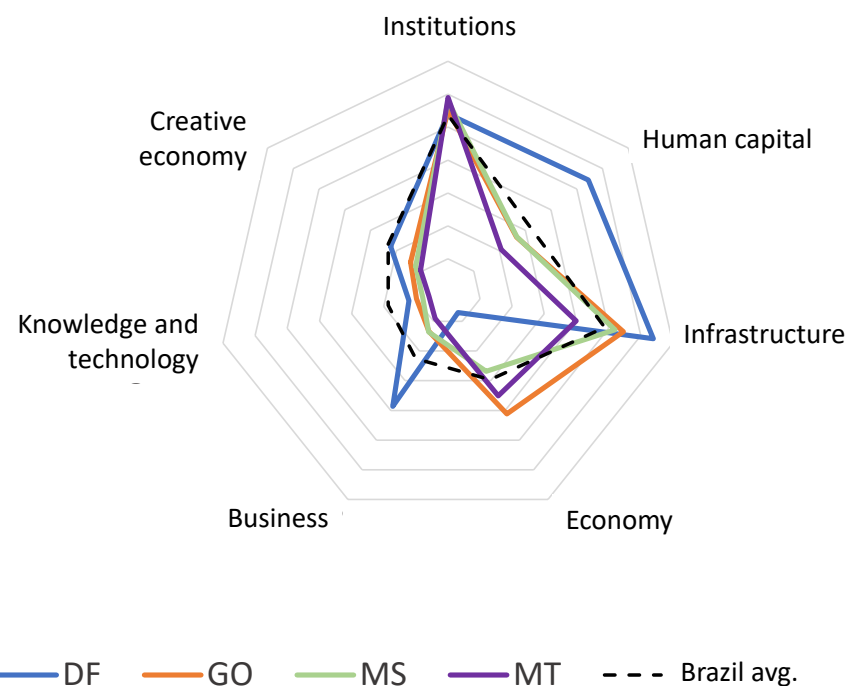


### 3.5 Midwest

The states of the Midwest Region occupy an intermediate position in the overall IBID ranking. There is remarkable heterogeneity between them in the field of innovation. The Federal District (7<sup>th</sup>) is the region's top-scoring economy, excelling in 'Human capital', 'Business' and 'Infrastructure'. Goiás (9<sup>th</sup>) performs relatively well in 'Economy', as does Mato Grosso (12<sup>th</sup>), which also deserves praise for its score in 'Institutions'. Mato Grosso do Sul (10<sup>th</sup>) ranks the highest comparatively in 'Infrastructure' (Figure 29).

Figure 29. IBID 2024: Midwest Region summary

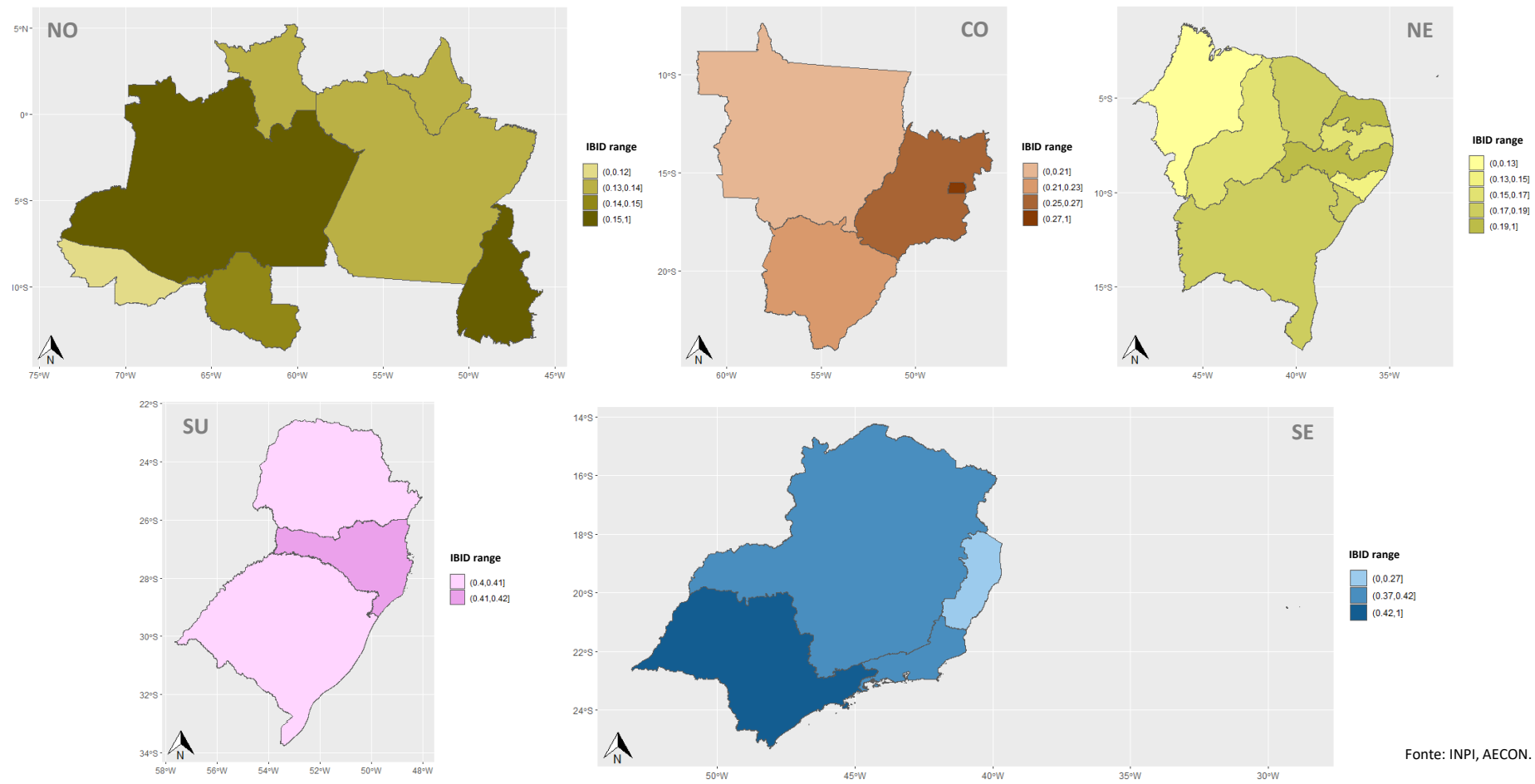
Rank	State	IBID	IBID-Input	Rank	IBID-Output	Rank
7	DF	0,304	0,436	7	0,172	7
9	GO	0,252	0,382	8	0,121	10
10	MS	0,228	0,354	10	0,101	14
12	MT	0,205	0,327	11	0,082	17
<b>Midwest</b>		<b>0,254</b>	<b>0,382</b>		<b>0,126</b>	



Source: INPI, Economic Affairs Advisory.

### 3.6 Geographical overview

Figure 30. IBID 2024: Regions overview





## Annexes

### A.1. Methodology

#### Data engineering

In order to construct the Brazil Innovation and Development Index (IBID), the Brazilian National Institute of Industrial Property – INPI follows the methodology used by the World Intellectual Property Organization – WIPO in the Global Innovation Index (GII). The GI is the global benchmark in the field of innovation, which annually measures the performance of innovation ecosystems in 132 countries, including Brazil.

As well as following the same methodology, the IBID has the same classification structure as the GI: a general index broken down into specific sub-indices for 2 groups, 7 pillars of innovation and 21 dimensions. The methodological adaptation of the GI to the specificities of the National Statistical System for the construction of the Brazilian index was a challenging task.

The first step was to analyze the applicability of the GI structure to the development of sub-national innovation metrics and indices. Which of the GI metrics are available in Brazil at a state level? To answer this question, extensive research was carried out with official and/or public dimension sources, resulting in the selection of 74 statistical indicators (the GI has 80).

The first criterion for defining the indicators was to select, in the light of the description and calculation method of each one, those that corresponded automatically or closely to the GI basket, by pillar of innovation and dimension. These indicators were promptly incorporated into the IBID.

There are indicators, however, which are not relevant below the national level for a large number of countries (variables which, by their nature, are aimed at international comparison). In other cases, the feasibility analysis, considering the availability of data, did not make it possible to implement them at state level. For these specific situations, the criteria for selecting the substitute indicator were: (i) alignment with the philosophy of the dimension; and (ii) international benchmarking, i.e. the

indicators selected by other countries with sub-national innovation indices when faced with the same technical and methodological challenge.

In this stage of defining the so-called Glossary of IBID Indicators (see Annex A.2), the document "Enabling Innovation Measurement at the Sub-National Level: A WIPO toolkit" (WIPO, 2024) was used as a reference, an initiative of the WIPO Department of Economics and Data Analysis aimed at member countries developing official regional innovation indices. In addition to being official, they are methodologically aligned with the GII, allowing for complementary and detailed analysis of the innovation scenario in each economy.

Brazil's experience in this area was presented by INPI at the 65<sup>th</sup> WIPO General Assembly, held in Geneva, Switzerland, in July 2024. During the event "Enabling Innovation Measurement at the Sub-National Level: The Role of Regional Innovation Indices", INPI's Economic Affairs Office (AECON) presented the project to build the IBID, including the methodological approach used, in a panel attended by the team responsible for the annual production of the GII and representatives of the countries that currently have sub-national innovation indices.

## Calculation method

In order to aggregate a set of 74 indicators of different nature and scale into a multidimensional index ranging from 0 to 1, the first stage consists of calculating the elementary indices, by UF. For indicators which growth means progress, the formula used for standardization is:

$$\xrightarrow{p_i \equiv +1} I_{i,j} = \frac{v_{i,j} - \min_i}{\max_i - \min_i}$$

If an increase in the indicator means a decline in the situation of the UF, the formula used is:

$$\xrightarrow{p_i \equiv -1} I_{i,j} = \frac{v_{i,j} - \max_i}{\min_i - \max_i}$$

where:

$p_i$  is the polarity of the indicator  $i$  ;

$I_{i,j}$  is the elementary index, i.e. the normalized value, from 0 to 1, of the indicator  $i$  in the UF  $j$ ;

$v_{i,j}$  is the value of indicator  $i$  in the UF  $j$

$\min_i$  is the minimum value of indicator  $i$  among all UFs;

$\max_i$  is the maximum value of indicator  $i$  among all UFs.

It should be noted that this calculation procedure implies caution when reading the time series of IBID data. A direct comparison between the state indices at two points in time should be avoided. The construction of the index requires an analysis of the relative position of the state compared to the others at these two points in time.

The sub-index for each dimension, pillar of innovation or group was obtained from the weighted average of the indicators that make it up, using the same weights used by WIPO to produce the GII for the previous year. In recent editions, it has been decided to assign the same weight to the areas when calculating the synthetic indicator. The same calculation applies to the general index for each UF.

The calculation of the top indices, by UF, is denoted by the following formula:

$$I_{ag} = \frac{\sum_{I \in ag} w_{i,j} I_{i,j}}{\sum_{I \in ag} w_{i,j}}$$

where:

$I_{ag}$  is the top index for a given aggregate  $ag$  (general, group, pillar or dimension);

$I_{i,j}$  is the elementary index (or the level immediately below) of indicator (or sub-index)  $i$  in the UF  $j$ ;

$w_{i,j}$  is the weight of the elementary index (or the level immediately below) of indicator  $i$  in the UF  $j$  within the aggregate  $ag$ .

The general summary indicator for the Regions and Brazil (national average) can be obtained from the weighted average of the summary indicators of the areas for the UFs that make them up. It was decided to weight the GDP per capita of each UF as a weight for this aggregate.

$$I_{ag}^R = \frac{\sum_{j \in R} w_j^R I_{ag,j}}{\sum_{j \in R} w_j^R}$$

where:

$I_{ag}^R$  is the top index for a given aggregate  $ag$  (general, group, pillar or dimension) and region (Brazil or Region);

$I_{ag,j}$  is the top index for a given aggregate  $ag$  (general, group, pillar or dimension) in the UF  $j$ ;

$w_j^R$  is the weight of the UF  $j$  in region  $R$  (defined by GDP per capita).

## A.2. Glossary of indicators

### 1. Institutions

#### 1.1 Institutional environment

##### 1.1.1 Commuting time to work | 2019

Average commuting time to the workplace(s) per week for people aged 15 and over, employed in the reference week.

Source: Brazilian Institute of Geography and Statistics – IBGE.

##### 1.1.2 Homicide rate per 100,000 inhabitants | 2022

Number of homicides per 100,000 inhabitants in the year.

Source: Department of Information and Informatics of the Unified Health System (DataSUS).

##### 1.1.3 Quality of municipal fiscal management | 2022

Sum of the municipalities' scores in the FIRJAN Fiscal Management Index (IFGF) weighted by the municipalities' shares (%) in the state's population.

Source: Federation of Industries of the State of Rio de Janeiro (FIRJAN).

##### 1.1.4 Quality of state accounting and fiscal information | 2022

Indicator, published by the National Treasury, which scores the states based on an assessment of 4 dimensions – Information Management, Accounting Information, Tax Information and Cross-referencing between Accounting and Tax Data.

Source: National Treasury.

#### 1.2 Regulatory environment

##### 1.2.1 Efficiency of the Judiciary Branch | 2023

Net Congestion Rate (percentage of cases that remained unresolved at the end of the period, compared to the total processed, excluding cases that have been suspended, stayed or provisionally archived).

Source: Brazilian National Council of Justice (CNJ)

### 1.2.2 Informality rate | 2023

Informality rate of people aged 14 and over employed in the reference week (%).

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 1.2.3 Transparency index | 2020

Transparent Brazil 360° Scale – Ranking of “Passive Transparency” and “Active Transparency”.

Source: Brazilian Government Accountability Office (CGU).

### 1.2.4 Default rate | 2022

Share of consumers in default in relation to the population over 18 years of age.

Source: Serasa.

## 1.3 Business environment

### 1.3.1 Number of high-growth companies | 2021

Number of local units of high-growth companies in relation to the total number of local units.

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 1.3.2 Business turnover | 2023

Balance between the number of companies established and closed in per capita terms in the state.

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 1.3.3 Entrepreneurship | 2023

Number of entrepreneurs (employer + self-employed) in relation to the total employed population of the UF, weighted by the UF's share of the total number of entrepreneurs in the country.

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 1.3.4 Unemployment rate | 2023

Percentage of unemployed people in relation to people in the workforce.

Source: Brazilian Institute of Geography and Statistics – IBGE.

## 2. Human capital

### 2.1 Education

#### 2.1.1 IDEB in the final years of primary education | 2021

Basic Education Development Index (IDEB) for regular primary education (final years).

Source: National Institute for Education Studies and Research – INEP.

#### 2.1.2 IDEB in high school | 2021

Basic Education Development Index (IDEB) for regular high school.

Source: National Institute for Education Studies and Research – INEP.

#### 2.1.3 Enrollments in technical professional education in high school | 2022

Number of people enrolled in Technical Professional Education at Secondary Level in relation to the population of the UF in the ideal age group (15-17 years of age), weighted by the UF's share of the total number of people enrolled in Technical Professional Education at Secondary Level in the country.

Source: National Institute for Education Studies and Research – INEP.

#### 2.1.4 Average schooling of the adult population | 2023

Average number of years of schooling for people aged 15 and over.

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 2.1.5 High school net attendance rate | 2023

Adjusted high school net attendance rate according to the ideal age group in the course (15 to 17 years of age).

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 2.1.6 Student-teacher ratio in primary education | 2022

Ratio, in primary education, between the number of students enrolled and the number of full-time teachers.

Source: National Institute for Education Studies and Research – INEP.



## 2.2 Tertiary education

### 2.2.1 Adult population with at least a college degree | 2023

People aged 25 and over with completed higher education in relation to the total resident population in this age group.

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 2.2.2 People enrolled and graduates with a college degree in STEM | 2022

Number of people enrolled and completing higher education in technological areas (Science, Technology, Engineering and Mathematics) in relation to the adult population of the state, weighted by the state's share of the total number of people enrolled and completing higher education in technological areas in Brazil.

Source: National Institute for Education Studies and Research – INEP.

## 2.3 R&D

### 2.3.1 Public investment in R&D | 2021

Share of public investment in R&D in state GDP.

Source: Ministry of Science, Technology, and Innovation – MCTI.

### 2.3.2 Offer of postgraduate programs of excellence | 2022

Number of postgraduate programs (Master's, Professional Master's and Doctorate) rated 5, 6 or 7 by CAPES.

Source: Coordination for Improvement of Higher Education Personnel – CAPES.

### 2.3.3 Research grants and research promotion | 2022

CAPES' per capita investment in scholarships and research grants, weighted by each UF's share of total disbursements.

Source: Coordination for Improvement of Higher Education Personnel – CAPES.

### 3. Infrastructure

#### 3.1 Information and communication technologies (ICTs)

##### 3.1.1 Percentage of the population with Internet access | 2022

Percentage of people who used the Internet in the reference period of the last three months in the population aged 10 and over.

Source: Brazilian Institute of Geography and Statistics – IBGE.

##### 3.1.2 Percentage of the population with access to a cell phone for personal use | 2022

Percentage of people with a cell phone for personal use in the population aged 10 and over (%).

Source: Brazilian Institute of Geography and Statistics – IBGE.

##### 3.1.3 Percentage of the population with broadband Internet connection at home | 2021

Percentage of people aged 10 and over who used the Internet in the reference period of the last three months (%), by type of Internet connection at home (fixed and mobile broadband only).

Source: Brazilian Institute of Geography and Statistics – IBGE.

##### 3.1.4 Broadband Internet speed | 2023

Fixed broadband internet speed, considering national and regional providers.

Source: Portal Minha Conexão.

#### 3.2 General infrastructure

##### 3.2.1 Accessibility to the airline market | 2023

Index composed of normalized data for the real average airfare for domestic flights (in R\$), the average distance of flights from each UF (Km) and the total number of public airports and aerodromes available.

Source: National Civil Aviation Agency of Brazil – ANAC.

### 3.2.2 Percentage of the population with access to electricity | 2022

Percentage of residents in households with full-time electricity from a network (%).

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 3.2.3 Per capita consumption of electricity | 2022

Average annual per capita consumption of electricity (kWh/inhabitant).

Source: Energy Research Company – EPE.

### 3.2.4 Road quality | 2022

Percentage of the road network categorized as being in a good or excellent state of preservation

Source: National Confederation of Transportation (CNT).

### 3.2.5 Average duration of electricity supply interruptions | 2023

Ratio between the total sum of hours of interruption multiplied by the number of households affected and the total number of households.

Source: Brazilian Electricity Regulatory Agency – ANEEL.

## 3.3 Ecological sustainability

### 3.3.1 CO2 emissions per capita | 2022

Total CO2 emissions, in tCO2e, in relation to the total resident population of the UF.

Source: System for Estimating Greenhouse Gas Emissions and Removals (SEEG).

### 3.3.2 National companies certified in environmental management (ISO 14001) | 2023

Share of national companies that have obtained certification in the environmental management system (ISO 14001) in the total number of companies in the UF, weighted by the UF's share in the total number of companies with ISO 14001 in Brazil.

Source: National Institute of Metrology, Standardization and Industrial Quality – INMETRO.

### 3.3.3 Solar and wind power generation capacity | 2022

Share of the UF's solar and wind power generation capacity in the UF's total power generation capacity, weighted by the share of the UF's solar and wind power generation capacity in the country's total solar and wind power generation capacity.

Source: Energy Research Company – EPE.

## 4. Economy

### 4.1 Credit

#### 4.1.1 Volume of credit as a proportion of GDP | 2023

Total balance of credit operations of the National Financial System (in million reais) in relation to GDP (in million reais)

Source: Brazil Central Bank (BCB).

#### 4.1.2 Financing of investments in innovation by the BNDES | 2023

BNDES System disbursements to finance investments in innovation (in million reais) in relation to GDP (in million reais), weighted by the participation of each UF in the total volume of disbursements.

Source: Brazilian National Bank for Economic and Social Development – BNDES.

### 4.2 Investment

#### 4.2.1 Public expenditure on science and technology (S&T) in per capita terms | 2023

Public expenditure on S&T in per capita terms by UF, weighted by each UF's share of total public expenditure on S&T in Brazil.

Source: National Treasury.

#### 4.2.2 Investment rate (Gross Fixed Capital Formation (GFCF)/GDP) | 2018

Share of Gross Fixed Capital Formation (GFCF) in GDP.

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 4.2.3 BNDES direct disbursements per capita | 2023

BNDES' direct disbursements per capita, weighted by each state's share in Brazil's total direct disbursements.

Source: Brazilian National Bank for Economic and Social Development – BNDES.

### 4.3 Industry, trade and services

#### 4.3.1 Gross Domestic Product (GDP) | 2021

Gross Domestic Product (in million reais)

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 4.3.2 Tax simplicity index | 2023

Indicator obtained by multiplying the level of tax complexity (measured by the Herfindahl-Hirschman Index (HHI)) and the level of tax visibility (represented by the ratio between direct taxes and tax revenue).

Source: National Treasury.

#### 4.3.3 Gini index for the distribution of gross value added by economic activity | 2021

Gini index for the distribution of gross value added by economic activity at current prices.

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 4.3.4 Gross added value of processing industries | 2021

Share of gross added value by economic activity in the processing industries.

Source: Brazilian Institute of Geography and Statistics – IBGE.

## 5. Business

### 5.1 Knowledge workers

#### 5.1.1 Number of masters and doctors | 2021

Number of master's and doctor's degrees granted per 100,000 inhabitants.

Source: Center for Management and Strategic Studies – CGEE

#### 5.1.2 Labor force employed with a college degree | 2022

Proportion of people aged 14 and older with a complete college degree employed in the reference week in comparison with the total employed population.

Source: Brazilian Institute of Geography and Statistics – IBGE.

### 5.2 Innovation support

#### 5.2.1 Number of technology parks | 2023

Number of operational technology parks (with companies or institutions).

Source: Ministry of Science, Technology, and Innovation – MCTI

### 5.2.2 Gross added value of scientific and technical activities | 2021

UF's share in the gross added value of professional, scientific, technical and administrative activities and complementary services.

Source: Brazilian Institute of Geography and Statistics – IBGE.

## 5.3 Knowledge absorption

### 5.3.1 Imports of high and medium-high technological intensity | 2023

Share of imports of high and medium-high technological intensity in the UF's total of imports, weighted by the UF's share in the total of imports of high and medium-high technological intensity in Brazil.

Source: Ministry of Development, Industry, Trade and Services – MDIC.

## 6. Knowledge and technology

### 6.1 Knowledge creation

#### 6.1.1 Bibliographic scientific production in technology areas | 2023

Number of bibliographic scientific products (papers, work registered in books) in technological areas (Science, Technology, Engineering and Mathematics) published per capita in the UF, weighted by the UF's share in the total bibliographic scientific products in STEM in Brazil.

Source: Coordination for Improvement of Higher Education Personnel – CAPES.

#### 6.1.2 Scientific impact of publications | 2023

Number of publications per capita among the 10% most relevant publications in Biomedical and Health Sciences, Life and Earth Sciences, Mathematics and Computer Science, Physical Sciences and Engineering.

Source: CWTS Leiden Ranking.

#### 6.1.3 Invention Patent filings per capita | 2023

Invention Patent filings per capita weighted by each UF's share (%) in the total Invention Patent filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

#### 6.1.4 Utility Model filings per capita | 2023

Utility Model filings per capita weighted by each UF's share (%) in total Utility Model filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

#### 6.1.5 Patents in force per capita | 2023

Patents in force per capita weighted by each UF's share (%) in total Patents in force in Brazil

Source: Brazilian National Institute of Industrial Property – INPI.

### 6.2 Knowledge impact

#### 6.2.1 Number of startups | 2023

Proportion of the UF in total startups in Brazil.

Source: Brazilian Startup Association (ABStartups).

#### 6.2.2 Number of innovative companies | 2017

Percentage of innovative companies (which have implemented product and/or process innovations) in comparison with the total companies of each UF weighted by the UF's share in the total innovative companies in Brazil.

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 6.2.3 Patent filings in agribusiness per capita | 2021

Patent filings in agribusiness per capita weighted by each UF's share (%) in the total Patent filings in agribusiness in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

#### 6.2.4 Patent filings in health per capita | 2021

Invention Patent filings per capita weighted by each UF's share (%) in the total Invention Patent filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

### 6.2.5 Patent filings in biotechnology per capita | 2021

Patent filings in biotechnology per capita weighted by each UF's share (%) in the total Patent filings in biotechnology in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

### 6.2.6 National companies certified in quality management (ISO 9001) | 2023

Share of national companies that have obtained certification in the quality management system (ISO 9001) in the total number of companies in the UF, weighted by the UF's share in the total number of companies with ISO 9001 in Brazil.

Source: National Institute of Metrology, Standardization and Industrial Quality – INMETRO.

## 6.3 Knowledge dissemination

### 6.3.1 Exports of high and medium technological intensity | 2023

Share of exports of high and medium-high technological intensity in the UF's total of imports, weighted by the UF's share in the total of imports of high and medium-high technological intensity in Brazil.

Source: Ministry of Development, Industry, Trade and Services – MDIC.

### 6.3.2 Degree of diversification of high and medium-high technological intensity exports | 2023

Herfindahl-Hirschman Index (HHI) of high and medium-high technological intensity exports.

Source: Ministry of Development, Industry, Trade and Services – MDIC.

### 6.3.3 Technology Transfer Agreements annotated per capita | 2023

Number of Technology Transfer Agreements annotated per capita weighted by the each UF's share (%) in the total number of Technology Transfer Agreements annotated per capita in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.



## 7. Creative economy

### 7.1 Intangible assets

#### 7.1.1 Trademark filings per capita | 2023

Trademark filings per capita weighted by each UF's share (%) in the total Trademark filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

#### 7.1.2 Industrial design filings per capita | 2023

Industrial design filings per capita weighted by each UF's share (%) in the total Industrial design filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

#### 7.1.3 Trademarks in force per capita | 2023

Trademarks in force per capita weighted by each UF's share (%) in total Trademarks in force in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

#### 7.1.4 Share of total Geographical Indication filings | 2023

Share (%) of each UF in the total number of Geographical Indication filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

### 7.2 Creative goods and services

#### 7.2.1 Gross added value of arts and culture activities | 2021

Share of each UF in the gross value added in the arts, culture, sport and recreation economic activity and other associated service activities.

Source: Brazilian Institute of Geography and Statistics – IBGE.

#### 7.2.2 Employment in creative sectors | 2023

Proportion of creative jobs in relation to total jobs.

Source: Escola Superior de Propaganda e Marketing (ESPM).

### 7.2.3 Creative industries | 2023

Proportion of creative enterprises in relation to total enterprises.

Source: Escola Superior de Propaganda e Marketing (ESPM).

### 7.2.4 Wages in creative sectors | 2023

Proportion of wages in creative sectors in relation to the average wage in the capital of each UF.

Source: Escola Superior de Propaganda e Marketing (ESPM).

## 7.3 Online creativity

### 7.3.1 Number of acceses to the Internet | 2023

Proportion of the number of acceses to the Internet via fixed broadband in relation to the number of inhabitants of the UF.

Source: Brazilian National Telecommunications Agency – ANATEL.

### 7.3.2 Computer software filings | 2023

Computer software filings per capita weighted by each UF's share (%) in the total Computer software filings in Brazil.

Source: Brazilian National Institute of Industrial Property – INPI.

### 7.3.3 Value of e-commerce | 2022

Total gross value of e-commerce by issuing UF in relation to each UF's GDP, weighted by the UF's proportion of the country's total e-commerce value.

Source: Ministry of Development, Industry, Trade and Services – MDIC.

### A.3. Federation Units and macro-regions of Brazil: acronyms and administrative map

#### NO = North Region

- TO = Tocantins
- AM = Amazonas
- RO = Rondônia
- RR = Roraima
- PA = Pará
- AP = Amapá
- AC = Acre

#### NE = Northeast Region

- RN = Rio Grande do Norte
- PE = Pernambuco
- CE = Ceará
- BA = Bahia
- SE = Sergipe
- PB = Paraíba
- PI = Piauí
- AL = Alagoas
- MA = Maranhão

#### SE = Southeast Region

- SP = São Paulo
- RJ = Rio de Janeiro
- MG = Minas Gerais
- ES = Espírito Santo



SU = South Region

SC = Santa Catarina

PR = Paraná

RS = Rio Grande do Sul

CO = Midwest Region

DF = Federal District

GO = Goiás

MS = Mato Grosso do Sul

MT = Mato Grosso

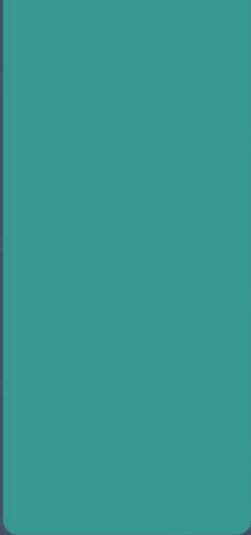
## References

Brazilian National Institute of Industrial Property – INPI. (2023). *INPI Strategic Plan 2023-2026*. Rio de Janeiro: INPI.

World Intellectual Property Organization – WIPO, Cornell University and INSEAD. (2013). *The Global Innovation Index 2013: The Local Dynamics of Innovation*. Editors: S. Dutta e B. Lanvin. Geneva, Ithaca and Fontainebleau: Cornell, INSEAD and WIPO.

World Intellectual Property Organization – WIPO. (2023). *Global Innovation Index 2023: Innovation in the face of uncertainty*. Geneva: WIPO.

World Intellectual Property Organization – WIPO. (2024). *Enabling Innovation Measurement at the Sub-National Level: A WIPO Toolkit*. Authors: Gaétan de Rassenfosse (Swiss Federal Institute of Technology Lausanne (EPFL)) and Sacha Wunsch-Vincent (WIPO). Geneva: WIPO, Department of Economics and Data Analysis.



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