BRAZIL COMPETITIVENESS REPORT

2021-2022

CNI
Brazilian National Confederation of Industry
THE FUTURE OF INDUSTRY

BRAZIL
COMPETITIVENESS
REPORT
2021–2022

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2021–2022

ECONOMIC INDICATORS CNI

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SUMMARY

INTRODUCTION

We are living a troubled moment in a changing world order affected by the covid-19 pandemic and the Russia-Ukraine conflict. Geopolitical tensions, lack of inputs and raw materials, and inflation are some of the challenges in the current scenario. In Brazil's case, these issues are added to old difficulties, which are holding us back in the race to win the fierce international competition.

In this report, the National Confederation of Industry (CNI) monitors the evolution of a series of factors that affect companies' ability to compete. Brazilian performance was examined in relation to that of countries with similar characteristics or that compete with us in the global market. For over 10 years, Brazil has been among the worst-ranked countries in terms of competitiveness.

Despite being in the group of countries with the worst performance, Brazil has shown progress. In the current edition, the country gained positions for the first time in the overall ranking, moving from 17th to 16th position, among 18 economies. The main highlights are the improvement in the business environment — for more than one edition — and the gains in financing and taxation.

The future competitiveness of countries will depend not only on their ability to recover from the challenges brought by the pandemic and by the war, but also on their ability to adapt to new production trends, such as digitization and the low-carbon economy.

Our path is even more challenging. In addition to addressing the new barriers, the country needs to move forward with an old agenda, reducing the so-called “Brazil Cost”. More than that, it needs an industry resumption plan. The strategy to promote the industrial sector cannot be separated from the measures to reduce systemic obstacles shown in this report, such as the high cost of credit, the complex and cumulative tax system, and the low quality of education.

Without this contemporary vision of the need to renew Brazilian industry, we are at risk of falling behind in the race for competitiveness. With our actions and proposals, CNI hopes to continue contributing to the country's development, as it has always done.

Enjoy the reading!

Robson Braga de Andrade
President of CNI

1 MAIN RESULTS

Brazil Moved up in the Overall Ranking, but it is the Country Most Frequently Ranked Among the Worst in Competitiveness Factors

The improvement in financing, taxation, and business environment, as well as the effects of the pandemic, have contributed to progress

Brazil is still among the six lowest-ranking countries (bottom third) of the Brazil Competitiveness ranking, but it has moved up one position. The country moved up from the second-to-last (17th position) to the 16th position in the overall ranking, among 18 selected economies, ahead of Peru and Argentina[1]. The bottom third of the ranking is also taken by Mexico, India and Colombia. Chile is the only Latin American economy that is not in the bottom third. It is located in the middle third, along with Thailand, Russia, Turkey, South Africa and Indonesia. The most competitive economies are the following ones: South Korea, Canada, Australia, China, Spain and Poland.

There are two main reasons for Brazil's results in the general ranking: one is the country's improvement in several competitiveness factors, which led to an increase in its average in the general ranking. The most notable improvements in this report are those in Financing, Taxation, and Business Environment when compared to the average performance of 18 countries.

The second reason is that the Covid-19 pandemic had a greater impact on the competitiveness factors of some countries as opposed to others. The pandemic was particularly notable in its impact on the Labor and Macroeconomic Environment factors, resulting in a reduction in the economically active population, significant increases in inflation rates, and higher public debt.

Peru, which had previously ranked 16th for its competitiveness in these factors, was particularly affected and fell to 17th in the overall ranking. Although both Brazil and Peru saw an increase in their overall average, Brazil advanced more than Peru and achieved its 16th position. It is important to note that a country's advancement in the ranking is always relative to that of other countries (as seen in greater detail in the box below).

Despite its overall improvement, Brazil still ranks in the bottom third for seven out of the nine competitiveness factors assessed, even in those that showed improvement. Among the 18 countries evaluated, Brazil is the country that appears most frequently in this bottom third.

The country's most challenging situation is in the Financing factor, the only one where it ranks last. Despite reducing its basic interest rate to the lowest level in 20 years, 2% per year in 2020[2], Brazil still has the highest short-term real interest rate (4.7%) and interest rate spread (26.8%) among the 18 countries evaluated.

Concerning the Taxation factor, Brazil ranks 17th among the 18 countries evaluated, with the second worst result. The country's tax burden in 2019 was the third-highest, reaching almost a third of GDP (32.5%) compared to an average of 24.1% for the selected countries. Additionally, Brazil has the third worst quality in its tax system, with the most negative qualitative assessment in the legislative and administrative processes of the tax system.

In the Macroeconomic Environment and Business Environment factors, Brazil ranks third-to-last, hindering the growth of public and private investment. The hostile investment environment is primarily due to the lack of fiscal and monetary balance, legal certainty, and excessive red tape. The restrictions imposed by the pandemic have put

[1] For this comparison, the past ranking (2019–2020) was recalculated taking into account the methodological revisions introduced in the current edition. See more details in Appendix A.
[2] The reporting period for this report is 2021 or the most recent year for which data is available for each variable and country. Most of the data used is from 2020, but in some cases, data from previous years has been used. Cases where the data lag exceeds two years are rare and typically involve indicators that do not change significantly in the short term.

pressure on prices and led to a rise in government gross debt. In 2021, Brazil had the third highest inflation rate (8.3%) and gross government debt (93% of GDP). Additionally, its nominal interest costs were the second highest, accounting for 5.2% of its GDP.

In the Labor factor, in which Brazil was never ranked in the bottom third in past editions, it is now in 15th place, reflecting the impacts of the pandemic on the labor market. The country experienced the second-largest drop in workforce growth in 2021, surpassing only Chile. Additionally, Brazil had the second lowest industry productivity, only ahead of India.

Also in Infrastructure and Logistics, Brazil is ranked 15th. In virtually all modes of transportation evaluated, the country is in the bottom third of the ranking. Despite the currency devaluation contributing to reducing the price of energy in dollars (US$ 0.13 per KWh), the difference compared to other countries left Brazil in the second to last position. Additionally, the quality of the energy supply also kept the country ranked second to last place, with energy generation losses of 16.1%.

In the Productive structure, scale, and competition factor, Brazil is ranked 13th. Despite having the 5th largest domestic market and the 11th most complex production structure, Brazil had the highest tariff barriers for non-agricultural products in 2020, which reduces competition in the domestic market.

The best positions for Brazil are in the Technology and Innovation and Education factors, the only ones where the country is not in the lower third of the ranking, occupying intermediate positions (9th and 10th positions respectively). In Technology and Innovation, Brazil falls within the middle third of the ranking for both of the associated dimensions, which are Research and Development (R&D) efforts and the outcomes of these efforts. Despite having the highest public spending on education as a proportion of GDP, Brazil ranks in the bottom third in terms of the dissemination and quality of education in the Education factor.

Brazil's general average increased from 4.02 to 4.19, a 4.3% increase, considering the scores obtained in the nine competitiveness factors. The general average of most countries increased, except for Thailand, Chile, and Mexico, which recorded a decrease. Brazil's increase in the general average was enough to surpass Peru, which had a lower growth of its average of 0.9%, from 4.07 to 4.10. This allowed Brazil to move up one position in the ranking, reaching 16th place.

Understanding the Evolution of the Overall Ranking

The general ranking is calculated as the simple average of results achieved in each factor, as described in Appendix A – Methodological Note. A change in the ranking position always reflects an improvement relative to other countries analyzed. For example, a country may have improved its competitiveness factors but still not move up in the ranking compared to the past. A country's improvement in its average may not necessarily result in an upward movement in the ranking unless it shows a substantial increase relative to the performance of other countries ahead.

Brazil improved in relation to the revised ranking in all factors except for Labor, Education, and Technology and innovation, resulting in an increase in its overall average. The main areas of improvement for Brazil compared to the average evolution of all countries were in the Financing, Taxation, and Business Environment factors.

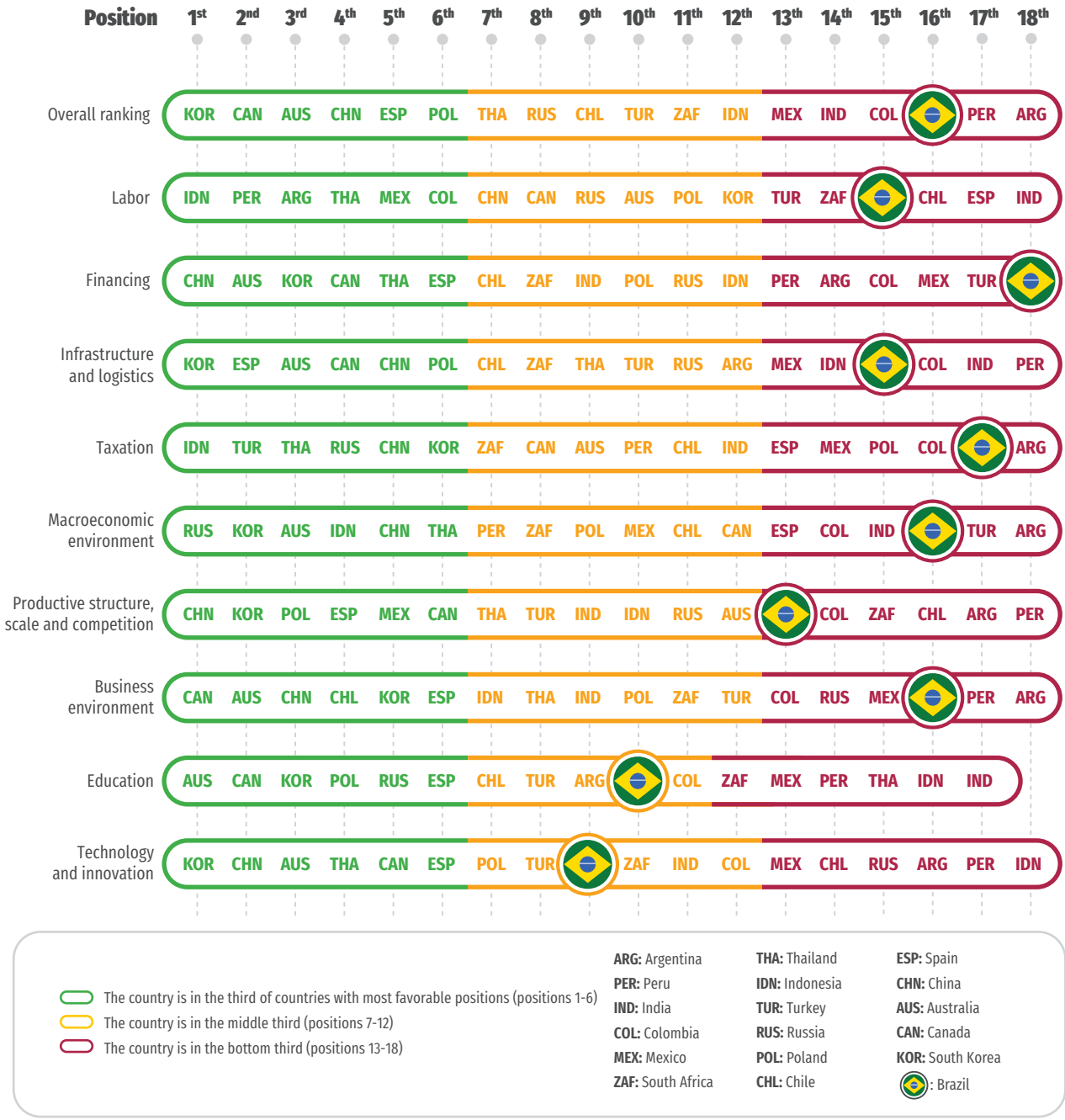
Brazil's improvement was due to its increase in the general average compared to Peru, whose general average also increased but not as much as Brazil's.

Compared to Peru, Brazil showed improvement in the Financing, Taxation, and Macroeconomic Environment factors.

RANKINGS 2019–2020 (REVISED) AND 2021–2022: OVERALL AVERAGE AND POSITION

Country	Overall average (2019–2020 revised)	Overall average 2021–2022	Overall average Var. (%)	Ranking (2019–2020 revised)	Ranking 2021–2022	Ranking Difference
South Korea	6.59	6.67	1.2	1st	1st	0
Canada	6.19	6.29	1.7	2nd	2nd	0
Australia	6.13	6.27	2.3	3rd	3rd	0
China	5.82	6.09	4.7	4th	4th	0
Spain	5.47	5.60	2.4	5th	5th	0
Poland	5.34	5.36	0.5	7th	6th	1
Thailand	5.39	5.33	-1.3	6th	7th	-1
Russia	5.00	5.06	1.1	9th	8th	1
Chile	5.10	5.02	-1.6	8th	9th	-1
Turkey	4.82	4.95	2.6	10th	10th	0
South Africa	4.75	4.81	1.4	11th	11th	0
Indonesia	4.51	4.75	5.3	13th	12th	1
Mexico	4.63	4.60	-0.6	12th	13th	-1
India	4.41	4.46	1.0	14th	14th	0
Colombia	4.26	4.40	3.1	15th	15th	0
Brazil	4.02	4.19	4.3	17th	16th	1
Peru	4.07	4.10	0.9	16th	17th	-1
Argentina	3.67	4.09	11.4	18th	18th	0

FIGURE 1 – COMPETITIVE POSITION OF THE 18 SELECTED COUNTRIES



Note: The overall ranking was built based on the simple average between the values recorded by each country in the nine competitiveness factors assessed.
For more details, see the methodological note in Appendix A.

2 COMPETITIVENESS FACTORS IN BRAZIL

2.1 LABOR

Pandemic Has a Strong Impact on Brazilian Labor Force and the Country Drops to the Bottom Third of the Ranking

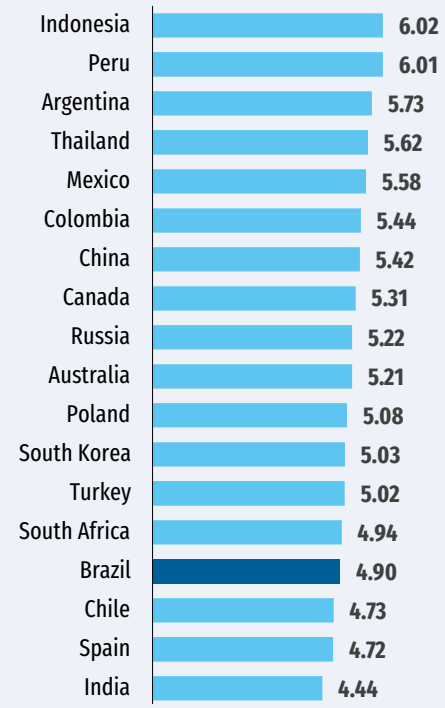
Brazil ranks 15th in the Labor factor and is in the lower third among the 18 countries assessed. The result shows a decline in the Labor availability subfactor, which was caused by the impacts of the COVID-19 pandemic on the labor market. In the other subfactor, the Labor cost, the country was ranked in the middle third.

During the pandemic, there was a reduction in both demand and labor supply[3]. The restrictions on normal business operations and decreased consumption resulted in a decrease in production and, therefore, demand for labor. On the other hand, social distancing measures, boosted by the implementation of emergency aid in Brazil, reduced the job offer[4].

These impacts affected the subfactor Labor availability in Brazil, so that the pace of growth of the labor force[5] of the population was down by 1% in 2021, placing the country among the worst-ranked in this subfactor, the 17th position. In terms of the size of its labor force, Brazil ranks 12th, in the middle third.

The country's performance in the Cost of labor is hindered by its low labor productivity in industry (as measured by output divided by employment). In 2019, Brazil had the second lowest labor productivity among the 18 countries, surpassing only India. In Brazil, production per worker amounted to USD (PPP) 34,468, while in India it amounted to USD (PPP) 18,842. Australia stands out with a significantly higher output per worker, amounting to USD (PPP) 130,690, more than three times higher than what was recorded in Brazil.

FIGURE 2 – LABOR FACTOR



Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

[3] Please see https://www.ipea.gov.br/portal/images/stories/PDFs/conjuntura/201106_nota_12_transicoes_de_mercado_de_trabalho.pdf.
[4] Please check https://www.ipea.gov.br/portal/images/stories/PDFs/conjuntura/201102_nota_10_microdados_setembro.pdf
[5] The pace of growth of the labor force is calculated using a three-year annual moving average growth rate of the economically active population.

At the same time, the low level of workers' remuneration in the industry, which accompanies the low labor productivity, placed the country in 8th place in this variable, contributing to the country's intermediate position in the Labor cost factor (11th position).

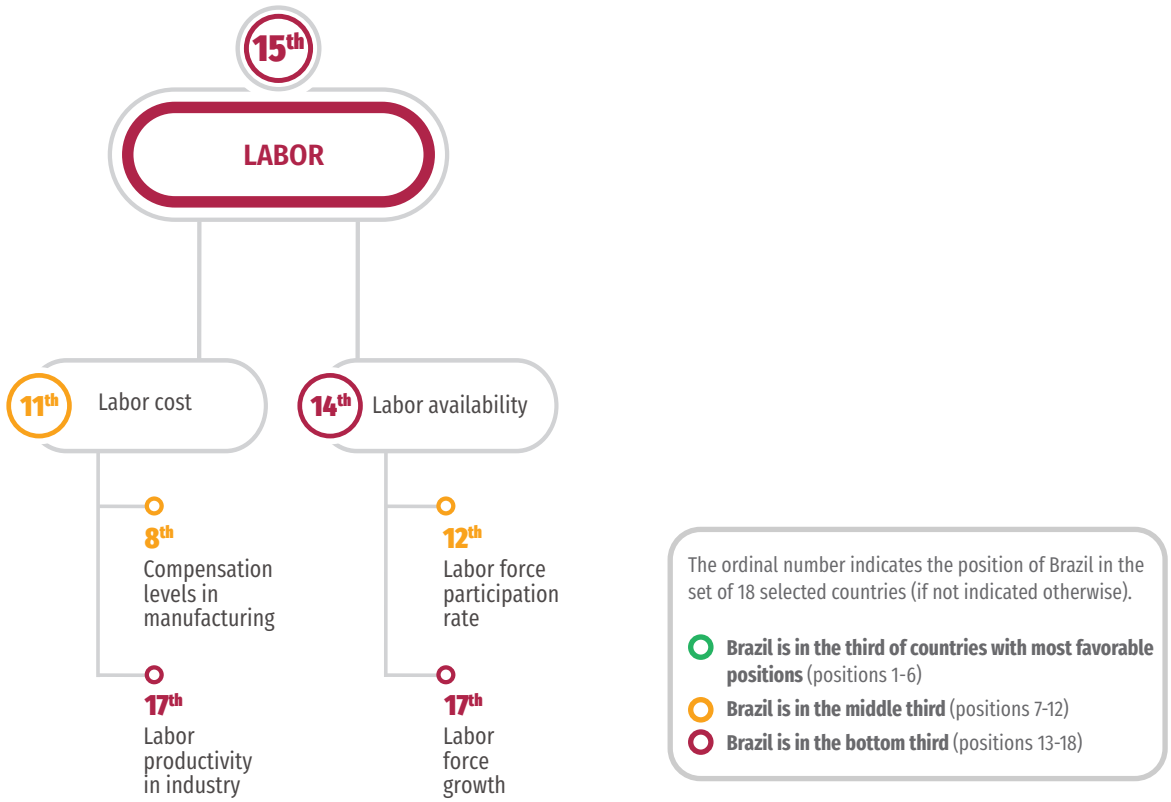
Compared to the previous ranking (2019–2020 revised),[6] Brazil recorded a change in the two subfactors associated with the Labor factor. In the Labor availability subfactor, Brazil fell from 8th to 14th position, moving from the middle third to the bottom third of the ranking. Between 2018 and 2021, the Brazilian labor force growth rate declined from 1.3% to -1%, which led to a loss of positions in the ranking.

In Labor cost, labor productivity in the industry remained relatively stable, changing by only 0.09%. This result was accompanied by a decrease in cost, in dollars, with the hourly wage dropping from USD 3.86 in 2018 to USD 2.93 in 2020, which may be related to the strong depreciation of real in that period. This resulted in an improvement of one position in the subfactor, reaching 11th place.

In the final calculation, Brazil dropped five positions in the Labor factor, moving from the middle third to the bottom third, reaching 15th place.

The pandemic has affected the workforce in nearly all countries but to varying degrees. Of the 18 countries, only Thailand saw growth in its workforce between 2019 and 2020, while the others suffered declines or remained stable. In addition to Brazil, Chile (with a decline of 11 positions) and Turkey (with a decline of 9 positions) stand out for their drop in the ranking. On the other hand, Argentina, Canada, and Poland each advanced 5 positions.

FIGURE 3 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE LABOR FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



[6] To allow for comparisons, the 2019–2020 ranking of the Brazil Competitiveness Report was recalculated taking into account the methodological changes made in the current edition. Further details can be found in Appendix A.

2.2 FINANCING

Brazil Has the Highest Cost of Capital Among the Selected Countries, Placing it Last in the Ranking

Brazil is the worst-performing country in the ranking for the Financing factor among the 18 countries evaluated. Despite being positioned in the middle third in two of the three dimensions evaluated – availability of capital and performance of the financial system – the cost of capital in Brazil is much higher than the cost in other countries, taking it to the bottom of the ranking on this factor.

In 2020, the Selic rate was reduced to its lowest level in 20 years, with a target of 2%. The Selic rate reduction had an impact on the interest rate spread and the real short-term interest rate, which fell from 32.2% to 26.8% and from 8.8% to 4.7% from 2018 to 2020, respectively.

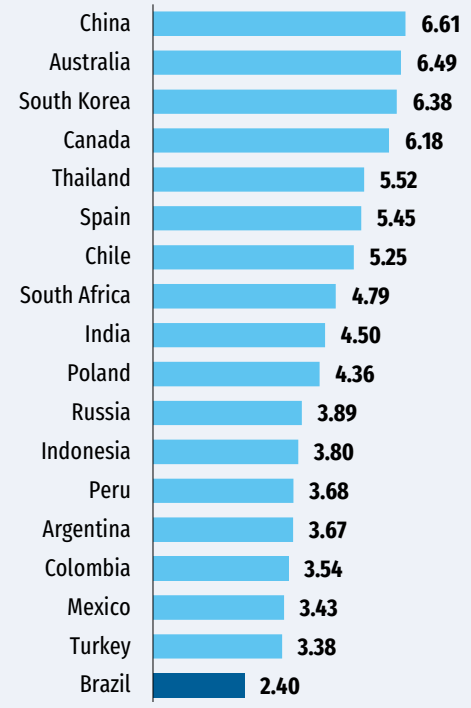
However, the interest rate spread in Brazil remained much higher compared to other countries. Even when compared to the 63 countries available in the primary data source, Brazil had the highest capital costs. Among the 18 selected countries, Turkey had the second highest short-term real interest rate (3.1%) and Peru had the second highest interest rate spread (11.1%) — more than two times lower than the Brazilian one.

In the Capital availability subfactor, Brazil is ranked in the 11th position. In the three variables considered in this subfactor, the country holds an intermediate position, ranking 9th in the subfactors Domestic credit to private sector and Stock market size, both of which are measured relative to GDP, and 10th in Venture capital availability, a qualitative variable that reflects the availability of resources for innovation[7].

Concerning the Financial system performance subfactor, Brazil was ranked 9th among 17 countries considered[8]. Despite having one of the largest Banking sector assets (6th out of 17), Brazil is third to last (16th out of 18) in credit rating issued by agencies such as Fitch, Moody's, and S&P. In 2020, Brazil had the third lowest score (24.7 on a 0-60 scale), surpassing only Turkey (20.3) and Argentina (5.5).

Compared to the revised 2019–2020 ranking, the only subfactor in which the country registered a change was Financial system performance, declining one position to 9th place. Although Brazil did not experience a drop in the rankings for Banking sector assets and Country credit rating variables, which make up that subfactor, Russia showed improvement in both variables in 2020, surpassing Brazil and taking the 8th position in the

FIGURE 4 – FINANCING FACTOR



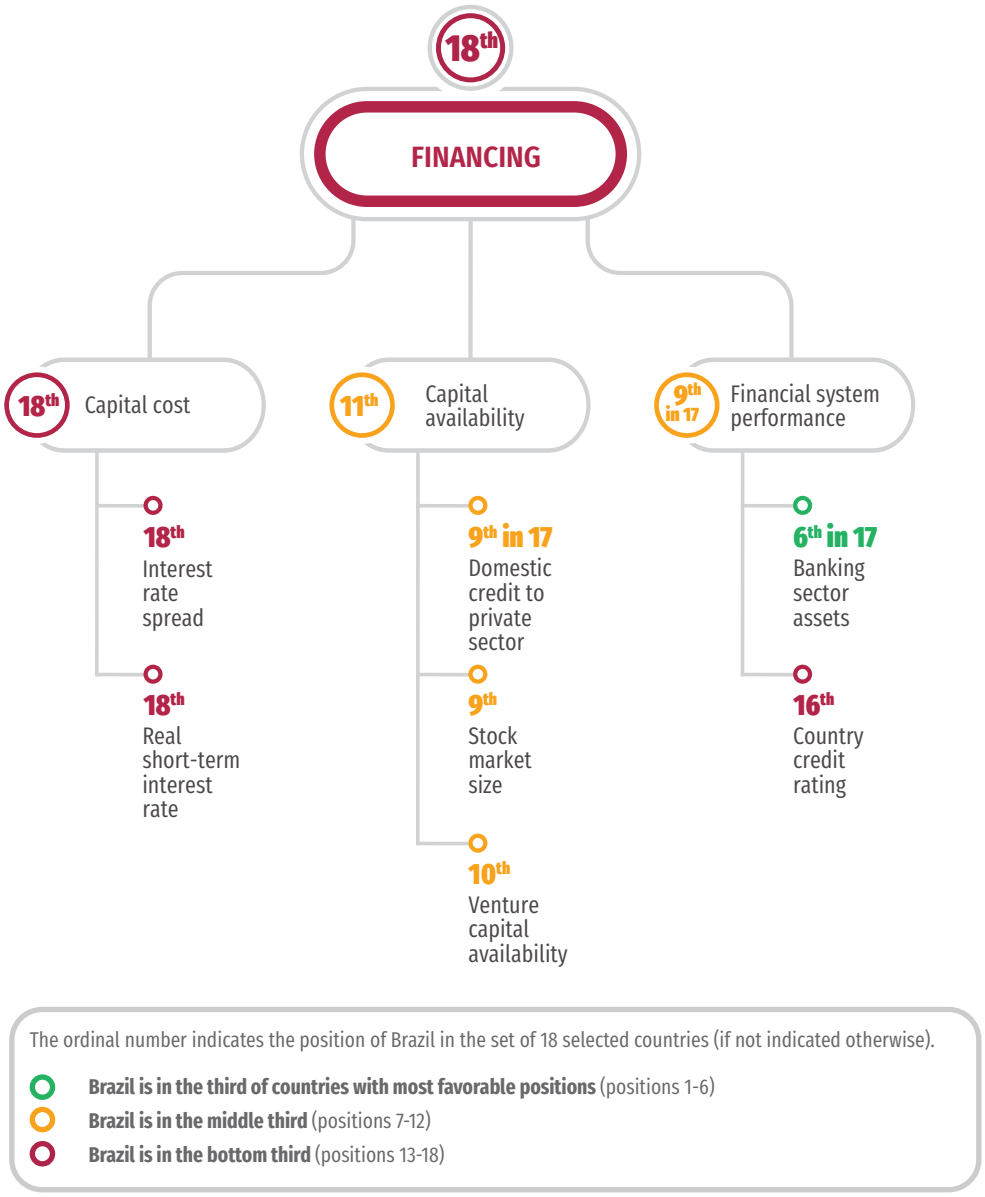
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

[7] Variable generated based on the perception of how easy it is for companies with innovative, albeit risky projects, to raise venture capital.
[8] There is no data available for Canada regarding this subfactor.

ranking. In the Capital availability subfactor, there was a three-position advance in the Venture capital availability variable, but this was not enough to change the country's placement in this subfactor.

Due to these changes, Brazil fell to last place in the Financing factor, driven by the negative impact arising from the Capital cost subfactor, where Brazil also remains in last place. Among the other countries, Argentina stands out with a four-position gain in the Financing factor, reflecting a negative short-term real interest rate, which indicates high inflation in the country. Other variables oppose this advance, such as the country's credit rating on that factor (ranking in which presented a significant deterioration, going from grade 17.3 to 5.5), or the calculation of inflation in the country for the Macroeconomic Environment factor.

FIGURE 5 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE FINANCING FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



2.3 INFRASTRUCTURE AND LOGISTICS

Brazil's Progress in Transport Infrastructure is Lower Compared to its Competitors, Resulting in its Position Dropping to Second to Last

In Infrastructure and logistics, Brazil ranked 15th among the 18 selected countries. In three of the four subfactors associated with this factor — Transport infrastructure, Energy infrastructure and International logistics — the country is in the bottom third of the ranking (among the six worst-ranked countries). When it comes to Telecommunications Infrastructure, Brazil holds an intermediate position, ranking 11th.

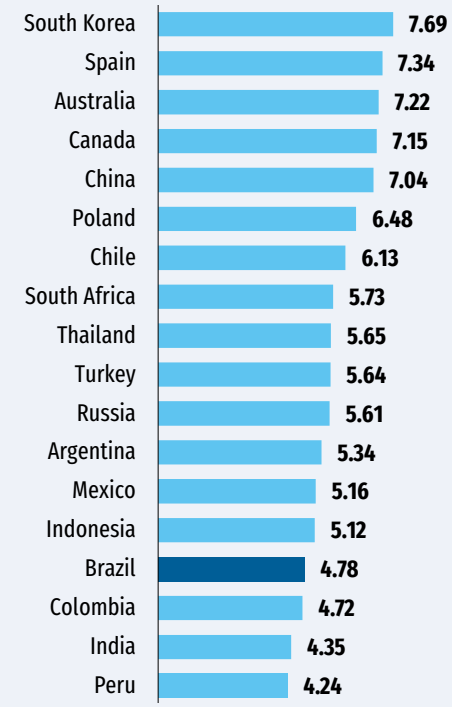
In all modes of transportation — roads, railways, ports, and airport infrastructure — Brazil is ranked at the bottom of the ranking. The only exception is the Air transport (freight) variable, which measures the volume of goods transported by air, where Brazil is ranked in an intermediate position (8th). In each transportation mode, Brazil's poor performance is determined based on a business opinion survey (that is, based on the opinion of service users) and on quantitative data. These results place Brazil at the bottom of the ranking in the Transport infrastructure subfactor, in the 17th position out of 18 countries analyzed.

In the Energy infrastructure subfactor, Brazil also ranks second to last (17th) among the 18 selected countries. Brazil has the second highest cost of electricity for industrial clients and the second worst quality of electricity supply. In 2020, the cost of electricity in Brazil was USD 0.13 per kWh, and losses in transmission and distribution systems were approximately 16.1% of all the electricity generated, based on 2016 data[9]. The Availability of electricity variable is the only one where Brazil is not in the bottom third of the ranking, occupying 7th position among the 18 competitors.

In International logistics, Brazil is in the bottom third of the ranking, in 14th position. The subfactor is calculated based on the *Logistic Performance Index* (LPI)[10] computed by the World Bank[11]. The country's logistics indicator is calculated based on qualitative and quantitative data collected from professionals in logistics.

Compared to the revised 2019–2020 ranking, the country advanced one position (to 17th) in the Energy infrastructure subfactor, due to an improvement in the energy cost variable, which advanced one position to 13th. Despite a 5%

FIGURE 6 – INFRASTRUCTURE AND LOGISTICS FACTOR



Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

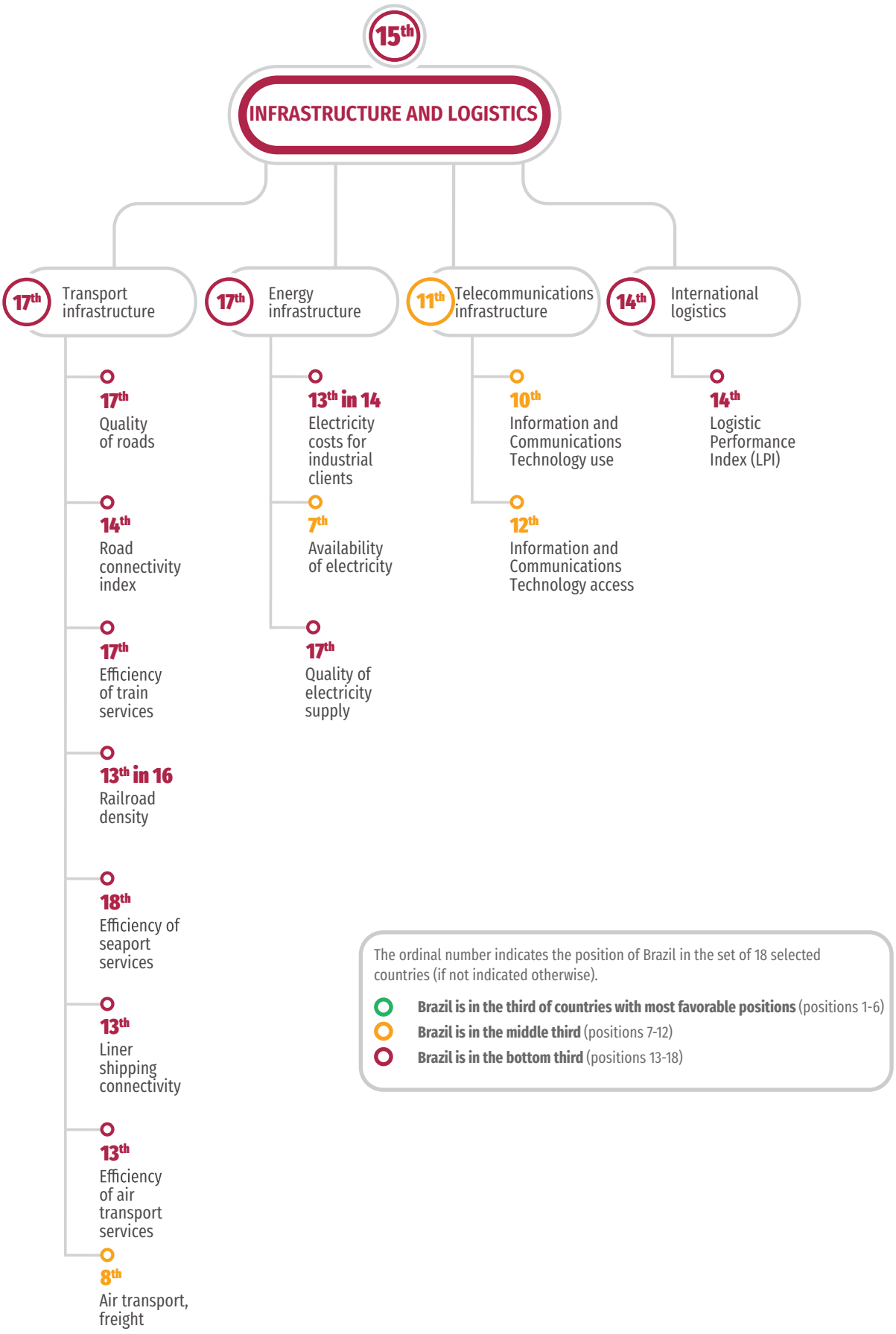
[9] The last available data used is from 2016 and was used in the 2019–2020 edition of Competitiveness Brazil.
[10] The LPI (Logistics Performance Index) is updated every three years, so the data used in this edition is the same as the previous one.
[11] In the previous edition of Competitiveness Brazil, the international logistics subfactor was calculated using the LPI and an indicator prepared by the World Bank's Doing Business, but this has been discontinued. It was decided to not include a new indicator due to the similarity of the two indicators and the greater scope of the LPI. For more information on the changes affecting the indicators, please refer to Appendix A.

increase in the cost of electricity in nominal terms when measured in reais, the strong devaluation of the real against the dollar resulted in a 25% decrease in cost measured in dollars (for comparison with other countries)[12].

In the Transport infrastructure and Telecommunications infrastructure subfactors, the country lost positions. Although Brazil improved its ranking in several variables that make up the Transport infrastructure subfactor, Colombia's progress was more significant, resulting in Brazil losing a position in this subfactor. In the Telecommunications infrastructure subfactor, the country lost two positions, reflecting a decline in access to information and communication technologies (drop from 60.2 to 58.9 in the indicator). As a result, Brazil remained in 15th place in the Infrastructure and logistics factor.

[12] The Brazilian currency, the real, suffered one of the worst devaluations in 2020, second only to the Argentine peso.

FIGURE 7 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE INFRASTRUCTURE AND LOGISTICS FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



2.4 TAXATION

An Improvement in the Perception of the Quality of the Tax System Has Led the Country to Move From the Last to the Second-To-Last Position in the Ranking

In the Taxation factor, Brazil ranked second-to-last among the 18 countries evaluated, ahead of Argentina. In both dimensions evaluated, the weight of taxes and quality of the tax system, Brazil is in the lower third of the ranking, in the third-to-last position (16th).

In 2019, the tax burden in Brazil represented nearly a third of GDP (32.5%), being lower only than in Poland (35.1%), Spain (34.7%), and Canada (33.8%), whose per capita income is at least twice that of Brazil, based on 2021 data[13].

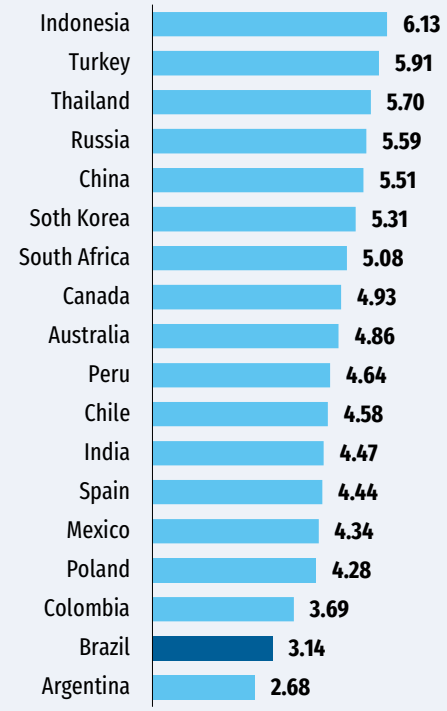
When considering the composite effective tax rate on corporate income, an index that reflects the average tax contribution of a company in an investment project with economic profits above zero, Brazil holds a middle-third position, ranking 12th, with a rate of 27.3%.

In the average of the subfactor, Brazil was in third-to-last place in the Tax burden, behind only Argentina and Chile.

In addition to its high tax burden, Brazil has a low-quality tax system and is ranked 16th in the ranking of the subfactor Quality of the tax system. The quality is assessed based on two qualitative variables.

The first variable is the *Tax Complexity Index* which measures the complexity of each country's tax system on a scale of 0 to 1, where higher values represent greater complexity[14]. In turn, the index is composed of two sub-indices: the Tax Code Complexity Index and the Tax Framework Complexity Index. The first measures the inherent complexity of each country's tax regulations, while the second measures the complexity that arises from the legislative and administrative processes and characteristics of each tax system.

FIGURE 8 – TAXATION FACTOR



Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

Developed countries generally have high sub-indices of tax complexity. The average of OECD countries, for example, was 0.47 in 2020, compared to 0.43 for Brazil. However, when observing the complexity of the tax framework, it is clear that advanced countries have lower rates. In the OECD countries, the average rate is 0.26 in this case,

[13] GDP per capita in PPP, according to World Bank data.
[14] The Tax Complexity Index is developed by researchers at the Universities of Munich and Paderborn in Germany and is part of the TR 266 Accounting for Transparency program funded by the German Research Foundation. Available at www.taxcomplexity.org. Accessed on: 10/4/2022.

compared to 0.44 in Brazil. Considering both sub-indices, Brazil ranks 16th in the Tax Complexity Index ranking, ahead of only India and Colombia.

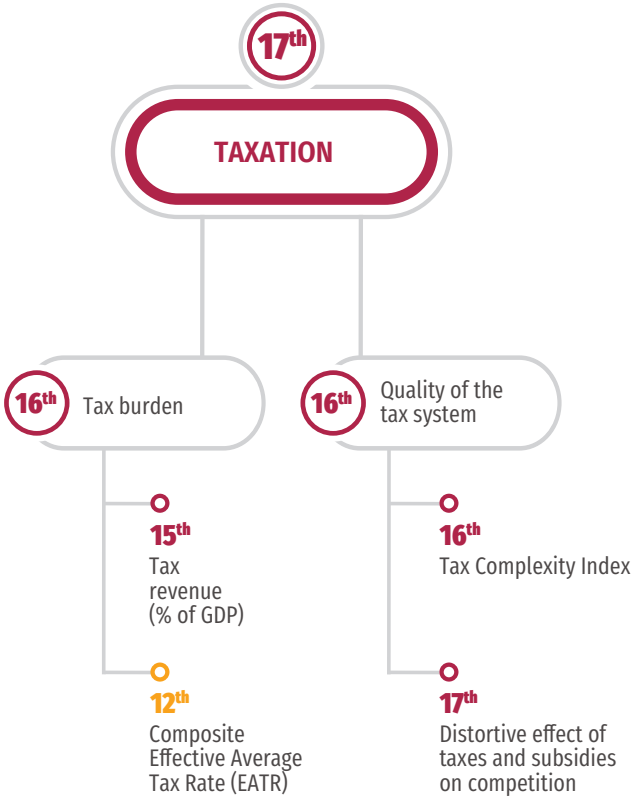
In the qualitative variable Distortive effects of taxes and subsidies, based on the perception of entrepreneurs on the distorting effects of taxes and subsidies on competition, Brazil is also at the bottom of the ranking, in 17th position, ahead of Argentina.

Brazil improved its ranking in the Taxation factor by one position to 17th place compared to the 2019–2020 revised ranking, surpassing Argentina. The country also improved its ranking in the Quality of the tax system subfactor by two positions to 16th place, reflecting advancements in the variables that measures the tax system complexity and the distorting effects of taxes and subsidies.

The only other change in the ranking was in the Composite effective average tax rate on corporate income, where Brazil lost one position to 12th place. The drop was not due to a worsening of the value of this variable, but rather the better performance of other countries, with India standing out by advancing nine positions to 9th place following recent tax reforms in the last years[15].

[15] For more information on India's tax reforms, visit www.investindia.gov.in/taxation. Accessed on: 10/4/2022.

FIGURE 9 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE TAXATION FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



The ordinal number indicates the position of Brazil in the set of 18 selected countries (if not indicated otherwise).

- **Brazil is in the third of countrieswith most favorable positions** (positions 1-6)
- **Brazil is in the middle third** (positions 7-12)
- **Brazil is in the bottom third of countries** (positions 13–18)

2.5 MACROECONOMIC ENVIRONMENT

Countries Have Recorded an Increase in Both the Price Level and the Gross Debt of Governments Due to the Pandemic.

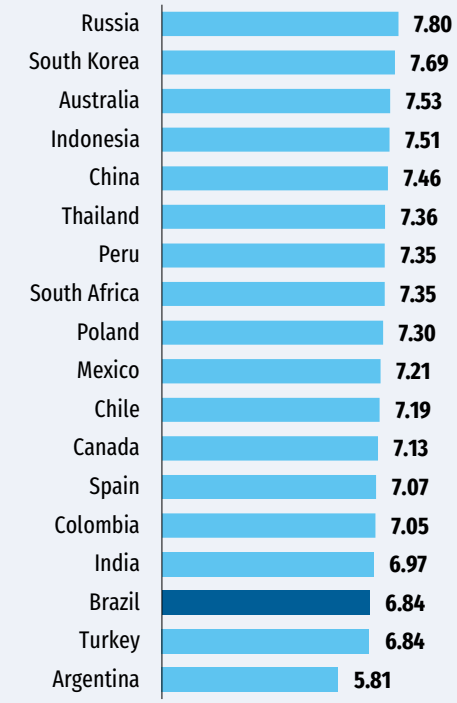
Brazil is in the lower third of the ranking in the Macroeconomic Environment factor, in the 16th position among 18 countries evaluated, ahead only of Turkey and Argentina. This low ranking is primarily due to the country's lack of fiscal balance which is an essential element for a favorable macroeconomic environment for investment, along with monetary stability and external balance.

The global pandemic has impacted inflation levels worldwide, leading to price increases across nearly all countries[16]. Specifically, Brazil saw an inflation rate[17] of 8.3% in 2021, the second-highest increase in percentage points after only Argentina. Thus, the country was placed among the worst-ranked ones in the Monetary balance subfactor, in 16th position, ahead of Argentina (48.4%) and Turkey (19.6%), according to consumer price index data from the *World Economic Outlook* database from the IMF.

The gross debt of selected countries increased significantly in 2020 due to government efforts to combat the COVID-19 pandemic, with an average growth of 23% between 2019 and 2020. However, between 2020 and 2021, the gross debt of the selected countries remained stable on average.

In Brazil, the increase in debt from 2019 to 2021 was only 6%, much lower when compared to the average of the selected countries. At the same time, Brazil had the second-highest inflation record, which served as a barrier to a larger increase in gross debt[18]. Despite the low growth, Brazil still has a high gross debt, ranking 16th in the Gross government debt variable and ahead of only Spain and Canada. Brazil's gross government debt represented 93% of its GDP in 2021, while it was 119% and 112% in Spain and Canada, respectively.

FIGURE 10 – MACROECONOMIC ENVIRONMENT FACTOR



Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

The assessment of the fiscal balance is supplemented with data on the cost of debt. Brazil has the second highest nominal interest expense: in 2021, interest expenses accounted for 5.2% of its GDP. Meanwhile, nominal interest costs in Spain and Canada were 1.9% and -0.6% of GDP[19], respectively.

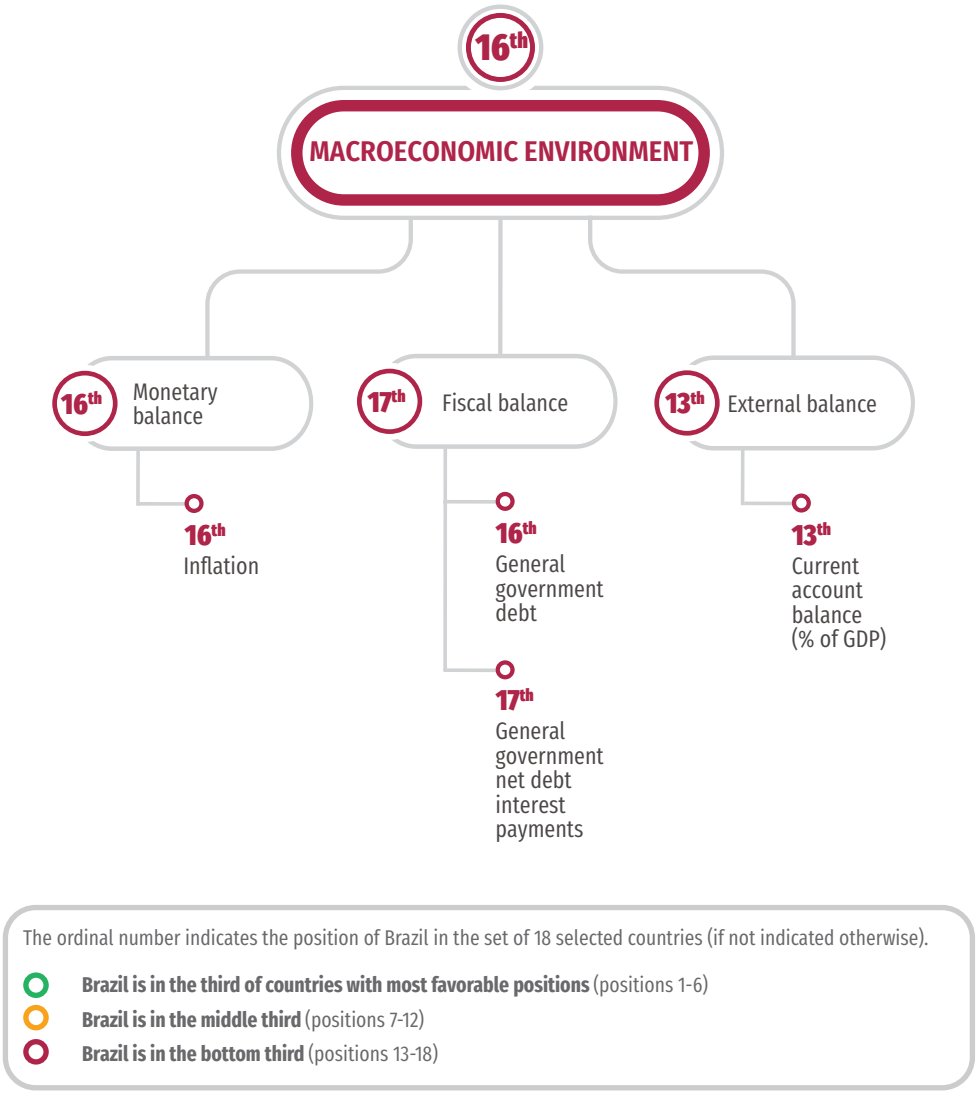
[16] The pandemic caused disruptions in production chains, resulting in shortages of inputs and raw materials, and contributed to inflationary pressure in countries, coupled with the increase in demand observed during the latter half of 2021.
[17] The International Monetary Fund (IMF) defines inflation as the yearly change in the average of a country's official consumer price index.
[18] The nominal increase in Gross Domestic Product (GDP) through a rise in the price level and the setting of interest rates with lower inflation expectations than what actually transpired, contributed to the decrease in gross debt as a percentage of GDP.

In External balance, Brazil recorded a current account deficit of 1.7% of GDP in 2021, which placed the country in 13th position among 18 countries in the bottom third of the ranking. The worst deficit was recorded by Chile, at 6.7% of GDP. On the other hand, Russia recorded the best result with a surplus of 6.9%, followed by South Korea (4.9%) and South Africa (3.7%).

Compared to the 2019–2020 ranking (revised), Brazil saw a decrease in the subfactors Monetary balance and External balance, falling from 14th to 16th and from 12th to 13th position, respectively.

The smaller increase in public debt compared to the average for countries, along with the reduction in debt interest (from 5.4% in 2018 to 5.2% of GDP in 2021), resulted in an improvement of one position in the Fiscal balance ranking, surpassing Spain in this subfactor and ranking 17th. As a result, the country remained ranked 16th in the Macroeconomic Environment factor.

FIGURE 11 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE MACROECONOMIC ENVIRONMENT FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



[19] Net losses are represented by positive values, while negative values denote net gains.

2.6 PRODUCTIVE STRUCTURE, SCALE AND COMPETITION

Reduction of Trade Tariff Barriers Can Increase Brazilian Competitiveness

In the Productive Structure, scale and competition factor, Brazil is in the middle third of the ranking, in 13th position among the 18 selected countries. Only in the Competition subfactor, the country is in the bottom third of the ranking and holds the 17th position.

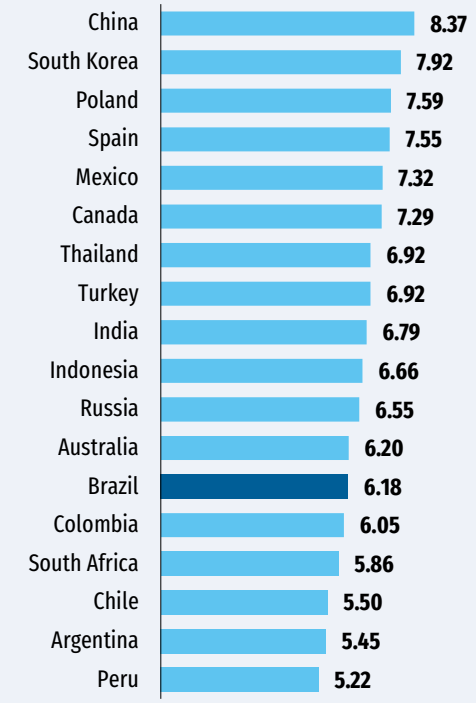
Brazil's best position is in the Scale subfactor, in the upper third of the ranking, with the fifth largest domestic market – behind only to those of China, India, Russia and Indonesia.

In the Productive structure subfactor, the Economic Complexity Index (ECI) reflects the country's ability to manufacture a wider range of goods, including complex products, i.e., goods that only a few countries are capable of producing. In 2019, Brazil's productive structure was ranked 11th in complexity among the 18 countries considered. South Korea is the most economically complex country, followed by China, according to the ECI index.

The detrimental effect on Brazil's competitiveness in the Competition subfactor is primarily shown in its performance in the Trade tariff barrier variable. The variable represents the average of import tariffs on all non-agricultural goods[20] for each trading partner. In the Market Dominance variable associated with the subfactor and based on perceptions of competitive market concentration, Brazil occupies an intermediate position at 7th place.

In 2020, among the 18 countries analyzed, Brazil had the highest average applied tariff on imports of non-agricultural goods at 13.59%[21]. With lower tariffs, just ahead of Brazil, are Argentina (13.08%), India (11.44%) and China (10.58%). Canada (1.57%), Australia (2.09%), and Peru (2.10%) held the top positions in the ranking.

FIGURE 12 – PRODUCTIVE STRUCTURE, SCALE AND COMPETITION FACTOR

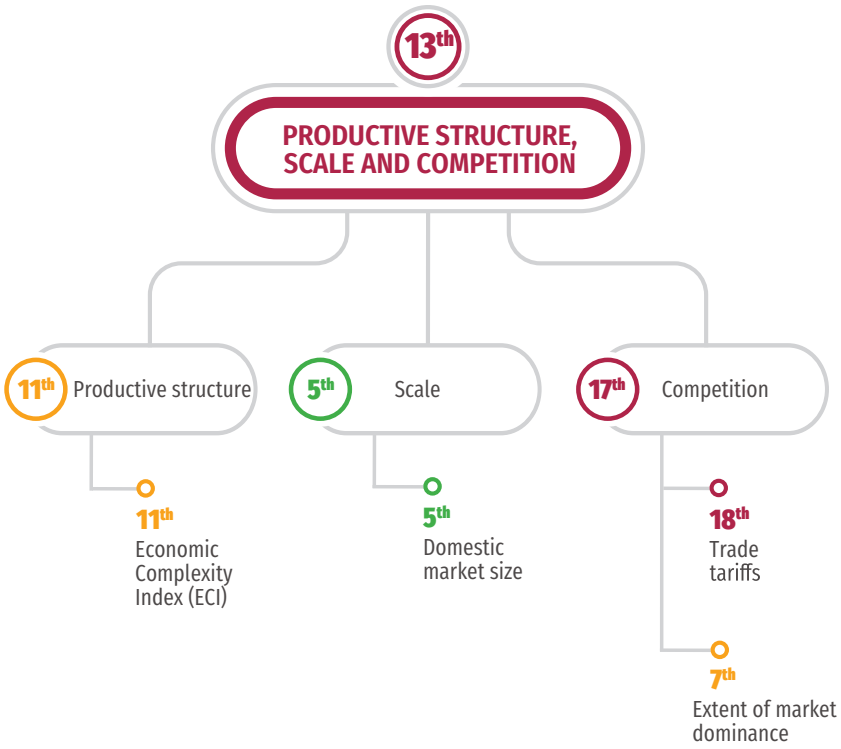


Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

Compared to the 2019–2020 ranking (revised), Brazil dropped one position in the Economic Complexity Index (ECI) variable ranking, being overtaken by Russia. At the same time, it gained a position in the Market Dominance variable due to a perception of less competitive market concentration. On average for the factor, Brazil lost one position in the Productive Structure, scale and competition ranking, coming in at 13th place.

[20] Non-agricultural products were defined by excluding agricultural products and were adapted to the Harmonized system in the Uruguay Round. The average is based on tariffs for non-agricultural products as they include products that compete with Brazilian industrial products. The rates are for all trading partners and are not limited to the Most Favored Nation (MFN).
[21] The data for the countries analyzed is from 2020, except for Thailand and Mexico, whose data is from 2015 and 2018, respectively.

FIGURE 13 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE PRODUCTIVE STRUCTURE, SCALE AND COMPETITION FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



The ordinal number indicates the position of Brazil in the set of 18 selected countries (if not indicated otherwise).

- **Brazil is in the third of countries with most favorable positions** (positions 1-6)
- **Brazil is in the middle third** (positions 7-12)
- **Brazil is in the bottom third** (positions 13-18)

2.7 BUSINESS ENVIRONMENT

For the Second Consecutive Edition, Brazil Has Advanced in the Business Environment Factor Ranking

Brazil has one of the three worst environments for doing business, ranking 16th out of 18 countries evaluated for the Business Environment factor. Peru is ranked 17th, while Argentina is in last place. The weak ranking of Brazil mainly reflects the lack of legal certainty and excessive red tape, but it has gained one position compared to the previous ranking.

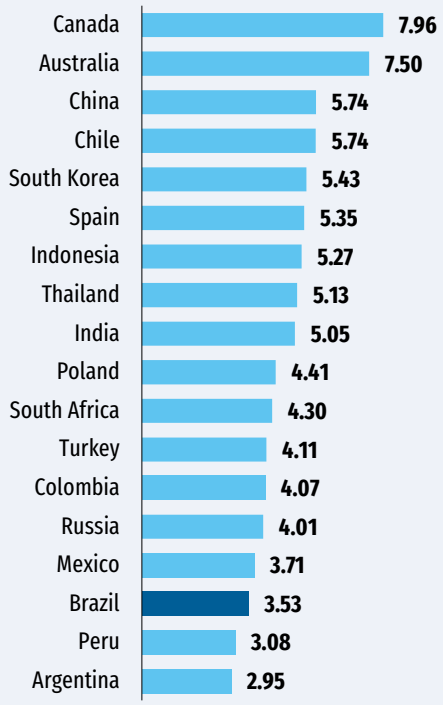
In the Legal certainty subfactor, Brazil ranks 15th. In this subfactor, regulatory aspects that directly impact the private sector are evaluated based on perceptions about compliance with legal standards. This includes aspects related to the execution of contracts, the protection of property rights, the efficiency of the police and justice system, and the ease of questioning government actions and regulations through the legal system. Additionally, the ease of resolving legal disputes between companies is also taken into consideration.

Within the subfactor of Legal certainty, Brazil ranks in the bottom third for the qualitative variables Efficiency of legal framework in settling disputes and Efficiency of legal framework in challenging regulations. Brazil scored 2.7 and 2.81 on a scale of 1 to 7, reaching 14th and 17th position among 18 countries, respectively. For the Rule of Law Index, the country is ranked in the middle third, at 11th place.

Also in relation to Red tape, Brazil is among the six worst-ranked countries, in the 16th position. This subfactor is composed of two qualitative variables: the first is Bureaucracy, that measures in a 1-10 scale the extent to witch red tape inhibits business activity; the second is Hiring and firing practices, which is a qualitative variable based on perceptions of the flexibility of hiring and firing rules. In both variables, the country is in the bottom third of the ranking (in 17th and 15th position, respectively).

The Business Environment factor also includes the Government Efficiency subfactor, which evaluates the efficiency of government operations based on perceptions about corruption in government, regulatory quality and the ability to formulate and implement policies, and the availability of information and legal texts (aspects such as ease of dissemination means, frequency, and language).

FIGURE 14 – BUSINESS ENVIRONMENT FACTOR



Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

Brazil is ranked 8th in this subfactor, which is the only one in which it is not in the bottom third of the ranking. Instead, Brazil holds an intermediate position. The favorable performance of Brazil in this subfactor is attributed to its high score in the Publicized laws and government data variable. Out of the 18 countries assessed, Brazil obtained the fourth-highest average score, with a score of 0.71 on a scale of 0 to 1, where 1 represents the highest score. Brazil ranks in the bottom third of the ranking in the other two variables associated with the subfactor: Control of Corruption and Regulatory Quality, holding the 13th and 16th positions, respectively.

In comparison to the previous ranking (revised 2019–2020), Brazil has recorded an improvement in its ranking in all subfactors. As a result, the country has advanced one position in the Business Environment factor, moving from 17th to 16th for the second consecutive edition of the Brazil Competitiveness Report[22].

The greatest advancements for Brazil have been in the subfactors of Legal certainty and Red tape, where it has advanced two positions in each. In Legal certainty, the Efficiency of the legal framework in challenging government regulations moved up 3 positions, with an improvement from a score of 2.66, in 2018-2019, to 2.81, in 2019-2020, on a scale of 1 to 7. The perception of ensuring compliance with legal rules has improved, advancing one position.

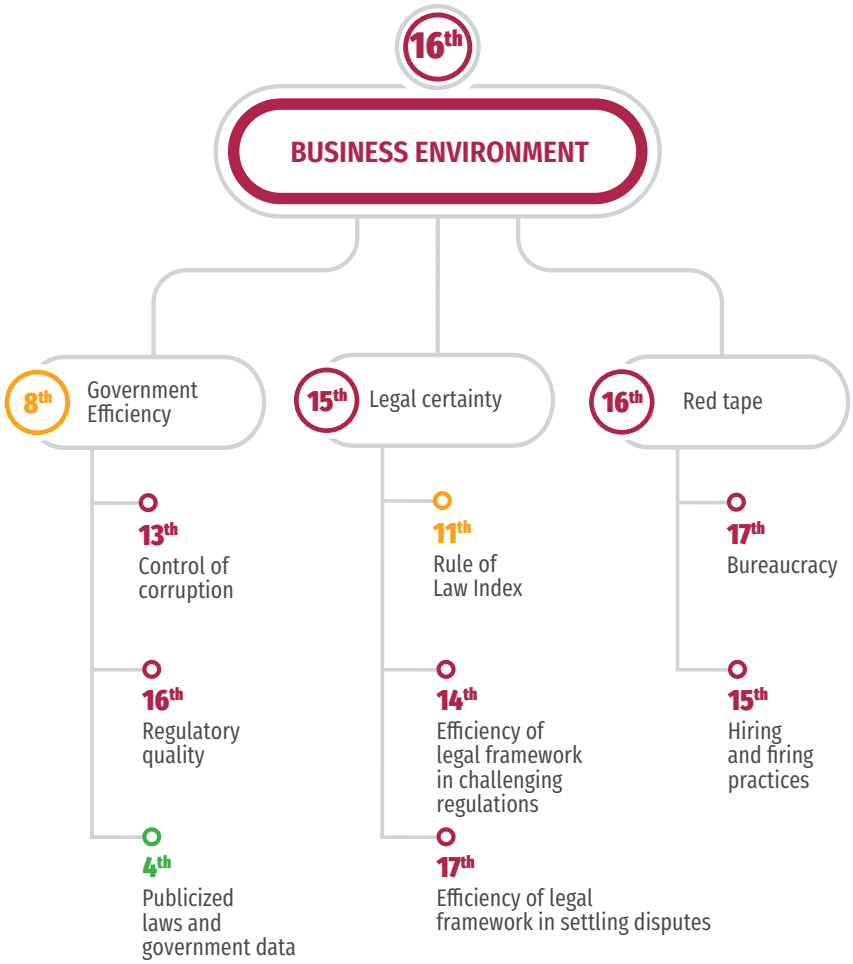
In the Red Tape subfactor, the variable Bureaucracy saw a slight improvement, going from 0.8 in 2019 to 1.1 in 2021 on a scale of 0 to 10. This led to Brazil gaining a position in the ranking. Among the other countries assessed, Argentina and Poland had a significant worsening, falling 7 and 5 positions respectively in this variable. Conversely, Colombia and Mexico showed improvement, advancing 5 positions each.

Brazil also made progress in the variable of Hiring and firing practices, advancing one position to reach 15th place. This was due to an improvement in the score from 2.76 in 2018-2019 to 2.81 in 2019–2020 on a scale of 1 to 7.

With regards to the Government Efficiency subfactor, the perception of control of corruption and regulatory quality in Brazil improved, leading to an advancement of two and one positions respectively. Nevertheless, the country lost one position in the Publicized laws and government data variable, falling to 4th place. Despite this setback, the overall average of the subfactor still allowed Brazil to advance one position, now ranking 8th.

[22] It is important to note that the previous variables based on the Doing Business report have been replaced in the current edition. To accurately analyze the country's progression, the past ranking has been recalculated to reflect these methodological changes. Further details can be found in Appendix A.

FIGURE 15 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE BUSINESS ENVIRONMENT FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



The ordinal number indicates the position of Brazil in the set of 18 selected countries (if not indicated otherwise).

- **Brazil is in the third of countries with most favorable positions** (positions 1-6)
- **Brazil is in the middle third** (positions 7-12)
- **Brazil is in the bottom third** (positions 13-18)

2.8 EDUCATION

Results in Dissemination and Quality of Education Are Unsatisfactory in Relation to the High Investment Made

In the Education factor, Brazil is at the middle third of the ranking, in 10th position among 17 countries assessed[23]. Despite having the highest public spending on education as a proportion of GDP, Brazil is in the bottom third in terms of the dissemination and quality of education.

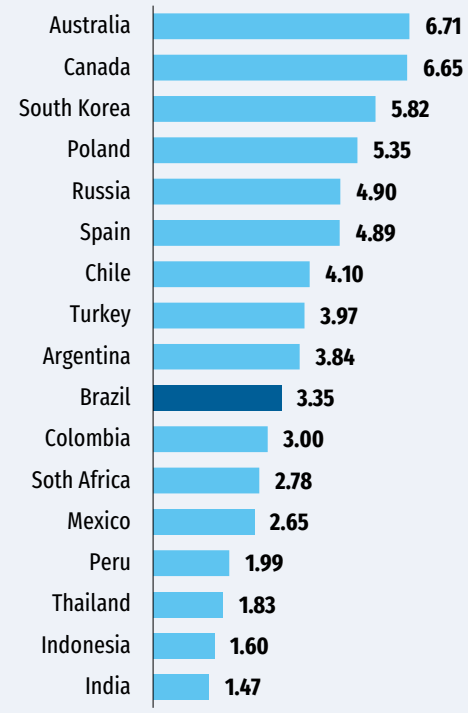
In 2018, public resources allocated to education in Brazil represented 5.3% of its GDP, making it the highest among the 18 countries analyzed. South Africa and Argentina had 5.1% and 5% of GDP allocated to education, respectively. Despite leading in spending as a percentage of GDP, Brazil ranks 8th in per capita spending on education. Therefore, Brazil stands at 3rd place in the subfactor Expenditure on education, which is an average of these two variables.

However, the high investment in education has not translated into satisfactory results. In the Educational attainment subfactor, Brazil ranks 11th among the 15 countries assessed[24]. The four variables associated with this subfactor assess the percentage of people in secondary and tertiary education and the percentage of those who completed these levels of education.

Brazil is in the middle third in both secondary and higher education enrollment. The country's enrollment rate for secondary education is close to 100%,[25] but only 55% for higher education. Other Latin American countries evaluated, such as Argentina and Chile, have higher enrollment rates (3rd and 4th) in higher education, with more than 90% of students enrolled.

Regarding the Educational assessment subfactor, the situation in Brazil is even worse: it ranked third to last in the 13th position among 15 countries assessed[26]. The quality of education is assessed based on the results of PISA, the Programme for International Student Assessment carried out by the OECD every three years. In practice, PISA applies reading, science and math tests to 15-year-old students from over 90 countries. The data for this edition of Brazil Competitiveness Report is a repeat of the previous edition, as it is a triennial test.

FIGURE 16 – EDUCATION FACTOR



Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

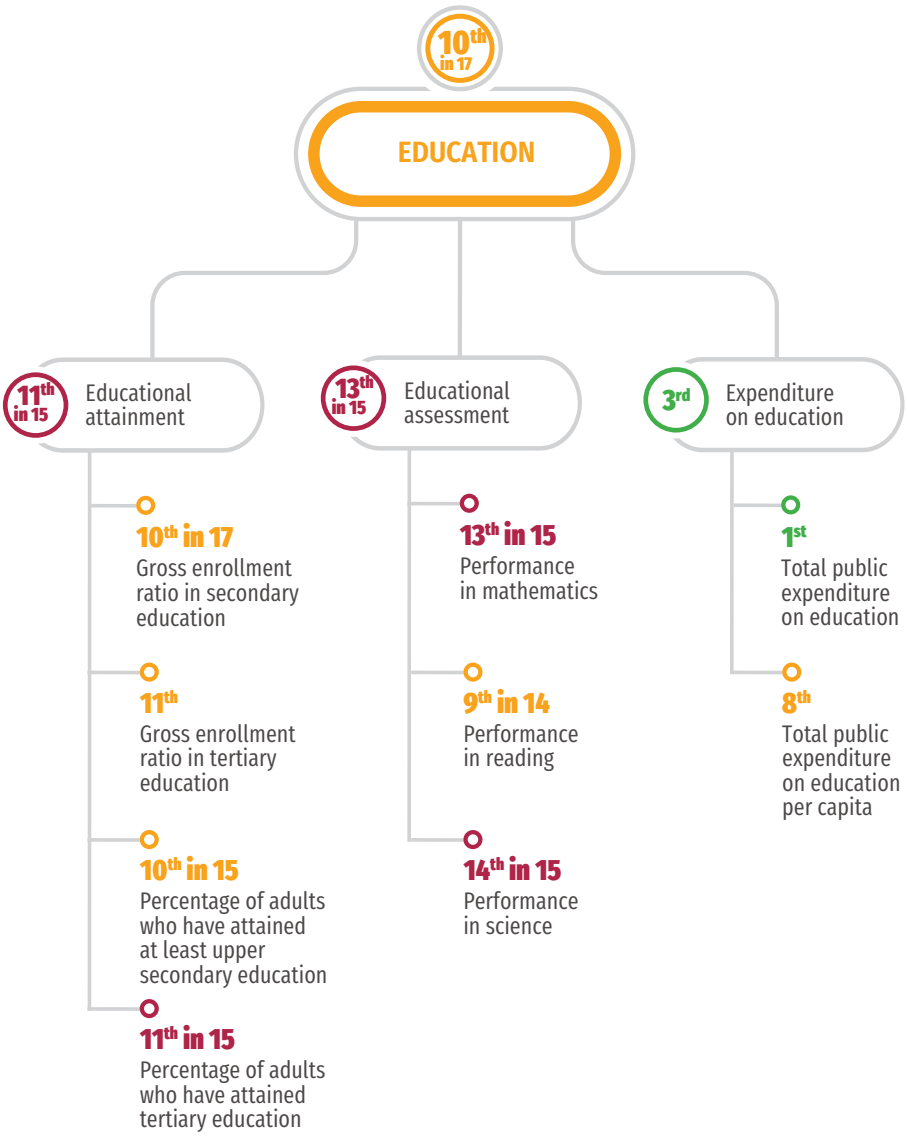
[23] No information is available for China in connection with most of the variables assessed. For this reason, China was excluded from the ranking of this factor.
[24] There is no data for China, Thailand, and Peru.
[25] The enrollment rate is calculated as the total number of students enrolled in a given level of education, regardless of the student's age, over the population of official school age to attend the same level of education. The indicator may exceed 100% due to the inclusion of people outside the official age to attend the determined level of education.
[26] No data is available for South Africa, China and India.

Only in the reading test Brazil is not in the bottom third of the ranking: it is the 9th best average among 14 countries assessed (Spain was not assessed in reading), according to the results of the last edition in 2018. Brazil is the third to last in the math test and second to last in the science test among the 15 countries considered. The countries that held the top three positions in the three assessments were: South Korea, Canada and Poland.

Compared to the previous ranking revision from 2019–2020, Brazil showed improvement in its Education attainment, reflected in the increase of its enrollment number indicators. The country advanced three positions in secondary education enrollments, now ranking 10th, and one position in tertiary education enrollments, rising to 11th place.

However, despite these advancements, Brazil was unable to move from its position in the Education factor and still ranks 10th out of the 17 countries evaluated.

FIGURE 17 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE EDUCATION FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



The ordinal number indicates the position of Brazil in the set of 18 selected countries (if not indicated otherwise).

- **Brazil is in the third of countries with most favorable positions** (positions 1-6)
- **Brazil is in the middle third** (positions 7-12)
- **Brazil is in the bottom third** (positions 13-18)

2.9 TECHNOLOGY AND INNOVATION

Participation in Exports of High Technology Products Drops by More Than 10 Percentage Points and Contributes to the Drop in the Ranking

In the Technology and innovation factor, Brazil ranks 9th out of the 18 countries assessed, occupying a position in the middle third of the ranking. This is the country's best result among the nine factors that determine competitiveness. In both aspects of the Technology and innovation factor assessed — research and development efforts and outcomes achieved — the country falls within the middle third of the ranking.

Brazil ranks 7th in the Gross expenditure on R&D variable, which includes the R&D efforts subfactor that encompasses both public and private expenditure. In 2018, the country's R&D expenditure represented 1.17% of its GDP, compared to South Korea and China which were first and second in the ranking with 4.53% and 2.14% respectively.

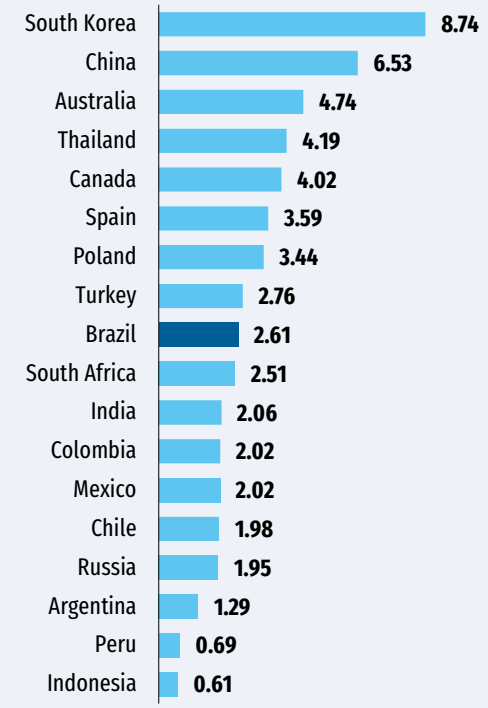
In the Gross expenditure on R&D financed by business enterprise variable, which measures the private sector's participation in investing in R&D in the country, Brazil holds an intermediate position in the ranking, coming in at 11th place. In 2017, the spending of Brazilian companies on R&D accounted for 38.9% of the total spending. In China and South Korea, the corporate spending accounted for more than 70% of total expenditures of these countries.

The subfactor Outcomes of R&D efforts is evaluated based on three variables: the number of scientific and technical articles produced, the amount of high-technology exports, and the number of international patent applications filed. In regards to all these variables, Brazil is in the middle third.

In 2020, the number of international patent applications in Brazil, filed through the Patent Cooperation Treaty (PCT)[27], was 0.2 per billion GDP measured in Purchasing Power Parity, taking the country to the 11th position among 17 countries[28] on this variable. Among the countries evaluated, the ones that filed the largest number of patent applications were the following: South Korea (8.7), China (2.8), Canada (1.4), and Australia (1.3)

In the categories of High-technology Exports and Scientific and Technical Articles, which measures the share of high-tech products in total exports[29] and the number of articles published in high-impact journals per billion GDP in Purchasing Power Parity, respectively, Brazil ranks 9th among 18 countries.

FIGURE 18 – TECHNOLOGY AND INNOVATION FACTOR



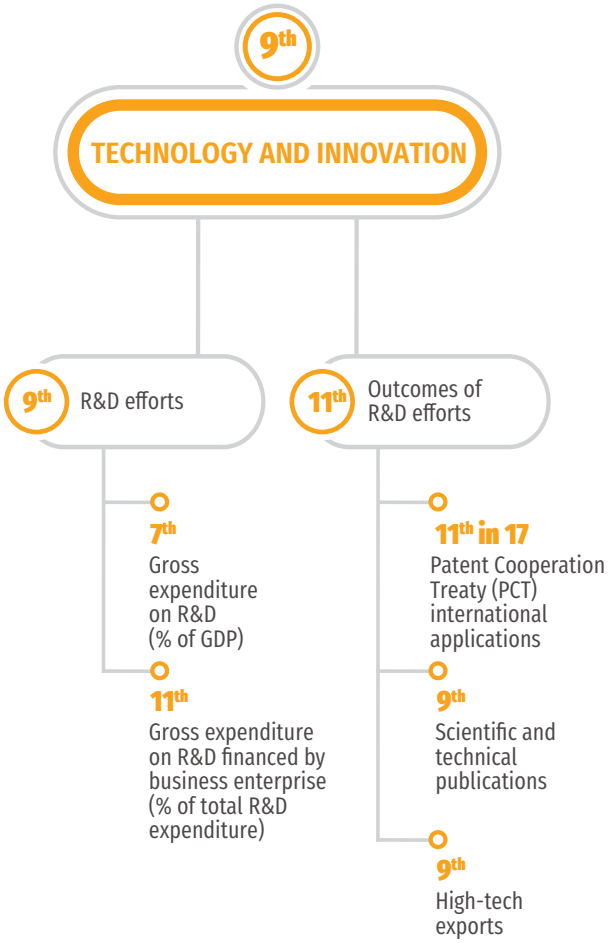
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

[27] The PCT makes it possible to apply for patent protection for an invention in many countries simultaneously by filing a single international patent application.
[28] There is no data for Argentina on this variable.
[29] The "high tech exports" variable is an approximate measure for the outcomes of innovation activities of companies, complementing patent-related data referring to inventions.

Brazil fell one place from 8th to 9th position in the Technology and innovation factor compared to the revised 2019-2020 ranking due to decreases in rankings in the two subfactors that make up this factor. Despite a two-position improvement in international patent applications, Brazil experienced a drop of two positions in the average of the subfactor Outcomes of R&D efforts. This reflects a significant decrease in the share of high-technology product exports in total exports, from 26.4% in 2017 to 15.2% in 2019.

Additionally, Brazil also dropped one place in the R&D efforts subfactor. Despite an increase in R&D spending as a proportion of GDP, from 1.12% to 1.17% between 2017 and 2018, Brazil dropped from 6th to 7th position, having been overtaken by Poland whose R&D indicator improved more, rising from 1.03% to 1.21%. In terms of the percentage of R&D funded by the private sector, the second variable that composes this subfactor, Brazil had the largest decrease in percentage points, dropping 5.4 pp between 2016 and 2017, leading to a drop of two positions in this category.

FIGURE 19 – BRAZIL'S POSITION IN THE RANKINGS RELATED TO THE TECHNOLOGY AND INNOVATION FACTOR AND ITS ASSOCIATED SUBFACTORS AND VARIABLES



The ordinal number indicates the position of Brazil in the set of 18 selected countries (if not indicated otherwise).

- **Brazil is in the third of countries with most favorable positions** (positions 1-6)
- **Brazil is in the middle third** (positions 7-12)
- **Brazil is in the bottom third** (positions 13-18)

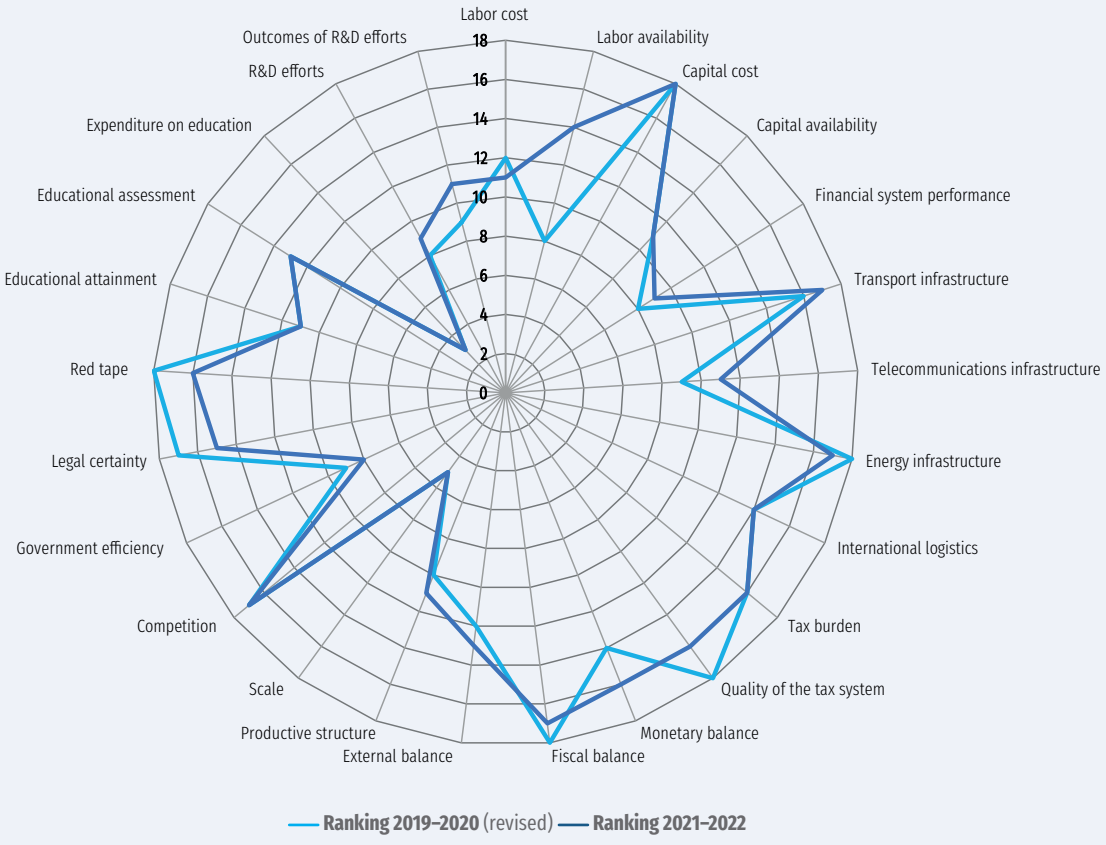
3 EVOLUTION OF COMPETITIVENESS FACTORS IN BRAZIL

COMPARISON OF POSITIONS IN THE RANKING

Figure 20 shows Brazil's positions in the rankings related to the 25 competitiveness subfactors. The further away a country is from the center of the circle, the lower its classification in relation to that subfactor (with positions 1-18). In the comparison between the 2019–2020 (revised version) and 2021–2022 rankings, a shift towards the center of the figure indicates a gain in positions, suggesting that the subfactor contributed to the increase in the competitiveness of Brazilian companies.

Among the 25 subfactors, Brazil climbed positions in seven cases, lost positions in nine and remained in the same position in the remaining nine. The country left the last place in the ranking in four out of five subfactors. In the Quality of the tax system and Red tape subfactors it advanced two positions. In the Energy infrastructure and Fiscal balance subfactors it gained one position. In the Capital cost subfactor it remained in the last place.

FIGURE 20 – EVOLUTION OF THE BRAZILIAN POSITION BETWEEN THE 2019–2020 (REVISED VERSION) AND 2021–2022 RANKINGS BY SUBFACTOR



SUBFACTORS IN WHICH BRAZIL GAINED POSITIONS

- **Labor Cost:** Brazil advanced one position due to a decrease in the cost of the hourly wage.
- **Energy Infrastructure:** saw an improvement, with Brazil gaining a position, reflecting the lower cost of electricity for industrial customers brought on by the dollar devaluation[30], and increased availability of electricity (measured relative to GDP).
- **Quality of the Tax System:** the country gained two positions, owing to a perceived improvement in both the complexity of the tax system and the distorting effects on competition caused by tax measures.
- **Fiscal Balance:** Brazil has improved, rising one position, as a result of a smaller-than-average increase in government debt, driven by higher inflation and a reduction in the cost of debt, measured as nominal interest on GDP.
- **Government Efficiency:** the country gained a position, with an improvement in the perception of regulatory quality and control of corruption.
- **Legal Certainty:** Brazil gained two positions with improvement in the perception of the efficiency of the legal system in questioning government regulations and in ensuring compliance with legal standards.
- **Red Tape:** the country gained two positions, due to an improvement in the perception of the labor rules for hiring and firing practices, and the reduction in the perception of red tape inhibiting business activity. However, it remains in the bottom third.

SUBFACTORS IN WHICH BRAZIL LOST POSITIONS

- **Labor Availability:** Brazil fell six positions, as a result of the sharp drop in the growth rate of the Brazilian workforce and economically active population during the Covid-19 pandemic.
- **Financial System Performance:** the country was down one position. Despite having improved in the subfactor, mainly in bank assets, other countries advanced more than Brazil.
- **Transport Infrastructure:** the country lost a position. Although Brazil showed improvement in one subfactor, other countries performed better, particularly in the variables Global Liner Shipping connectivity and Efficiency of air transport services.
- **Telecommunications Infrastructure:** the country dropped two positions, due to the worsening in access to information and communication technologies.
- **Monetary Balance:** Brazil fell two positions, reflecting the second highest increase in percentage points of inflation among the 18 countries evaluated (from 3.7% in 2018 to 8.3% in 2021).
- **External Balance:** the country fell one position. Although it had an improvement in the current account balance (from -2.7% of GDP in 2018 to -1.7% of GDP in 2021), it was lower than the performance of other countries.
- **Productive Structure:** despite not experiencing any decline in the variable measuring productive complexity, Brazil was overtaken by Russia, falling one position.
- **R&D Efforts:** despite an improvement in spending on R&D, there was a decline in the financing of R&D by companies as a percentage of total R&D financing, causing a drop of one position in the average of the subfactor.
- **Outcomes of R&D Efforts:** The country fell two positions due to a significant decline in the share of high-technology products in total exports, from 26.4% to 15.2%.

[30] For more details, see the analysis presented in section 2.3 Infrastructure and Logistics.

COMPARISON BETWEEN THE VALUES OF THE INDICATORS

The following graphs are based not on positions, but rather on the values of the indicators associated with the 9 factors (Figure 21) and the 25 subfactors (Figure 22). For each of these factors or subfactors, the values obtained for Brazil are compared to the average of the values corresponding to the 18 countries.

The horizontal axis shows the value assumed by the indicator for Brazil as a percentage of the average indicator, i.e., the average of the values for the 18 countries covered in this report — clearly showing Brazil's relative position. Values above 100% indicate that Brazil is above average. Below 100%, Brazil is below average.

The vertical axis represents, in percentage points, the difference between the growth rates of the indicators for Brazil and the average indicators of the 18 countries between the 2019–2020 (revised) and 2021–2022 rankings, demonstrating how the evolution of this factor in the country impacted the competitiveness of Brazilian companies. When the difference is greater than zero, Brazil's variable grew above the average rate recorded for the 18 countries, that is, the competitiveness of Brazilian companies increased. Values below zero indicate loss of competitiveness.

FIGURE 21 – COMPARISON BETWEEN THE BRAZILIAN PERFORMANCE AND THE AVERAGE PERFORMANCE OF THE 18 COUNTRIES BY FACTOR

QUADRANTS	
A – Brazil is regaining competitiveness	**B – Brazil´s low competitiveness worsens**
20 Financing	10 Labor
30 Infraestructure and logistics	80 Education
40 Taxation	90 Technology and innovation
50 Macroeconomic Environment	**C – Brazil has become more competitive**
60 Productive structure, scale and competition	
70 Business Environment	**D – Brazil´s competitiveness is threatened**

In the seven factors in which Brazil is in the bottom third of the ranking (red third), the value of the Brazilian indicator is lower than the average indicator. However, in six of them — Financing, Infrastructure, Taxation, Macroeconomic Environment, Productive Structure, and Business Environment — Brazil is improving its competitiveness and is located in quadrant A. This quadrant consists of factors where Brazil has a lower indicator value compared to the average, albeit its performance in terms of the growth rate of the indicator between the 2019–2020 (revised) and 2021–2022 rankings is better than the average performance.

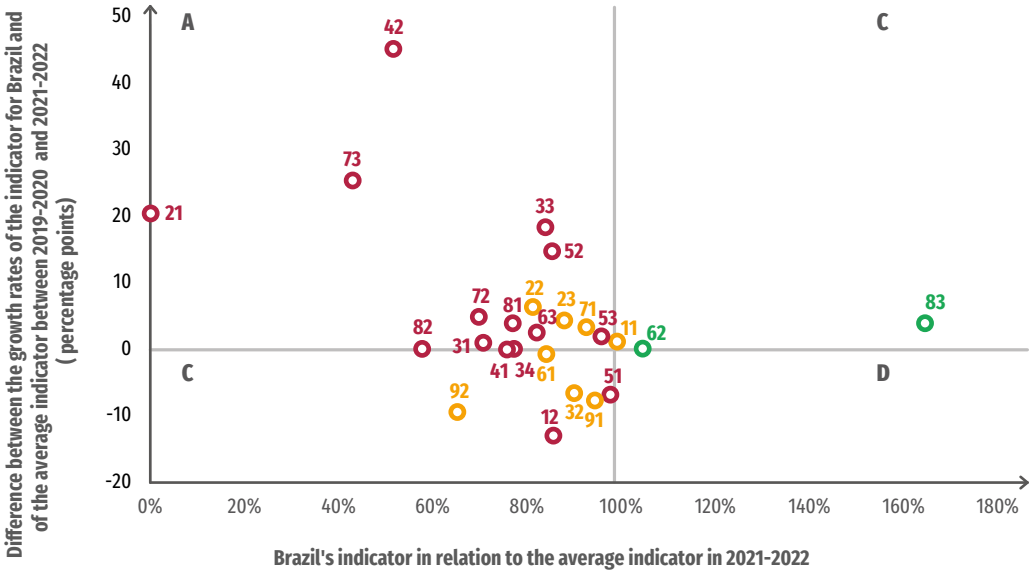
As for the Labor factor, in which Brazil is also in the bottom third of the ranking and has an indicator value lower than the average indicator, the country is placed in quadrant B. In this case, the country's low competitiveness is deteriorating. Not only the Brazilian indicator is below average, its growth rate is lower than the average growth rate of the indicators of the selected countries. The Education, and Technology and Innovation factors, in which Brazil is in the middle third (yellow third) of the ranking, are also included in quadrant B.

Among the factors in quadrant A, Brazil improved its ranking in Taxation and Business Environment, but declined in its ranking in Financing and Productive structure, scale and competition. Among the factors included in quadrant B, Brazil lost position in the Labor and Technology and Innovation factors. In Infrastructure and Macroeconomic Environment, despite showing a growth rate above the average rate, the country remained in the same positions. The same is true for the Education factor, where the growth rate is lower than the average rate.

Lastly, it is worth noting that Brazil does not have any factors classified in Quadrants C and D. Quadrant C encompasses cases where Brazil is not only more competitive than the average, but also has a growth rate that surpasses the average rate. In Quadrant D, the country is more competitive than the average of its competitors, however its indicators demonstrate a slower growth rate over the considered period.

Figure 22 presents the same exercise for the 25 subfactors. Most of them (88%) are classified in quadrants A and B, in which the Brazilian indicator is lower than the average indicator, that is, Brazil is less competitive than the average of its competitors. In more than half of the subfactors, which is 60%, the brazilian lack of competitiveness is improving, as the Brazilian indicator showed a growth rate higher than the average during the period. For over a quarter of the subfactors (28%), the gap in competitiveness is widening, meaning that the Brazilian indicator showed slower growth (or a greater decrease) compared to the average indicator during the period.

FIGURE 22 – COMPARISON BETWEEN THE BRAZILIAN PERFORMANCE AND THE AVERAGE PERFORMANCE OF THE 18 COUNTRIES BY SUBFACTOR



Brazil is in the top third Brazil is in the middle third Brazil is in the bottom third

QUADRANTS	
A – Brazil is regaining competitiveness	**B – Brazil´s low competitiveness worsens**
21 Capital cost	12 Labor availability
22 Capital availability	32 Telecommunications infrastructure
23 Financial system performance	41 Tax burden
31 Transport infrastructure	51 Monetary balance
33 Energy infrastructure	61 Productive structure
34 International logistics	91 R&D efforts
42 Quality of the tax system	92 Outcomes of R&D efforts
52 Fiscal balance	
53 External balance	**C – Brazil has become more competitive**
63 Competition	11 Labor cost
71 Government efficiency	62 Scale
72 Legal certainty	83 Expenditure on education
73 Red tape	
81 Educational attainment	**D – Brazil´s competitiveness is threatened**
82 Educational assessment	

Brazil is more competitive than the average in only three subfactors: Labor Cost, Scale, and Expenditure on education, which are depicted in quadrant C. In Labor Cost and Scale, it is only 0.3% and 5.8% higher than the average, respectively, while in Expenditure on Education, it is 67% higher.

The country also performed better than the average indicator in these three subfactors. The Scale grew slightly better than the average (0.3 percentage points above), while the Labor Cost and Expenditure on Education grew by 1 and 3 percentage points above the average, respectively.

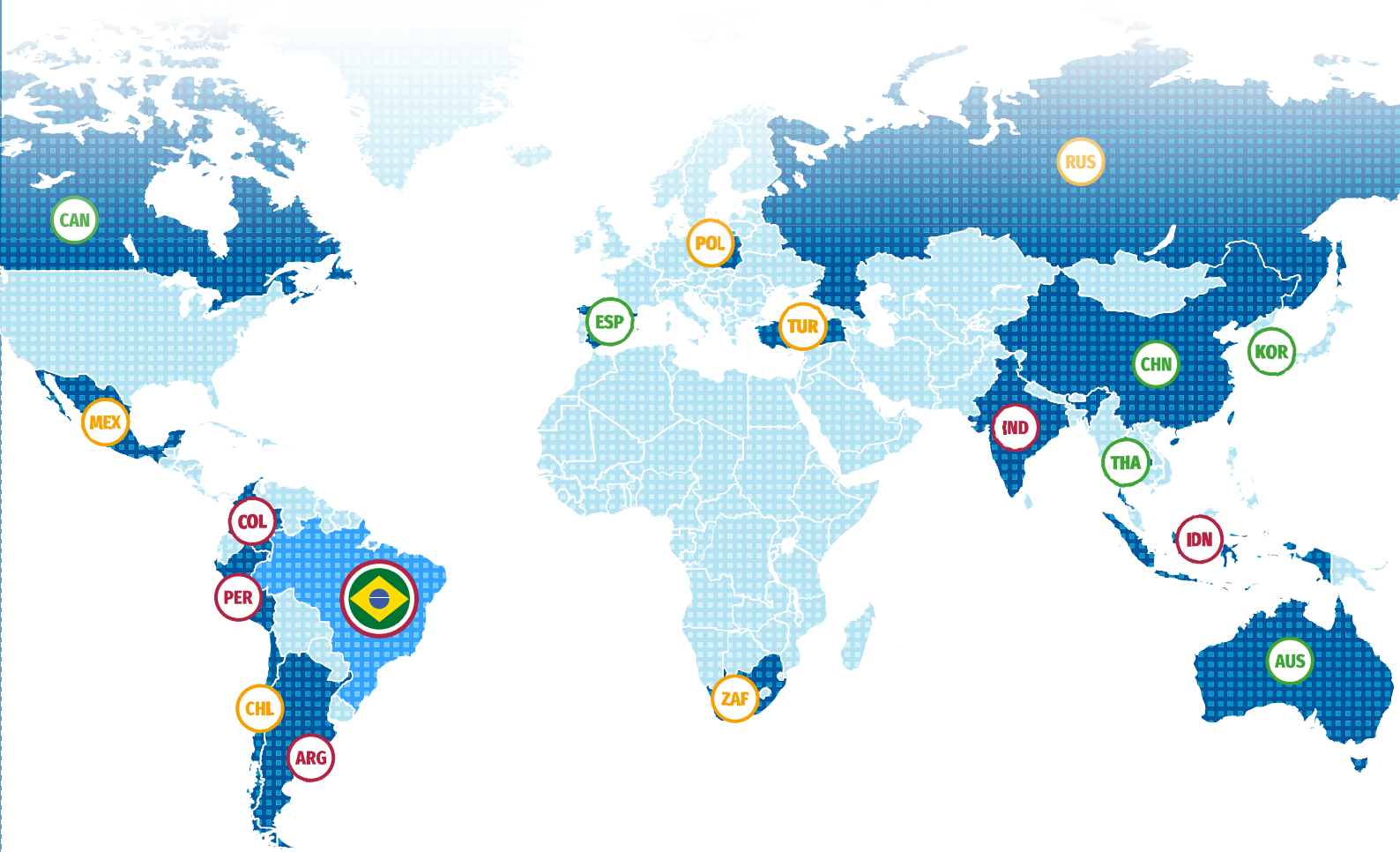
4 COMPETITIVENESS FACTORS OF THE SELECTED COUNTRIES

The charts and tables in this section of the report show the performance of each of the 17 selected countries. The first table shows some structural indicators of the country, such as its area, population, GDP and GDP per capita, which are also relevant for understanding its performance.

The second table shows the results achieved by the country selected in this edition (the score, ranging from 0 to 10, and position in the ranking, ranging from 1 to 18), considering the nine factors that determine competitiveness and their subfactors. For comparison purposes, the table also shows the results for the best-performing country and the results for Brazil.

The spider web graph compares the selected country with Brazil in a given competitiveness factor. The further away from the center of the circumference, the better the country's performance in that competitiveness factor (the higher the score on a 0-10 scale). The distance between the two points within the same radius represents the difference in performance between the selected country and Brazil.

Finally, the bar graph displays the scores (ranging from 0 to 10) obtained by the selected country in each of the nine determinants of competitiveness. The color of the bar indicates whether the selected country is in the upper, middle or bottom third of the ranking among the 18 countries. The overall average is the simple average between the values in the nine factors.



4.1 SOUTH AFRICA

South Africa ranks 11th in the 2021–2022 Brazil Competitiveness, placing it in the middle third (positions 7 to 12). The country is placed in the middle third in seven of the nine determining factors of competitiveness. In the Labor and Productive Structure, Scale, and Competition factors, the country is in the lower third (among the six worst placed). In 2020, South Africa had the third least complex corporate tax system, which led the country to reach the seventh position in the Taxation factor, the best result achieved by the country. Brazil outperforms South Africa in only three factors: Productive Structure, Scale and Competition, Education, and Technology and Innovation. In the 2019–2020 revised ranking, the country gained five positions in the Macroeconomic Environment factor due to an improvement in the current account balance, and lost two positions in the Labor factor. Despite these changes, South Africa remained in the same position in the overall ranking.

TABLE 1 – SOUTH AFRICA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	1,219
Population (millions)	60
GDP (billion USD)	418
GDP per capita, PPP (thousand USD)	14
Agricultural products exports (billion USD)	12
Total exports (billion USD)	124
Total imports (billion USD)	114

FIGURE 23 – BRAZIL–SOUTH AFRICA COMPARISON

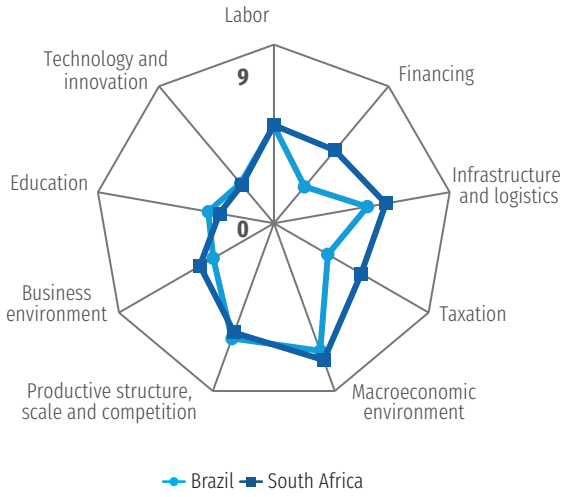


FIGURE 24 – SOUTH AFRICA'S PERFORMANCE
Average scores (0 = worst performance; 10 = best performance)

Overall average: 4.8

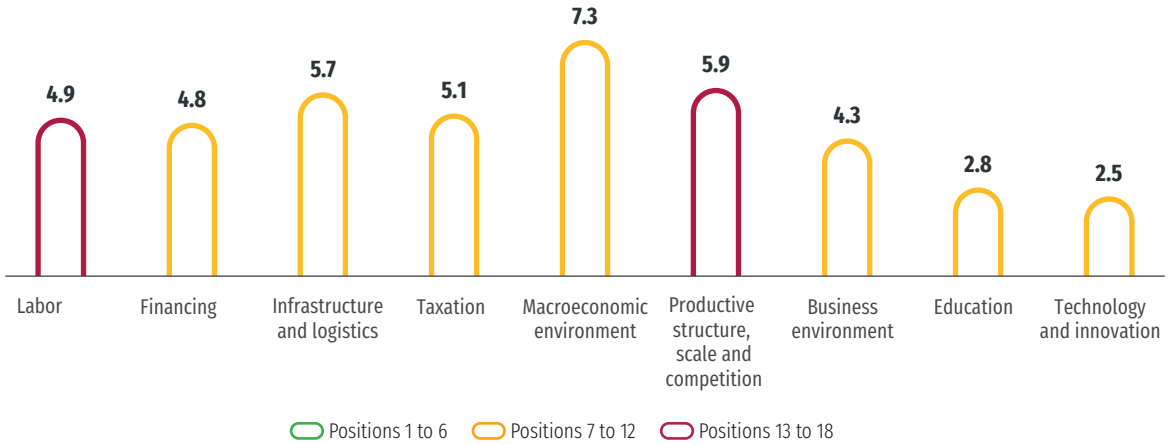


TABLE 2 – SOUTH AFRICA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

SOUTH AFRICA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**4.94**	**14**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.33	10	Turkey	5.93	5.24	11
Labor Availability	4.55	15	Peru	6.59	4.56	14
Financing	**4.79**	**8**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.37	10	Argentina	9.90	0.00	18
Capital Availability	5.64	3	Canada	6.47	3.10	11
Financial System Performance	3.35	13	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.73**	**8**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	5.27	9	China	7.94	4.00	17
Telecommunications Infrastructure	4.90	15	South Korea	9.58	5.88	11
Energy Infrastructure	6.39	1	South Africa	6.39	4.65	17
International Logistics	6.34	8	Spain	8.36	4.60	14
Taxation	**5.08**	**7**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	5.16	11	Indonesia	7.61	4.20	16
Quality of the Tax System	4.99	6	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.35**	**8**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.26	11	China	9.62	8.89	16
Fiscal Balance	5.12	14	Russia	6.29	4.65	17
External Balance	7.67	3	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**5.86**	**15**	**China**	**8.37**	**6.18**	**13**
Productive Structure	4.46	13	South Korea	9.13	4.62	11
Scale	7.00	16	China	10.00	8.23	5
Competition	6.12	14	Spain	8.66	5.68	17
Business Environment	**4.30**	**11**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	5.29	9	Australia	9.20	5.37	8
Legal Certainty	6.32	5	Canada	7.80	3.59	15
Red Tape	1.29	17	Canada	7.22	1.62	16
Education	**2.78**	**12**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	2.88	13	Australia	8.24	4.01	11
Educational Assessment	-	-	South Korea	8.35	3.01	13
Expenditure on Education	2.68	5	Australia	4.43	3.04	3
Technology and Innovation	**2.51**	**10**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	3.40	10	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	1.61	10	South Korea	8.19	1.59	11

4.2 ARGENTINA

Argentina ranks last in the Brazil Competitiveness Report 2021–2022. Among the nine determining factors of competitiveness, the country is in the bottom third (among the six worst-ranked countries) in six of them. The country is in the middle third of the ranking (between 7th and 12th positions) in the Infrastructure and Logistics, and Education factors. It's best performance is in the Labor factor, where it holds the 3rd position among the 18 countries evaluated. This result was due to the low cost of labor and the increase in the country's workforce. Argentina is in last place in three factors: Taxation, Macroeconomic Environment, and Business Environment. Compared to the 2019–2020 (revised) ranking, the country gained five positions in the Labor factor and four positions in the Financing factor. On the other hand, it had losses in the Business Environment and Taxation factors, losing two positions in the former and one in the latter. Despite these changes, Argentina remains at the bottom of the overall ranking.

TABLE 3 – ARGENTINA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	2,780
Population (millions)	46
GDP (billion USD)	489
GDP per capita, PPP (thousand USD)	24
Agricultural products exports (billion USD)	36
Total exports (billion USD)	78
Total imports (billion USD)	63

FIGURE 25 – BRAZIL-ARGENTINA COMPARISON

FIGURE 26 – ARGENTINA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

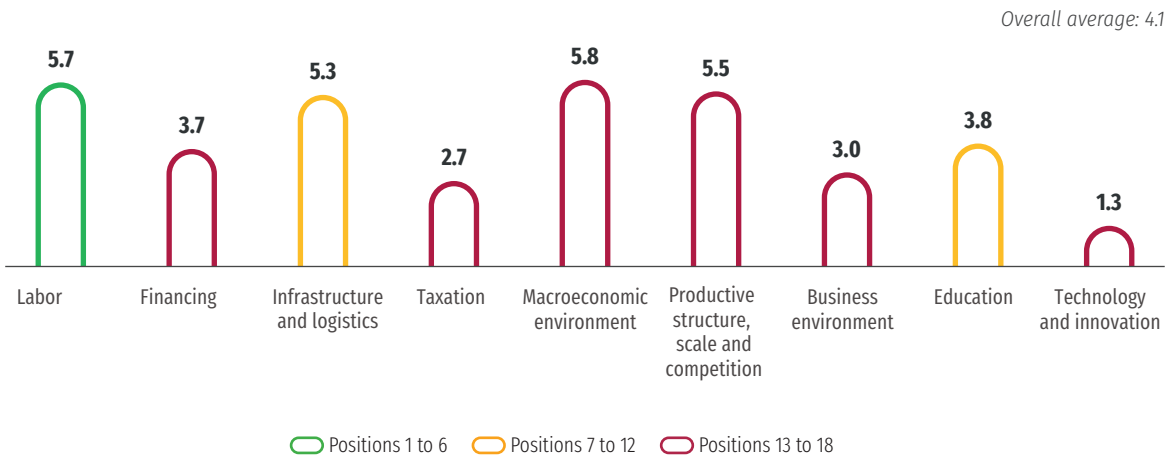


TABLE 4 – ARGENTINA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

ARGENTINA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.73**	**3**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.58	3	Turkey	5.93	5.24	11
Labor Availability	5.88	5	Peru	6.59	4.56	14
Financing	**3.67**	**14**	**China**	**6.61**	**2.40**	**18**
Capital Cost	9.90	1	Argentina	9.90	0.00	18
Capital Availability	0.75	18	Canada	6.47	3.10	11
Financial System Performance	0.37	17	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.34**	**12**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	4.51	15	China	7.94	4.00	17
Telecommunications Infrastructure	6.72	8	South Korea	9.58	5.88	11
Energy Infrastructure	5.97	6	South Africa	6.39	4.65	17
International Logistics	4.17	16	Spain	8.36	4.60	14
Taxation	**2.68**	**18**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	3.59	18	Indonesia	7.61	4.20	16
Quality of the Tax System	1.76	18	South Korea	5.59	2.09	16
Macroeconomic Environment	**5.81**	**18**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	4.94	18	China	9.62	8.89	16
Fiscal Balance	5.12	13	Russia	6.29	4.65	17
External Balance	7.37	6	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**5.45**	**17**	**China**	**8.37**	**6.18**	**13**
Productive Structure	3.82	16	South Korea	9.13	4.62	11
Scale	7.17	14	China	10.00	8.23	5
Competition	5.37	18	Spain	8.66	5.68	17
Business Environment	**2.95**	**18**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	5.14	10	Australia	9.20	5.37	8
Legal Certainty	3.20	17	Canada	7.80	3.59	15
Red Tape	0.51	18	Canada	7.22	1.62	16
Education	**3.84**	**9**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	5.84	7	Australia	8.24	4.01	11
Educational Assessment	2.78	14	South Korea	8.35	3.01	13
Expenditure on Education	2.90	4	Australia	4.43	3.04	3
Technology and Innovation	**1.29**	**16**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	1.59	15	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	1.00	15	South Korea	8.19	1.59	11

4.3 AUSTRALIA

Australia is the third economy with the best performance in the ranking of the Brazil Competitiveness Report 2021–2022. Among the nine determining factors of competitiveness, the country is in the upper third (among the six best-ranked countries) in six of them. Australia ranked first in the Education factor — the best result achieved by the country. The country has the highest number of enrollments in secondary and tertiary education, the highest public expenditure per capita on education, and the fourth-best score in PISA tests. The worst performance for Australia is in the Productive Structure, Scale and Competition factor, where it is in the 12th place. Two other factors are in the middle third: Labor and Taxation. Brazil is behind Australia in all nine factors and is placed 13 positions behind the country in the overall ranking. Compared to the revised 2019–2020 ranking, Australia gained four positions in the Labor factor and lost three positions in the Taxation factor. In the overall ranking, Australia remains in third place.

TABLE 5 – AUSTRALIA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	7,741
Population (millions)	26
GDP (billion USD)	1,633
GDP per capita, PPP (thousand USD)	56
Agricultural products exports (billion USD)	31
Total exports (billion USD)	344
Total imports (billion USD)	261

FIGURE 27 – BRAZIL-AUSTRALIA COMPARISON

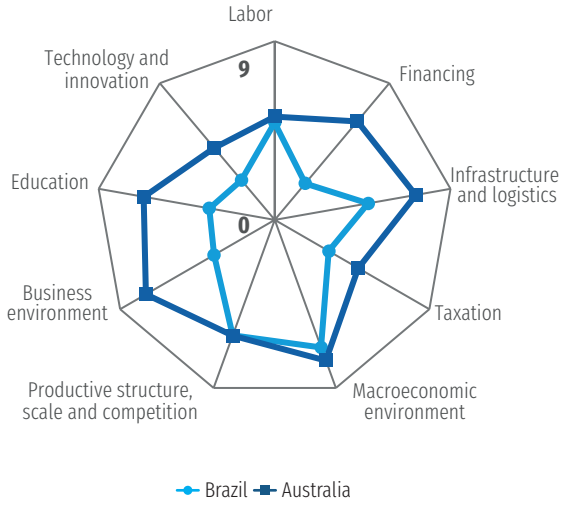


FIGURE 28 – AUSTRALIA'S PERFORMANCE
Average scores (0 = worst performance; 10 = best performance)

TABLE 6 – AUSTRALIA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

AUSTRALIA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.21**	**10**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	4.25	18	Turkey	5.93	5.24	11
Labor Availability	6.17	3	Peru	6.59	4.56	14
Financing	**6.49**	**2**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.69	8	Argentina	9.90	0.00	18
Capital Availability	5.03	6	Canada	6.47	3.10	11
Financial System Performance	8.74	1	Australia	8.74	4.10	9
Infrastructure and Logistics	**7.22**	**3**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	6.69	4	China	7.94	4.00	17
Telecommunications Infrastructure	8.50	3	South Korea	9.58	5.88	11
Energy Infrastructure	5.68	7	South Africa	6.39	4.65	17
International Logistics	8.00	2	Spain	8.36	4.60	14
Taxation	**4.86**	**9**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	4.65	13	Indonesia	7.61	4.20	16
Quality of the Tax System	5.07	5	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.53**	**3**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.43	5	China	9.62	8.89	16
Fiscal Balance	5.52	9	Russia	6.29	4.65	17
External Balance	7.66	4	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.20**	**12**	**China**	**8.37**	**6.18**	**13**
Productive Structure	3.34	17	South Korea	9.13	4.62	11
Scale	7.49	11	China	10.00	8.23	5
Competition	7.78	4	Spain	8.66	5.68	17
Business Environment	**7.50**	**2**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	9.20	1	Australia	9.20	5.37	8
Legal Certainty	7.17	2	Canada	7.80	3.59	15
Red Tape	6.14	4	Canada	7.22	1.62	16
Education	**6.71**	**1**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	8.24	1	Australia	8.24	4.01	11
Educational Assessment	7.45	4	South Korea	8.35	3.01	13
Expenditure on Education	4.43	1	Australia	4.43	3.04	3
Technology and Innovation	**4.74**	**3**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	5.72	4	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	3.76	4	South Korea	8.19	1.59	11

4.4 CANADA

Canada is the second economy with the best performance in the ranking of the Brazil Competitiveness Report 2021–2022. Among the nine determining factors of competitiveness, the country is in the upper third (among the six best-ranked countries) in six of them. In the Labor, Taxation, and Macroeconomic Environment factors, the country is ranked in the intermediate third (between 7th and 12th place). Canada boasts the best ranking in the Business Environment factor, with the highest evaluation in Legal certainty and Red Tape and ranking second in Government Efficiency. Brazil, on the other hand, is 15 positions behind Canada in this factor, coming in at 16th place. Canada's weakest ranking is in the Macroeconomic Environment factor where it stands at the 12th place. According to the revised 2019–2020 ranking, the country made gains in the Labor factor, rising by five positions, and in the Taxation factor, rising by three positions. However, it lost two positions in the Financing factor. Despite these fluctuations, Canada's overall ranking remained unchanged.

TABLE 7 – CANADA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	9,880
Population (millions)	38
GDP (billion USD)	1,991
GDP per capita, PPP (thousand USD)	53
Agricultural products exports (billion USD)	70
Total exports (billion USD)	503
Total imports (billion USD)	499

FIGURE 29 – BRAZIL-CANADA COMPARISON

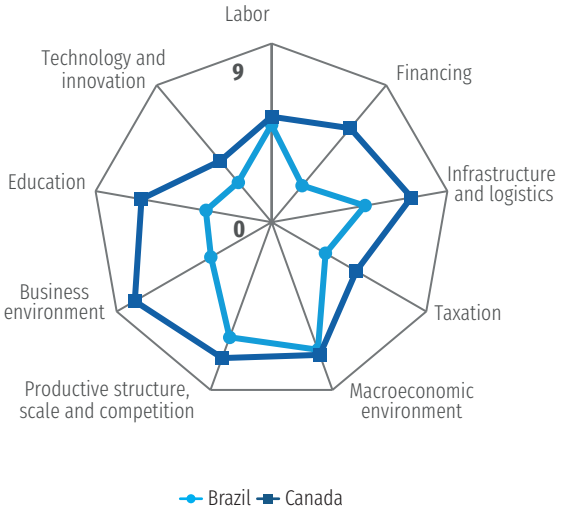


FIGURE 30 – CANADA'S PERFORMANCE
Average scores (0 = worst performance; 10 = best performance)

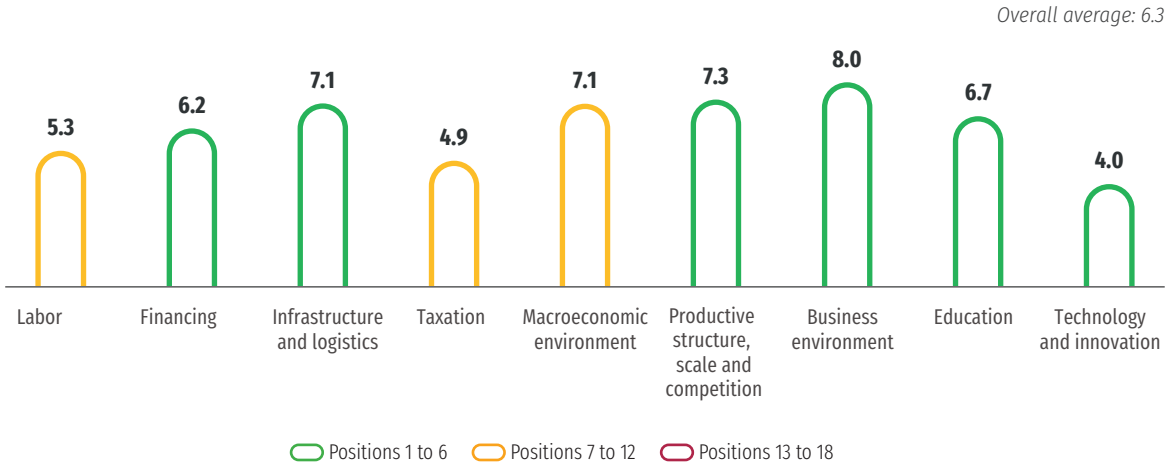


TABLE 8 – CANADA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

CANADA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.31**	**8**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	4.64	15	Turkey	5.93	5.24	11
Labor Availability	5.98	4	Peru	6.59	4.56	14
Financing	**6.18**	**4**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.88	6	Argentina	9.90	0.00	18
Capital Availability	6.47	1	Canada	6.47	3.10	11
Financial System Performance	-	-	Australia	8.74	4.10	9
Infrastructure and Logistics	**7.15**	**4**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	6.13	6	China	7.94	4.00	17
Telecommunications Infrastructure	8.46	4	South Korea	9.58	5.88	11
Energy Infrastructure	6.12	4	South Africa	6.39	4.65	17
International Logistics	7.89	3	Spain	8.36	4.60	14
Taxation	**4.93**	**8**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	4.56	14	Indonesia	7.61	4.20	16
Quality of the Tax System	5.29	2	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.13**	**12**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.37	7	China	9.62	8.89	16
Fiscal Balance	4.80	15	Russia	6.29	4.65	17
External Balance	7.22	9	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**7.29**	**6**	**China**	**8.37**	**6.18**	**13**
Productive Structure	5.99	7	South Korea	9.13	4.62	11
Scale	7.76	9	China	10.00	8.23	5
Competition	8.11	3	Spain	8.66	5.68	17
Business Environment	**7.96**	**1**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	8.87	2	Australia	9.20	5.37	8
Legal Certainty	7.80	1	Canada	7.80	3.59	15
Red Tape	7.22	1	Canada	7.22	1.62	16
Education	**6.65**	**2**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	7.87	2	Australia	8.24	4.01	11
Educational Assessment	8.24	2	South Korea	8.35	3.01	13
Expenditure on Education	3.85	2	Australia	4.43	3.04	3
Technology and Innovation	**4.02**	**5**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	4.21	6	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	3.83	3	South Korea	8.19	1.59	11

4.5 CHILE

In the Brazil Competitiveness Report 2021–2022, Chile holds the 9th position of the ranking. It is the best-ranked Latin American country – Mexico is the second one, in the 13th position. Out of the nine determining factors of competitiveness, Chile ranks in the middle third (between 7th and 12th positions) in five of them. On the other hand, Chile ranks in the bottom third (the six lowest ranked) in three of these factors. In the Business Environment factor, Chile stands out as the only Latin American country among the top six, with the third-best ranking for legal certainty and government efficiency. In comparison, Brazil lags behind Chile by 12 positions in this factor. Chile's worst results are in the Labor and Productive Structure, Scale, and Competition factors, where it ranks 16th in both. In comparison to the revised 2019–2020 ranking, Chile lost one position in the overall ranking. This decline was largely due to a loss of 11 positions in the Labor factor, attributed to a reduction in its workforce.

TABLE 9 – CHILE:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	757
Population (millions)	19
GDP (billion USD)	317
GDP per capita, PPP (thousand USD)	27
Agricultural products exports (billion USD)	22
Total exports (billion USD)	95
Total imports (billion USD)	92

FIGURE 31 – BRAZIL-CHILE COMPARISON

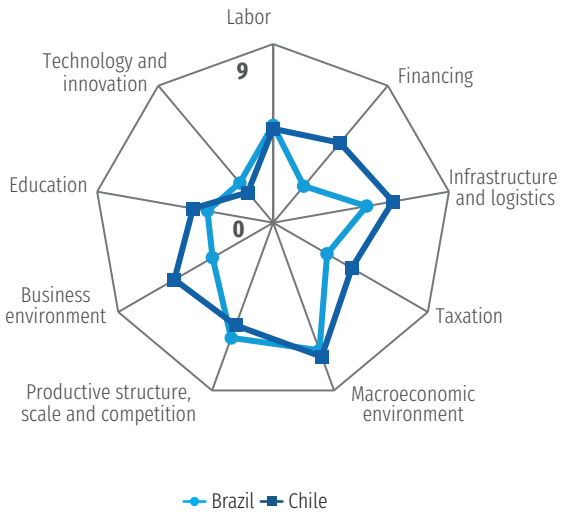


FIGURE 32 – CHILE'S PERFORMANCE
Average scores (0 = worst performance; 10 = best performance)

TABLE 10 – CHILE:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

CHILE			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**4.73**	**16**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.59	2	Turkey	5.93	5.24	11
Labor Availability	3.88	17	Peru	6.59	4.56	14
Financing	**5.25**	**7**	**China**	**6.61**	**2.40**	**18**
Capital Cost	6.36	3	Argentina	9.90	0.00	18
Capital Availability	4.55	7	Canada	6.47	3.10	11
Financial System Performance	4.85	6	Australia	8.74	4.10	9
Infrastructure and Logistics	**6.13**	**7**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	6.41	5	China	7.94	4.00	17
Telecommunications Infrastructure	7.28	7	South Korea	9.58	5.88	11
Energy Infrastructure	4.74	16	South Africa	6.39	4.65	17
International Logistics	6.07	9	Spain	8.36	4.60	14
Taxation	**4.58**	**11**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	4.02	17	Indonesia	7.61	4.20	16
Quality of the Tax System	5.14	4	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.19**	**11**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.26	10	China	9.62	8.89	16
Fiscal Balance	5.94	2	Russia	6.29	4.65	17
External Balance	6.36	18	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**5.50**	**16**	**China**	**8.37**	**6.18**	**13**
Productive Structure	3.91	15	South Korea	9.13	4.62	11
Scale	6.56	17	China	10.00	8.23	5
Competition	6.03	15	Spain	8.66	5.68	17
Business Environment	**5.74**	**4**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	7.26	3	Australia	9.20	5.37	8
Legal Certainty	6.42	3	Canada	7.80	3.59	15
Red Tape	3.54	9	Canada	7.22	1.62	16
Education	**4.10**	**7**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	5.29	8	Australia	8.24	4.01	11
Educational Assessment	4.72	8	South Korea	8.35	3.01	13
Expenditure on Education	2.28	7	Australia	4.43	3.04	3
Technology and Innovation	**1.98**	**14**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	2.29	14	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	1.67	9	South Korea	8.19	1.59	11

4.6 CHINA

China is the fourth economy with the best performance in the ranking of the Brazil Competitiveness Report 2021–2022. It is in the upper third of the ranking (among the six best-ranked countries) in seven of eight determining factors of competitiveness*. China has the largest domestic market among the 18 countries and its productive structure is the second most capable of producing a greater diversity of goods. These results place China in first position in the Productive structure, scale and competition factor. The good performance of its financial system and abundant capital availability placed China first in the Financing factor. Brazil, on the other hand, is ranked last in this factor. China's lowest ranking is in the Labor factor, where it ranks in the 7th place due to high labor costs and low productivity. When compared to the revised 2019–2020 ranking, China has improved its position in the Business Environment, Macroeconomic Environment, and Labor Factors, and has declined in the Taxation factor. Despite this, it still maintains its overall ranking of fourth.

TABLE 11 – CHINA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	9,600
Population (millions)	1,412
GDP (billion USD)	17,458
GDP per capita, PPP (thousand USD)	19
Agricultural products exports (billion USD)	78
Total exports (billion USD)	3,364
Total imports (billion USD)	2,688

FIGURE 33 – BRAZIL-CHINA COMPARISON

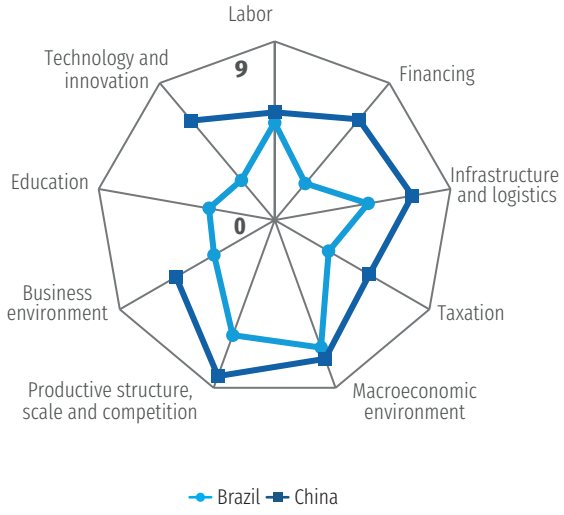
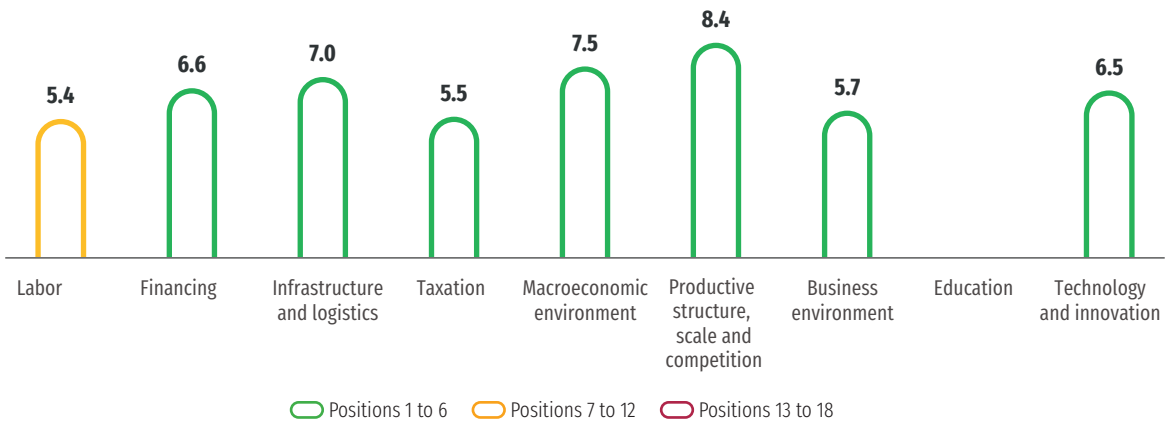


FIGURE 34 – CHINA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

*Overall average: 6.1***



*No data is available for the Education factor for China.

**In determining the general ranking, the scores for the Education factor are calculated based on the simple average of the values of the variables for which information is available for China. For additional details, see the methodological note in Appendix A, under "Aggregation of Variables into Subfactors and Factors".

TABLE 12 – CHINA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

CHINA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.42**	**7**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.03	14	Turkey	5.93	5.24	11
Labor Availability	5.81	6	Peru	6.59	4.56	14
Financing	**6.61**	**1**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.52	9	Argentina	9.90	0.00	18
Capital Availability	5.98	2	Canada	6.47	3.10	11
Financial System Performance	8.33	2	Australia	8.74	4.10	9
Infrastructure and Logistics	**7.04**	**5**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	7.94	1	China	7.94	4.00	17
Telecommunications Infrastructure	6.52	9	South Korea	9.58	5.88	11
Energy Infrastructure	6.37	2	South Africa	6.39	4.65	17
International Logistics	7.35	5	Spain	8.36	4.60	14
Taxation	**5.51**	**5**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	6.06	6	Indonesia	7.61	4.20	16
Quality of the Tax System	4.96	7	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.46**	**5**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.62	1	China	9.62	8.89	16
Fiscal Balance	5.31	11	Russia	6.29	4.65	17
External Balance	7.44	5	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**8.37**	**1**	**China**	**8.37**	**6.18**	**13**
Productive Structure	7.50	2	South Korea	9.13	4.62	11
Scale	10.00	1	China	10.00	8.23	5
Competition	7.61	5	Spain	8.66	5.68	17
Business Environment	**5.74**	**3**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.62	13	Australia	9.20	5.37	8
Legal Certainty	5.76	7	Canada	7.80	3.59	15
Red Tape	6.85	2	Canada	7.22	1.62	16
Education	**-**	**-**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	-	-	Australia	8.24	4.01	11
Educational Assessment	-	-	South Korea	8.35	3.01	13
Expenditure on Education	0.82	15	Australia	4.43	3.04	3
Technology and Innovation	**6.53**	**2**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	6.89	2	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	6.17	2	South Korea	8.19	1.59	11

4.7 COLOMBIA

Colombia is the fourth economy with the worst performance in the ranking of Brazil Competitiveness Report 2021–2022 – ahead of Brazil, Peru, and Argentina. Among the nine determining factors of competitiveness, the country is in the bottom third (among the six worst-ranked countries) except for three of them. The country's best performance is in the Labor factor, ranking 6th, mainly due to the compensation levels in manufacturing and the size of its labor force. The worst performing factors are Infrastructure and Logistics and Taxation, both ranking 16th. Colombia is ahead of Brazil in five factors, and the largest gap between them is in the Labor factor (nine positions). The most significant changes compared to the revised 2019–2020 ranking can be seen in the Labor and Macroeconomic Environment factors, where there has been a decline of three positions each, and in the Technology and Innovation factor, which has seen an improvement of three positions. In the Macroeconomic Environment, Colombia's ranking declined from the middle third to the bottom third, reflecting a worsening in the inflation rate, the debt interest-to-GDP ratio, and the current account balance. In the overall ranking, the country retained its 15th position.

TABLE 13 – COLOMBIA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	1,141
Population (millions)	51
GDP (billion USD)	314
GDP per capita, PPP (thousand USD)	16
Agricultural products exports (billion USD)	8
Total exports (billion USD)	40
Total imports (billion USD)	61

FIGURE 35 – BRAZIL-COLOMBIA COMPARISON

FIGURE 36 – COLOMBIA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

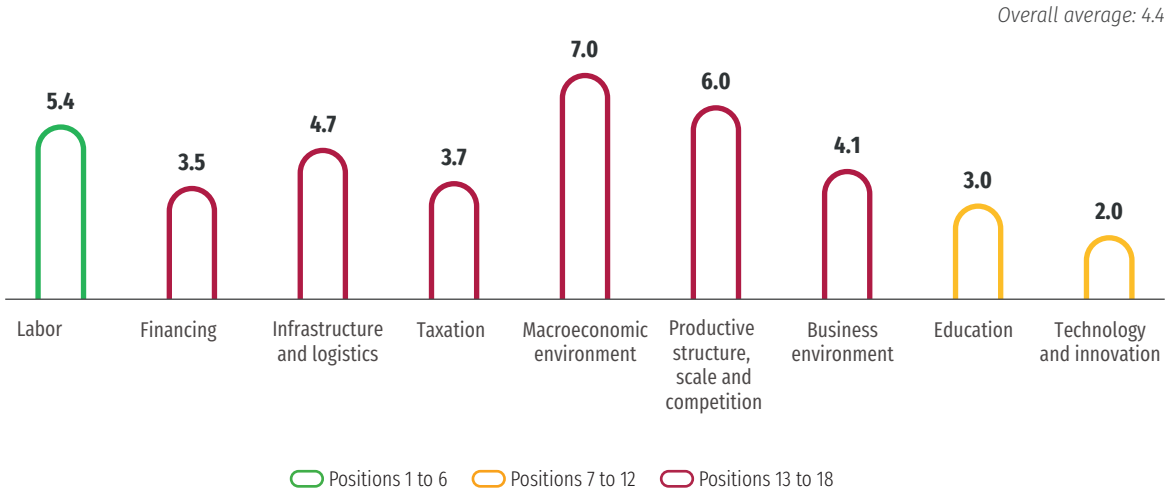


TABLE 14 – COLOMBIA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

COLOMBIA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.44**	**6**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.44	8	Turkey	5.93	5.24	11
Labor Availability	5.45	10	Peru	6.59	4.56	14
Financing	**3.54**	**15**	**China**	**6.61**	**2.40**	**18**
Capital Cost	4.67	16	Argentina	9.90	0.00	18
Capital Availability	2.59	13	Canada	6.47	3.10	11
Financial System Performance	3.38	12	Australia	8.74	4.10	9
Infrastructure and Logistics	**4.72**	**16**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	4.00	16	China	7.94	4.00	17
Telecommunications Infrastructure	5.30	14	South Korea	9.58	5.88	11
Energy Infrastructure	5.17	13	South Africa	6.39	4.65	17
International Logistics	4.41	15	Spain	8.36	4.60	14
Taxation	**3.69**	**16**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	5.30	10	Indonesia	7.61	4.20	16
Quality of the Tax System	2.08	17	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.05**	**14**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.36	8	China	9.62	8.89	16
Fiscal Balance	5.30	12	Russia	6.29	4.65	17
External Balance	6.49	17	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.05**	**14**	**China**	**8.37**	**6.18**	**13**
Productive Structure	4.59	12	South Korea	9.13	4.62	11
Scale	7.06	15	China	10.00	8.23	5
Competition	6.48	12	Spain	8.66	5.68	17
Business Environment	**4.07**	**13**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	5.60	7	Australia	9.20	5.37	8
Legal Certainty	3.96	13	Canada	7.80	3.59	15
Red Tape	2.64	14	Canada	7.22	1.62	16
Education	**3.00**	**11**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	4.23	10	Australia	8.24	4.01	11
Educational Assessment	3.26	11	South Korea	8.35	3.01	13
Expenditure on Education	1.50	11	Australia	4.43	3.04	3
Technology and Innovation	**2.02**	**12**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	3.26	11	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	0.77	16	South Korea	8.19	1.59	11

4.8 SOUTH KOREA

South Korea ranked first in the Brazil Competitiveness Report 2021–2022. Among the nine determining factors of competitiveness, the Labor factor is the only one where the country does not rank among the six best ranked countries. South Korea is the most competitive economy in the Infrastructure and Logistics and Technology and Innovation factors. In the Infrastructure and Logistics factor, the quality of telecommunications and transport infrastructures stands out. In Technology and Innovation, it has the highest expenditure on Research and Development (R&D) as a proportion of GDP, the highest number of international patent applications and the highest share of high-tech goods and services in exports. In six out of the nine factors, South Korea is at least 11 positions ahead of Brazil. In the revised 2019–2020 ranking, South Korea experienced a decline in its position only in the Business Environment factor, while it improved its position in the Labor, Taxation, and Macroeconomic Environment factors. Specifically, the country saw an improvement of three positions in the Labor Factor, moving from the lower third of the ranking to the middle third. Despite this, South Korea maintained its first place position in the overall ranking.

TABLE 15 – SOUTH KOREA: STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	100
Population (millions)	52
GDP (billion USD)	1,799
GDP per capita, PPP (thousand USD)	49
Agricultural products exports (billion USD)	13
Total exports (billion USD)	644
Total imports (billion USD)	615

FIGURE 37 – BRAZIL-SOUTH KOREA COMPARISON

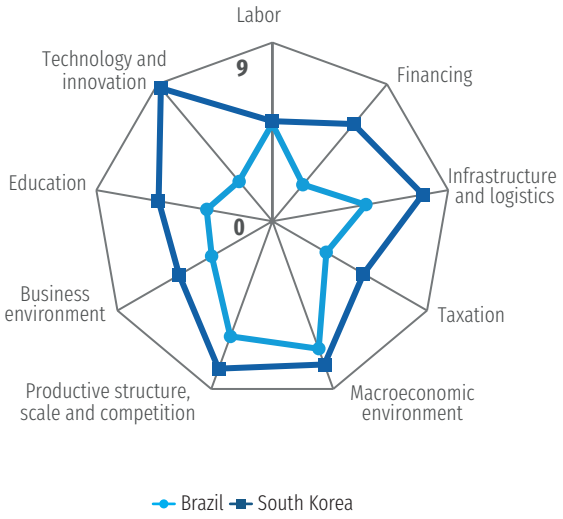


FIGURE 38 – SOUTH KOREA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

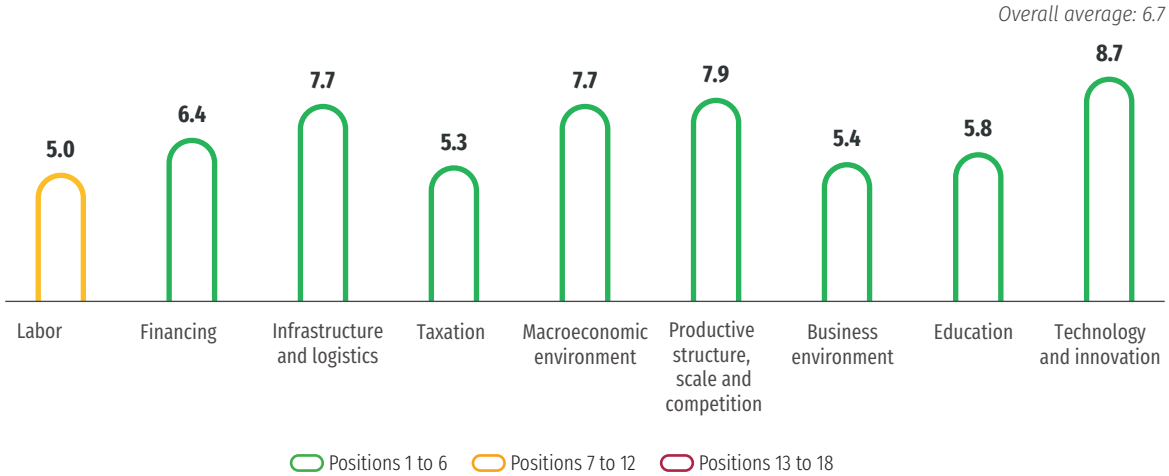


TABLE 16 – SOUTH KOREA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

SOUTH KOREA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.03**	**12**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	4.60	16	Turkey	5.93	5.24	11
Labor Availability	5.46	9	Peru	6.59	4.56	14
Financing	**6.38**	**3**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.95	5	Argentina	9.90	0.00	18
Capital Availability	5.38	4	Canada	6.47	3.10	11
Financial System Performance	7.82	3	Australia	8.74	4.10	9
Infrastructure and Logistics	**7.69**	**1**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	7.72	2	China	7.94	4.00	17
Telecommunications Infrastructure	9.58	1	South Korea	9.58	5.88	11
Energy Infrastructure	6.07	5	South Africa	6.39	4.65	17
International Logistics	7.38	4	Spain	8.36	4.60	14
Taxation	**5.31**	**6**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	5.02	12	Indonesia	7.61	4.20	16
Quality of the Tax System	5.59	1	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.69**	**2**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.46	4	China	9.62	8.89	16
Fiscal Balance	5.80	4	Russia	6.29	4.65	17
External Balance	7.83	2	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**7.92**	**2**	**China**	**8.37**	**6.18**	**13**
Productive Structure	9.13	1	South Korea	9.13	4.62	11
Scale	7.96	8	China	10.00	8.23	5
Competition	6.68	9	Spain	8.66	5.68	17
Business Environment	**5.43**	**5**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	7.06	4	Australia	9.20	5.37	8
Legal Certainty	6.39	4	Canada	7.80	3.59	15
Red Tape	2.83	11	Canada	7.22	1.62	16
Education	**5.82**	**3**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	6.69	4	Australia	8.24	4.01	11
Educational Assessment	8.35	1	South Korea	8.35	3.01	13
Expenditure on Education	2.41	6	Australia	4.43	3.04	3
Technology and Innovation	**8.74**	**1**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	9.30	1	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	8.19	1	South Korea	8.19	1.59	11

4.9 SPAIN

Spain is the fifth economy with the best performance in the ranking of the Brazil Competitiveness Report 2021–2022 — behind South Korea, Canada, Australia and China. Among the nine determining factors of competitiveness, the country is in the upper third (among the six best-ranked countries) in six of them. Spain is ranked 2nd in the Infrastructure and Logistics factor, outperforming Brazil by a margin of 13 positions. The country boasts the best international logistics, the second-best telecommunications infrastructure, and the third-best transport infrastructure. However, the Labor factor is the country's weakest placement, ranking 17th, due to the high cost and low availability of labor. This is the only factor in which Spain lags behind Brazil, with two fewer positions. Despite these changes, Spain remains in 5th place in the overall ranking, when compared to the revised 2019–2020 ranking. The most significant changes were observed in the Taxation factor, with an improvement of 2 positions, and in the Macroeconomic Environment factor, with a decline of 3 positions.

TABLE 17 – SPAIN:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	506
Population (millions)	47
GDP (billion USD)	1,426
GDP per capita, PPP (thousand USD)	42
Agricultural products exports (billion USD)	65
Total exports (billion USD)	384
Total imports (billion USD)	418

FIGURE 39 – BRAZIL-SPAIN COMPARISON

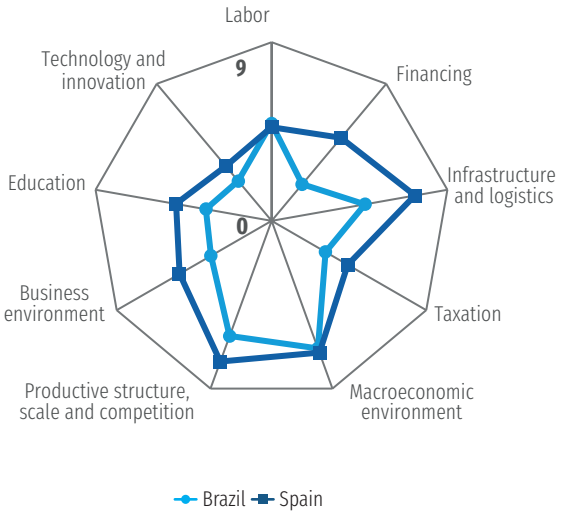


FIGURE 40 – SPAIN'S PERFORMANCE
Average scores (0 = worst performance; 10 = best performance)

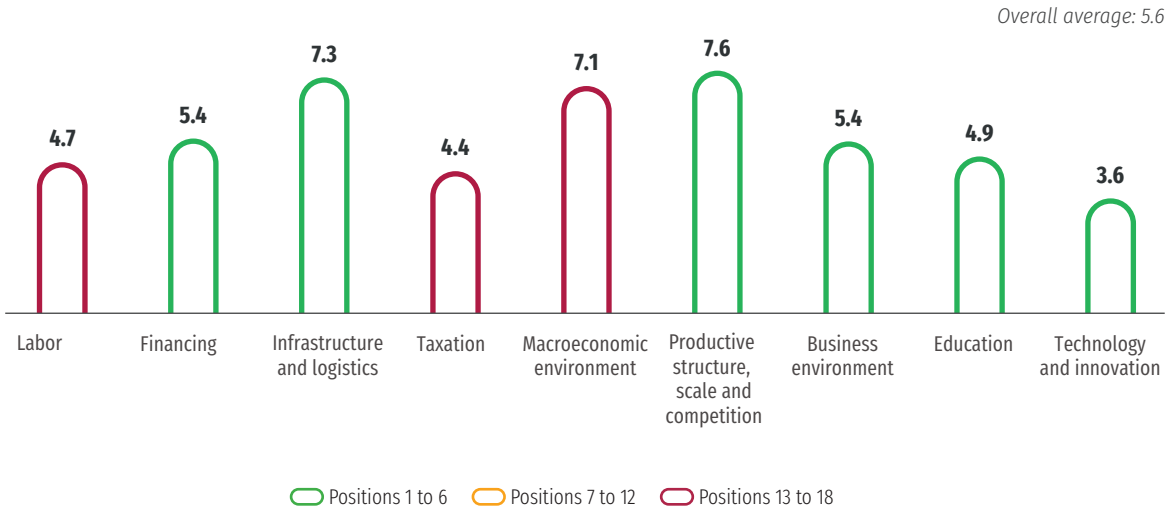


TABLE 18 – SPAIN:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

SPAIN			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**4.72**	**17**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	4.55	17	Turkey	5.93	5.24	11
Labor Availability	4.88	12	Peru	6.59	4.56	14
Financing	**5.45**	**6**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.88	7	Argentina	9.90	0.00	18
Capital Availability	4.25	8	Canada	6.47	3.10	11
Financial System Performance	6.22	4	Australia	8.74	4.10	9
Infrastructure and Logistics	**7.34**	**2**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	7.18	3	China	7.94	4.00	17
Telecommunications Infrastructure	8.89	2	South Korea	9.58	5.88	11
Energy Infrastructure	4.91	14	South Africa	6.39	4.65	17
International Logistics	8.36	1	Spain	8.36	4.60	14
Taxation	**4.44**	**13**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	4.53	15	Indonesia	7.61	4.20	16
Quality of the Tax System	4.34	10	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.07**	**13**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.40	6	China	9.62	8.89	16
Fiscal Balance	4.49	18	Russia	6.29	4.65	17
External Balance	7.33	7	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**7.55**	**4**	**China**	**8.37**	**6.18**	**13**
Productive Structure	6.25	6	South Korea	9.13	4.62	11
Scale	7.74	10	China	10.00	8.23	5
Competition	8.66	1	Spain	8.66	5.68	17
Business Environment	**5.35**	**6**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	6.93	5	Australia	9.20	5.37	8
Legal Certainty	6.11	6	Canada	7.80	3.59	15
Red Tape	3.02	10	Canada	7.22	1.62	16
Education	**4.89**	**6**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	6.33	5	Australia	8.24	4.01	11
Educational Assessment	6.63	5	South Korea	8.35	3.01	13
Expenditure on Education	1.70	8	Australia	4.43	3.04	3
Technology and Innovation	**3.59**	**6**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	4.20	7	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	2.97	5	South Korea	8.19	1.59	11

4.10 INDIA

India is in the bottom third of the ranking of the Brazil Competitiveness Report 2021–2022, ahead of four Latin American countries (Colombia, Peru, Brazil and Argentina). The country ranks in the middle third in five out of the nine determining factors of competitiveness. The country's worst rankings are in the Labor and Education factors, where it is placed last in both categories. It is followed by the Infrastructure and Logistics factor, which is in the second-to-last position. The country has the weakest telecommunications and energy infrastructures, the worst results in education attainment indicators, the lowest labor productivity, and the lowest availability of labor. The best rankings are in the Financing, Production Structure, Scale and Competition, and Business Environment factors, with all of them in the ninth place. Brazil is ahead of India only in four factors: Labor, Infrastructure and Logistics, Education, and Technology and Innovation. In terms of the revised 2019–2020 ranking, the biggest changes were in the Technology and Innovation factor, where the country gained three positions, and in the Business Environment factor, where it dropped three positions. In the Technology and Innovation factor, the country moved from the bottom third to the middle third of the ranking. Despite these changes, the country remained in 14th place in the overall ranking.

TABLE 19 – INDIA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	3,287
Population (millions)	1,393
GDP (billion USD)	3,042
GDP per capita, PPP (thousand USD)	7
Agricultural products exports (billion USD)	39
Total exports (billion USD)	395
Total imports (billion USD)	573

FIGURE 41 – BRAZIL-INDIA COMPARISON

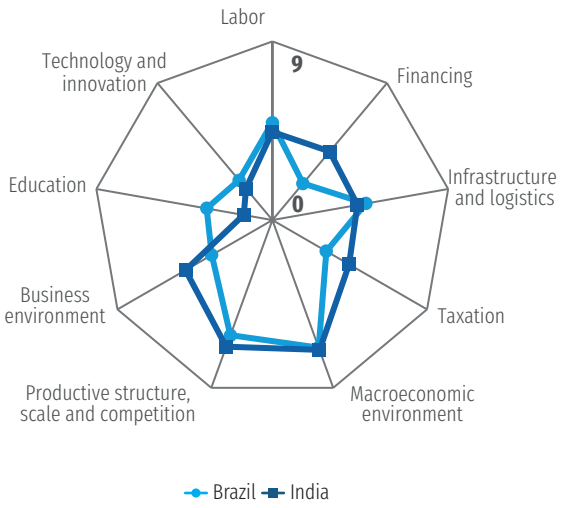


FIGURE 42 – INDIA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

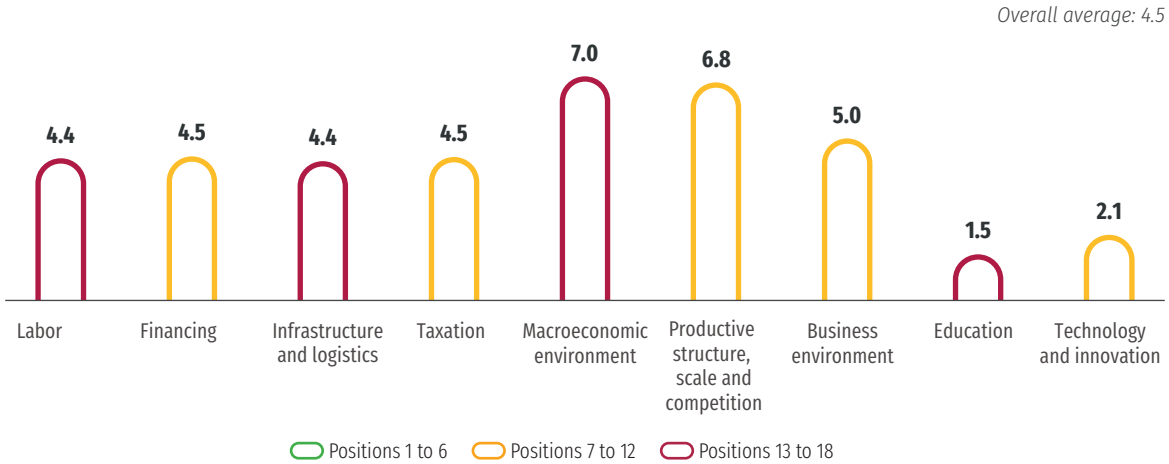


TABLE 20 – INDIA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

INDIA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**4.44**	**18**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.08	13	Turkey	5.93	5.24	11
Labor Availability	3.79	18	Peru	6.59	4.56	14
Financing	**4.50**	**9**	**China**	**6.61**	**2.40**	**18**
Capital Cost	6.38	2	Argentina	9.90	0.00	18
Capital Availability	3.64	9	Canada	6.47	3.10	11
Financial System Performance	3.49	11	Australia	8.74	4.10	9
Infrastructure and Logistics	**4.35**	**17**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	5.24	10	China	7.94	4.00	17
Telecommunications Infrastructure	2.27	18	South Korea	9.58	5.88	11
Energy Infrastructure	4.44	18	South Africa	6.39	4.65	17
International Logistics	5.45	10	Spain	8.36	4.60	14
Taxation	**4.47**	**12**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	6.29	5	Indonesia	7.61	4.20	16
Quality of the Tax System	2.66	15	South Korea	5.59	2.09	16
Macroeconomic Environment	**6.97**	**15**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.16	13	China	9.62	8.89	16
Fiscal Balance	4.76	16	Russia	6.29	4.65	17
External Balance	7.00	12	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.79**	**9**	**China**	**8.37**	**6.18**	**13**
Productive Structure	5.45	9	South Korea	9.13	4.62	11
Scale	9.16	2	China	10.00	8.23	5
Competition	5.75	16	Spain	8.66	5.68	17
Business Environment	**5.05**	**9**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.87	12	Australia	9.20	5.37	8
Legal Certainty	5.35	10	Canada	7.80	3.59	15
Red Tape	4.92	6	Canada	7.22	1.62	16
Education	**1.47**	**17**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	1.33	15	Australia	8.24	4.01	11
Educational Assessment	-	-	South Korea	8.35	3.01	13
Expenditure on Education	1.61	10	Australia	4.43	3.04	3
Technology and Innovation	**2.06**	**11**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	2.92	12	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	1.20	13	South Korea	8.19	1.59	11

4.11 INDONESIA

Indonesia is in 12th position in the ranking of the Brazil Competitiveness Report 2021–2022, in the middle third (positions 7–12). Indonesia is in the upper third of the ranking in three of the nine determining factors of competitiveness, namely: Labor, Taxation and Macroeconomic Environment. The country excels in the Labor factor, ranking first, due to the high availability of labor and competitive compensation levels in industry. Indonesia also ranks first in the Taxation factor, mainly because of its low tax burden (11.6% of GDP). Despite this, the country is ranked last in the Technology and Innovation factor, with the lowest investment in R&D and the second worst result of R&D efforts. Brazil outperforms Indonesia only in Education (where it is ranked six positions higher) and in Technology and Innovation (where it is ranked nine positions higher). In comparison with the 2019–2020 revised ranking, Indonesia moved up one position in the overall ranking. The most significant changes occurred in the Taxation and Macroeconomic Environment factors, with a gain of four and five positions, respectively.

TABLE 21 – INDONESIA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	1,917
Population (millions)	276
GDP (billion USD)	1,186
GDP per capita, PPP (thousand USD)	13
Agricultural products exports (billion USD)	47
Total exports (billion USD)	230
Total imports (billion USD)	196

FIGURE 43 – BRAZIL-INDONESIA COMPARISON

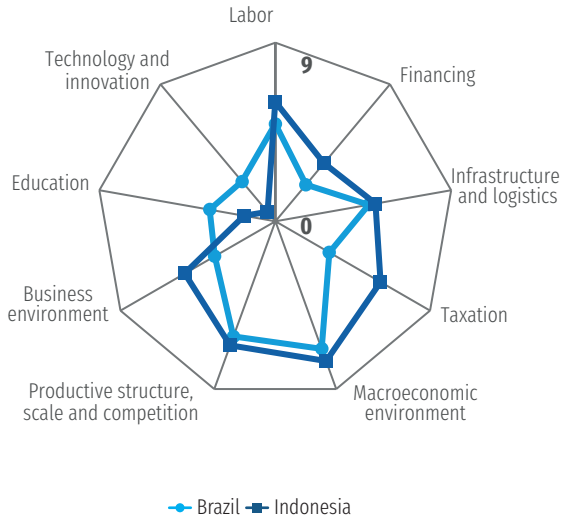


FIGURE 44 – INDONESIA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

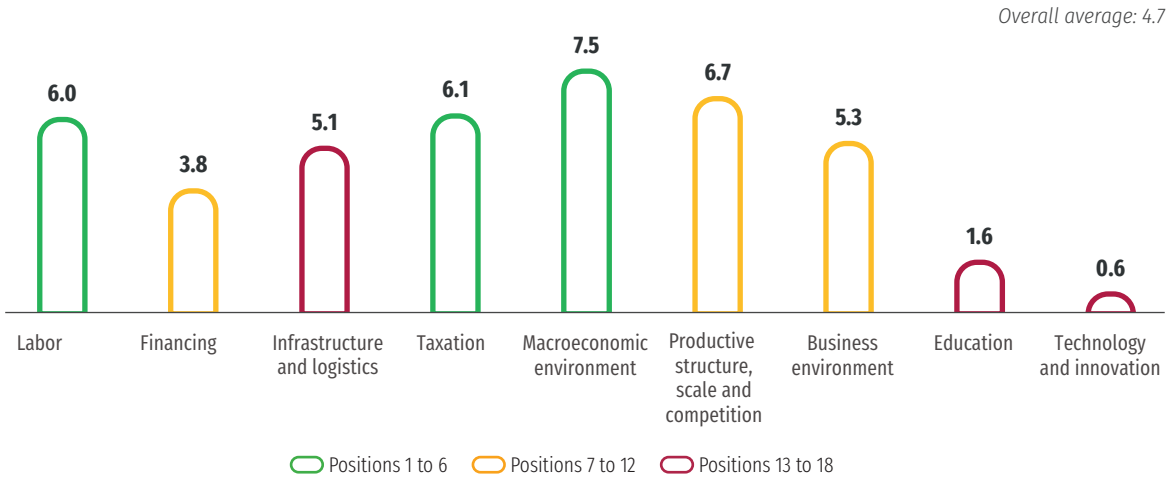


TABLE 22 – INDONESIA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

Indonesia			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**6.02**	**1**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.54	6	Turkey	5.93	5.24	11
Labor Availability	6.49	2	Peru	6.59	4.56	14
Financing	**3.80**	**12**	**China**	**6.61**	**2.40**	**18**
Capital Cost	4.98	13	Argentina	9.90	0.00	18
Capital Availability	3.24	10	Canada	6.47	3.10	11
Financial System Performance	3.19	14	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.12**	**14**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	4.83	14	China	7.94	4.00	17
Telecommunications Infrastructure	4.71	16	South Korea	9.58	5.88	11
Energy Infrastructure	5.61	8	South Africa	6.39	4.65	17
International Logistics	5.33	11	Spain	8.36	4.60	14
Taxation	**6.13**	**1**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	7.61	1	Indonesia	7.61	4.20	16
Quality of the Tax System	4.64	8	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.51**	**4**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.55	3	China	9.62	8.89	16
Fiscal Balance	5.72	6	Russia	6.29	4.65	17
External Balance	7.24	8	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.66**	**10**	**China**	**8.37**	**6.18**	**13**
Productive Structure	4.43	14	South Korea	9.13	4.62	11
Scale	8.28	4	China	10.00	8.23	5
Competition	7.26	6	Spain	8.66	5.68	17
Business Environment	**5.27**	**7**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.12	18	Australia	9.20	5.37	8
Legal Certainty	5.54	8	Canada	7.80	3.59	15
Red Tape	6.15	3	Canada	7.22	1.62	16
Education	**1.60**	**16**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	2.46	14	Australia	8.24	4.01	11
Educational Assessment	2.16	15	South Korea	8.35	3.01	13
Expenditure on Education	0.16	17	Australia	4.43	3.04	3
Technology and Innovation	**0.61**	**18**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	0.74	18	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	0.49	17	South Korea	8.19	1.59	11

4.12 MEXICO

Mexico ranked 13th in the Brazil Competitiveness Report 2021–2022, placing it in the bottom third (last six positions). Mexico is the second best positioned Latin American country, with only Chile ahead of it. The remaining Latin American countries — Colombia, Brazil, Peru and Argentina — are the four worst-ranked ones. Among the nine determining factors of competitiveness, six of them place Mexico in the bottom third. Mexico's worst performance was in the Financing factor, where it was ranked 16th. The country is in the top third for both the Labor and Productive Structure, Scale and Competition factors, with both placed in 5th. Mexico had the third highest labor force growth rate (1.3%) in 2021 and the third most complex productive structure among the 18 selected countries. Brazil ranks ahead of Mexico in only two factors: Education and Technology and innovation. The most significant changes compared to the 2019–2020 revised ranking occurred in the Macroeconomic Environment, where it gained four positions, and in the Taxation factor, with a decline of six positions. In the overall ranking, Mexico lost one position when compared to the 2019-2020 revised ranking.

TABLE 23 – MEXICO:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	1,964
Population (millions)	130
GDP (billion USD)	1,295
GDP per capita, PPP (thousand USD)	21
Agricultural products exports (billion USD)	40
Total exports (billion USD)	494
Total imports (billion USD)	522

FIGURE 45 – BRAZIL-MEXICO COMPARISON

FIGURE 46 – MEXICO'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

Overall average: 4.6

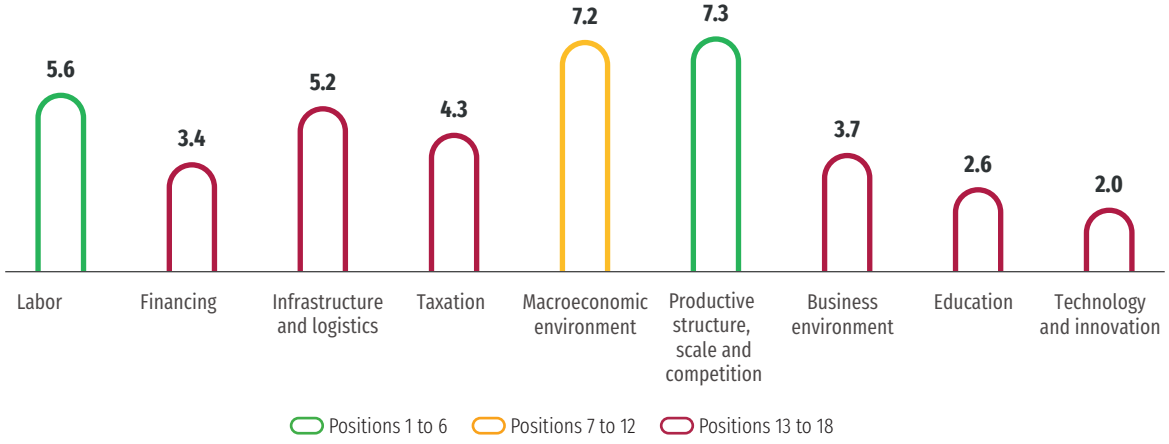


TABLE 24 – MEXICO:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

Mexico			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.58**	**5**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.54	5	Turkey	5.93	5.24	11
Labor Availability	5.61	8	Peru	6.59	4.56	14
Financing	**3.43**	**16**	**China**	**6.61**	**2.40**	**18**
Capital Cost	4.75	15	Argentina	9.90	0.00	18
Capital Availability	2.37	15	Canada	6.47	3.10	11
Financial System Performance	3.18	15	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.16**	**13**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	4.84	13	China	7.94	4.00	17
Telecommunications Infrastructure	5.60	13	South Korea	9.58	5.88	11
Energy Infrastructure	5.29	12	South Africa	6.39	4.65	17
International Logistics	4.90	13	Spain	8.36	4.60	14
Taxation	**4.34**	**14**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	5.71	8	Indonesia	7.61	4.20	16
Quality of the Tax System	2.97	13	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.21**	**10**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.14	14	China	9.62	8.89	16
Fiscal Balance	5.33	10	Russia	6.29	4.65	17
External Balance	7.16	10	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**7.32**	**5**	**China**	**8.37**	**6.18**	**13**
Productive Structure	7.42	3	South Korea	9.13	4.62	11
Scale	7.98	7	China	10.00	8.23	5
Competition	6.57	10	Spain	8.66	5.68	17
Business Environment	**3.71**	**15**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.98	11	Australia	9.20	5.37	8
Legal Certainty	3.35	16	Canada	7.80	3.59	15
Red Tape	2.81	13	Canada	7.22	1.62	16
Education	**2.65**	**13**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	3.24	12	Australia	8.24	4.01	11
Educational Assessment	3.72	9	South Korea	8.35	3.01	13
Expenditure on Education	0.98	13	Australia	4.43	3.04	3
Technology and Innovation	**2.02**	**13**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	1.48	16	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	2.55	6	South Korea	8.19	1.59	11

4.13 PERU

Peru is in the second-to-last position in the ranking of Brazil Competitiveness Report 2021–2022, ahead only of Argentina. Among the nine determining factors of competitiveness, the country is in the bottom third (among the six worst-ranked countries) in six of them. Peru is ranked last in both the Productive Structure, Scale and Competition and the Infrastructure and Logistics factors. The country has the worst international logistics and transport infrastructure, and the second worst telecommunications infrastructure. Furthermore, Peru has the smallest domestic market and the least complex productive structure. Conversely, Peru is ranked second for the Labor factor, as it has the highest availability of labor among the 18 countries studied. Peru is the highest-ranked Latin American country in the Labor factor, 13 positions ahead of Brazil. In comparison to the 2019–2020 revised ranking, Peru gained positions in Taxation, Business Environment, and Education and lost positions in Macroeconomic Environment and Labor. In the overall ranking, Peru dropped one position and was overtaken by Brazil.

TABLE 25 – PERU:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	1,285
Population (millions)	33
GDP (billion USD)	225
GDP per capita, PPP (thousand USD)	14
Agricultural products exports (billion USD)	10
Total exports (billion USD)	63
Total imports (billion USD)	51

FIGURE 47 – BRAZIL-PERU COMPARISON

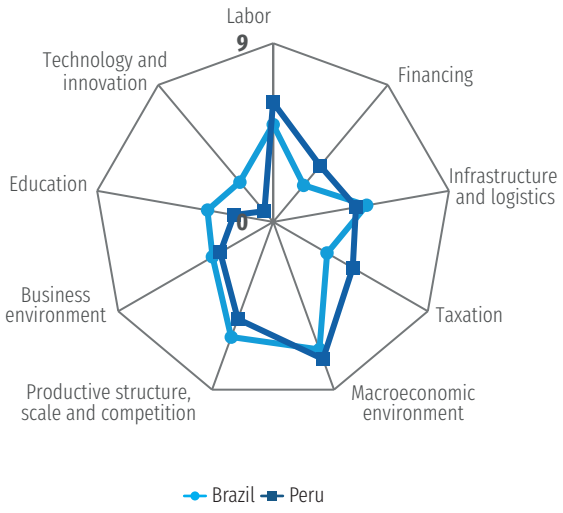


FIGURE 48 – PERU'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

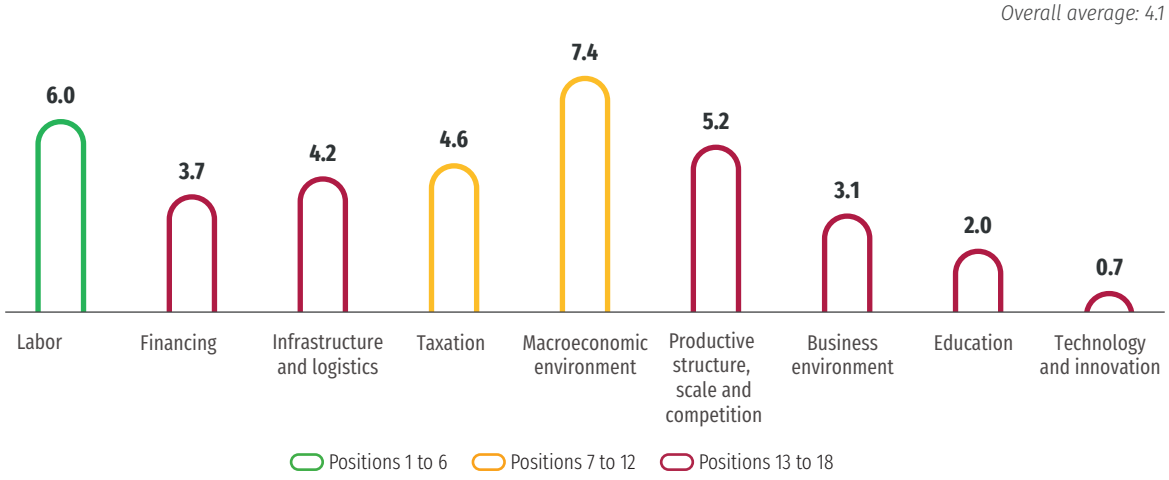


TABLE 26 – PERU:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

PERU			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**6.01**	**2**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.44	9	Turkey	5.93	5.24	11
Labor Availability	6.59	1	Peru	6.59	4.56	14
Financing	**3.68**	**13**	**China**	**6.61**	**2.40**	**18**
Capital Cost	4.46	17	Argentina	9.90	0.00	18
Capital Availability	2.51	14	Canada	6.47	3.10	11
Financial System Performance	4.07	10	Australia	8.74	4.10	9
Infrastructure and Logistics	**4.24**	**18**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	3.69	18	China	7.94	4.00	17
Telecommunications Infrastructure	4.54	17	South Korea	9.58	5.88	11
Energy Infrastructure	5.42	9	South Africa	6.39	4.65	17
International Logistics	3.31	18	Spain	8.36	4.60	14
Taxation	**4.64**	**10**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	5.81	7	Indonesia	7.61	4.20	16
Quality of the Tax System	3.48	12	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.35**	**7**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.31	9	China	9.62	8.89	16
Fiscal Balance	5.89	3	Russia	6.29	4.65	17
External Balance	6.86	16	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**5.22**	**18**	**China**	**8.37**	**6.18**	**13**
Productive Structure	2.55	18	South Korea	9.13	4.62	11
Scale	6.42	18	China	10.00	8.23	5
Competition	6.68	8	Spain	8.66	5.68	17
Business Environment	**3.08**	**17**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.40	16	Australia	9.20	5.37	8
Legal Certainty	3.03	18	Canada	7.80	3.59	15
Red Tape	1.82	15	Canada	7.22	1.62	16
Education	**1.99**	**14**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	-	-	Australia	8.24	4.01	11
Educational Assessment	3.05	12	South Korea	8.35	3.01	13
Expenditure on Education	0.94	14	Australia	4.43	3.04	3
Technology and Innovation	**0.69**	**17**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	1.01	17	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	0.36	18	South Korea	8.19	1.59	11

4.14 POLAND

Poland is the sixth best performing economy of the Brazil Competitiveness Report 2021-2022 ranking. It is the last country of the upper third of the ranking (positions 1 to 6). Out of the nine determining factors of competitiveness, Poland ranks in the middle third of the ranking (between 7th and 12th positions) in five of them. Poland ranks in the upper third in three factors: Infrastructure and Logistics, Production Structure, Scale and Competition, and Education. The country has a market with the second-highest level of competition and the fifth-most complex production structure, which explains why it is third in the factor of Productive Structure, Scale and Competition, its best performance. However, Poland's worst performance is in the Taxation factor, where it ranks 15th, the only factor in the lower third of the ranking (positions 13th to 18th). In comparison to the 2019–2020 revised ranking, the country experienced a decline in the Taxation, Macroeconomic Environment, and Technology and Innovation factors. In the Labor factor, the country advanced five positions, due to an increase in its workforce. In the overall ranking, the country moved up one position, moving from the middle third to the upper third.

TABLE 27 – POLAND:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	313
Population (millions)	38
GDP (billion USD)	674
GDP per capita, PPP (thousand USD)	38
Agricultural products exports (billion USD)	41
Total exports (billion USD)	338
Total imports (billion USD)	338

FIGURE 49 – BRAZIL-POLAND COMPARISON

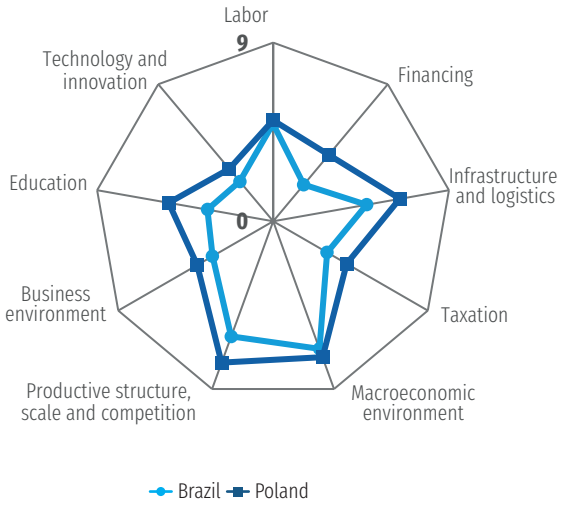


FIGURE 50 – POLAND'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

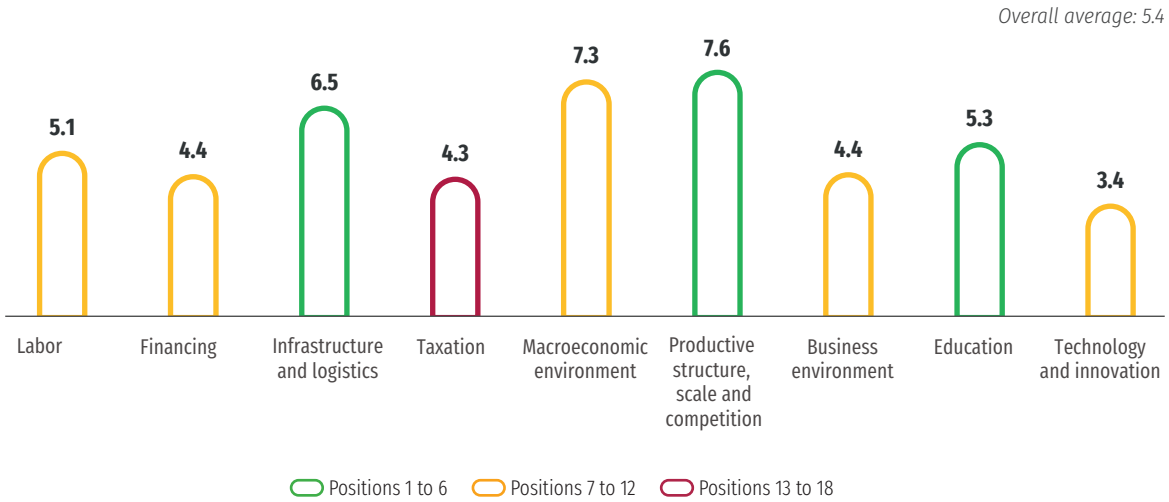


TABLE 28 – POLAND:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

POLAND			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.08**	**11**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.19	12	Turkey	5.93	5.24	11
Labor Availability	4.97	11	Peru	6.59	4.56	14
Financing	**4.36**	**10**	**China**	**6.61**	**2.40**	**18**
Capital Cost	6.34	4	Argentina	9.90	0.00	18
Capital Availability	2.20	17	Canada	6.47	3.10	11
Financial System Performance	4.54	7	Australia	8.74	4.10	9
Infrastructure and Logistics	**6.48**	**6**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	5.80	8	China	7.94	4.00	17
Telecommunications Infrastructure	7.68	5	South Korea	9.58	5.88	11
Energy Infrastructure	5.38	10	South Africa	6.39	4.65	17
International Logistics	7.06	6	Spain	8.36	4.60	14
Taxation	**4.28**	**15**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	5.61	9	Indonesia	7.61	4.20	16
Quality of the Tax System	2.95	14	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.30**	**9**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.20	12	China	9.62	8.89	16
Fiscal Balance	5.59	7	Russia	6.29	4.65	17
External Balance	7.10	11	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**7.59**	**3**	**China**	**8.37**	**6.18**	**13**
Productive Structure	6.88	5	South Korea	9.13	4.62	11
Scale	7.41	12	China	10.00	8.23	5
Competition	8.48	2	Spain	8.66	5.68	17
Business Environment	**4.41**	**10**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	6.36	6	Australia	9.20	5.37	8
Legal Certainty	4.06	11	Canada	7.80	3.59	15
Red Tape	2.82	12	Canada	7.22	1.62	16
Education	**5.35**	**4**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	6.31	6	Australia	8.24	4.01	11
Educational Assessment	8.06	3	South Korea	8.35	3.01	13
Expenditure on Education	1.68	9	Australia	4.43	3.04	3
Technology and Innovation	**3.44**	**7**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	4.46	5	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	2.42	7	South Korea	8.19	1.59	11

4.15 RUSSIA

Russia ranks eighth in the overall ranking of Brazil Competitiveness Report 2021–2022, located in the middle third of the ranking (positions 7–12). Four of the nine determining factors of competitiveness fall within the middle third and three are within the top third (among the top 6 positions). Russia's best ranking was in the Macroeconomic Environment factor, where it was the country with the best external and fiscal balance. Conversely, its lowest ranking was in Technology and innovation, where it placed 15th. The main changes from the previous 2019–2020 revised ranking were observed in the Financing and Taxation factors. In the Financing factor, Russia improved its rank by 3 positions, rising from 14th to 11th and moving from the bottom third to the middle third. However, in the Taxation factor, the country lost 3 positions, slipping from 1st to 4th place. In the overall ranking, Russia gained one position.

TABLE 29 – RUSSIA:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	17,098
Population (millions)	143
GDP (billion USD)	1,776
GDP per capita, PPP (thousand USD)	31
Agricultural products exports (billion USD)	36
Total exports (billion USD)	494
Total imports (billion USD)	304

FIGURE 51 – BRAZIL-RUSSIA COMPARISON

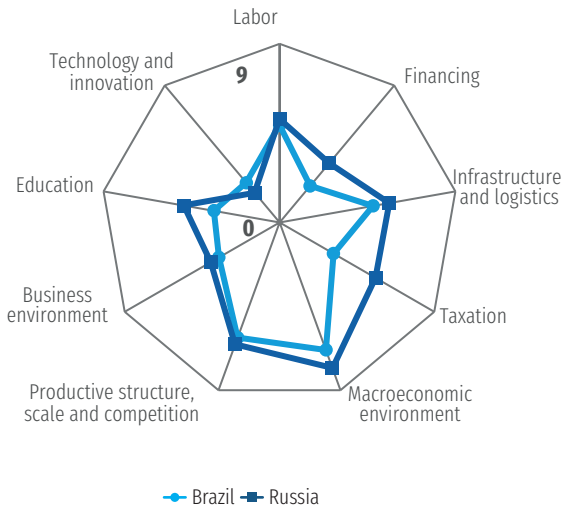


FIGURE 52 – RUSSIA'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

Overall average: 5.1

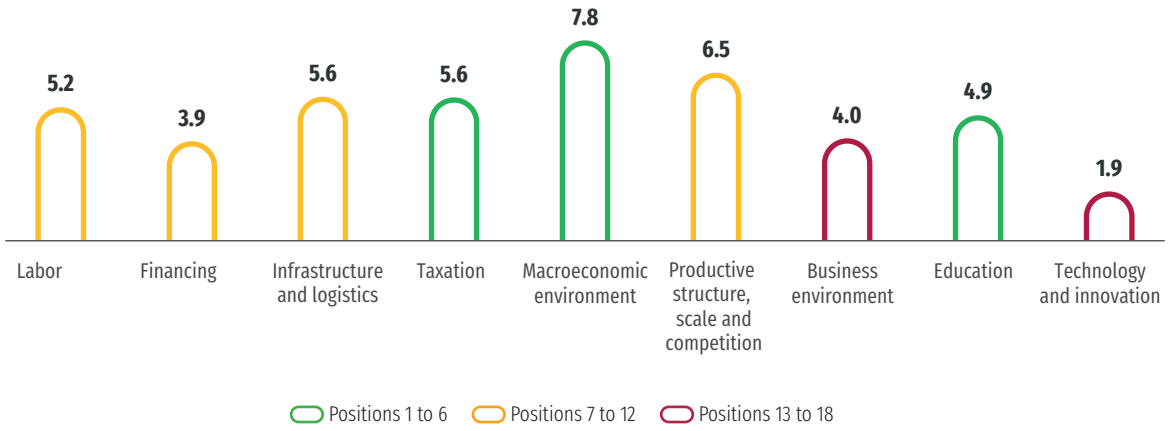


TABLE 30 – RUSSIA:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

RUSSIA			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.22**	**9**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.58	4	Turkey	5.93	5.24	11
Labor Availability	4.85	13	Peru	6.59	4.56	14
Financing	**3.89**	**11**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.22	11	Argentina	9.90	0.00	18
Capital Availability	2.32	16	Canada	6.47	3.10	11
Financial System Performance	4.15	8	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.61**	**11**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	5.18	11	China	7.94	4.00	17
Telecommunications Infrastructure	7.46	6	South Korea	9.58	5.88	11
Energy Infrastructure	6.23	3	South Africa	6.39	4.65	17
International Logistics	3.59	17	Spain	8.36	4.60	14
Taxation	**5.59**	**4**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	6.68	3	Indonesia	7.61	4.20	16
Quality of the Tax System	4.50	9	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.80**	**1**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.04	15	China	9.62	8.89	16
Fiscal Balance	6.29	1	Russia	6.29	4.65	17
External Balance	8.08	1	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.55**	**11**	**China**	**8.37**	**6.18**	**13**
Productive Structure	4.67	10	South Korea	9.13	4.62	11
Scale	8.48	3	China	10.00	8.23	5
Competition	6.49	11	Spain	8.66	5.68	17
Business Environment	**4.01**	**14**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.15	17	Australia	9.20	5.37	8
Legal Certainty	3.91	14	Canada	7.80	3.59	15
Red Tape	3.96	7	Canada	7.22	1.62	16
Education	**4.90**	**5**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	7.77	3	Australia	8.24	4.01	11
Educational Assessment	6.63	6	South Korea	8.35	3.01	13
Expenditure on Education	0.32	16	Australia	4.43	3.04	3
Technology and Innovation	**1.95**	**15**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	2.85	13	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	1.05	14	South Korea	8.19	1.59	11

4.16 THAILAND

Thailand is in 7th position in the ranking of Brazil Competitiveness Report 2021–2022, in the middle third (positions 7 to 12). It is among the six best-ranked countries in five out of the nine determining factors of competitiveness. The country's best placement is in the Taxation factor, where it ranks 3rd. Thailand has the fourth-lowest tax burden (17.2% of GDP) and the third-lowest effective tax rate on corporate income (19.6%). Brazil is ahead of Thailand only in the Education factor, by five positions. In other factors, Brazil is at least five positions behind Thailand, with the biggest gap being in the Taxation factor (14 positions behind). The most significant changes from the 2019–2020 revised ranking were in the Macroeconomic Environment, where Thailand lost four places, and in the Labor factor, where it gained three places. The deterioration of the current account balance, from 5.8% of GDP in 2018 to -2.1% of GDP in 2021, contributed to the drop in the Macroeconomic Environment ranking. The country dropped one place in the overall ranking, moving from the top third to the middle third.

TABLE 31 – THAILAND:
STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	513
Population (millions)	70
GDP (billion USD)	513
GDP per capita, PPP (thousand USD)	19
Agricultural products exports (billion USD)	42
Total exports (billion USD)	271
Total imports (billion USD)	268

FIGURE 53 – BRAZIL–THAILAND COMPARISON

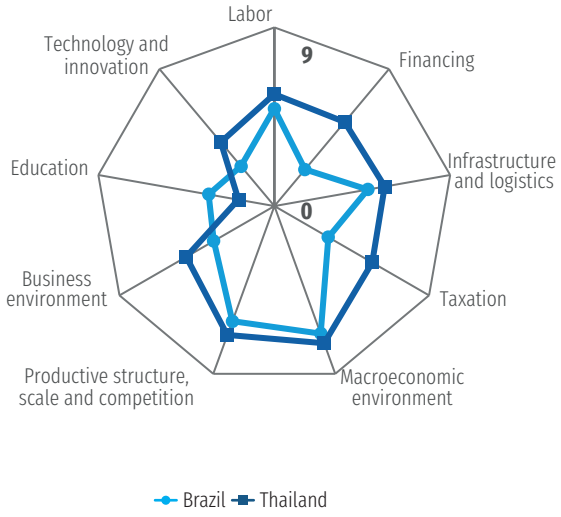


FIGURE 54 – THAILAND'S PERFORMANCE
Average scores (0 = worst performance; 10 = best performance)

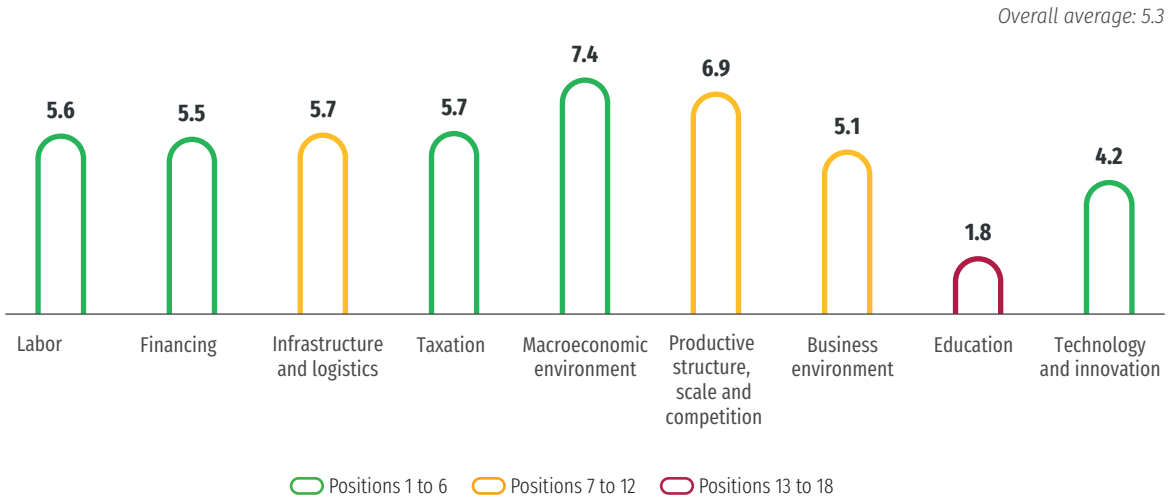


TABLE 32 – THAILAND:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

THAILAND			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.62**	**4**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.49	7	Turkey	5.93	5.24	11
Labor Availability	5.76	7	Peru	6.59	4.56	14
Financing	**5.52**	**5**	**China**	**6.61**	**2.40**	**18**
Capital Cost	5.18	12	Argentina	9.90	0.00	18
Capital Availability	5.31	5	Canada	6.47	3.10	11
Financial System Performance	6.08	5	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.65**	**9**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	5.10	12	China	7.94	4.00	17
Telecommunications Infrastructure	5.67	12	South Korea	9.58	5.88	11
Energy Infrastructure	5.34	11	South Africa	6.39	4.65	17
International Logistics	6.49	7	Spain	8.36	4.60	14
Taxation	**5.70**	**3**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	7.13	2	Indonesia	7.61	4.20	16
Quality of the Tax System	4.27	11	South Korea	5.59	2.09	16
Macroeconomic Environment	**7.36**	**6**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	9.58	2	China	9.62	8.89	16
Fiscal Balance	5.57	8	Russia	6.29	4.65	17
External Balance	6.94	15	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.92**	**7**	**China**	**8.37**	**6.18**	**13**
Productive Structure	7.04	4	South Korea	9.13	4.62	11
Scale	7.41	13	China	10.00	8.23	5
Competition	6.31	13	Spain	8.66	5.68	17
Business Environment	**5.13**	**8**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.49	15	Australia	9.20	5.37	8
Legal Certainty	5.50	9	Canada	7.80	3.59	15
Red Tape	5.39	5	Canada	7.22	1.62	16
Education	**1.83**	**15**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	-	-	Australia	8.24	4.01	11
Educational Assessment	3.52	10	South Korea	8.35	3.01	13
Expenditure on Education	0.14	18	Australia	4.43	3.04	3
Technology and Innovation	**4.19**	**4**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	6.01	3	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	2.38	8	South Korea	8.19	1.59	11

4.17 TURKEY

Turkey ranked 10th in the Brazil Competitiveness Report 2021–2022. Out of the nine determining factors of competitiveness, the country ranks in the middle third (between 7th and 12th positions) in five of them. Turkey is in 2nd place in the Taxation factor and is among the top six only in this factor. The country has the second lowest effective tax rate on corporate income (18.3%) and the second least complex corporate tax system. Turkey lags behind Brazil only in the Macroeconomic Environment factor, placing 17th, just one position behind Brazil. This is Turkey's worst results along with the Financing factor. In 2021, the country had the second highest inflation (19.6%), and in 2020, it had the second highest real short-term interest rate (3.1%) and the second worst credit rating. The sharp drop of nine positions in the Labor factor from the 2019–2020 revised ranking stands out, moving from the upper third to the bottom third (from 4th to 13th position). This is due to the reduction of the country's workforce and the drop in its growth rate. Despite this, Turkey remained in 10th position in the overall ranking.

TABLE 33 – TURKEY: STRUCTURAL CHARACTERISTICS

Area (thousand sq. km)	785
Population (millions)	85
GDP (billion USD)	807
GDP per capita, PPP (thousand USD)	35
Agricultural products exports (billion USD)	21
Total exports (billion USD)	225
Total imports (billion USD)	271

FIGURE 55 – BRAZIL-TURKEY COMPARISON

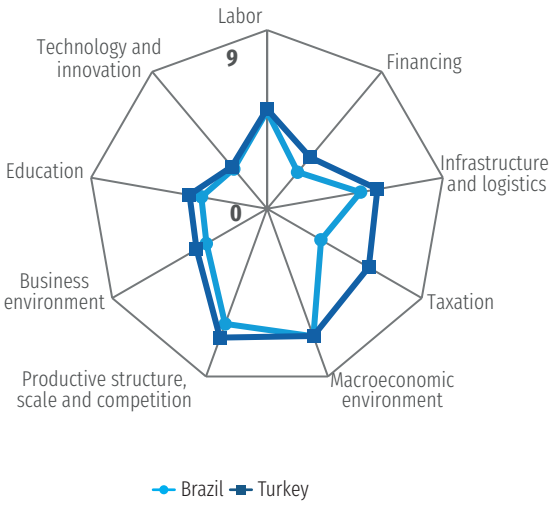


FIGURE 56 – TURKEY'S PERFORMANCE

Average scores (0 = worst performance; 10 = best performance)

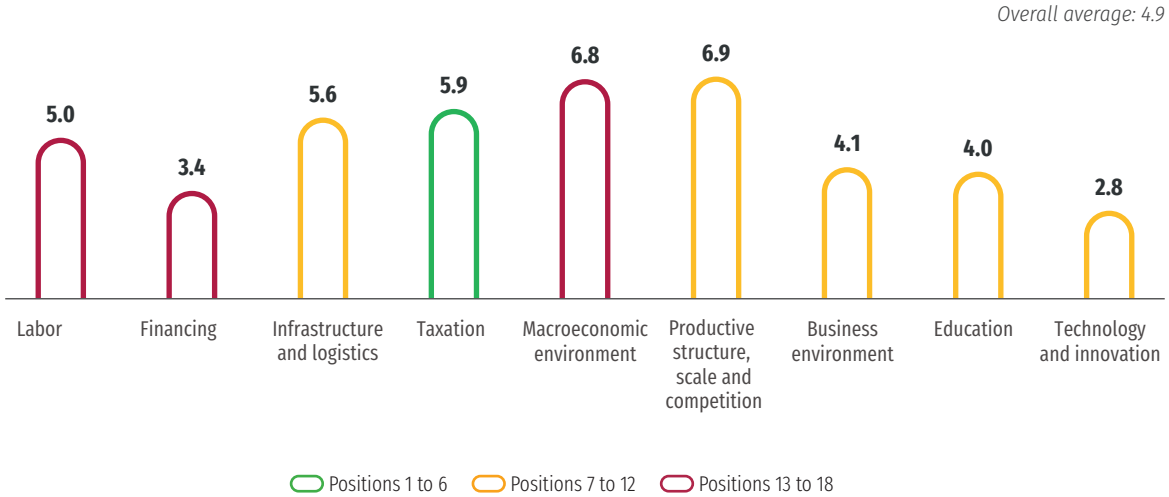


TABLE 34 – TURKEY:
PERFORMANCE IN THE FACTORS AND SUBFACTORS DETERMINING COMPETITIVENESS

Average scores (0 = worst performance; 10 = best performance) and position in the ranking

TURKEY			BEST PERFORMANCE		BRAZIL	
Factor/Subfactor	**Score**	**Rank**	**Country**	**Score**	**Score**	**Rank**
Labor	**5.02**	**13**	**Indonesia**	**6.02**	**4.90**	**15**
Labor Cost	5.93	1	Turkey	5.93	5.24	11
Labor Availability	4.11	16	Peru	6.59	4.56	14
Financing	**3.38**	**17**	**China**	**6.61**	**2.40**	**18**
Capital Cost	4.96	14	Argentina	9.90	0.00	18
Capital Availability	2.67	12	Canada	6.47	3.10	11
Financial System Performance	2.51	16	Australia	8.74	4.10	9
Infrastructure and Logistics	**5.64**	**10**	**South Korea**	**7.69**	**4.78**	**15**
Transport Infrastructure	6.09	7	China	7.94	4.00	17
Telecommunications Infrastructure	6.31	10	South Korea	9.58	5.88	11
Energy Infrastructure	4.86	15	South Africa	6.39	4.65	17
International Logistics	5.31	12	Spain	8.36	4.60	14
Taxation	**5.91**	**2**	**Indonesia**	**6.13**	**3.14**	**17**
Tax Burden	6.62	4	Indonesia	7.61	4.20	16
Quality of the Tax System	5.21	3	South Korea	5.59	2.09	16
Macroeconomic Environment	**6.84**	**17**	**Russia**	**7.80**	**6.84**	**16**
Monetary Balance	7.77	17	China	9.62	8.89	16
Fiscal Balance	5.77	5	Russia	6.29	4.65	17
External Balance	6.97	14	Russia	8.08	6.99	13
Productive Structure, Scale and Competition	**6.92**	**8**	**China**	**8.37**	**6.18**	**13**
Productive Structure	5.80	8	South Korea	9.13	4.62	11
Scale	8.00	6	China	10.00	8.23	5
Competition	6.95	7	Spain	8.66	5.68	17
Business Environment	**4.11**	**12**	**Canada**	**7.96**	**3.53**	**16**
Government Efficiency	4.52	14	Australia	9.20	5.37	8
Legal Certainty	4.05	12	Canada	7.80	3.59	15
Red Tape	3.75	8	Canada	7.22	1.62	16
Education	**3.97**	**8**	**Australia**	**6.71**	**3.35**	**10**
Educational Attainment	4.64	9	Australia	8.24	4.01	11
Educational Assessment	5.81	7	South Korea	8.35	3.01	13
Expenditure on Education	1.45	12	Australia	4.43	3.04	3
Technology and Innovation	**2.76**	**8**	**South Korea**	**8.74**	**2.61**	**9**
R&D Efforts	4.02	8	South Korea	9.30	3.63	9
Outcomes of R&D Efforts	1.50	12	South Korea	8.19	1.59	11

APPENDIX A
METHODOLOGICAL NOTE

ABOUT THE REPORT

CNI's agenda places priority on improving the competitiveness of industry and, consequently, of the Brazilian economy. This focus motivates the preparation of the **Brazil Competitiveness Report**, which was first published in 2010. Since then, the following editions were published: 2012, 2013, 2014, 2016, 2017–2018, 2018–2019, and 2019–2020.

The reporting period for this report is 2021 or the most recent year for each variable and country. Most of the data used is from 2020, but in some cases, data from previous years has been used[1].

The growing attention given to the competitiveness theme leads to the multiplication of studies and research that seek to identify the determinants of the competitiveness of companies in a country. This research effort has culminated in the regular publication of reports that compare the competitiveness of countries from this perspective.

This report is one of such studies and it focuses on:

- A limited set of countries that, due to their economic and social characteristics and/or their position in the international market, provide a more appropriate benchmark for assessing the competitive potential of Brazilian companies;
- A specific set of variables more directly related to the reality of this set of countries selected from variables included in reports published by international organizations.

METHODOLOGICAL CHANGES

In the 2021–2022 edition, the methodology underwent changes due to the discontinuation of two key sources: the World Bank's report Doing Business and the World Economic Forum's World Competitiveness Report. The World Bank discontinued the Doing Business report in 2021 due to irregularities in the data from the 2018 and 2020 reports, among other issues[2]. Meanwhile, the World Economic Forum modified its World Competitiveness Report for a special edition in 2020 in response to the global crisis caused by the COVID-19 pandemic, which interrupted the annual disclosure of the accompanying database.

The Trade tariffs variable in the Productive Structure, Scale, and Competition factor is now calculated by CNI using data for non-agricultural[3] products, based on information from the International Trade Center (ITC). In previous editions, the Trade tariffs variable referred to the total of products and was collected from the World Competitiveness Report of the World Economic Forum.

[1] Cases where the data lag exceeds two years are rare. Furthermore, these are, in general, indicators that do not change in the short term.
[2] Available at: https://www.worldbank.org/pt/news/statement/2021/09/16/world-bank-group-to-discontinue-doing-business-report. Accessed on: 09/26/2022.
[3] Further details of variables and sources for the current edition can be found in Appendix B.

The subfactor International Logistics in the Infrastructure and Logistics factor now consists only of the Logistic Performance Index (LPI), which is collected from the World Bank's triennial report. The other variable that previously composed this subfactor, Time and cost to export and import, was sourced from the discontinued Doing Business report. It was decided to not include a new indicator due to the similarity of the two indicators and the greater scope of the LPI.

In the Tax burden subfactor, the variable Total tax rate (% of profit), sourced from the Doing Business report, was replaced by the Composite Effective Average Tax Rate from the OECD. In the Quality of the Tax System subfactor, the variables Payments (number per year) and Postfiling index (0-100), which were also sourced from the Doing Business report, were replaced by the Tax Complexity Index calculated by researchers from universities in Munich and Paderborn, Germany.

In the Business Environment factor, the variable Enforcing contracts was replaced by the variable Efficiency of legal framework in settling disputes, in the Legal certainty subfactor; and the variable Starting a business was replaced by the variable Bureaucracy, in the subfactor Red Tape. The source of substituted variables has been changed from the Doing Business report to the World Economic Forum and the IMD.

The Labor force growth variable, in the Labor factor, is now calculated by CNI, using data from the International Labor Organization (ILO). Previously, the variable was collected from the IMD World Competitiveness Yearbook, but this data was often an estimate and underwent significant revisions with each update by the original source. To improve the reliability of this indicator, it is now obtained based on a three-year moving average of the labor stock. This smoothens out short-term fluctuations.

For the purpose of comparison with the previous edition, the ranking for 2019–2020 has been revised to reflect the methodological changes that were implemented. For collecting data for the previous reference period, the most recent databases available were used. The revised 2019–2020 of the overall ranking can be found in Appendix C.

FACTORS WITH A BEARING ON COMPETITIVENESS AND ASSOCIATED VARIABLES

The term competitiveness refers to a company's ability to compete in the market — that is, to its ability to outperform competitors in winning consumer preference. Companies are basically provided with two mechanisms to win consumer preference: price and quality.

The competitive potential of an economy can be assessed by analyzing factors with a bearing on the ability of its companies to manage these competition mechanisms effectively. For this, it should be considered:

Factors that directly impact the efficiency of companies, such as:

- Labor;
- Financing;
- Infrastructure and Logistics;
- Taxation;
- Technology and Innovation.

Factors with a bearing on the previous ones and which indirectly affect the performance of companies, such as:

- Macroeconomic Environment;
- Productive Structure, Scale And Competition;
- Business Environment;
- Education.

These factors were divided into 25 subfactors, to which 59 variables were associated. The starting point for assessing the competitiveness of Brazilian companies is the value assumed by these 59 variables in Brazil and in 17 other countries. This set of variables comprises 42 economic variables disseminated in international and national databases, as well as 17 qualitative variables. As such, the quantitative variables account for 71.2% of the set of variables, and the qualitative variables account for 28.8%.

The qualitative variables were derived from surveys conducted by international organizations and disseminated in the following reports: The Global Competitiveness Report from World Economic Forum; IMD World Competitiveness Yearbook from IMD; The WJP Rule of Law Index from The World Justice Project (WJP); Tax Complexity Index from The Global MNC Tax Complexity Project; The Worldwide Governance Indicators and Connecting to Compete 2018 – Trade Logistics in the Global Economy, both from the World Bank.

Table 1 shows the distribution of variables according to their factors and subfactors. The definitions and corresponding sources for the 59 variables can be found in Section 6 of this report.

TABLE A1 - 2021–**2022** REPORT: FACTORS, SUBFACTORS AND VARIABLES

VARIABLES	WEIGHT
Labor	
Labor Cost	*50%*
Compensation Levels in Manufacturing	50%
Labor Productivity in Industry	50%
Labor Availability	*50%*
Labor Force Participation Rate	50%
Labor Force Growth	50%
Financing	
Capital Cost	*33.3%*
Interest Rate Spread	50%
Real Short-Term Interest Rate	50%
Capital Availability	*33.3%*
Domestic Credit to Private Sector	33.3%
Stock Market Size	33.3%
Venture Capital Availability	33.3%
Financial System Performance	*33.3%*
Banking Sector Assets	50%
Country Credit Rating	50%
Infrastructure and Logistics	
Transport Infrastructure	*25%*
Quality Of Roads	12.5%
Road Connectivity Index	12.5%
Efficiency of Train Services	12.5%
Railroad Density	12.5%
Efficiency of Seaport Services	12.5%
Liner Shipping Connectivity	12.5%
Efficiency of Air Transport Services	12.5%
Air Transport, Freight	12.5%

VARIABLES	WEIGHT
Energy Infrastructure	*25%*
Electricity Costs for Industrial Clients	33.3%
Availability of Electricity	33.3%
Quality of Electricity Supply	33.3%
Telecommunications Infrastructure	*25%*
ICT Use	50%
ICT Access	50%
International Logistics	*25%*
Logistic Performance Index (LPI)	100%
Taxation	
Tax Burden	*50%*
Tax Revenue (% of GDP)	50%
Composite Effective Average Tax Rate (EATR)	50%
Quality of the Tax System	*50%*
Distortive Effect of Taxes and Subsidies on Competition	50%
Tax Complexity Index	50%
Macroeconomic Environment	
Monetary Balance	*33.3%*
Inflation Rate	100%
Fiscal Balance	*33.3%*
General government debt	50%
General Government Net Debt Interest Payments	50%
External Balance	*33.3%*
Current Account Balance (% of GDP)	100%
Productive Structure, Scale and Competition	
Productive Structure	*33.3%*
Economic Complexity Index (ECI)	100%
Scale	*33.3%*
Domestic Market Size	100%
Competition	*33.3%*
Trade Tariffs	50%
Extent of Market Dominance	50%
Business Environment	
Government Efficiency	*33.3%*
Control of Corruption	33.3%
Regulatory Quality	33.3%
Publicized Laws and Government Data	33.3%
Legal Certainty	*33.3%*
Rule of Law Index	33.3%
Efficiency of Legal Framework in Challenging Regulations	33.3%
Efficiency of Legal Framework in Settling Disputes	33.3%

VARIABLES	WEIGHT
Red Tape	*33.3%*
Red Tape	50%
Hiring and Dismissing Practices	50%
Education	
Educational Attainment	*33.3%*
Gross Enrollment Ratio in Secondary Education	25%
Gross Enrollment Ratio in Tertiary Education	25%
Percentage of Adults who Have Attained at Least Upper Secondary Education	25%
Percentage of Adults who Have Attained Tertiary Education	25%
Educational Assessment	*33.3%*
Performance in Mathematics	33.3%
Performance in Reading	33.3%
Performance in Science	33.3%
Expenditure on Education	*33.3%*
Total Public Expenditure on Education	50%
Total Public Expenditure on Education Per Capita	50%
Technology and Innovation	
R&D Efforts	*50%*
Gross Expenditure on R&D (% of GDP)	50%
Gross Expenditure on R&D Financed by Business Enterprise (% of Total R&D Expenditure)	50%
Outcomes of R&D Efforts	*50%*
PCT International Applications	33.3%
Scientific and Technical Publications	33.3%
High-tech Exports	33.3%

COUNTRIES SELECTED AS A BENCHMARK FOR ASSESSING THE COMPETITIVENESS OF THE BRAZILIAN ECONOMY

The competitive potential of the Brazilian economy was evaluated by comparing Brazil's relative position to a selected set of countries. An effort was made to select countries at a similar level of development and/or of a similar size to Brazil, countries that compete with Brazil in third markets or with international activities like those of Brazil and neighboring countries.

This set of countries includes: South Africa, Argentina, Australia, Canada, Chile, China, Colombia, South Korea, Spain, India, Indonesia, Mexico, Peru, Poland, Russia, Thailand and Turkey.

The table below shows some structural characteristics of these economies.

TABLE A2 – *Structural characteristics of the selected countries – 2021*

Country	Area* (thousand sq. km)	Population (millions)	GDP (billion USD)	GDP per capita, PPP (thousand USD)	Agricultural products exports* (billion USD)	Total exports (billion USD)	Total imports (billion USD)
South Africa	1,219	60	418	14	12	124	114
Argentina	2,780	46	489	24	36	78	63
Australia	7,741	26	1,633	56	31	344	261
Brazil	**8,516**	**214**	**1,608**	**16**	**93**	**281**	**235**
Canada	9,880	38	1,991	53	70	503	499
Chile	757	19	317	27	22	95	92
China	9,600	1,412	17,458	19	78	3,364	2,688
Colombia	1,141	51	314	16	8	40	61
South Korea	100	52	1,799	49	13	644	615
Spain	506	47	1,426	42	65	384	418
India	3,287	1,393	3,042	7	39	395	573
Indonesia	1,917	276	1,186	13	47	230	196
Mexico	1,964	130	1,295	21	40	494	522
Peru	1,285	33	225	14	10	63	51
Poland	313	38	674	38	41	338	338
Russia	17,098	143	1,776	31	36	494	304
Thailand	513	70	513	19	42	271	268
Turkey	785	85	807	35	21	225	271

Source: World Development Indicators, World Bank; World Economic Outlook Database, Apr. 2022, IMF; WTO merchandise trade by commodity group, WTO.:

*The reference year is 2020.

PROCEDURES ADOPTED

The effect of each of the 59 variables from the point of view of the competitiveness of Brazilian companies can be assessed based on Brazil's position in the list of countries, defined according to the values of these variables in each of the 18 countries.

The 59 variables were aggregated into 25 subfactors and the subsequent aggregation of these subfactors into nine factors makes it in turn possible to assess the effect of each of these subfactors and factors on the competitiveness of Brazilian companies. This aggregation process was carried out through the procedures described below.

The set of 59 variables comprises quantitative variables that reflect economic magnitudes, as well as qualitative variables derived from surveys.

The qualitative variables are based on different scales, as they were derived from different surveys. Such scales were converted into a single scale (a 0–10 scale).

CALCULATION OF COMPARABLE MEASURES (NORMALIZATION)

The quantitative variables used in this report measure various magnitudes and, in some cases, are expressed in different units. In accordance with the procedure outlined in the World Economic Forum's Global Competitiveness Report, the variables were normalized and converted to the same scale using the following formula to match the scale used for survey variables:

$$VN_i^v = 10 \times \frac{V_i - V_{min}}{V_{max} - V_{min}} \quad (1)$$

Where VN_i^v represents the normalized value of the variable V for country i; V_{max} and V_{min} represent the maximum and minimum values in the original sample of 18 countries (the highest and lowest observed values), and V_i is the value of country i. In the case of variables for which the most favorable result is the lowest from the point of view of competitiveness, the following formula was adopted:

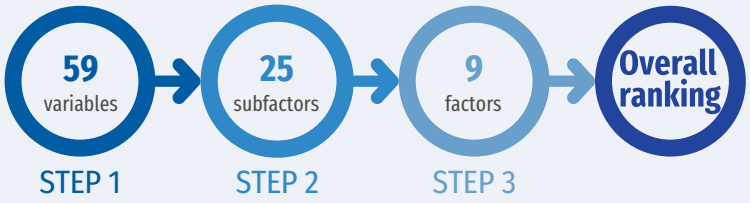
$$VN_i^v = 10 - 10 \times \frac{V_i - V_{min}}{V_{max} - V_{min}} \quad (2)$$

AGGREGATION OF VARIABLES INTO SUBFACTORS AND FACTORS

The scores of the subfactor are the weighted average of the normalized variables associated with the subfactor (the weights are shown in table 1 above). Factor scores were determined by the simple average of the scores for the subfactors associated with them.

The overall ranking of a country is determined by taking the simple average of scores for the nine factors.

FIGURE A1 – AGGREGATION PROCESS



To calculate the annual ranking of the Brazil Competitiveness Report, it is necessary to collect data for the 59 variables and to check the availability of data for the 18 selected countries.

In some cases no information is available for a country for some of the variables in the reference year, i.e.,the last year for which data is available. In such cases, the most recent available data is repeated for the reference year. For example, if the reference year of a given variable is 2021 and the most recent data available for the country is from 2019, the value recorded in 2019 is repeated for 2021.

When data for a country is very outdated or not available for a country in any year of the series for any variable, the missing data is excluded from the calculation of the subfactor scores. The weighted average of the normalized variables is then calculated by taking into account the assigned weights for each variable. In case of missing data, the weight is equally redistributed among the remaining variables.

The score of a country on a subfactor is calculated only if more than 50% of the variables that make up the subfactor are available. At the factor level, the country score is calculated if more than 50% of the scores of the subfactors that make up the factor are available.

In determining the overall ranking, if a country does not have a score for any of the nine factors, the missing value is estimated. This is, for example, the case of China in the 2021–2022 ranking, in which it has no score in the Education factor. Scores are estimated according to the following methodology:

a) the scores for the Education factor are calculated based on the simple average of the values of the variables for which information for China is available;
b) a new ranking for the Education factor is calculated based on the scores calculated in item a. It is a new ranking because the average is calculated based only on the variables for which information for China is available;
c) the original ranking is checked to determine which score aligns with China's position as stated in item b;
d) a simple average is calculated to estimate China's score based on the score calculated in item c and on the scores assigned to countries in neighboring positions.

The only case of missing data in the 2021–2022 overall ranking is that of China in the Education factor.

APPENDIX B
LIST OF VARIABLES

Description and source of the variables

Name	Description	Source [original source]
Labor		
Labor Cost		
Compensation Levels in Manufacturing	Total hourly compensation in manufacturing (wages plus supplementary benefits), US$ *Reference year: 2020*	IMD World Competitiveness Yearbook 2021 [Passport GMID; "Source: © Euromonitor International 2021"; national sources]
Labor Productivity in Industry	Related GDP (PPP) per person employed in industry (in thousands of US$, constant 2017 prices) *Reference year: 2019*	Calculated by CNI, based on data from World Bank and International Labour Organization (ILO). *Brazil: CNI estimate, based on data from World Bank and IBGE (System of Quarterly National Accounts, System of National Accounts – reference 2010).
Labor Availability		
Labor Force Participation Rate	Labor force as a percentage of the total population over 15 years old *Reference year: 2021*	ILOSTAT – International Labour Organization (ILO) [ILO modelled estimates, Nov. 2021]
Labor Force Growth	Percentage change of 3-year moving average *Reference year: 2019-2021, moving average*	Calculated by CNI, based on data from International Labour Organization (ILO).
Financing		
Capital Cost		
Interest Rate Spread	Lending rate minus deposit rate *Reference year: 2020*	IMD World Competitiveness Yearbook 2021. [International Financial Statistics Online April 2021 (IMF); national sources].
Real Short-Term Interest Rate	Real discount or bank rate *Reference year: 2020*	IMD World Competitiveness Yearbook 2021. [International Financial Statistics Online April 2021 (IMF); national sources].
Capital Availability		
Domestic Credit to Private Sector	Financial resources provided to the private sector by financial corporations as a percentage of GDP *Reference year: 2018-2020, moving average*	Calculated by CNI, based on data from World Bank
Stock Market Size	Market value for listed domestic companies as a percentage of GDP. *Reference year: 2020*	World Bank [World Federation of Exchanges database]
Venture Capital Availability	Variable generated from answers to the question: In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? [1 = extremely difficult; 7 = extremely easy] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Financial System Performance		
Banking Sector Assets	Percentage of GDP *Reference year: 2020*	IMD World Competitiveness Yearbook 2021 [IMF Monetary and Financial Stats (MFS) April 2021]
Country Credit Rating	Index (0-60) of three country credit ratings: Fitch, Moody's and S&P. *Reference year: 2020*	IMD World Competitiveness Yearbook 2021 [Fitch Ratings, Moody's Corporation and Standard & Poor's]

Name	Description	Source [original source]
Infrastructure and Logistics		
Transport Infrastructure		
Quality Of Roads	Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of road infrastructure [1 = extremely poor—among the worst in the world; 7 = extremely good—among the best in the world] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Road Connectivity Index	Average speed and straightness of a driving itinerary connecting the 10 or more largest cities that together account for at least 15 percent of the economy's total population. *Reference year: 2019*	The Global Competitiveness Report 2019, World Economic Forum [World Economic Forum's calculations]
Efficiency of Train Services	Variable generated from answers to the question: In your country, how efficient (i.e., frequency, punctuality, speed, price) are train transport services? [1 = extremely inefficient—among the worst in the world; 7 = extremely efficient—among the best in the world] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Railroad Density	Kilometers of railroad per 100 square kilometers of land *Reference year: 2019 or most recent year available*	Calculated by CNI, based on data from World Bank. * Brazil: Calculated by CNI, based on data from ANTT and World Bank. ** Colombia and Peru: the source is The Global Competitiveness Report 2019, World Economic Forum.
Efficiency of Seaport Services	Variable generated from answers to the question: In your country, how efficient (i.e., frequency, punctuality, speed, price) are seaport services (ferries, boats) (for landlocked countries: assess access to seaport services) [1 = extremely inefficient—among the worst in the world; 7 = extremely efficient—among the best in the world] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Liner Shipping Connectivity	Index generated from the average of six components: (a) The number of scheduled ship calls per week; (b) the total deployed capacity offered at the country; (c) The number of regular liner shipping services from and to the country; (d) The number of liner shipping companies that provide services from and to the country; (e) The average of the ships deployed by the scheduled service with the largest average vessel size; and (f) The number of other countries that are connected to the country through direct liner shipping services. The base of the index is the maximum value in 2006 (China). *Reference year: 2021 (4 quarters average)*	UNCTAD, Division on Technology and Logistics, based on MDS Transmodal (https://www.mdst.co.uk/).
Efficiency of Air Transport Services	Variable generated from answers to the question: In your country, how efficient (i.e., frequency, punctuality, speed, price) are air transport services? [1 = extremely inefficient—among the worst in the world; 7 = extremely efficient—among the best in the world] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Air Transport, Freight	Volume of freight measured in metric tons times kilometers traveled. *Reference year: 2020*	World Bank [International Civil Aviation Organization, Civil Aviation Statistics of the World and ICAO staff estimates]
Energy Infrastructure		
Electricity Costs for Industrial Clients	USD per kWh *Reference year: 2020*	IMD World Competitiveness Yearbook 2021 [OECD Energy Prices and Taxes 2020 (International Energy Agency); national sources] *Brazil: CNI estimate based on data from the Brazilian Electricity Regulatory Agency (ANEEL) and from the Central Bank of Brazil.
Availability of Electricity	Ratio between electricity and heat output and GPD, expressed in TWh/US$ trillion. *Reference year: 2020*	Calculated by CNI, based on data from the International Energy Agency and the World Bank.
Quality of Electricity Supply	Electric power transmission and distribution losses as a percentage of output. *Reference year: 2016*	The Global Competitiveness Report 2019, World Economic Forum [International Energy Agency (IEA)]

Name	Description	Source [original source]
Telecommunications Infrastructure		
ICT Use	Aggregation of the weighted values (33% each) of three indicators: (1) percentage of individuals using the Internet; (2) fixed (wired)-broadband Internet subscriptions per 100 inhabitants; (3) active mobile-broadband subscriptions per 100 inhabitants. *Reference year: 2019*	Global Innovation Index 2021
ICT Access	Aggregation of the weighted values (20% each) of five indicators: (1) fixed telephone subscriptions per 100 inhabitants; (2) mobile cellular telephone subscriptions per 100 inhabitants; (3) international Internet bandwidth (bit/s) per Internet user; (4) percentage of households with a computer; and (5) percentage of households with Internet access. *Reference year: 2019*	Global Innovation Index 2021
International Logistics		
Logistic Performance Index (LPI)	Aggregation of the values (1-5 scale) of six components: (1) the efficiency of customs and border management; (2) the quality of trade and transport infrastructure; (3) the ease of arranging competitively priced shipments; (4) the competence and quality of logistics services; (5) the ability to track and trace consignments; (6) the frequency with which shipments reach consignees within scheduled or expected delivery times. *Reference year: 2018*	Connecting to Compete 2018. Trade Logistics in the Global Economy, World Bank, 2018
Taxation		
Tax Burden		
Tax Revenue (% of GDP)	Percentage of GDP *Reference year: 2019*	OECD Global Revenue Statistics (OECD, 2022) *India and Russia: the source is IMD.
Composite Effective Average Tax Rate (EATR)	The indicator reflects the average tax contribution a firm makes on an investment project earning above-zero economic profits. *Reference year: 2020*	OECD Corporate Tax Statistics (OECD, 2021)
Quality of the Tax System		
Distortive Effect of Taxes and Subsidies on Competition	Variable generated from responses to the question: In your country, to what extent do tax measures (subsidies, tax incentives, etc.) distort competition? (1 = they distort competition to a great extent; 7 = they do not distort competition in any way) *Reference year: 2019–2020 (weighted average)*	The Global Competitiveness Report 2020, World Economic Forum (Data received through direct communication)
Tax Complexity Index	The indicator measures the complexity of a country's corporate income tax system as faced by multinational corporations. It covers the complexity of the tax code (inherent in regulations) and the complexity of the tax framework (inherent in the processes of a tax system) in a scale from 0 (not complex) to 1 (extremely complex). *Reference year: 2020*	The Global MNC Tax Complexity Project, 2022
Macroeconomic Environment		
Monetary Balance		
Inflation Rate	Consumer price index – annual variation – percentage *Reference: 2021*	World Economic Outlook Database, Apr. 2022, IMF

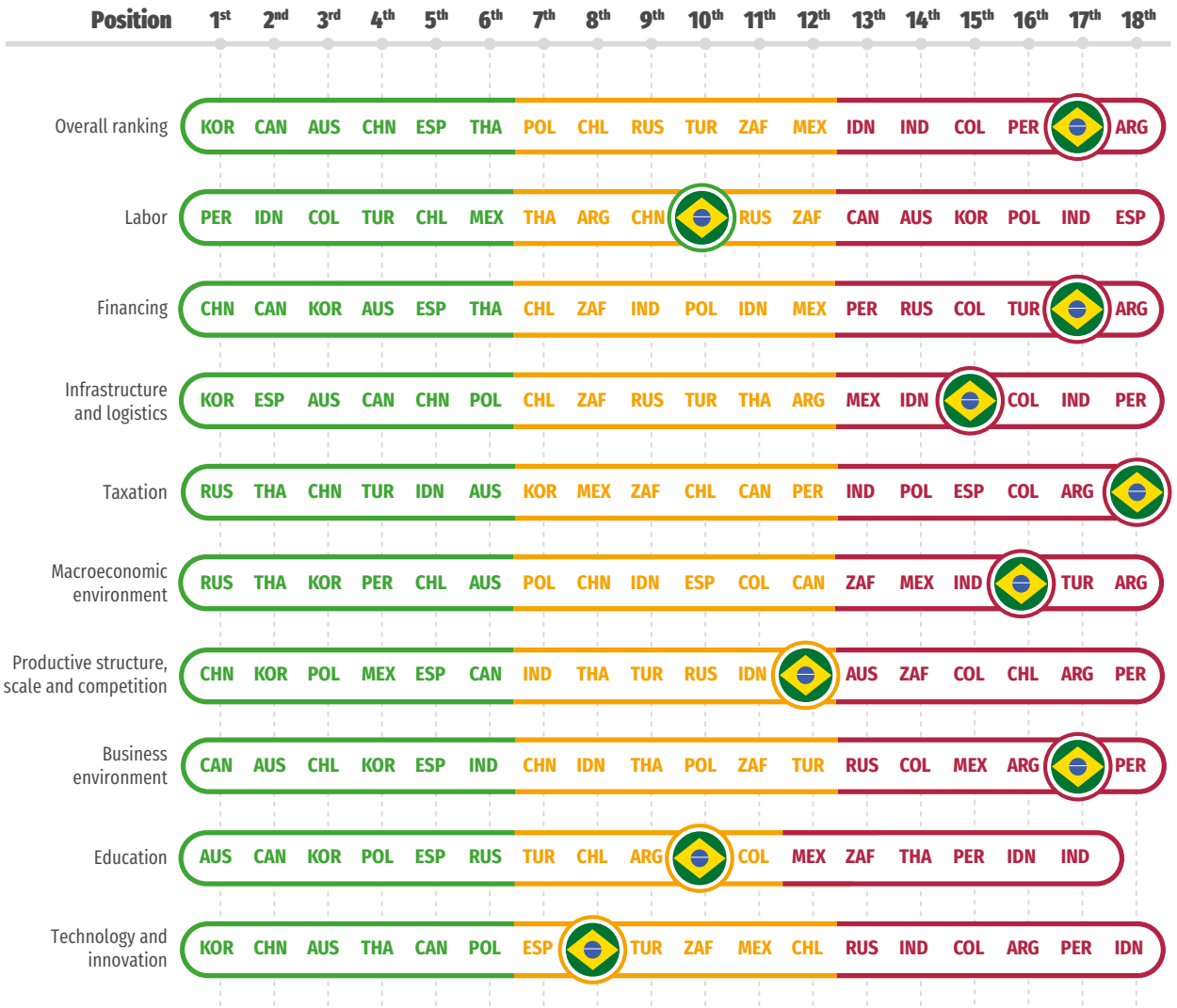
Name	Description	Source [original source]
Fiscal Balance		
General government gross debt	Gross General Government Debt as a percentage of GDP *Reference: 2021*	World Economic Outlook Database, Apr. 2022, IMF
General Government Net Debt Interest Payments	Spending on nominal interest on net government debt, calculated based on the difference between the nominal result and the primary result. Percentage of GDP. *Reference: 2021*	Calculated by CNI based on data from the World Economic Outlook Database, Apr. 2022, IMF.
External Balance		
Current Account Balance (% of GDP)	Current account balance as a percentage of GDP *Reference: 2020*	World Economic Outlook Database, Apr. 2022, IMF
Productive Structure, Scale and Competition		
Productive Structure		
Economic Complexity Index (ECI)	The economic complexity index is based on the diversity of exports a country produces and their ubiquity, or the number of the countries able to produce them. Countries that can sustain a diverse range of productive know-how, including sophisticated, unique know-how, show high values for ECI. These countries can produce a wide diversity of goods, including complex products that few other countries can make. *Reference year: 2019*	The Atlas of Economic Complexity, Center of International Development at Harvard University
Scale		
Domestic Market Size	Sum of GDP (PPP) plus value of imports (PPP) of goods and services, minus value of exports (PPP) of goods and services (in billions of U.S. dollars). *Reference year: 2020*	Calculated by CNI, based on data from World Bank.
Competition		
Trade Tariffs	Average rate applied on the import of non-agricultural products *Reference year: 2020*	Calculated by CNI, based on data from the International Trade Centre (ITC).
Extent of Market Dominance	Variable generated from answers to the question: In your country, how do you characterize corporate activity? [1 = dominated by a few business groups; 7 = spread among many firms] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Business Environment		
Government Efficiency		
Control of Corruption	Index generated based on perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. *Reference year: 2020*	The Worldwide Governance Indicators, 2021 Update [Daniel Kaufmann, Natural Resource Governance Institute (NRGI) and Brookings Institution; Aart Kraay, World Bank Development Research Group]
Regulatory Quality	Index generated based on perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. *Reference year: 2020*	The Worldwide Governance Indicators, 2021 Update [Daniel Kaufmann, Natural Resource Governance Institute (NRGI) and Brookings Institution; Aart Kraay, World Bank Development Research Group]
Publicized Laws and Government Data	Index generated based on perceptions about access to information and text of laws publicized by the government, as well as based on the Open Data Index. *Reference year: 2021*	Rule of Law Index ® 2021, World Justice Project

Name	Description	Source [original source]
Legal Certainty		
Rule of Law Index	Index generated based on perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular, the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. *Reference year: 2020*	The Worldwide Governance Indicators, 2021 Update [Daniel Kaufmann, Natural Resource Governance Institute (NRGI) and Brookings Institution; Aart Kraay, World Bank Development Research Group]
Efficiency of Legal Framework in Challenging Regulations	Variable generated from answers to the question: In your country, how easy is it for private businesses to challenge government actions and/or regulations through the legal system? [1 = extremely difficult; 7 = extremely easy] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Efficiency of Legal Framework in Settling Disputes	Variable generated from answers to the question: In your country, how efficient are the legal and judicial systems for companies in settling disputes? [1 = extremely inefficient; 7 = extremely efficient] *Reference year: 2018–2019, weighted average*	The Global Competitiveness Report 2019, World Economic Forum [Executive Opinion Survey]
Red Tape		
Red Tape	Variable generated from answers to the statement: Red Tape does not hinder business activity. Scale from 0 to 10 (best). *Reference year: 2021*	IMD World Competitiveness Executive Opinion Survey based on an index from 0 to 10
Hiring and Dismissing Practices	Variable generated from answers to the question: In your country, to what extent do regulations allow flexible hiring and firing of workers? [1 = not at all; 7 = to a great extent] *Reference year: 2019–2020, weighted average*	The Global Competitiveness Report 2020, World Economic Forum [Executive Opinion Survey] (Data received through direct communication)
Education		
Educational Attainment		
Gross Enrollment Ratio in Secondary Education	Number of students enrolled in secondary level, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. *Reference year: 2019*	UNESCO Institute for Statistics. Education: September 2021
Gross Enrollment Ratio in Tertiary Education	Number of students enrolled in tertiary level, regardless of age, expressed as a percentage of the official school-age population corresponding to the same level of education. *Reference year: 2019*	UNESCO Institute for Statistics. Education: September 2021
Percentage of Adults who Have Attained at Least Upper Secondary Education	Percentage of adults aged between 25 and 64 who have attained at least upper secondary education. *Reference year: 2020*	OECD: Education at a Glance 2021
Percentage of Adults who Have Attained Tertiary Education	Percentage of adults aged between 25 and 64 who have attained tertiary education. *Reference year: 2020*	OECD: Education at a Glance 2021
Educational Assessment		
Performance in Mathematics	Average scores in math tests, 15-year-old students. *Reference year: 2018*	PISA 2018 Results (Volume I): What Students Know and Can Do – OECD 2019
Performance in Reading	Average scores in reading tests, 15-year-old students. *Reference year: 2018*	PISA 2018 Results (Volume I): What Students Know and Can Do – OECD 2019
Performance in Science	Average scores in science tests, 15-year-old students. *Reference year: 2018*	PISA 2018 Results (Volume I): What Students Know and Can Do – OECD 2019

Name	Description	Source [original source]
Expenditure on Education		
Total Public Expenditure on Education	Percentage of GDP *Reference year: 2018*	Education at a Glance 2021: OECD Indicators – © OECD 2021 *China, India, Indonesia, Thailand and Peru: the source is the IMD.
Total Public Expenditure on Education Per Capita	USD per capita *Reference year: 2019*	IMD World Competitiveness Yearbook 2021 [UNESCO (http://stats.uis.unesco.org); Eurostat October 2020; national sources]
Technology and Inovation		
R&D Efforts		
Gross Expenditure on R&D (% of GDP)	Total expenditure on research and development (R&D) as a percentage of GDP *Reference year: 2018*	UNESCO Institute for Statistics. Science, Technology and Innovation: March 2021 *Brazil: the source is MCTIC.
Gross Expenditure on R&D Financed by Business Enterprise (% of Total R&D Expenditure)	Gross expenditure on research and development (R&D) financed by business enterprise as a percentage of total expenditure on R&D *Reference year: 2017*	UNESCO Institute for Statistics. Science, Technology and Innovation: March 2021 *Brazil: the source is MCTIC. **Australia: the source is the Global Innovation Index 2019. ***Peru: Calculated by CNI, based on data from the IMD.
Outcomes of R&D Efforts		
PCT International Applications	Number of international patent applications filed by residents at the Patent Cooperation Treaty (PCT) (per billion PPP$ GDP). *Reference year: 2020*	Global Innovation Index 2021
Scientific and Technical Publications	Number of scientific and technical journal articles (per billion PPP$ GDP). Articles counts are from a set of journals covered by the Science Citation Index (SCI) and the Social Sciences Citation Index (SSCI). *Reference year: 2020*	Global Innovation Index 2021
High-tech Exports	High-technology exports minus re-exports (% of total trade) *Reference year: 2019*	Global Innovation Index 2021

APPENDIX C
REVISED 2019–2020 RANKING

FIGURE C1 – REVISED VERSION OF THE PREVIOUS RANKING (2019–2020): COMPETITIVE POSITION OF THE 18 SELECTED COUNTRIES



Note: The overall ranking was built based on the simple average between the values recorded by each country in the nine competitiveness factors assessed. For more details, see the methodological note in Appendix A.

LEARN MORE

For more information on the survey, including historical series and methodology, please visit: www.cni.com.br/e_competbrasil

English version of "Competitividade Brasil 2021–2022"

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ECONOMIC INDICATORS CNI

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