CNI

BRAZIL COMPETITIVENESS REPORT
2016

A COMPARISON WITH SELECTED COUNTRIES

BRASÍLIA – 2016

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ABOUT THE
REPORT

Increasing the competitiveness of Brazilian industry and, consequently, that of the Brazilian economy as a whole is a priority on CNI's agenda. This is the main motivation for drawing up the **Brazil Competitiveness Report: a comparison with selected countries**, which was published for the first time in 2010 and again in 2012, 2013, and 2014.

In this fifth edition of the report, three new countries were included in the analysis: Indonesia, Peru, and Thailand. The determinants of competitiveness were reviewed and reorganized with the aim of improving their relationship with the Strategic Map of Industry 2013-2022. The Microeconomic environment factor was renamed as Competition and scale of the domestic market and the Business environment factor was created.

The reference period of the data provided in the 2016 report is the latest year available for each variable and country. In most cases, 2015 is the most current year. The data for each variable and country are presented in the form of rankings at the end of the report.

The increasing attention being given to the issue of competitiveness has led to the multiplication of studies and research efforts to identify the determinants of the competitiveness of companies in a country. Those efforts have led to the periodic publication of reports comparing the competitiveness of countries from that perspective.

This report falls under this line of studies and is focused on:

- A limited set of countries that, because of their economic and social characteristics and/or position in the international market, provide a more appropriate benchmark for assessing the competitive potential of Brazilian companies;

- A restricted set of variables that are more directly related to the reality of this set of countries, which were selected based on the universe of variables contemplated in reports published by international organizations.

Factors that affect competitiveness and associated variables

Competitiveness refers to a company's ability to compete in the market — i.e. to its ability to overcome its competitors in 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 examining the factors that influence the ability of the companies operating in it to manage those competition mechanisms effectively. For this purpose, the following elements must be considered:

- Factors that directly affect the efficiency of companies and the effectiveness with which they manage these instruments, such as:

    o   Availability and cost of labor;

    o   Availability and cost of capital;

    o   Infrastructure and logistics;

    o   Taxation;

    o   Technology and innovation.

- Factors that have a bearing on the elements above and affect the performance of companies indirectly, such as:

    o   Macroeconomic environment;

    o   Competition and scale of the domestic market;

    o   Business environment;

    o   Education.

These factors were broken down into 20 sub-factors, to which 56 variables were associated.

The starting point for assessing the competitiveness of Brazilian companies is the value attributed to these 56 variables in Brazil and 17 other countries. The aggregation of the 56 variables into the 20 sub-factors and subsequent aggregation of these sub-factors into the nine indicated factors make in turn possible to assess the effect of each of these sub-factors and factors on the competitiveness of Brazilian companies.

Countries selected as a benchmark

The competitive potential of the Brazilian economy was assessed according to the relative position of Brazil vis-à-vis a selected set of countries according to their socioeconomic characteristics and/or the nature of their position in the international market. This set of countries includes Argentina, Australia, Canada, Chile, China, Colombia, India, Indonesia, Mexico, Peru, Poland, Russia, South Africa, South Korea, Spain, Thailand, and Turkey.

How results are presented

The next section presents a summary of results with the relative positions of each of the 18 countries considered. Next, a second section describes the relative performance of Brazil in each of the nine determinants of competitiveness.

Countries are classified into three groups according to their relative position. Thirds are identified by the colors green, yellow, and red:

- By the green color when a country is included in the third of countries in a more favorable position (positions 1-6);

- By the yellow color when a country is included in the middle third (positions 7-12);

- By the red color when a country is included in the bottom third (positions 13-18).

In section 3, bilateral comparisons are made between Brazil and the selected countries.

Finally, the results for Brazil are compared to those recorded in the previous year in section 4.
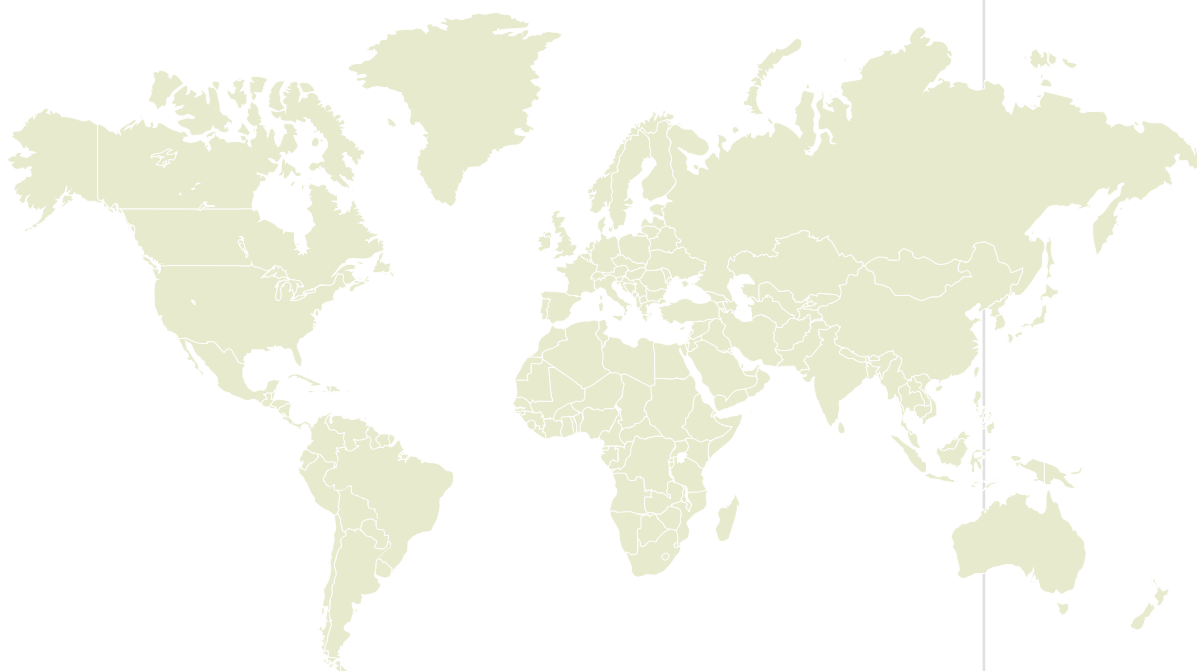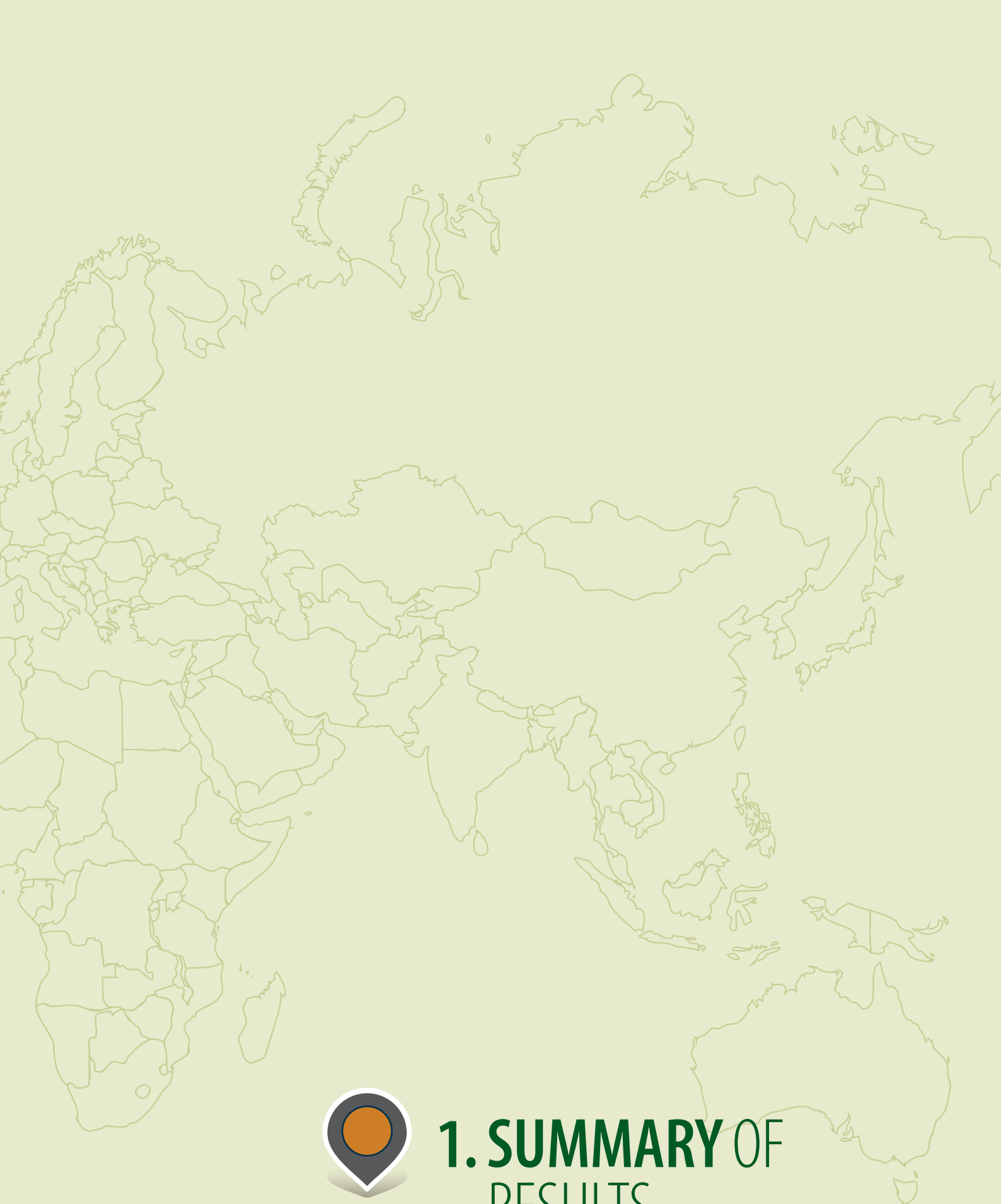
1. SUMMARY OF RESULTS

Brazil remains in the next-to-last position in the ranking

On the general average, Brazil is in the next-to-last position in the ranking of the determining factors of competitiveness among the 18 selected countries, ahead of Argentina. Among the nine factors, only in four - Availability and cost of labor, Competition and scale of the domestic market, Education, and Technology and innovation - the country is not in the bottom third of the ranking (between the 18th and the 13th position). In relation to these factors, Brazil is in the middle third (yellow third).

Brazil's best position among the nine factors is in the Education factor (9th position among 15) and its worst position was recorded in the Availability and cost of capital factor (18th position). The result in education is mainly due to the country's positive performance in the Expenditure on education variable (4th position). It is worth stressing that in relation to the other dimensions associated with the factor - education attainment and assessment - the country is in the bottom third of the ranking. In terms of Availability and cost of capital, Brazil ranks last, as it has the highest real short-term interest rate and the highest interest rate spread.

As compared with the 2015 ranking[1] , Brazil's position improved only in relation to the Education factor and, among the 20 sub-factors, only in relation to Labor cost[2] . Brazil moved down in the ranking in four factors: Availability and cost of labor, Macroeconomic environment, Competition and scale of the domestic market, and Technology and innovation.

In relation to Availability and cost of labor, Brazil moved down from the top third (5th position among 17) to the bottom third of the ranking (11th position among 16). This downward movement was determined by its drop from the second to the 10th position in the Availability of labor sub-factor as a result of its 10-position drop in Labor force growth, which became negative. The upward movement from the 13th to the 12th position in the Cost of labor sub-factor resulted from Brazil's better position in terms of Compensation levels in manufacturing.

In relation to Technology and innovation, the drop of two positions was due to the poorer performance of Brazil in R&D and innovation in companies. In this sub-factor, the country fell from the middle to the bottom third of the ranking as Gross expenditure on R&D performed by business enterprise fell and its position in Capacity for innovation dropped to a lower level.

Brazil fell two positions in the Macroeconomic environment and Competition and scale of the domestic market factors. In relation to the former, the fall is due to a higher inflation and a low investment rate, which led to Brazil's drop in the ranking. In connection with the latter, the decline experienced by the country resulted from a domestic market shrinkage - Brazil switched positions with Russia, from the 3rd to the 4th position - and from a less intense competition in the domestic market.

Overall, Canada is the highest-ranking country, followed by South Korea, Australia, China, Spain, and Chile, which make up the top third of the ranking. Among the nine factors analyzed, Canada is not in the top third of the ranking only in the Availability and cost of labor and Macroeconomic environment factors.

As compared to the 2015 ranking, Chile fell one position but is still in the upper third (6th position), behind Spain. Chile lost positions in five of the nine factors. The only factors in which it did not lose positions in the ranking are the Availability and cost of labor, Macroeconomic environment, Business environment, and Education factors. The sharpest fall was the one

[1] For comparison purposes, the 2015 ranking was calculated based on the same variables and on the same set of countries included in the 2016 ranking.

[2] In relation to Education, Brazil moved up one position (from the 10th to the 9th position) as South Africa moved down in the ranking (from the 7th to the 11th position).

recorded in Technology and Innovation (2 positions). In the case of Spain, it is worth highlighting that it rose in the ranking in the Availability and cost of capital factor (4 positions).

In the middle third, Thailand and Indonesia moved up one position. Thailand switched positions with Turkey and Indonesia did the same with South Africa.

The situation in the bottom third is virtually the same recorded in the 2015 ranking. The selected Latin American countries remain in the bottom third, except for Chile: no change was recorded for Argentina, Brazil, Peru, Colombia, and Mexico. The other position is occupied by India, which moved up from the 15th to the 14th position, switching positions with Colombia.

FIGURE 1 COMPETITIVE POSITION OF THE 18 SELECTED COUNTRIES

Position	18º	17º	16º	15º	14º	13º	12º	11º	10º	9º	8º	7º	6º	5º	4º	3º	2º	1º
Overall ranking	ARG	BRA	PER	COL	IND	MEX	ZAF	IDN	TUR	THA	RUS	POL	CHL	ESP	CHN	AUS	KOR	CAN
Availability and cost of labor			ESP	ZAF	POL	MEX	RUS	BRA	AUS	KOR	CAN	CHN	THA	CHL	COL	TUR	PER	IDN
Availability and cost of capital	BRA	ARG	RUS	PER	COL	TUR	ESP	MEX	POL	IDN	THA	IND	KOR	CHL	ZAF	CHN	AUS	CAN
Infrastructure and logistics	COL	IND	PER	BRA	IDN	ARG	RUS	MEX	CHL	TUR	THA	POL	ZAF	CHN	AUS	KOR	CAN	ESP
Taxation	ARG	ESP	BRA	POL	IND	CHN	MEX	PER	ZAF	AUS	CHL	TUR	RUS	COL	KOR	CAN	IDN	THA
Macroeconomic environment	ARG	BRA	ESP	ZAF	TUR	POL	MEX	RUS	IND	CAN	PER	THA	COL	AUS	CHL	KOR	IDN	CHN
Competition and scale of the domestic market	ARG	CHL	PER	ZAF	THA	COL	BRA	IND	POL	RUS	MEX	KOR	CAN	TUR	IDN	AUS	ESP	CHN
Business environment	ARG	BRA	IDN	ZAF	RUS	MEX	COL	THA	IND	PER	CHN	TUR	KOR	POL	ESP	CHL	AUS	CAN
Education				IDN	PER	MEX	THA	ZAF	COL	BRA	TUR	CHL	ESP	RUS	POL	KOR	AUS	CAN
Technology and innovation			CHL	COL	ARG	MEX	THA	BRA	POL	TUR	ZAF	RUS	IDN	ESP	CAN	AUS	CHN	KOR

■ (green) Brazil is in the third of countries in a more favorable position (positions 1 to 6)

■ (yellow) Brazil is in the middle third (positions 7-12)

■ (red) Brazil is in the bottom third (positions 13-18)

ARG: Argentina
AUS: Australia
CAN: Canada
CHL: Chile
CHN: China
COL: Colombia

ESP: Spain
IDN: Indonesia
IND: India
KOR: South Korea
MEX: Mexico
PER: Peru

POL: Poland
RUS: Russia
THA: Thailand
TUR: Turkey
ZAF: South Africa
◆ : Brazil

Note: The overall ranking was built based on the simple average between the figures for each country in the nine competitiveness factors. For more details, see the methodological note in the fifth section.

2. BRAZIL'S
COMPETITIVENESS
FACTORS

2.1 AVAILABILITY AND COST OF LABOR

FIGURE 2 – BRAZIL's POSITION IN THE AVAILABILITY AND COST OF LABOR FACTOR AND ITS ASSOCIATED SUB-FACTORS AND VARIABLES

AVAILABILITY AND COST OF LABOR
11th AMONG 16

Labor cost
12th
among 16

Compensation levels in manufacturing
6th among 17

Labor productivity in industry
15th among 17

Labor availability
10th

Labor force participation rate
6th

Labor force growth
14th

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 in a more favorable position (positions 1-6)

Brazil is in the middle third (positions 7-12)

Brazil is in the bottom third (positions 13-18)

High supply of workers is a positive factor for competitiveness

Brazil was ranked 11th in the Availability and cost of labor factor among the 16 countries assessed[3] and is in the middle third of the ranking.

This positive result in comparison with other factors reflects Brazil's performance in the Labor availability sub-factor, particularly its better position in the Labor force participation rate, in relation to which Brazil is in the top third of the ranking (6th position).

In relation to Labor cost, Brazil is in the bottom third of the ranking due to its position in the Labor productivity in industry variable, which is the 15th among 17 competitors, ahead of India and China only.

[3]No information is available for Argentina and India in connection with this factor.

The value attributed to this variable is so much lower than that recorded for other countries included in the ranking that although Brazil has the sixth lowest Compensation level in manufacturing - behind Indonesia, Colombia, Peru, Thailand, and Mexico - it was ranked in the bottom third (among the five lowest positions) in the Labor cost sub-factor.

As compared to the 2015 ranking, Brazil fell six positions in the Availability and cost of labor factor and is no longer positioned in the top third of the ranking.

This result mainly reflects a slowdown in the growth rate of the labor force, which became negative. As a result, Brazil fell from the 4th to the 14th position and was included in the lower third of the ranking in this variable.

In the Labor cost sub-factor, Brazil moved up one position due to a lower Compensation level in manufacturing. In this variable, the country rose from the ninth to the sixth position and was included in the top third of the ranking. This upward movement reflects not only a lower cost in Brazil, but also the drop of one position by China - the only country in which an increase in the cost was recorded - and the fact that India is no longer included in the ranking[4].

Overall, it should be noted that Indonesia rose five positions in the ranking, recording the second highest labor force growth rate, 3.1% - the highest rate is the one recorded by Turkey, 6.43%[5] . As a result of having risen positions in the ranking, Indonesia ranks first now in the Availability and cost of labor factor. Turkey ranks third, behind Peru.

FIGURE 3 - AVAILABILITY AND COST OF LABOR FACTOR

Country	Score
Indonesia	5.9
Peru	5.6
Turkey	5.6
Colombia	5.6
Chile	5.4
Thailand	5.3
China	5.2
Canada	5.1
South Korea	5.1
Australia	5.1
Brazil	5.1
Russia	5.0
Mexico	4.8
Poland	4.6
South Africa	4.6
Spain	4.3

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

[4] India is not considered in the ranking for this variable because information is missing for this purpose. In the 2015 ranking, India recorded the lowest Compensation level in manufacturing (1st position).

[5] The reference period for the labor force growth is 2014.

2.2 AVAILABILITY AND COST OF CAPITAL

FIGURE 4 – BRAZIL's POSITION IN THE AVAILABILITY AND COST OF CAPITAL FACTOR AND ITS ASSOCIATED SUB-FACTORS AND VARIABLES

AVAILABILITY AND COST OF CAPITAL
18th

Capital cost
18th

Interest rate spread
18th

Real short-term interest rate
18th

Capital availability
16th

Ease of access to loans
14th

Ease of financing through local equity market
16th

Stock market size
16th

Venture capital availability
17th

Financial system performance
9th among 17

Banking sector assets
6th among 17

Country credit rating
12th

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 in a more favorable position
(positions 1-6)

Brazil is in the middle third
(positions 7-12)

Brazil is in the bottom third
(positions 13-18)

Interest rate leads Brazil to be ranked last in Availability and cost of capital

Although Brazil is in the bottom third of the ranking in five of nine competitiveness-determinant factors, it was only in Availability and cost of capital that the country was ranked last among the 18 countries assessed.

Brazil's poor performance is due to the Capital cost and Capital availability sub-factors. In Financial system performance, the third sub-factor of the Availability and cost of capital factor, Brazil occupies an intermediate position.

In the variables associated with the Capital cost sub-factor, Brazil has the highest real short-term interest rate, 11%, and the highest interest rate spread, 31.3%[6]. The second highest interest rate is the one recorded by India, 3.5%, and the second highest interest rate spread is the one recorded by Peru, 13.8%.

In all financing modes assessed in connection with the Capital availability sub-factor - bank loans, stock market, and venture capital - Brazil is in the bottom third of the ranking (six last positions).

In relation to the 2015 ranking, Brazil fell one position in Capital availability for having fallen positions in all variables associated with this sub-factor. Despite falling four positions in the Country credit rating variable, Brazil remained in the middle third in terms of Financial system performance. This result is due to Brazil's better position in Banking sector assets, in relation to which it occupies the sixth position.

Spain's recovery in the Availability and cost of capital factor due to its better performance in Capital availability, which led it to rise from the 16th to the 12th position, deserves special mention. In Financial system performance, the higher score of Spain in Country credit rating, which led it to rise five positions in the ranking for this variable, is worthy of mention.

FIGURE 5 - AVAILABILITY AND COST OF CAPITAL FACTOR
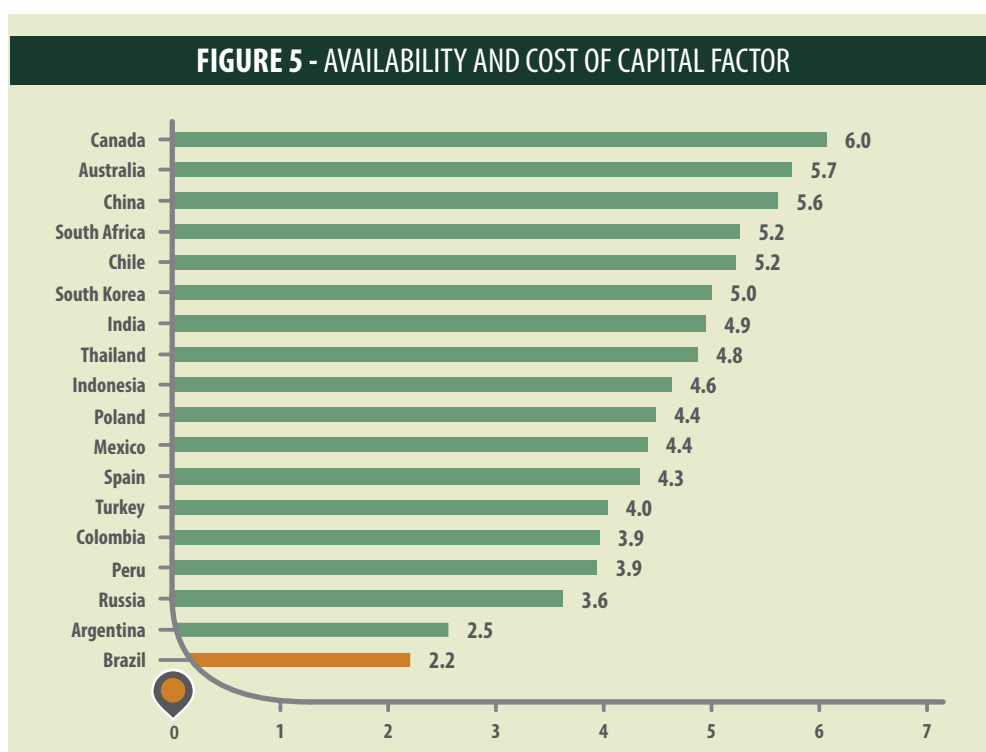
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

[6] The reference period for the interest rate and spread data is 2015.

2.3 INFRASTRUCTURE AND LOGISTICS

FIGURE 6 - BRAZIL's POSITION IN THE INFRASTRUCTURE AND LOGISTICS
FACTOR AND ASSOCIATED SUB-FACTORS AND VARIABLES

INFRASTRUCTURE AND LOGISTICS
15th

Transport infrastructure
18th

Quality of roads
16th

Quality of railroad infrastructure
17th

Quality of port infrastructure
18th

Liner shipping connectivity
12th

Quality of airport infrastructure
18th

Energy infrastructure
10th among 10

Electricity costs for industrial clients
10th among 10

Availability of electricity
7th

Telecommunications infrastructure
8th

ICT Use
6th

ICT Access
9th

International logistics
15th

Logistic Performance Index (LPI)
13th

Time and cost to export and import goods
17th

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 in a more favorable position (positions 1-6)

Brazil is in the middle third (positions 7-12)

Brazil is in the bottom third (positions 13-18)

Improvements were not sufficient to increase competitiveness

In terms of infrastructure and logistics, Brazil was ranked 15th among the 18 selected countries. This result reflects the low competitiveness of the country in the Transport infrastructure, Energy infrastructure, and International logistics sub-factors. Telecommunications infrastructure is the only sub-factor in which Brazil is not in the bottom third of the ranking (among the six lowest ranking countries), occupying the eighth position (middle third).

In all transportation modes - roads, railroads, and port and air transportation infrastructure - Brazil was ranked among the lowest ranking countries in the 2016 ranking based on variables from an opinion survey. Liner shipping connectivity[7] is the only sub-sector in which Brazil was ranked in the middle third of the ranking, occupying the 12th position.

Although it was ranked favorably in terms of Availability of electricity as the seventh largest producer of electricity and heat in relation to GDP, Brazil was ranked last in the Energy infrastructure sub-factor. This result reflects the high cost of electricity for industrial clients, U$ 0.16 per kWh, in relation to its cost in the 10 countries assessed[8].

In terms of Telecommunications infrastructure, Brazil was ranked sixth in the indicator that measures Internet use and ninth in the indicator that measures the access of its population to information and communication technologies.

As compared to the previous ranking, it can be seen that Brazil's averages rose in all transportation modes. However, the effect of this increase on Brazil's capacity to compete depends on a comparison with the trends observed in other countries. In relative terms, there was no change in Brazil's position, which remains in the bottom third of the ranking in terms of Transport infrastructure.

FIGURE 7 - INFRASTRUCTURE AND LOGISTICS FACTOR

Spain 8.1
Canada 7.8
South Korea 7.4
Australia 7.3
China 6.3
South Africa 5.8
Poland 5.8
Thailand 5.5
Turkey 5.4
Chile 5.3
Mexico 5.0
Russia 4.9
Argentina 4.8
Indonesia 4.4
Brazil 4.2
Peru 4.1
India 4.1
Colombia 3.8
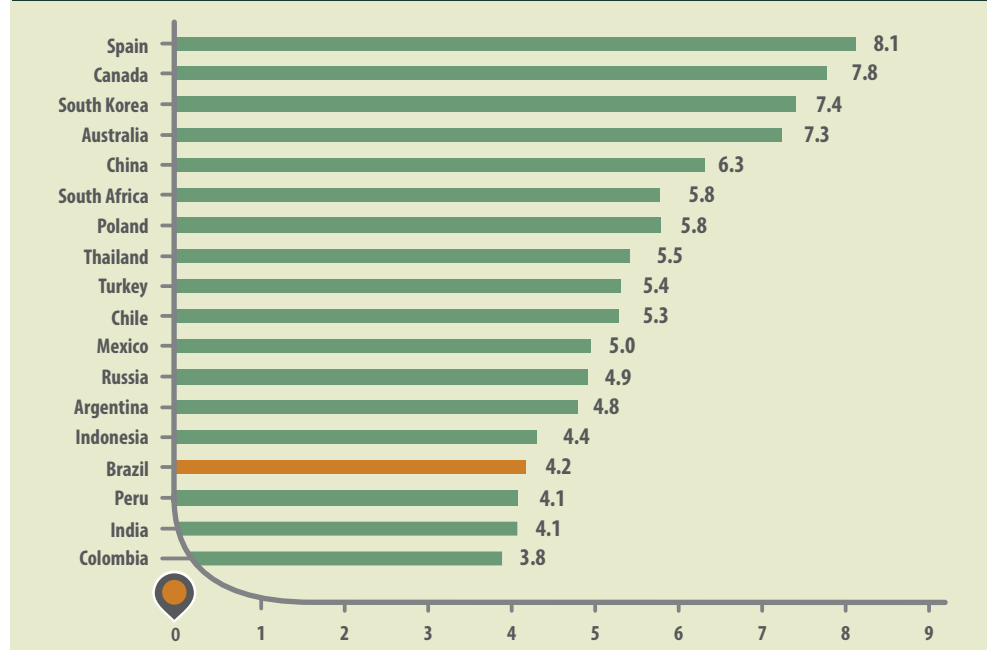
Source: CNI
Note: Average scores (0 = worst performance: 10 = best performance).

[7] The index is the average of five components: (a) number of ships; (b) container-carrying capacity of ships; (c) maximum vessel size; (d) number of services and (e) number of companies that deploy container ships on services from and to a country's ports.

[8] The reference period for electricity cost is 2015. The data for Brazil is a CNI estimate based on rate data provided by ANEEL and on exchange rate data provided by the World Bank. No information is available for Argentina, Australia, Canada, China, South Africa, Spain, Thailand, and Peru. These countries were not included in the ranking.

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2.4 TAXATION

FIGURE 8 - BRAZIL's POSITION IN THE TAXATION FACTOR AND ASSOCIATED SUB-FACTORS AND VARIABLES

TAXATION
16th

Taxes
16th

Collected total
tax revenues
11th

Corporate
tax rates
16th

Total tax
rate (% of profit)
16th

Indirect tax
rates
14th

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 in a more favorable position (positions 1-6)

Brazil is in the middle third (positions 7-12)

Brazil is in the bottom third (positions 13-18)

Brazil was only ranked above Spain and Argentina

In the Taxation factor, Brazil is in the bottom third of the ranking of the 18 countries assessed. Among the four variables considered for this factor, Collected total tax revenues[9] was the only one in which Brazil was not ranked among the lowest ranking countries, occupying a middle position.

As compared to the 2015 ranking, Brazil fell three positions in terms of Collected total tax revenues, although no change was recorded in the value of this variable - in terms of GDP, total tax revenue[10] in Brazil is 21%. The change in Brazil's ranking is explained by the progress achieved by Russia, Mexico, and China. In Russia, for example, the percentage dropped from 24% to 18%. As a result, the country rose seven positions in the ranking for this variable and six positions in the Taxation factor[11].

In the final calculation, Brazil remained in the 16th position in the Taxation factor, as no changes were recorded in the other variables.

FIGURE 9 - TAXATION FACTOR

Country	Score
Thailand	7.7
Indonesia	7.5
Canada	6.8
South Korea	6.7
Colombia	6.4
Russia	6.4
Turkey	6.3
Chile	6.2
Australia	6.2
South Africa	6.1
Peru	6.1
Mexico	5.9
China	5.9
India	5.8
Poland	5.2
Brazil	5.2
Spain	4.9
Argentina	3.5
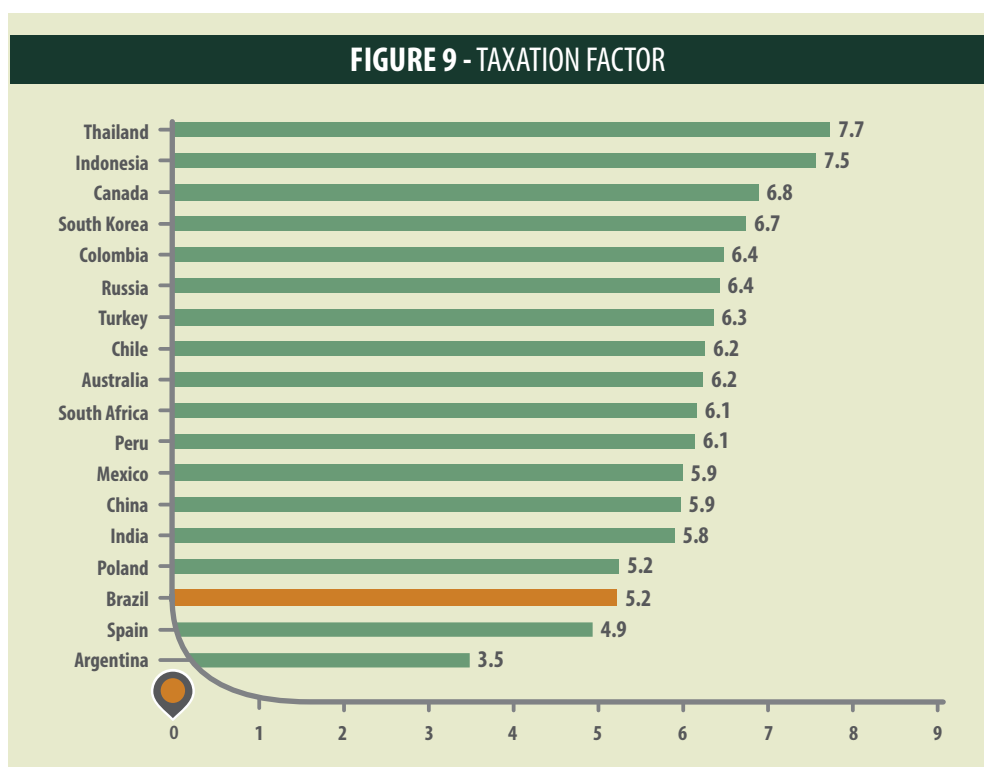
Source: CNI
Note: Average scores (0 = worst performance: 10 = best performance).

[9] Collected total tax revenues as a percentage of GDP.

[10] The reference period of Collected total tax revenues 2014. The reference period for the 2015 ranking is 2013.

[11] The data provided by the IMD Competitiveness Yearbook 2016 is compared with that provided by the 2015 edition.

2.5 MACROECONOMIC ENVIRONMENT

FIGURE 10 - BRAZIL'S POSITION IN THE MACROECONOMIC ENVIRONMENT FACTOR
AND ASSOCIATED SUB-FACTORS AND VARIABLES

MACROECONOMIC ENVIRONMENT
17th

Macroeconomic
indicators
17th

Inflation
16th among 17

General
government
debt
16th

General
government net
debt interest
payments
18th

Gross fixed
capital
formation
17th

Direct
investment
flows inward
2nd

Real effective
exchange rate
3rd

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
in a more favorable position**
(positions 1-6)

Brazil is in the middle third
(positions 7-12)

Brazil is in the bottom third
(positions 13-18)

Deterioration of the macroeconomic environment reduces competitiveness even more

The Macroeconomic Environment factor contributes negatively to the country's competitiveness in the 2016 ranking. As a result of high inflation, gross debt and interest payments, and a low investment rate, Brazil was ranked next to last among the 18 countries assessed, ahead of Argentina. Among the six variables associated with this factor, it should be noted that Brazil is in the top third in terms of exchange rate and foreign direct investment.

In the 2016 ranking, inflation[12] in Brazil, 9%, was second only to the one recorded in Russia, 15.5%. In relation to the investment rate, Brazil was ranked 17th with a rate of 18.2%, higher only than the one recorded in Argentina. In China and Indonesia, which are high-growth emerging countries, the investment rate hit the mark of 44.3% and 33.2%, respectively[13] .

With regard to the variable General government debt, Brazil was ranked 16th, ahead of Spain and Canada. In Brazil, General government debt accounted for 73.7% of GDP in 2015. The percentage in Spain is 99% and 91.5% in Canada.

However, this analysis of the gross debt/GDP ratio must be supplemented with data on the debt profile. Brazil has the highest interest payments on government debt among the 18 countries, namely, 8.4% of GDP in 2015. In Spain and Canada, interest payments amounts to 2.7% and 0.7% of GDP, respectively.

In the comparison between the 2015 and 2016 rankings, the fact that Brazil moved up two positions in the ranking for the real exchange rate variable[14] deserves special mention. The Brazilian currency devalued by 25.6%, standing third in the ranking. Brazil lost positions in relation to inflation and investment rate variables and fell two positions in the Macroeconomic Environment factor.

FIGURE 11 - MACROECONOMIC ENVIRONMENT FACTOR

Country	Score
China	7.0
Indonesia	6.4
South Korea	6.2
Chile	6.2
Australia	6.1
Colombia	6.1
Thailand	6.0
Peru	6.0
Canada	5.8
India	5.8
Russia	5.7
Mexico	5.7
Poland	5.6
Turkey	5.6
South Africa	5.5
Spain	5.4
Brazil	5.2
Argentina	4.4
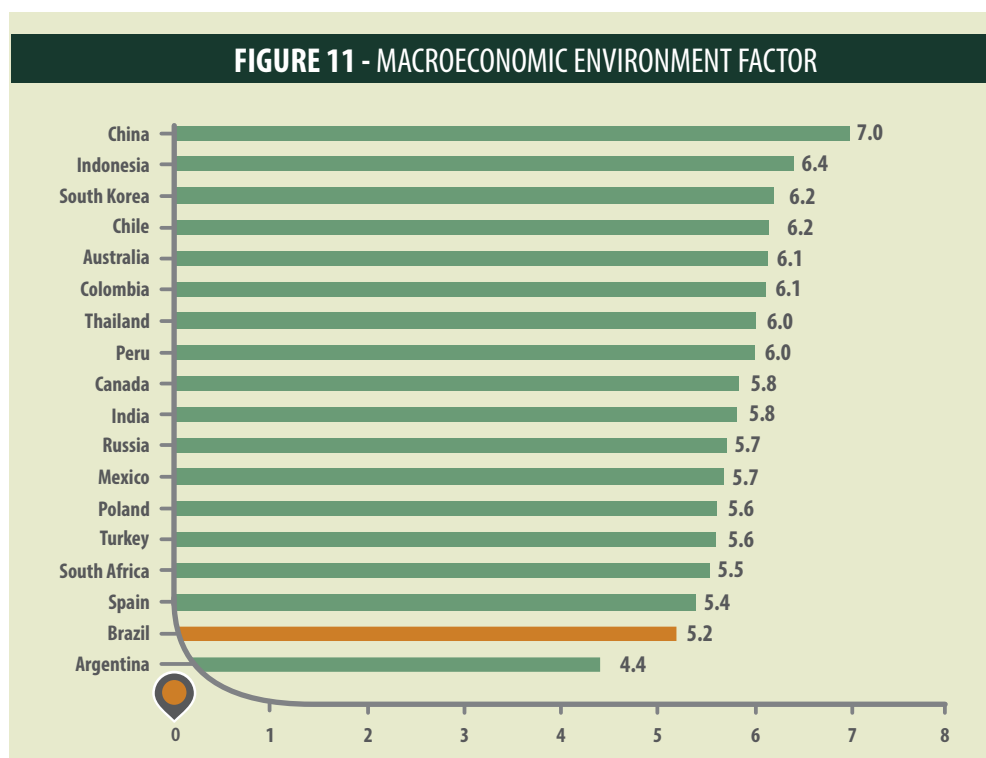
Source: CNI
Note: Average scores (0 = worst performance: 10 = best performance).

[12] The reference period for the six variables associated with the Macroeconomic Environment factor is 2015.

[13] The data for China provided by the IMD Competitiveness Yearbook 2016 refers to the year 2014.

[14] This variable measures the extent to which the real exchange rate in December 2015 varied in relation to the average monthly rates recorded in the last five years to December 2015. This is interpreted as follows: the more depreciated the exchange rate, the more it contributes positively to the competitiveness of countries.

2.6 COMPETITION AND SCALE OF THE DOMESTIC MARKET

FIGURE 12 - BRAZIL's POSITION IN THE COMPETITION AND SCALE OF THE DOMESTIC MARKET FACTOR AND ASSOCIATED SUB-FACTORS AND VARIABLES

COMPETITION AND SCALE OF THE DOMESTIC MARKET
12th

Competition
16th

Trade tariffs
17th

Scale
4th

Domestic
market size
4th

Intensity of
local competition
12th

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 in a more favorable position (positions 1-6)

Brazil is in the middle third (positions 7-12)

Brazil is in the bottom third (positions 13-18)

Decline in the consumer market and lower competition led Brazil to lose its position

In the Competition and scale of the domestic market factor, Brazil is in the middle third of the ranking and occupies the 12th position. This result reflects the positive performance of the country in the Scale sub-factor, as it has the fourth largest domestic market. The Competition sub-factor in turn has been contributing negatively to its competitiveness, especially in relation to its performance in the Trade tariffs variable.

Brazil has the second highest average tariff rate applied to imports of goods[15], 11.5%, behind India, the rate of which was 13%. The figure recorded in Brazil is so much higher than the one observed in the highest ranking countries that the negative effect caused by this variable prevails. In South Korea, which occupies the 14th position in the ranking, the average rate is 7.08%. Spain and Poland were both ranked first, with an average rate of 1.04%.

As compared to the 2015 ranking, the country fell two positions in the Competition and scale of the domestic market factor. In relation to the Domestic market size, Brazil switched positions with Russia, falling from the third to the fourth position as a result of a sharper shrinkage of the market[16].

In relation to the Intensity of local competition variable based on an opinion survey, Brazil fell from the ninth to the 12th position. This result reflects a decrease in the intensity of competition in the country's domestic market - on a scale of 1 to 7, the score reduced from 5.37 to 5.26 - and the fact that some countries improved their positions in the ranking. South Africa, for example, moved up five positions and was ranked sixth, with a score of 5.46.

FIGURE 13 - COMPETITION AND SCALE OF THE DOMESTIC MARKET FACTOR

China	8.4
Spain	8.0
Australia	8.0
Indonesia	7.8
Turkey	7.8
Canada	7.8
South Korea	7.7
Mexico	7.6
Russia	7.6
Poland	7.5
India	7.3
Brazil	7.2
Colombia	7.0
Thailand	7.0
South Africa	7.0
Peru	6.8
Chile	6.8
Argentina	6.0
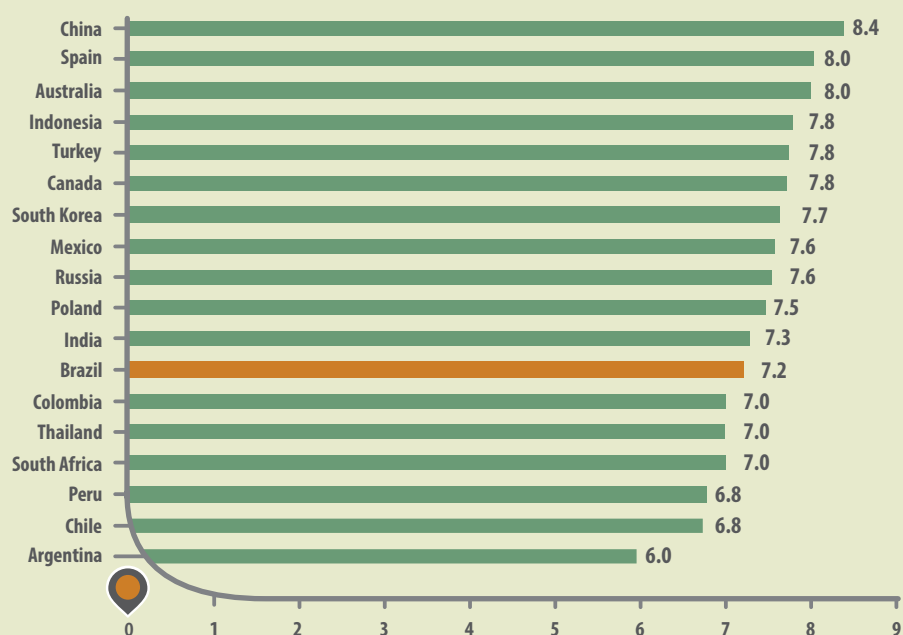
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

[15] The reference period for the average tariff rate applied to imports is 2015. For Colombia, Mexico, and Peru, the data refers to 2014. For India, the data refers to 2009.

[16] The data provided by the Global Competitiveness Report of the World Economic Forum 2015-2016 is compared with the one provided for 2016-2017.

2.7 BUSINESS
ENVIRONMENT

FIGURE 14 - BRAZIL'S POSITION IN THE BUSINESS ENVIRONMENT
FACTOR AND ASSOCIATED SUB-FACTORS AND VARIABLES

BUSINESS ENVIRONMENT
17th

Government
Efficiency
17th

Legal certainty,
red tape and
labor relations
17th

Irregular
payments and
bribes
18th

Rule of Law
11th

Regulatory
Quality
14th

Starting a
business
18th

Transparency
of government
policymaking
18th

Flexibility
of wage
determination
16th

Hiring and
firing practices
18th

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
in a more favorable position**
(positions 1-6)

Brazil is in the middle third
(positions 7-12)

Brazil is in the bottom third
(positions 13-18)

Brazil occupies the next-to-last position in Business environment

Occupying the 17th position in the ranking for the two sub-factors - Government efficiency and Legal certainty, red tape and labor relations - Brazil ranked next to last in the Business Environment factor among the 18 countries assessed.

The Government efficiency factor assesses the efficiency with which the government operations are executed based on perceptions on: the transparency of political decisions; the quality of regulation and the ability to formulate and implement policies, and the occurrence of irregular payments and bribes.

Brazil ranks next to last in both the ranking for the Irregular payments and bribes variable and for the Transparency of government policymaking variable. In the Regulatory quality variable, the country ranks 14th.

In Legal certainty, red tape and labor relations, regulatory issues that have a direct impact on the private sector are evaluated based on perceptions on the following: ease of starting a business; flexibility of labor rules in determining wages and hiring and firing procedures, and enforcement of legal provisions (aspects related to the enforcement of contracts, property rights, the police, and court decisions).

Only in Rule of Law Brazil is not in the bottom third of the ranking (among the last six positions), standing at 11th.

The case of Chile deserves special mention, as in contrast to Brazil's performance, the only variable in which it is not in the top third of the ranking is in flexibility of labor rules for hiring and firing workers. In the final calculation, Chile ranks third in the Business environment factor, behind Australia and Canada.

FIGURE 15 - BUSINESS ENVIRONMENT FACTOR

Country	Score
Canada	8.6
Australia	8.0
Chile	7.5
Spain	6.5
Poland	6.4
South Korea	6.4
Turkey	5.9
China	5.6
Peru	5.5
India	5.5
Thailand	5.4
Colombia	5.4
Mexico	5.4
Russia	5.3
South Africa	5.2
Indonesia	4.8
Brazil	3.6
Argentina	3.3
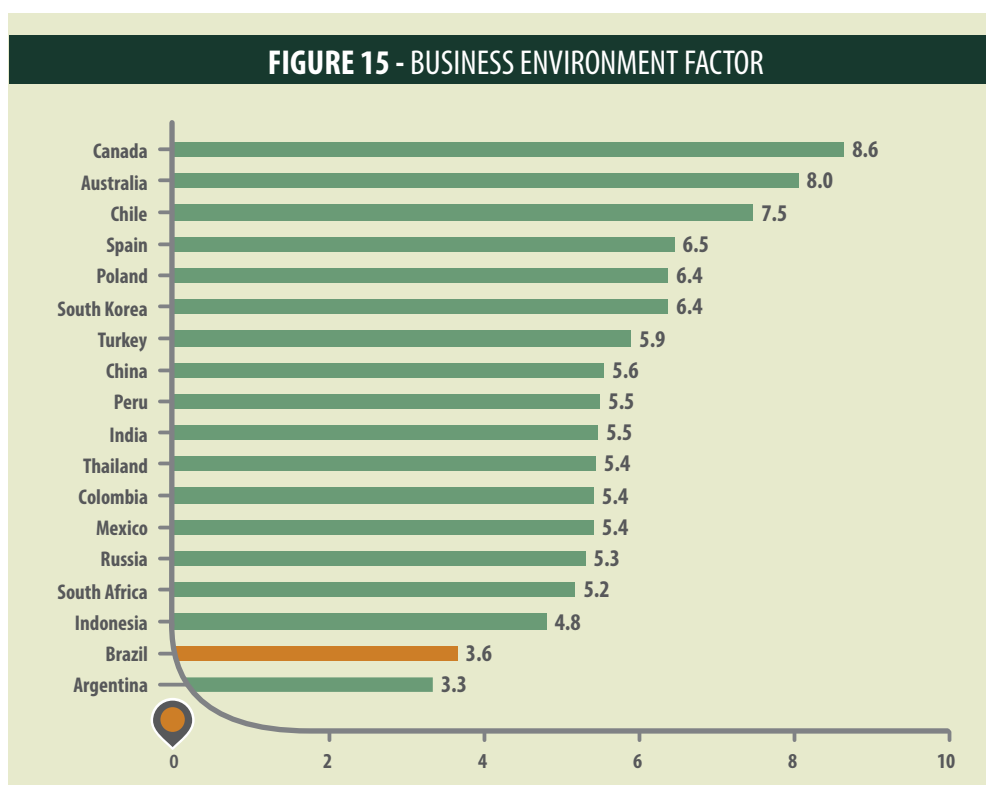
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

2.8 EDUCATION

FIGURE 16 - BRAZIL's POSITION IN THE EDUCATION FACTOR AND ASSOCIATED SUB-FACTORS AND VARIABLES

EDUCATION
9th among 15

Educational attainment
10th among 13

Educational assessment
12th among 14

Expenditure on education
4th

Gross enrolment ratio in secondary education
6th

Performance in mathematics
14th among 14

Total public expenditure on education
2nd

Gross enrolment ratio in tertiary education
11th among 16

Performance in reading
12th among 14

Total public expenditure on education per capita
5th

Percentage of adults who have attained at least upper secondary education
9th among 13

Performance in science 13th among 14

Percentage of adults who have attained tertiary education
11th among 13

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 in a more favorable position (positions 1-6)

Brazil is in the middle third (positions 7-12)

Brazil is in the bottom third (positions 13-18)

High expenditure on education improves Brazil's position, but results are still low

Brazil ranks 9th among 15 countries for which information is available[17] about the education factor, standing in the middle third of the ranking.

This result reflects the positive performance of the country in the Expenditure on education sub-factor, in relation to which it occupies the fourth position in the ranking, since in the other dimensions associated with the factor - educational attainment and educational assessment - it is in the lower third of the ranking.

Both in the variable that measures total public expenditure on education as a percentage of GDP and in the variable measuring this expenditure in per capita terms Brazil is in the top third of the ranking (among the six highest ranking countries). In the 2016 ranking, the volume of resources earmarked for education in Brazil accounted for 6.4% of GDP in 2014, second only to that observed in South Africa (7.3%)[18].

Although it is in the middle third of the ranking in Gross enrolment ratio in tertiary education, Brazil had a weak performance in the variable that measures the Percentage of adults who have attained tertiary education - the country was ranked 11th among 13 countries for which information is available[19]. In the final calculation, Brazil was ranked 10th among 13 countries in the Educational attainment factor.

Regarding the quality of education, as reflected in the PISA 2015 assessments, Brazil was ranked 12th among 14 countries[20,21]. In the three areas assessed by PISA, Brazil is in the bottom third of the ranking. In the evaluation in mathematics, Brazil was ranked last; in science, only the performance of Peru was worse than that of Brazil and in reading the country was ranked 12th, ahead of Indonesia and Peru. Among Latin American countries, Chilean students had the best performance, ranking 7th in the Educational assessment sub-factor.

[17] No information is available for Argentina, China, and India, which were not included in the ranking.

[18] The source is the IMD Competitiveness Yearbook 2016. The reference period for the analysis is 2014. For Australia, Canada, Chile, South Korea, Peru and Spain the data is from 2012. For Argentina and Poland, the data is from 2013.

19 The source is the OECD report Education at a Glance 2016. No information is available for Argentina, China, India, Thailand, and Peru.

[20] PISA (Program for International Student Assessment) is a survey carried out by OECD with 15-year-old students to evaluate their knowledge and skills in science, reading and mathematics. In 2015, 72 countries participated in the survey.

[21] No data is available for Argentina, China, India, and South Africa.

FIGURE 17 - EDUCATION FACTOR

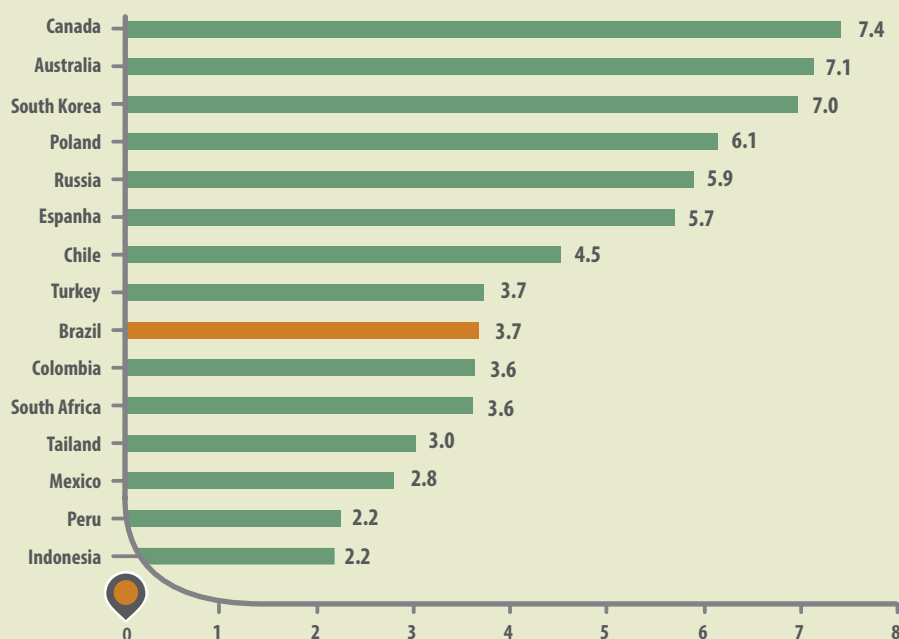| Country	Score
Canada	7.4
Australia	7.1
South Korea	7.0
Poland	6.1
Russia	5.9
Espanha	5.7
Chile	4.5
Turkey	3.7
Brazil	3.7
Colombia	3.6
South Africa	3.6
Tailand	3.0
Mexico	2.8
Peru	2.2
Indonesia	2.2

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

2.9 TECHNOLOGY
AND INNOVATION

FIGURE 18 - BRAZIL's POSITION IN THE TECHNOLOGY AND
INNOVATION FACTOR AND ASSOCIATED SUB-FACTORS AND VARIABLES

TECHNOLOGY AND INNOVATION
11th among 16

Government
support
10th among 17

Gross domestic
expenditure on R&D
5th among 17

Government
procurement of
advanced
tech products
15th

R&D and
innovation in
companies
13th among 16

Gross
expenditure on
R&D performed by
business enterprise
9th among 16

Capacity for
innovation
17th

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
in a more favorable position**
(positions 1-6)

Brazil is in the middle third
(positions 7-12)

Brazil is in the bottom third
(positions 13-18)

[22] No information is
available for India and
Peru, which were not
included in the ranking.

[23] No information is
available for Peru.

[24] The source is UNESCO.
The reference period for
the analysis is 2014, but
for Australia, Brazil, and
Indonesia, the latest data
available is from 2013
and for South Africa it is
from 2012.

Investment in R&D of government and companies place Brazil in the middle third of the ranking in terms of competitiveness

Brazil occupies an intermediate position in the ranking for the Technology and innovation factor - it was ranked 11th among 16 countries[22] .

This result reflects Brazil's better position in the Government support sub-factor, especially in the Gross domestic expenditure on R&D variable, in which it was ranked fifth among 17 countries assessed[23]. Total spending on R&D in Brazil accounted for 1.24% of GDP, while in South Korea, the top-ranking country, the percentage was 4.29%[24] .

The R&D and innovation in companies sub-factor has a negative effect on Brazil's competitiveness due to the low innovativeness recorded in the country. Brazil was ranked next to last in the Capacity for innovation variable, ahead only of Peru[25]. In Gross expenditure on R&D performed by business enterprise, Brazil was ranked ninth among 16 countries assessed, with such expenditure accounting for 0.42% of GDP[26]. The effort made by the private sector in the R&D area in South Korea also led it to be ranked first, with expenditures accounting for 3.36% of GDP.

Comparing the 2015 and 2016 rankings, Brazil fell from the middle to the bottom third in the ranking for the R&D and innovation in companies sub-factor as a result of having lost positions in both variables associated with this factor.

The private sector in Brazil reduced its expenditure on R&D from 0.51% in 2013 to 0.42% in 2014 (the reference year for the ranking). As a result, the country fell from seventh to ninth among 16 countries assessed. It should be noted that Argentina, Brazil, Chile, and Colombia reduced this spending over the period, while China, Poland, South Korea, Russia, Turkey, and Thailand increased it.

Regarding the ability of Brazilian companies to innovate, although it did not lose positions (on a scale of 1-7, Brazil's score remained at 3.8), Brazil fell four positions in this variable due to the higher score recorded by most countries[27] .

In the final calculation, Brazil fell two positions in the Technology and innovation factor. Despite this decline, it remained in the middle third of the ranking.

FIGURE 19 - TECHNOLOGY AND INNOVATION FACTOR

Country	Score
South Korea	7.9
China	5.5
Australia	5.1
Canada	4.3
Spain	3.6
Indonesia	3.4
Russia	3.4
South Africa	3.2
Turkey	3.2
Poland	2.9
Brazil	2.7
Thailand	2.7
Mexico	2.5
Argentina	2.2
Colombia	2.1
Chile	2.0
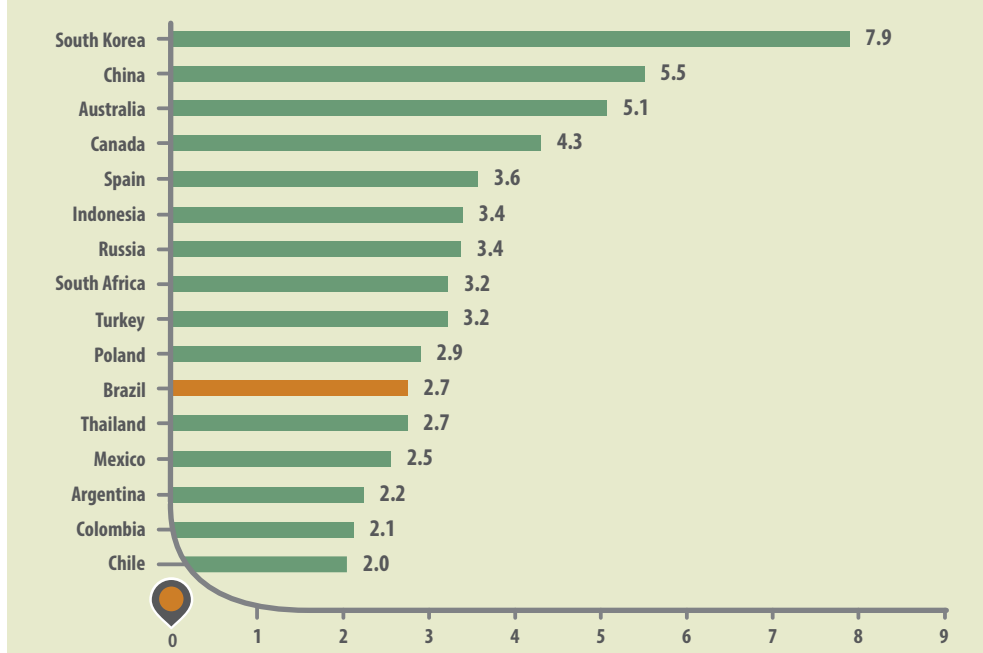
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance).

[25] This is a variable based on an opinion survey on the innovation capacity of companies.

[26] The reference period for Gross expenditure on R&D performed by business enterprise is 2014. The latest data available for Brazil in this regard is from 2010. For 2013 and 2014, the data is a CNI estimate based on Gross expenditure on R&D by the private sector as calculated in IBGE's National Accounts - reference year 2010.

[27] The data from the Global Competitiveness Report of the World Economic Forum 2015-2016 is compared with that for 2016-2017.

3. BRAZIL'S COMPETITIVE ADVANTAGES AND DISADVANTAGES AS COMPARED TO THOSE OF EACH OF THE 17 SELECTED COUNTRIES

The charts included in this section compare the evaluation of Brazil's performance with that of each of the 17 selected countries in relation to the nine factors that have a bearing on the competitive capacity of their companies.

The results of the evaluation of Brazil and of a given country in relation to a specific competition-related factor are shown on a spider web chart. Each radius on the chart corresponds to one of the nine factors and originates at the center of the circle. The factors are identified by a capital letter.

The farther from the center of the circle, the better the result achieved by the country in relation to that competitive factor (on a scale of 0-10). The distance between two points on the same radius indicates the performance differential between Brazil and a given country with regard to the competitiveness factor associated with the radius.

The colored lines, which connect points in the different radii and are associated with a country, have no specific meaning, as they are only a means to provide an overview of the position of the two countries in relation to the set of nine factors considered.

The indication of the axes associated with each of the competitiveness factors follows the following correspondence:

L   availability and cost of labor

K   availability and cost of capital

G   infrastructure and logistics

F   taxation

M   macroeconomic environment

C   competition and scale of the domestic market

N   business environment

E   education

T   technology and innovation

FIGURE 20 - BRAZIL – SOUTH AFRICA COMPARISON
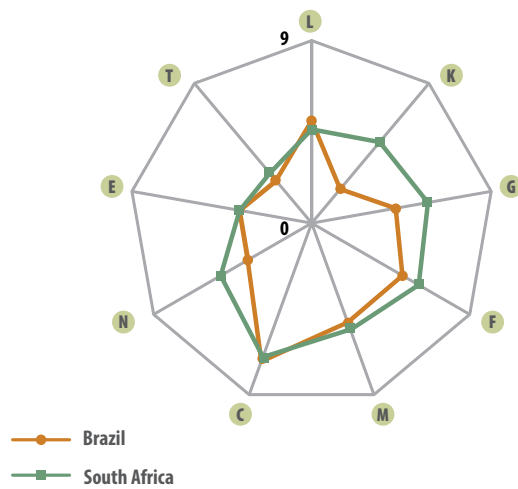
	Brazil	South Africa
Availability and cost of labor	5.1	4.6
Availability and cost of capital	2.2	5.2
Infrastructure and logistics	4.2	5.8
Taxation	5.2	6.1
Macroeconomic environment	5.2	5.5
Competition and scale of the domestic market	7.2	7.0
Business environment	3.6	5.2
Education	3.7	3.6
Technology and innovation	2.7	3.2

FIGURE 21 - BRAZIL – ARGENTINA COMPARISON

	Brazil	Argentina
Availability and cost of labor	5.1	
Availability and cost of capital	2.2	2.5
Infrastructure and logistics	4.2	4.8
Taxation	5.2	3.5
Macroeconomic environment	5.2	4.4
Competition and scale of the domestic market	7.2	6.0
Business environment	3.6	3.3
Education	3.7	
Technology and innovation	2.7	2.2

FIGURE 22 - BRAZIL – AUSTRALIA COMPARISON
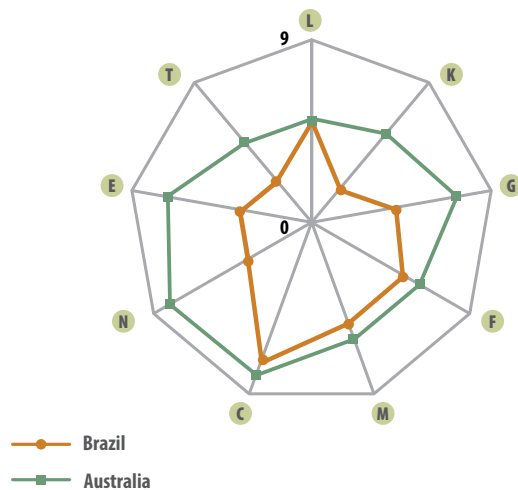
	Brazil	Australia
Availability and cost of labor	5.1	5.1
Availability and cost of capital	2.2	5.7
Infrastructure and logistics	4.2	7.3
Taxation	5.2	6.2
Macroeconomic environment	5.2	6.1
Competition and scale of the domestic market	7.2	8.0
Business environment	3.6	8.0
Education	3.7	7.1
Technology and innovation	2.7	5.1

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FIGURE 23 - BRAZIL – CANADA COMPARISON
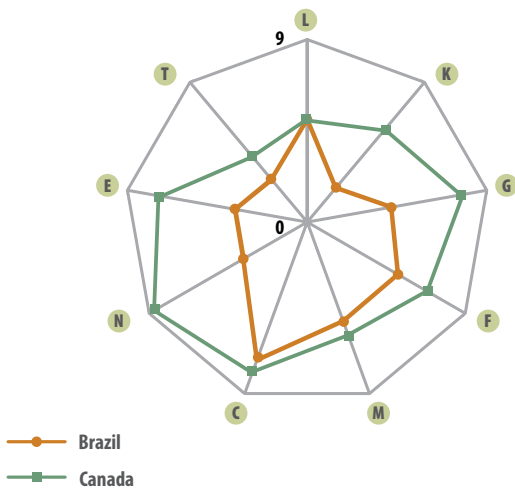
	Brazil	Canada
Availability and cost of labor	5.1	5.1
Availability and cost of capital	2.2	6.0
Infrastructure and logistics	4.2	7.8
Taxation	5.2	6.8
Macroeconomic environment	5.2	5.8
Competition and scale of the domestic market	7.2	7.8
Business environment	3.6	8.6
Education	3.7	7.4
Technology and innovation	2.7	4.3

Brazil
Canada

FIGURE 24 - BRAZIL – CHILE COMPARISON
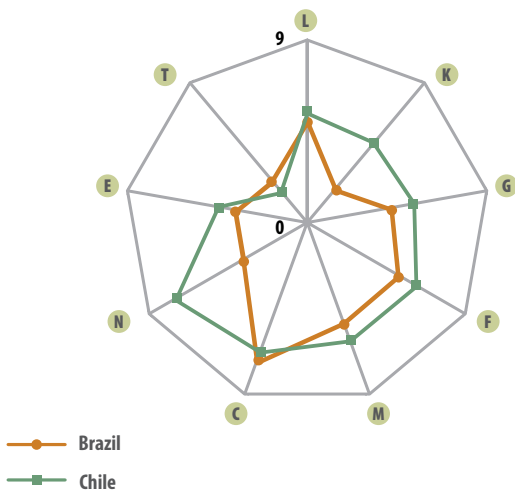
	Brazil	Chile
Availability and cost of labor	5.1	5.4
Availability and cost of capital	2.2	5.2
Infrastructure and logistics	4.2	5.3
Taxation	5.2	6.2
Macroeconomic environment	5.2	6.2
Competition and scale of the domestic market	7.2	6.8
Business environment	3.6	7.5
Education	3.7	4.5
Technology and innovation	2.7	2.0

Brazil
Chile

FIGURE 25 - BRAZIL – CHINA COMPARISON

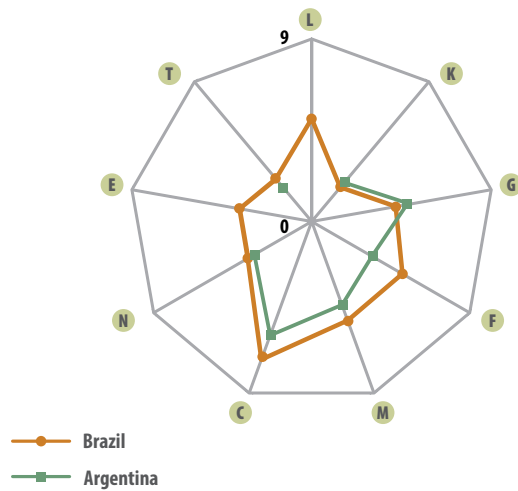|	Brazil	China
Availability and cost of labor	5.1	5.2
Availability and cost of capital	2.2	5.6
Infrastructure and logistics	4.2	6.3
Taxation	5.2	5.9
Macroeconomic environment	5.2	7.0
Competition and scale of the domestic market	7.2	8.4
Business environment	3.6	5.6
Education	3.7	
Technology and innovation	2.7	5.5

Brazil
China

COMPETITIVENESS
FACTORS

L availability and cost of labor

K availability and cost of capital

G infrastructure and logistics

F taxation

M macroeconomic environment

C competition and scale of the domestic market

N business environment

E education

T technology and innovation

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FIGURE 26 - BRAZIL – COLOMBIA COMPARISON
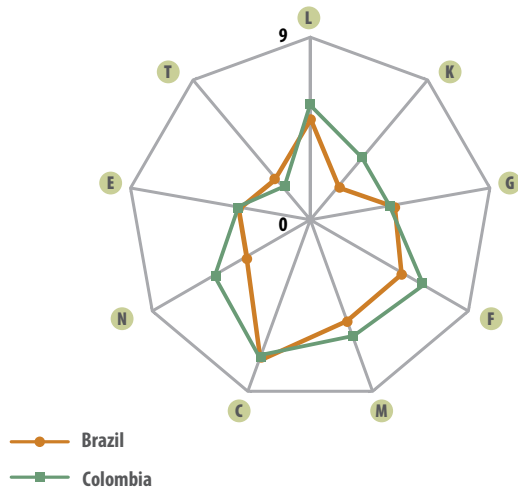
	Brazil	Colombia
Availability and cost of labor	5.1	5.6
Availability and cost of capital	2.2	3.9
Infrastructure and logistics	4.2	3.8
Taxation	5.2	6.4
Macroeconomic environment	5.2	6.1
Competition and scale of the domestic market	7.2	7.0
Business environment	3.6	5.4
Education	3.7	3.6
Technology and innovation	2.7	2.1

FIGURE 27- BRAZIL – SOUTH KOREA COMPARISON
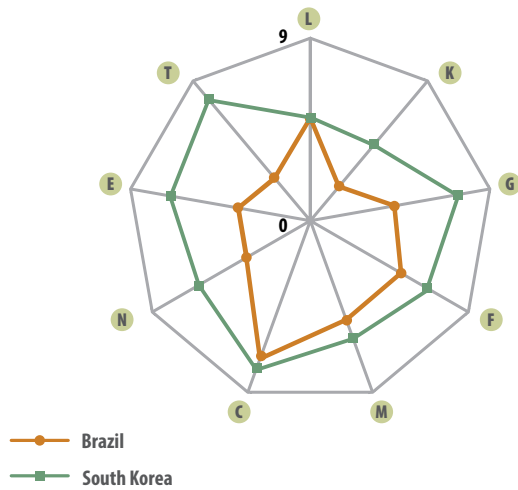
	Brazil	South Korea
Availability and cost of labor	5.1	5.1
Availability and cost of capital	2.2	5.0
Infrastructure and logistics	4.2	7.4
Taxation	5.2	6.7
Macroeconomic environment	5.2	6.2
Competition and scale of the domestic market	7.2	7.7
Business environment	3.6	6.4
Education	3.7	7.0
Technology and innovation	2.7	7.9

FIGURE 28 - BRAZIL – SPAIN COMPARISON
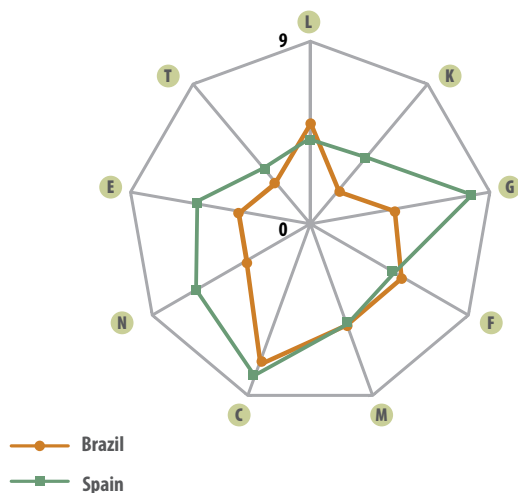
	Brazil	Spain
Availability and cost of labor	5.1	4.3
Availability and cost of capital	2.2	4.3
Infrastructure and logistics	4.2	8.1
Taxation	5.2	4.9
Macroeconomic environment	5.2	5.4
Competition and scale of the domestic market	7.2	8.0
Business environment	3.6	6.5
Education	3.7	5.7
Technology and innovation	2.7	3.6

FIGURE 29 - BRAZIL – INDIA COMPARISON
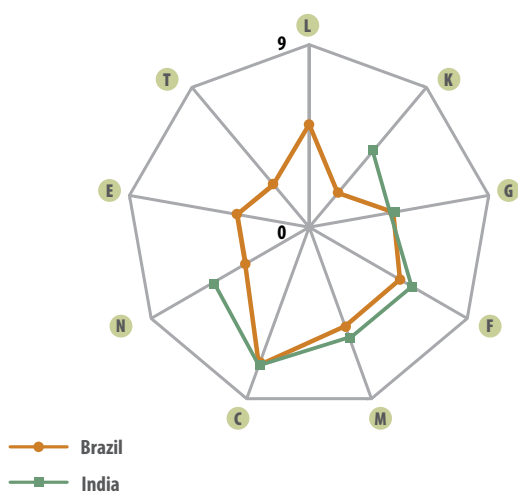
	Brazil	India
Availability and cost of labor	5.1	
Availability and cost of capital	2.2	4.9
Infrastructure and logistics	4.2	4.1
Taxation	5.2	5.8
Macroeconomic environment	5.2	5.8
Competition and scale of the domestic market	7.2	7.3
Business environment	3.6	5.5
Education	3.7	
Technology and innovation	2.7	

FIGURE 30 - BRAZIL – INDONESIA COMPARISON
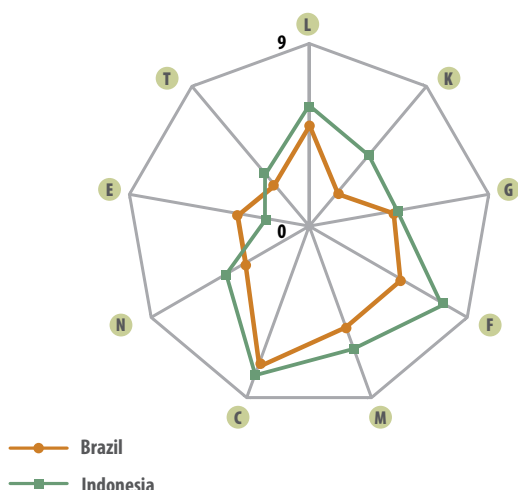
	Brazil	Indonesia
Availability and cost of labor	5.1	5.9
Availability and cost of capital	2.2	4.6
Infrastructure and logistics	4.2	4.4
Taxation	5.2	7.5
Macroeconomic environment	5.2	6.4
Competition and scale of the domestic market	7.2	7.8
Business environment	3.6	4.8
Education	3.7	2.2
Technology and innovation	2.7	3.4

FIGURE 31- BRAZIL – MEXICO COMPARISON
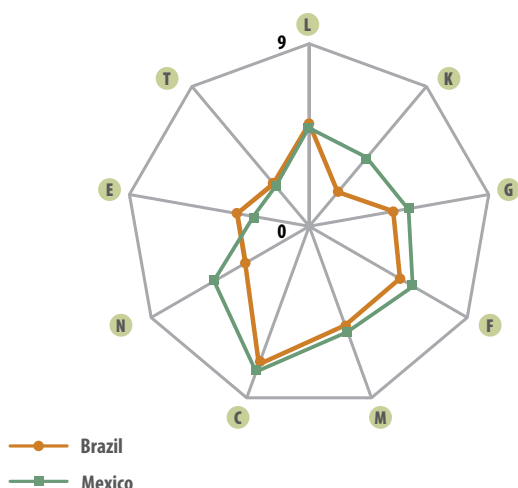
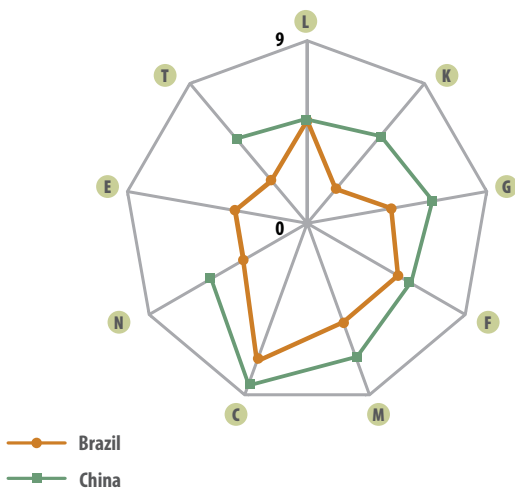|	Brazil	Mexico
Availability and cost of labor	5.1	4.8
Availability and cost of capital	2.2	4.4
Infrastructure and logistics	4.2	5.0
Taxation	5.2	5.9
Macroeconomic environment	5.2	5.7
Competition and scale of the domestic market	7.2	7.6
Business environment	3.6	5.4
Education	3.7	2.8
Technology and innovation	2.7	2.5

COMPETITIVENESS FACTORS

- **L** availability and cost of labor
- **K** availability and cost of capital
- **G** infrastructure and logistics
- **F** taxation
- **M** macroeconomic environment
- **C** competition and scale of the domestic market
- **N** business environment
- **E** education
- **T** technology and innovation

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FIGURE 32 - BRAZIL – PERU COMPARISON
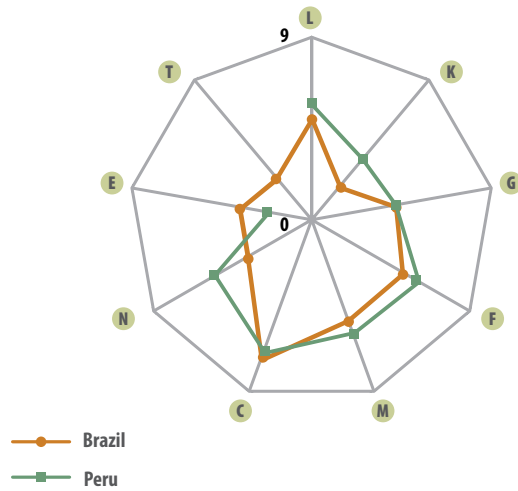
	Brazil	Peru
Availability and cost of labor	5.1	5.6
Availability and cost of capital	2.2	3.9
Infrastructure and logistics	4.2	4.1
Taxation	5.2	6.1
Macroeconomic environment	5.2	6.0
Competition and scale of the domestic market	7.2	6.8
Business environment	3.6	5.5
Education	3.7	2.2
Technology and innovation	2.7	

FIGURE 33 - BRAZIL – POLAND COMPARISON
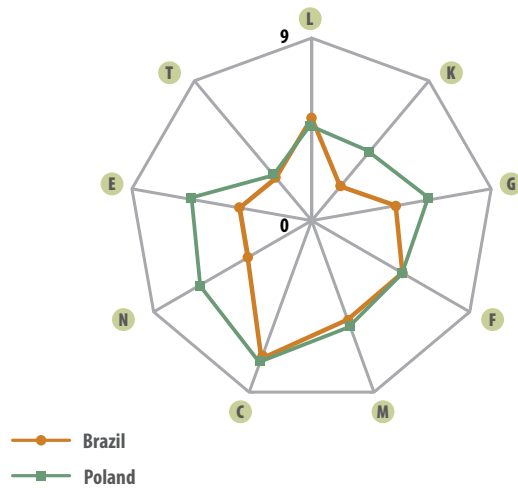
	Brazil	Poland
Availability and cost of labor	5.1	4.6
Availability and cost of capital	2.2	4.4
Infrastructure and logistics	4.2	5.8
Taxation	5.2	5.2
Macroeconomic environment	5.2	5.6
Competition and scale of the domestic market	7.2	7.5
Business environment	3.6	6.4
Education	3.7	6.1
Technology and innovation	2.7	2.9

FIGURE 34 - BRAZIL – RUSSIA COMPARISON
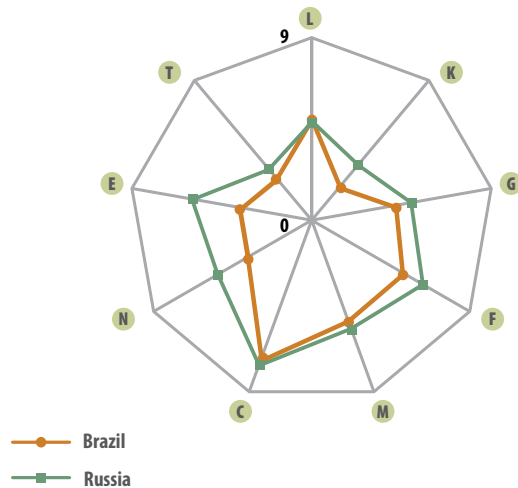
	Brazil	Russia
Availability and cost of labor	5.1	5.0
Availability and cost of capital	2.2	3.6
Infrastructure and logistics	4.2	4.9
Taxation	5.2	6.4
Macroeconomic environment	5.2	5.7
Competition and scale of the domestic market	7.2	7.6
Business environment	3.6	5.3
Education	3.7	5.9
Technology and innovation	2.7	3.4

FIGURE 35 - BRAZIL – THAILAND COMPARISON
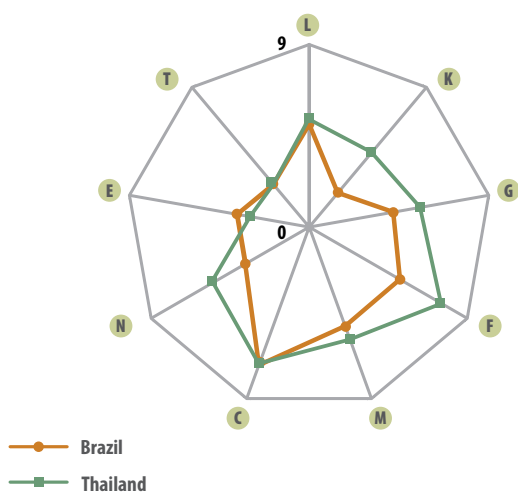
	Brazil	Thailand
Availability and cost of labor	5.1	5.3
Availability and cost of capital	2.2	4.8
Infrastructure and logistics	4.2	5.5
Taxation	5.2	7.7
Macroeconomic environment	5.2	6.0
Competition and scale of the domestic market	7.2	7.0
Business environment	3.6	5.4
Education	3.7	3.0
Technology and innovation	2.7	2.7

FIGURE 36 - BRAZIL – TURKEY COMPARISON
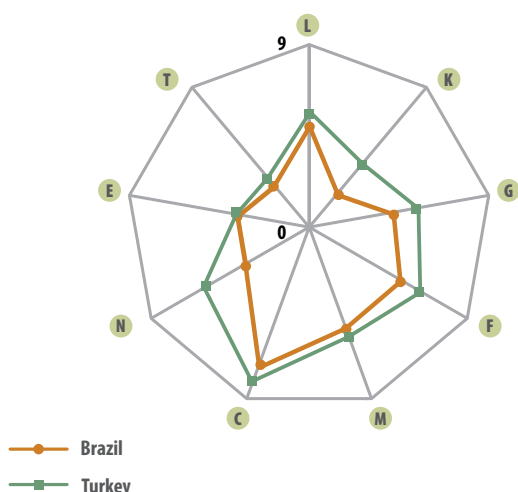
	Brazil	Turkey
Availability and cost of labor	5.1	5.6
Availability and cost of capital	2.2	4.0
Infrastructure and logistics	4.2	5.4
Taxation	5.2	6.3
Macroeconomic environment	5.2	5.6
Competition and scale of the domestic market	7.2	7.8
Business environment	3.6	5.9
Education	3.7	3.7
Technology and innovation	2.7	3.2

COMPETITIVENESS FACTORS

L availability and cost of labor

K availability and cost of capital

G infrastructure and logistics

F taxation

M macroeconomic environment

C competition and scale of the domestic market

N business environment

E education

T technology and innovation

45

4. EVOLUTION OF COMPETITIVENESS FACTORS OF BRAZIL

Brazil's lack of competitiveness has become more pronounced in most sub-factors

To keep track of the evolution of Brazil's competitiveness over time, the 2015 ranking was calculated considering the methodology adopted for the 2016 ranking and the same set of countries.

Figure 37 shows Brazil's positions in rankings for the 20 competitiveness sub-factors. The farther from the center of the circle, the better Brazil's position is in relation to one of those sub-factors (positions 1-18). In the comparison between the 2015 and 2016 rankings, a shift toward the center of the figure indicates loss of positions, suggesting that the sub-factor contributed to reducing the competitiveness of Brazilian companies.

FIGURE 37 - EVOLUTION OF BRAZIL'S POSITION BETWEEN THE 2015 AND 2016 RANKINGS BY SUB-FACTORS
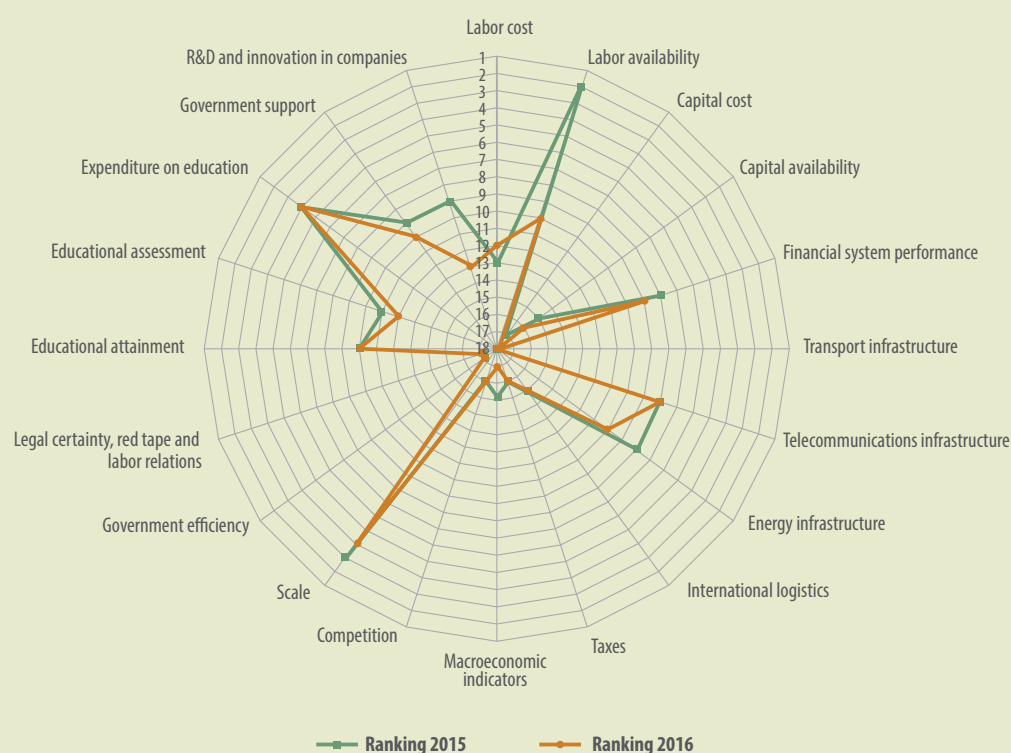
Figure 37 reveals Brazil's loss of competitiveness in relation to its competitors even though no changes were recorded in the country's position in a significant part of the sub-factors assessed. Among the 20 sub-factors, Brazil's position improved in only one case, declined in 10 of them, and remained unchanged in the nine remaining ones.

Sub-factor in which Brazil's position improved:

- Labor cost: the country moved up one position, but it remained in the bottom third of the ranking due to its low labor productivity in industry, which led Brazil to rank 15th among 17 countries.

Sub-factors in which Brazil's position worsened:

- Labor availability: the country fell eight positions and dropped from the upper third to the middle third of the ranking, mainly due to the drop in Brazil's position in connection with the Labor force growth variable.

- Capital cost: as a result of the inclusion of Spain, which had not been considered in the previous year's ranking due to lack of information, Brazil fell from the 17th to the 18th position and continued to rank last in this sub-factor.

- Capital availability: Brazil lost positions in all the variables associated with this sub-factor. In the final calculation, it lost one position in this sub-factor.

- Financial system performance: loss of one position, which is explained by the decline in Brazil's position in Country credit rating, with loss of four positions.

- Energy infrastructure: loss of two positions, which led the country to rank last in this sub-factor due to an increase in the electricity costs for industrial clients.

- Macroeconomic indicators: loss of two positions, reflecting a higher inflation and a decline in the investment rate in the country, which was already ranked among the lowest ones.

- Scale: loss of one position due to the shrinking of the domestic market, which led the country to shift positions with Russia from the 3rd to the 4th position.

- Educational assessment: Brazil's results in the PISA 2015 assessment led it to lose three positions in mathematics and one position in reading and science education. It should be noted that Peru moved up positions in mathematics and that Colombia moved up positions in all areas, surpassing Brazil.

- Government support: drop of one position, which is explained by changes in the positions of other countries, especially in connection with the Government procurement of advanced technology products variable.

- R&D and innovation in companies: drop of four positions, leading the country to fall from the middle to the bottom third of the ranking, reflecting a drop in its private-sector R&D expenditure and in the variable Capacity for innovation of companies.

Sub-factors in which Brazil remained in the same position:

- Transport infrastructure; Telecommunications Infrastructure; International logistics; Taxes; Competition; Government Efficiency; Legal certainty, red tape and labor relations; Educational attainment and Expenditure on education.

Sub-factors in which Brazil continued to rank last:

- Capital cost and Transport infrastructure.

The second chart (Figure 38) is not based on positions, but rather on the values of the indicators associated with 29 factors or sub-factors. For each of these factors or sub-factors, the values recorded for Brazil are compared to the average of those recorded for the 18 countries.

FIGURE 38 - EVOLUTION OF BRAZIL's POSITION BETWEEN THE 2015 AND 2016 RANKINGS BY FACTORS AND SUB-FACTORS
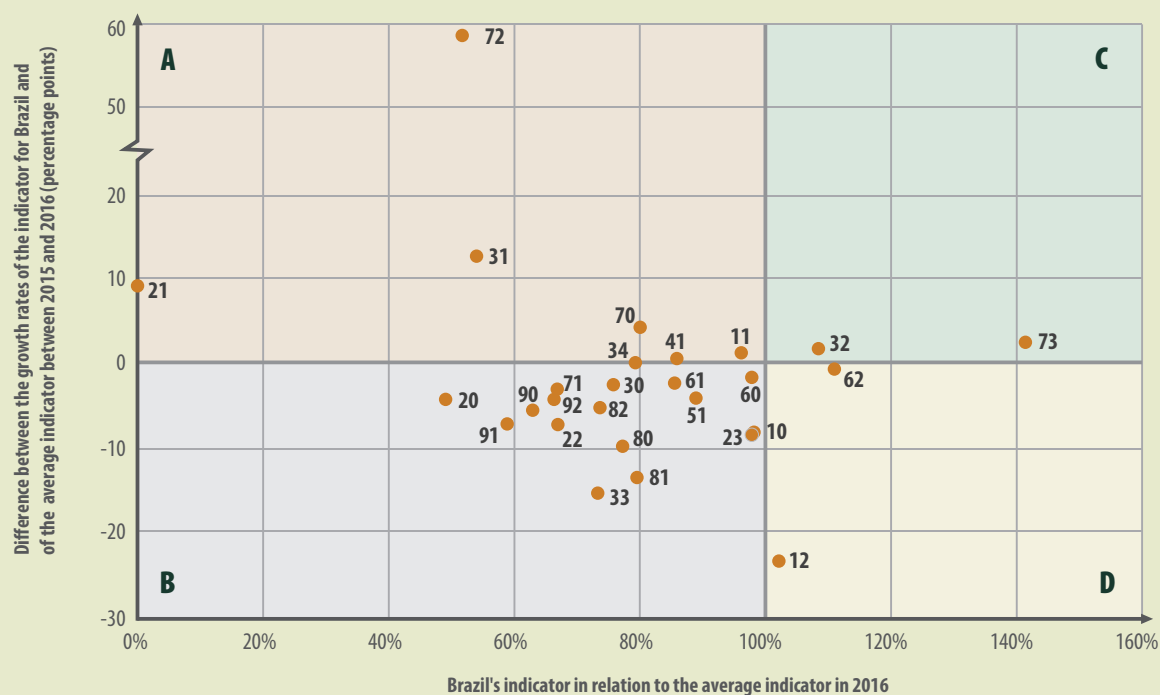
QUADRANTS

A – Brazil is regaining competitiveness	B – Brazil's low competitiveness worsens	
11 Labor cost	10 Availability and cost of labor	61 Competition
21 Capital cost	20 Availability and cost of capital	71 Educational attainment
31 Transport infrastructure	22 Capital availability	80 Technology and innovation
41 Taxation	23 Financial system performance	81 Government support
70 Education	30 Infrastructure and logistics	82 R&D and innovation in companies
72 Educational assessment	33 Energy infrastructure	90 Business environment
	51 Macroeconomic indicators	91 Government Efficiency
	60 Competition and scale of the domestic market	92 Legal certainty, red tape and labor relations
C – Brazil has become more competitive	D – Brazil's competitiveness is threatened	Not ranked
73 Expenditure on education	12 Labor availability	34 International logistics
32 Telecommunications infrastructure	62 Scale	

51

The horizontal axis shows the value taken by the indicator for Brazil as a percentage of the average indicator, i.e. as the average of the 18 countries considered in this report – clearly indicating Brazil's relative position. Values above 100% indicate that Brazil is above average. Values below 100% indicate that Brazil is below average.

The vertical axis indicates, in percentage points, the difference between the growth rates of the indicators calculated for Brazil and the average indicators of the 18 countries between the 2015 and 2016 rankings – clearly indicating whether the evolution of this factor in the country contributed to improving 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, i.e. the competitiveness of Brazilian companies increased. Values below zero mean loss of competitiveness.

Brazil is recovering its competitiveness in connection with the factors and sub-factors shown in **quadrant A**. This means that although the Brazilian indicator is lower than the average one, it recorded a higher growth over the period (or a less pronounced drop). Such cases account for 22% of all factors and sub-factors.

The situation of Brazil's lack of competitiveness in connection with the factors and sub-factors shown in **quadrant B** is getting worse. They account for more than half of all factors and sub-factors (59%). In such cases, Brazil's indicator is lower than the average indicator and this gap is increasing, as the growth rate of the indicator for Brazil was lower during the period.

Brazil is more competitive than the average of its competitors only in Expenditure on Education and Telecommunications Infrastructure, as can be seen in **quadrant C**. The value of the Expenditure on education sub-factor is 41% higher than the average values recorded for the 18 countries. In addition, Brazil's indicator dropped by 4% between the 2015 and 2016 rankings, while the average indicator decreased by 6%. Regarding the Telecommunications infrastructure sub-factor, Brazil's indicator is 8% higher than the average and declined less (-0.6% against -2.2%) as compared to the previous ranking.

Brazil's competitiveness is under threat in connection with the Labor availability and Scale sub-factors, as can be seen in **quadrant D**. Brazil is more competitive than the average of its competitors in relation to these sub-factors (Brazil's indicators represent 102% and 111% of the average indicators, respectively), but its indicators increased at a slower pace during the period (or dropped more sharply). Considering Brazil's poorer performance with regard to the labor force growth, which became negative in 2014, and the shrinking of the domestic market, the country runs the risk of being overtaken by its competitors.

In terms of International logistics, Brazil's indicator is 21% lower than the average indicator. This case was not ranked in any of the quadrants, as it was not possible to assess its evolution because the data was not updated[28].

[28] The variable associated with the International logistics sub-factor was taken from the Logistics Performance Index survey carried out by the World Bank every two years. In 2016, the reference period is the same used for calculating the indicators for 2015.

5. TECHNICAL
NOTES

Factors that affect competitiveness and associated variables

As mentioned in the presentation of this report, competitiveness refers to a company's ability to compete in the market — i.e. to its ability to overcome its competitors in 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 examining the factors that influence the ability of the companies operating in it to manage those competition mechanisms effectively. For this purpose, the following elements must be considered:

- Factors that directly affect the efficiency of companies and the effectiveness with which they manage these instruments, such as:

  - o   Availability and cost of labor;

  - o   Availability and cost of capital;

  - o   Infrastructure and logistics;

  - o   Taxation;

  - o   Technology and innovation.

- Factors that have a bearing on the elements above and affect the performance of companies indirectly, such as:

  - o   Macroeconomic environment;

  - o   Competition and scale of the domestic market;

  - o   Business environment;

  - o   Education.

These factors were broken down into 20 sub-factors, to which 56 variables were associated. The starting point for assessing the competitiveness of Brazilian companies is the value attributed to these 56 variables in Brazil and 17 other countries. This set of variables comprises 38 economic variables disseminated in international and domestic databases, as well as 18 qualitative variables taken from surveys conducted by international organizations and disseminated in the following reports: "The Global Competitiveness Report" of the World Economic Forum; "IMD World Competitiveness Yearbook" of the IMD; "The Worldwide Governance Indicators" and "Connecting to Compete 2014 – Trade Logistics in the Global Economy," both of which are published by the World Bank.

In the 2016 report, the competitiveness determining factors were reviewed and reorganized with the aim of improving their relationship with the Strategic Map of Industry 2013- 2022. The microeconomic environment factor was renamed as Competition and scale of the domestic market and the Business environment factor was created.

Regarding the variable set, variables for three factors were reviewed: Availability and cost of capital, Infrastructure and logistics and Macroeconomic environment. In this review, a more general objective was that of increasing the number of quantitative variables, replacing or complementing already considered qualitative variables. This is the case of the new variables "Stock market size" and "Liner shipping connectivity."

Regarding Infrastructure and logistics, the "Broadband internet" and "Mobile phone" variables were replaced with the variables making up the indicators for use and access to information and communication technologies with the aim of taking into account the development of digital infrastructure in Brazil, given the progress of digital technologies affecting different areas of the economies of countries. As for the Macroeconomic environment, the analysis of the size of General government debt was complemented with data on the debt profile by including the variable "General government net debt interest payments."

The table below summarizes the distribution of the variables according to factors and sub-factors. The list of the 56 variables, with their definition and an indication of their corresponding sources, can be found in section 6 of this report.

TABLE 1 – THE 2016 REPORT: FACTORS, SUB-FACTORS AND VARIABLES	WEIGHT
Availability and cost of 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%
Availability and cost of capital	
Capital cost	33.3%
Interest rate spread	50%
Real short-term interest rate	50%
Capital availability	33.3%
Ease of access to loans	33.3%
Ease of financing through local equity market	16.7%
Stock market size	16.7%
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	25%
Quality of railroad infrastructure	25%
Quality of port infrastructure	12.5%
Liner shipping connectivity	12.5%
Quality of air transport infrastructure	25%
Telecommunications infrastructure	25%
ICT Use	50%
ICT Access	50%
Energy infrastructure	25%
Electricity costs for industrial clients	50%
Availability of electricity	50%

TABLE 1 – THE 2016 REPORT: FACTORS, SUB-FACTORS AND VARIABLES	WEIGHT
International logistics	25%
Logistic Performance Index (LPI)	50%
Time and cost to export and import	50%
Taxation	
Taxes	100%
Collected total tax revenues	25%
Total tax rate (% of profit)	25%
Corporate tax rates	25%
Indirect tax rates	25%
Macroeconomic environment	
Macroeconomic indicators	100%
Inflation	20%
General government debt	10%
General government net debt interest payments	10%
Gross fixed capital formation	20%
Direct investment flows inward	20%
Real effective exchange rate	20%
Competition and scale of the domestic market	
Competition	50%
Trade tariffs	50%
Intensity of local competition	50%
Scale	50%
Domestic market size	100%
Business environment	
Government Efficiency	50%
Irregular payments and bribes	33%
Regulatory Quality	33%
Transparency of government policymaking	33%
Legal certainty, red tape and labor relations	50%
Rule of Law	33.3%
Starting a business	33.3%
Flexibility of wage determination	16.7%
Hiring and firing practices	16.7%
Education	
Educational attainment	33.3%
Gross enrolment ratio in secondary education	25%
Gross enrolment 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	
Government support	50%
Gross domestic expenditure on R&D	25%
Government procurement of advanced tech products	25%
R&D and innovation in companies	50%
Gross expenditure on R&D performed by business enterprise	25%
Capacity for innovation	25%

Countries selected as a benchmark for assessing the competitiveness of the Brazilian economy

The competitive potential of the Brazilian economy was assessed according to Brazil's relative position in relation to a set of selected countries. It were selected countries at a similar level of development and/or with a similar size as that of Brazil, coun tries that compete with Brazil in third markets or with an international position similar to that of Brazil, and neighboring countries.

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

The following table shows some structural characteristics of the economies of those countries.

TABLE 2 - STRUCTURAL CHARACTERISTICS OF THE SELECTED COUNTRIES – 2015							
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	55	315	13.2	10	82	105
Argentina	2,780	43	630	20.5	35	57	60
Australia	7,741	24	1,225	47.6	36	188	208
Brazil	**8,516**	**204**	**1,773**	**15.6**	**80**	**191**	**179**
Canada	9,985	36	1,551	45.6	64	408	436
Chile	756	18	240	23.5	20	63	63
China	9,563	1,373	11,182	14.3	73	2,275	1,682
Colombia	1,142	48	292	13.8	7	36	54
South Korea	100	51	1,378	36.6	11	527	436
Spain	506	46	1,200	34.9	49	282	309
India	3,287	1,293	2,073	6.2	35	267	392
Indonesia	1,911	255	859	11.1	40	150	143
Mexico	1,964	121	1,144	18.4	27	381	405
Peru	1,285	31	192	12.5	8	34	38
Poland	313	38	475	26.5	28	198	193
Russia	17,098	143	1,326	26.0	27	340	194
Thailand	513	69	395	16.1	36	214	203
Turkey	784	78	718	20.4	17	144	207

Source: World Development Indicators, World Bank; World Economic Outlook Database, Oct. 2016, IMF; Total merchandise trade and Merchandise trade by commodity, World Trade Organization.

Procedures adopted

The effect of each of the 56 variables from the standpoint of the competitiveness of Brazilian companies can be evaluated based on Brazil's position in the list of countries as ordered according to the values recorded for those variables in each of the 18 countries. In most, but not all, cases the higher values indicate a more favorable result.

The 56 variables were aggregated into 20 sub-factors and the subsequent aggregation of those sub-factors into the nine factors mentioned above allows in turn for assessing the effect of each of these sub-factors and factors on the competitiveness of Brazilian companies. This aggregation was made according to the procedures described below.

The set of 56 variables comprises quantitative variables that reflect economic magnitudes and qualitative variables taken from surveys.

The qualitative variables are referenced on different scales, since they were taken from different surveys. Those scales were converted into a single scale (0-10 scale).

Calculating comparable measures (normalization)

The quantitative variables measure different magnitudes and, in many cases, they are expressed in different units. Following a procedure adopted in the Global Competitiveness Report of the World Economic Forum, these variables were normalized and converted into the same scale applied to the qualitative variables using the following formula:

$$VN^v_i = 10 \times \frac{(V_i - V_{min})}{(V_{max} - V_{min})} \tag{1}$$

Where: VN^v_i is the normalized value of variable V of country i; V_{max} and V_{min} are the maximum and minimum values in the original sample of countries from which the values for the 18 selected countries were taken, i.e. the highest and lowest observed value, and V_i is the value of country i.

In cases of variables where the most favorable result from the standpoint of competitiveness is the lowest value, the following formula was adopted:

$$VN^v_i = 10 - 10 \times \frac{(V_i - V_{min})}{(V_{max} - V_{min})} \tag{2}$$

Aggregation of variables into sub-factors and factors

The scores for the sub-factor are the weighted average of the normalized variables associated with the sub-factor. The weights are shown in table 1. The scores of the factors were determined by the simple average of the scores of the sub-factors associated with them.

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

FIGURE 39 – AGGREGATION PROCESS
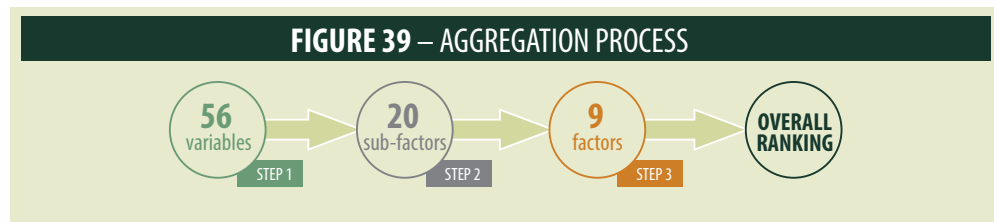
For calculating the annual Brazil Competitiveness Report ranking, data is collected for the 56 variables and the availability of data for the 18 selected countries is checked.

There are cases in which no information on some of the variables for a country is available in the reference year, i.e. the last year available. In such cases, the most recent data available is repeated for the reference year. For example, if the reference year of a certain variable is 2015 and the most recent data available for a country is 2014, then the value for 2014 is repeated for 2015.

When the data for a country is very outdated or when no data is available for a country in any year of the series for a given variable, such missing data is excluded from the calculation of the sub-factor scores. The weighted average of the available normalized variables is calculated (the weight attributed to missing data is equally redistributed in the remaining variables).

However, if more than 50% of the variables making up a sub-factor are excluded, then the score of a country in the sub-factor is not calculated. At the factor level, if more than 50% of the scores of the sub-factors making up a factor are excluded, the country's score in the factor is not calculated.

Regarding the overall ranking, if no score can be calculated for a country for any of the nine factors, such missing value is estimated. This estimation process is carried out in four steps:

1) The factor scores are calculated based on the simple average of the variables for which data is available for a country.

2) Based on the scores calculated in step 1, a new ranking of countries is calculated in the factor in question (ranking based on a limited number of variables).

3) In the original ranking (the ranking based on the values of all variables associated with the factor in question), a score consistent with the position of the country for which data is missing as determined in step 2 is checked.

4) Based on this score and its adjacent scores, a simple average is calculated to estimate the score of the country for which data is missing.

The cases of countries for which data is missing in the overall ranking in 2016 are the following ones: Argentina and India for the Availability and cost of labor factor; Argentina, China, and India for the Education factor and India and Peru for the Technology and innovation factor.

6. LIST OF VARIABLES

Description and source of the variables

NAME	DESCRIPTION	SOURCE [ORIGINAL SOURCE]
Availability and cost of labor		
Labor cost		
Compensation levels in manufacturing	Total hourly compensation in manufacturing (wages plus supplementary benefits), US$. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [Passport GMID, Source: © Euromonitor International 2016; national sources]
Labor productivity in industry	Related GDP (PPP) per person employed in industry, US$. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [OECD (2016), Main Economic Indicators - complete database, IMF World Economic Outlook April 2016; national sources]
Labor availability		
Labor force participation rate	Labour force participation rate: labor force as a percentage of the total population over 15 years old. Reference year: 2015	Key Indicators of the Labour Market (KILM) – International Labour Organization (ILO), 9th edition, 2015 [LFEP Database, 7th edition (January 2016 of the 2015 revision)]
Labor force growth	Annual percentage change. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [OECD (2016), Main Economic Indicators - complete database; national sources]
Availability and cost of capital		
Capital cost		
Interest rate spread	Lending rate minus deposit rate. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [International Financial Statistics Online April 2016 (IMF); national sources.]
Real short-term interest rate	Real discount or bank rate. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [International Financial Statistics Online April 2016 (IMF); national sources.]
Capital availability		
Ease of access to loans	Variable generated from answers to the question: In your country, how easy is it for businesses to obtain a bank loan? [1 = extremely difficult; 7 = extremely easy]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Ease of financing through local equity market	Variable generated from answers to the question: In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market? [1 = not at all; 7 = to a great extent]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Stock market size	Market value for listed domestic companies. Percentage of GDP. Reference year: 2015	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: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]

NAME	DESCRIPTION	SOURCE [ORIGINAL SOURCE]
Financial system performance		
Banking sector assets	Percentage of GDP. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [IMF Monetary and Financial Stats (MFS) May 2016]
Country credit rating	Rating on a scale of 0-100 assessed by the Institutional Investor Magazine. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [Institutional Investor, September 2015]
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: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Quality of railroad infrastructure	Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of the railroad system [1 = extremely poor-among the worst in the world; 7 = extremely good-among the best in the world]. Reference year: 2015-2016 weighted average. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Quality of port infrastructure	Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of seaports (for landlocked countries, assess access to seaports) [1 = extremely poor-among the worst in the world; 7 = extremely good-among the best in the world]. Reference year: 2015-2016 weighted average. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Liner shipping connectivity	Index generated from the average of five components: (a) the number of ships; (b) the total container-carrying capacity of those ships; (c) the maximum vessel size; (d) the number of services; and (e) the number of companies that deploy container ships on services from and to a country's ports. The base year is 2004 and the base value is the maximum value in 2004. Reference: 2016	United Nations Conference on Trade and Development, Statistics [UNCTAD, Division on Technology and Logistics, based on Containerization International Online (www.ci-online.co.uk) and Lloyds List Intelligence]
Quality of air transport infrastructure	Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of airports [1 = extremely poor-among the worst in the world; 7 = extremely good-among the best in the world]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Energy infrastructure		
Electricity costs for industrial clients	US$ per kwh. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [OECD Energy Prices and Taxes 1/2016 (International Energy Agency); national sources.]. * Brazil: CNI estimate based on data provided by Brazilian Electricity Regulatory Agency (ANEEL) and by the World Bank.
Availability of electricity	Ratio between electricity output and GDP, expressed in TWh/US$ trillion. Reference year: 2013	Calculate based on data from CO_2 Emissions from Fuel Combustion Highlights (2015 Edition), IEA, Paris.

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: 2016	International Telecommunication Union (ITU) Measuring the Information Society Report 2016 [Data for all these indicators are collected by ITU]
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: 2016	International Telecommunication Union (ITU) Measuring the Information Society Report 2016 [Data for all these indicators are collected by ITU]
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: 2016	Connecting to Compete 2016. Trade Logistics in the Global Economy, World Bank, 2016
Time and cost to export and import	Distance to frontier (0-100 scale). Simple average of scores in eight indicators: (1) time and cost for documentary compliance when exporting; (2) time and cost for border compliance when exporting; (3) time and cost for documentary compliance when importing; (4) time and cost for border compliance when importing. Reference year: 2015	World Bank, Doing Business 2016
Taxation		
Taxes		
Collected total tax revenues	Percentage of GDP. Reference year: 2014	IMD World Competitiveness Yearbook 2016. [OECD Revenue Statistics 2015, Government Finance Statistics 2013; national sources.]
Total tax rate (% of profit)	Total taxes paid by a company as a percentage of its profits (the profit or corporate income tax, social contributions and labor taxes paid by the employer, property taxes, property transfer taxes, dividend tax, capital gains tax, financial transactions tax, waste collection taxes, vehicle and road taxes, and any other small taxes or fees). Reference year: 2014	World Bank, Doing Business 2016.
Corporate tax rates	Corporate tax rates. Reference year: 2016	Tax Rates Online, KPMG.
Indirect tax rates	Indirect tax rates. Reference year: 2016	Tax Rates Online, KPMG.

NAME	DESCRIPTION	SOURCE [ORIGINAL SOURCE]
Macroeconomic environment		
Macroeconomic indicators		
Inflation	Annual percent change in consumer price index (year average). Reference year: 2015 or most recent year available	The Global Competitiveness Report 2016-2017, World Economic Forum. [International Monetary Fund, World Economic Outlook Database (April 2016 edition)]
General government debt	Percentage of GDP. Reference year: 2015 or most recent year available	The Global Competitiveness Report 2016-2017, World Economic Forum. [International Monetary Fund, World Economic Outlook Database (April 2016 edition) and Article IV Consultation Staff Reports]
General government net debt interest payments	Interest payments on government debt, obtained by the difference between General government net lending/borrowing and General government primary net lending/borrowing. Percentage of GDP. Reference year: 2015	Calculated based on data from World Economic Outlook Database, Oct. 2016, IMF.
Gross fixed capital formation	Percentage of GDP. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [national sources]
Direct investment flows inward	Percentage of GDP. Reference year: 2015	IMD World Competitiveness Yearbook 2016. [UNCTADSTAT 2015 http://unctadstat.unctad.org OECD (2016), Main Economic Indicators - complete database International Financial Statistics Online May 2016 (IMF); national sources.]
Real effective exchange rate	Real effective exchange rate (monthly average) on the reference date, expressed as a percentage of the arithmetic average of the monthly rates observed from January 2011 to December 2015. Reference year: December 2015	Prepared by CNI, based on the real effective exchange rate estimated by the Bank for International Settlements.
Competition and scale of the domestic market		
Competition		
Trade tariffs	Trade-weighted average tariff rate. The weights are the trade patterns of the importing country's reference group. Reference year: 2015 or most recent year available	The Global Competitiveness Report 2016-2017, World Economic Forum. [International Trade Centre; Trade Competitiveness Map Data]
Intensity of local competition	Variable generated from answers to the question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [Executive Opinion Survey.]
Scale		
Domestic market size	Sum of gross domestic product plus value of imports of goods and services, minus value of exports of goods and services, normalized on a 1-7 (best) scale. Reference year: 2015	The Global Competitiveness Report 2016-2017, World Economic Forum.
Business environment		
Government Efficiency		
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. Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Reference year: 2015.	The Worldwide Governance Indicators, 2016 Update [Daniel Kaufmann, Natural Resource Governance Institute (NRGI) and Brookings Institution; Aart Kraay, World Bank Development Research Group]

NAME	DESCRIPTION	SOURCE [ORIGINAL SOURCE]
Irregular payments and bribes	Variable generated from answers to the following questions: In your country, how common is it for firms to make undocumented extra payments or bribes connected with (a) imports and exports; (b) public utilities; (c) annual tax payments; (d) awarding of public contracts and licenses; (e) obtaining favorable judicial decisions? [1 = very common; 7 = never occurs]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [World Economic Forum, Executive Opinion Survey. For more details, refer to Chapter 1.3 of The Global Competitiveness Report 2016–2017]
Transparency of government policymaking	Variable generated from answers to the question: In your country, how easy is it for companies to obtain information about changes in government policies and regulations affecting their activities? [1 = extremely difficult; 7 = extremely easy]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [World Economic Forum, Executive Opinion Survey. For more details, refer to Chapter 1.3 of The Global Competitiveness Report 2016–2017]
Legal certainty, red tape and labor relations		
Rule of Law	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. Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance. Reference year: 2015	The Worldwide Governance Indicators, 2016 Update [Daniel Kaufmann, Natural Resource Governance Institute (NRGI) and Brookings Institution;Aart Kraay, World Bank Development Research Group]
Starting a business	Distance to frontier (0-100 scale). Simple average of scores in four indicators: (1) procedures to legally start and formally operate a company (number); (2) time required to complete each procedure (calendar days); (3) cost required to complete each procedure (percentage of per capita income); (4) paid-in minimum capital (percentage of per capita income). Reference year: 2016	World Bank, Doing Business 2016.
Flexibility of wage determination	Variable generated from answers to the question: In your country, how are wages generally set? [1 = by a centralized bargaining process; 7 = by each individual company]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [World Economic Forum, Executive Opinion Survey. For more details, refer to Chapter 1.3 of The Global Competitiveness Report 2016–2017]
Hiring and firing 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: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [World Economic Forum, Executive Opinion Survey. For more details, refer to Chapter 1.3 of The Global Competitiveness Report 2016–2017]
Education		
Educational attainment		
Gross enrolment 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: 2014 or most recent year available	UNESCO Institute for Statistics. Education: June 2016.

NAME	DESCRIPTION	SOURCE [ORIGINAL SOURCE]
Gross enrolment 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: 2014 or most recent year available	UNESCO Institute for Statistics. Education: June 2016.
Percentage of adults who have attained at least upper secondary education	Percentage of adults aged between 25 and 34 who have attained at least upper secondary education. Reference year: 2015	Education at a Glance 2016: OECD Indicators - © OECD 2016.
Percentage of adults who have attained at least upper secondary education	Percentage of adults aged between 25 and 34 who have attained tertiary education. Reference year: 2015	Education at a Glance 2016: OECD Indicators - © OECD 2016.
Educational assessment		
Performance in mathematics	Average scores in math tests, 15-year-old students. Reference year: 2015	PISA 2015 Results (Volume I): Excellence and Equity in Education - OECD 2016.
Performance in reading	Average scores in reading tests, 15-year-old students. Reference year: 2015	PISA 2015 Results (Volume I): Excellence and Equity in Education - OECD 2016.
Performance in science	Average scores in science tests, 15-year-old students. Reference year: 2015	PISA 2015 Results (Volume I): Excellence and Equity in Education - OECD 2016.
Expenditure on education		
Total public expenditure on education	Percentage of GDP. Reference year: 2014	IMD World Competitiveness Yearbook 2016. [Government Finance Statistics Yearbook 2013, Eurostat April 2016; national sources.]
Total public expenditure on education per capita	US$ per capita. Reference year: 2014	IMD World Competitiveness Yearbook 2016. [Government Finance Statistics Yearbook 2013, Eurostat April 2016; national sources.]
Technology and innovation		
Government support		
Gross domestic expenditure on R&D	Percentage of GDP. Reference year: 2014	UNESCO Institute for Statistics. Science, technology and innovation: July 2016.
Government procurement of advanced tech products	Variable generated from answers to the question: In your country, to what extent do government purchasing decisions foster innovation? [1 = not at all; 7 = to a great extent]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [World Economic Forum, Executive Opinion Survey. For more details, refer to Chapter 1.3 of The Global Competitiveness Report 2016–2017]
R&D and innovation in companies		
Gross expenditure on R&D performed by business enterprise	Percentage of GDP. Reference year: 2014	UNESCO Institute for Statistics. Science, technology and innovation: July 2016.
Capacity for innovation	Variable generated from answers to the question: In your country, to what extent do companies have the capacity to innovate? [1 = not at all; 7 = to a great extent]. Reference year: 2015-2016 weighted average	The Global Competitiveness Report 2016-2017, World Economic Forum. [World Economic Forum, Executive Opinion Survey. For more details, refer to Chapter 1.3 of The Global Competitiveness Report 2016–2017]

7. RANKINGS OF SUB-FACTORS AND VARIABLES

1 Labor cost sub-factor

Turkey	6.1
Indonesia	6.0
Chile	5.9
Mexico	5.7
Colombia	5.7
South Africa	5.6
Russia	5.6
Peru	5.5
Poland	5.5
Thailand	5.5
Canada	5.4
Brazil	5.3
Australia	5.2
South Korea	5.2
China	5.0
Spain	5.0
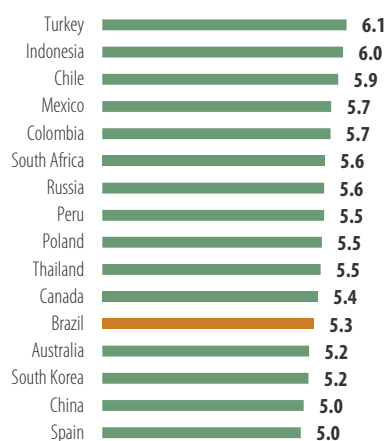
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

1.1 Compensation levels in manufacturing (2015)

Indonesia	1.05
Colombia	1.75
Peru	1.88
Thailand	2.09
Mexico	2.41
Brazil	2.52
Argentina	2.89
South Africa	3.42
China	3.56
Turkey	3.60
Russia	4.37
Chile	4.79
Poland	5.86
South Korea	17.84
Spain	18.08
Canada	19.55
Australia	25.62
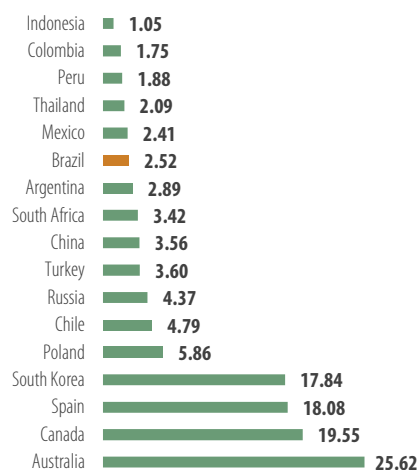
Total hourly compensation in manufacturing (wages plus supplementary benefits), US$
Source: IMD World Competitiveness Yearbook 2016

1.2 Labor productivity in industry (2015)

Australia	149
Canada	128
South Korea	109
Spain	102
Turkey	79
Chile	76
Poland	64
Indonesia	62
Russia	59
Mexico	57
South Africa	55
Colombia	53
Peru	46
Thailand	44
Brazil	39
China	33
India	18
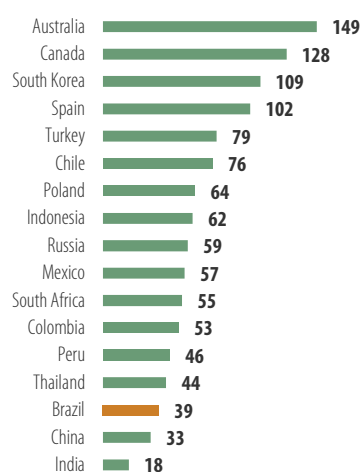
Related GDP (PPP) per person employed in industry, US$
Source: IMD World Competitiveness Yearbook 2016
Note: China, India and Peru (2014); Russia (2013)

2 Labor availability sub-factor

Indonesia	5.9
Peru	5.7
Colombia	5.5
China	5.4
Thailand	5.2
Turkey	5.1
South Korea	5.0
Chile	5.0
Australia	4.9
Brazil	4.8
Canada	4.8
Russia	4.4
Argentina	4.3
India	4.0
Mexico	4.0
Poland	3.8
South Africa	3.7
Spain	3.6
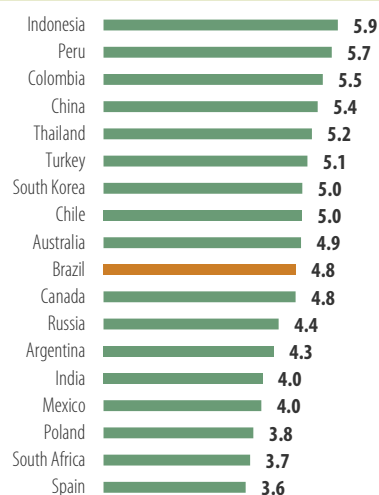
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

2.1 Labor force participation rate (2015)

Peru	74.1
Thailand	71.4
China	70.9
Colombia	68.6
Indonesia	67.4
Brazil	67.1
Canada	65.6
Australia	64.7
Russia	63.5
Chile	62.4
Mexico	62.2
Argentina	61.0
South Korea	60.8
Spain	58.4
Poland	56.9
India	53.7
South Africa	53.0
Turkey	50.3
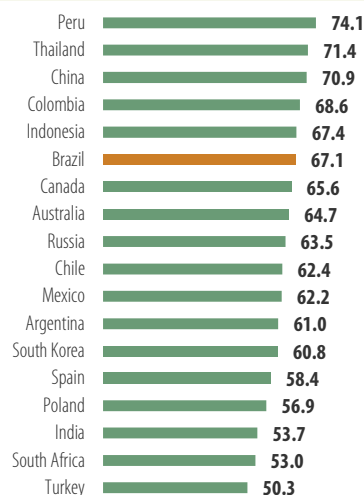
Labour force as a percentage of the total population over 15 years old
Source: International Labour Organization (ILO)

2.2 Labor force growth (2014)

Turkey	6.43
Indonesia	3.11
South Korea	2.56
Chile	2.01
India	1.82
Colombia	1.56
Australia	1.16
South Africa	1.10
Canada	0.46
Peru	0.41
China	0.38
Argentina	0.29
Poland	0.09
Brazil	-0.05
Russia	-0.17
Thailand	-0.22
Spain	-1.02
Mexico	-1.08
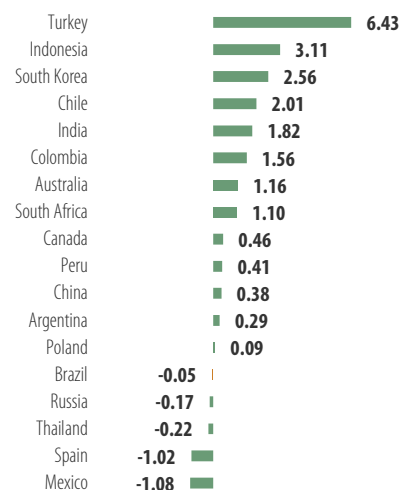
Annual percentage change
Source: IMD World Competitiveness Yearbook 2016

3 Capital cost sub-factor

South Korea	5.8
Canada	5.7
Mexico	5.6
Chile	5.6
Australia	5.5
China	5.5
South Africa	5.5
Turkey	5.5
Poland	5.4
Indonesia	5.3
Argentina	5.3
Russia	5.3
India	5.1
Thailand	5.0
Colombia	4.8
Spain	4.6
Peru	3.8
Brazil	0.0
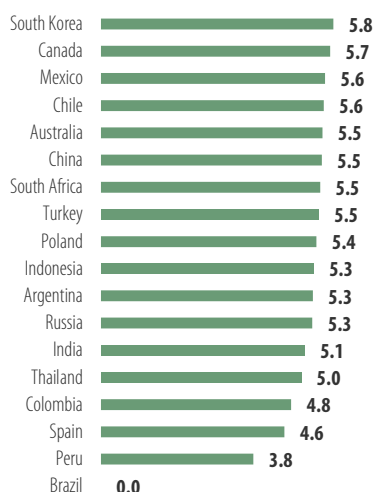
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

3.1 Interest rate spread (2015)

South Korea	1.72
Canada	2.70
Mexico	2.83
China	2.85
Poland	3.00
South Africa	3.26
Australia	3.27
Turkey	3.44
Argentina	3.75
Chile	4.18
India	4.31
Indonesia	4.33
Thailand	5.15
Russia	6.52
Colombia	6.87
Spain	8.98
Peru	13.82
Brazil	31.34
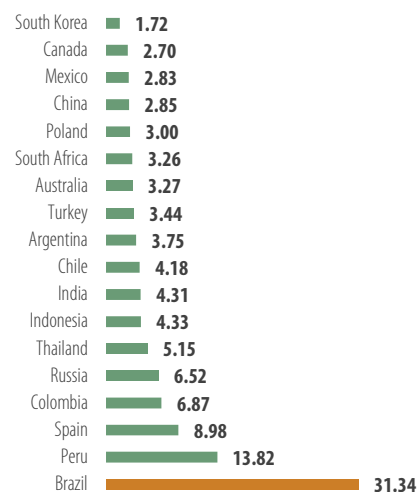
Lending rate minus deposit rate
Source: IMD World Competitiveness Yearbook 2016
Note: Chile (2014)

3.2 Real short-term interest rate (2015)

Russia	-2.34
Chile	-1.34
Canada	-0.47
South Korea	0.29
Australia	0.57
Mexico	0.58
Peru	0.75
Spain	0.80
Indonesia	1.07
South Africa	1.18
Turkey	1.23
China	1.44
Argentina	2.24
Poland	2.62
Colombia	2.63
Thailand	2.93
India	3.47
Brazil	10.98
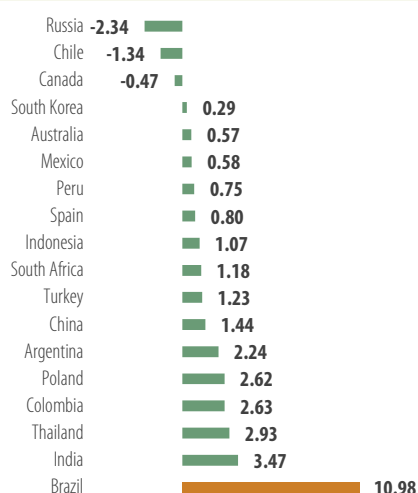
Real discount or bank rate
Source: IMD World Competitiveness Yearbook 2016
Note: Argentina (2013); Chile (2014)

4 Capital availability sub-factor

South Africa	7.6
India	6.5
Canada	6.3
China	6.3
Australia	6.2
Thailand	6.0
Indonesia	6.0
Chile	5.9
Peru	4.9
Spain	4.3
South Korea	4.2
Poland	4.1
Mexico	4.1
Colombia	4.1
Turkey	4.0
Brazil	3.3
Russia	2.8
Argentina	2.0
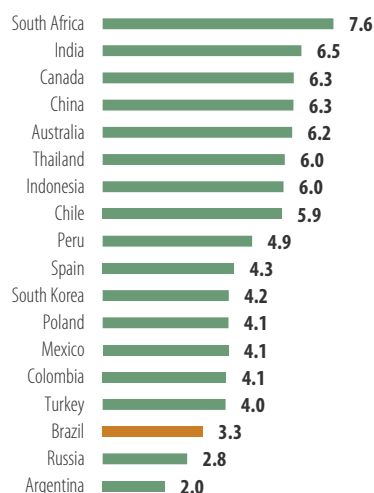
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

4.1 Ease of access to loans (2015-2016 weighted average)
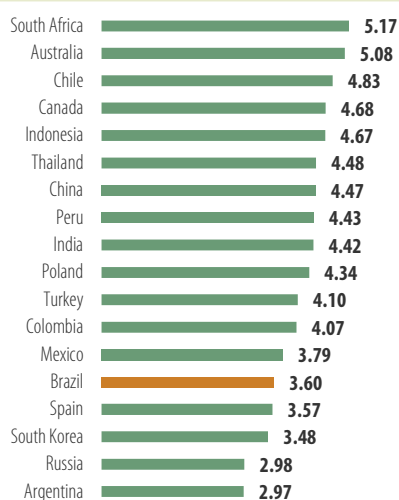
South Africa	5.17
Australia	5.08
Chile	4.83
Canada	4.68
Indonesia	4.67
Thailand	4.48
China	4.47
Peru	4.43
India	4.42
Poland	4.34
Turkey	4.10
Colombia	4.07
Mexico	3.79
Brazil	3.60
Spain	3.57
South Korea	3.48
Russia	2.98
Argentina	2.97

Variable generated from answers to the question: In your country, how easy is it for businesses to obtain a bank loan? [1 = extremely difficult; 7 = extremely easy]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

4.2 Ease of financing through local equity market (2015-2016 weighted average)
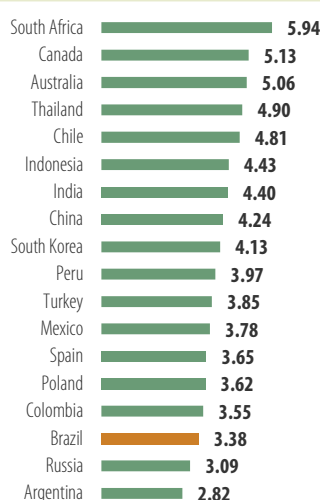
South Africa	5.94
Canada	5.13
Australia	5.06
Thailand	4.90
Chile	4.81
Indonesia	4.43
India	4.40
China	4.24
South Korea	4.13
Peru	3.97
Turkey	3.85
Mexico	3.78
Spain	3.65
Poland	3.62
Colombia	3.55
Brazil	3.38
Russia	3.09
Argentina	2.82

Variable generated from answers to the question: In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market? [1 = not at all; 7 = to a great extent]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

4.3 Stock market size (2015)

Country	Value
South Africa	235.3
Canada	102.8
South Korea	89.4
Australia	88.6
Thailand	88.2
Chile	79.2
China	75.4
India	73.1
Spain	65.7
Indonesia	41.0
Mexico	35.2
Russia	29.7
Peru	29.4
Colombia	29.4
Poland	29.0
Brazil	27.6
Turkey	26.3
Argentina	9.6
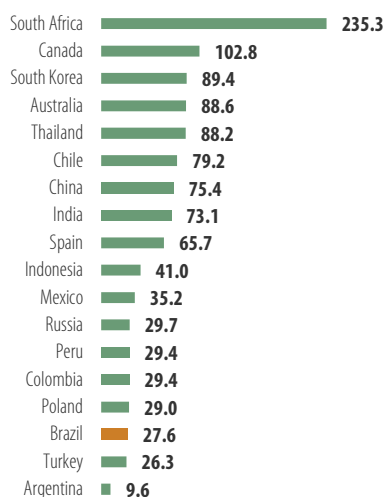
Market value for listed domestic companies. Percentage of GDP.
Source: World Bank

4.4 Venture capital availability (2015–2016 weighted average)

Country	Value
India	4.36
China	4.10
Indonesia	3.80
Thailand	3.48
Canada	3.41
Peru	3.22
Spain	3.20
Chile	3.20
Australia	3.16
South Africa	3.04
Mexico	3.01
Colombia	2.84
South Korea	2.75
Turkey	2.70
Poland	2.67
Russia	2.62
Brazil	2.53
Argentina	2.15

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]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

5 Financial system performance sub-factor

Country	Value
Australia	5.3
China	4.9
South Korea	4.9
Chile	4.1
Spain	4.0
Poland	3.8
Thailand	3.5
Mexico	3.4
Brazil	3.3
India	3.1
Peru	3.0
Colombia	2.9
Russia	2.7
South Africa	2.6
Turkey	2.5
Indonesia	2.5
Argentina	0.3
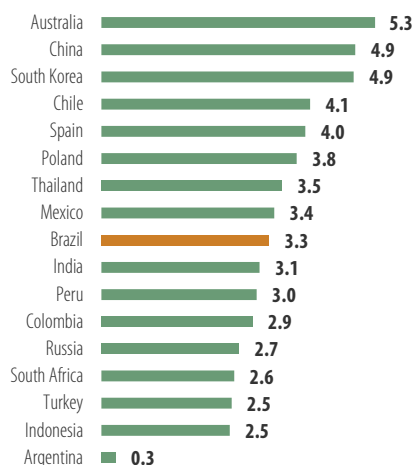
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

5.1 Banking sector assets (2015)

Country	Value
China	238.3
South Korea	189.3
Spain	185.4
Thailand	173.1
Australia	151.9
Brazil	127.1
Chile	98.1
South Africa	96.4
Russia	95.9
India	92.3
Turkey	85.4
Poland	84.2
Colombia	59.8
Peru	55.4
Mexico	54.5
Argentina	54.4
Indonesia	52.6
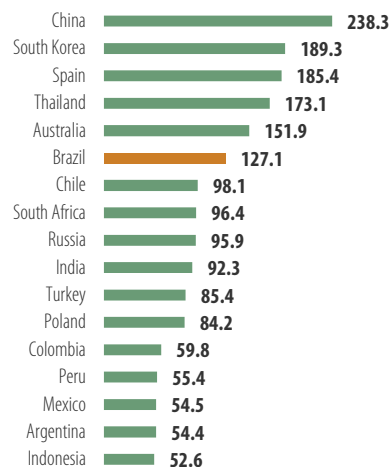
Percentage of GDP
Source: IMD World Competitiveness Yearbook 2016

5.2 Country credit rating (2015)

Country	Value
Canada	93.8
Australia	90.1
South Korea	80.2
Chile	76.4
China	75.9
Poland	73.9
Mexico	70.2
Spain	66.5
Peru	65.0
Colombia	63.4
India	62.3
Brazil	61.7
Thailand	60.9
Indonesia	57.5
Russia	56.0
Turkey	54.8
South Africa	54.5
Argentina	24.1
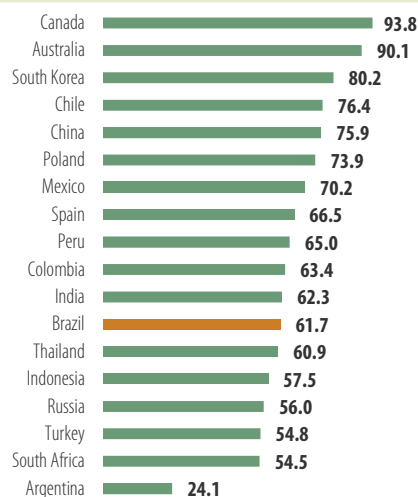
Rating on a scale of 0-100 assessed by the Institutional Investor Magazine
Source: IMD World Competitiveness Yearbook 2016

6 Transport infrastructure sub-factor

Country	Value
South Korea	7.7
Spain	7.6
China	6.9
Canada	6.8
South Africa	6.1
Australia	5.6
Turkey	5.5
India	5.4
Chile	4.9
Mexico	4.6
Indonesia	4.5
Poland	4.5
Thailand	4.5
Russia	4.3
Argentina	3.2
Peru	3.0
Colombia	2.8
Brazil	2.7
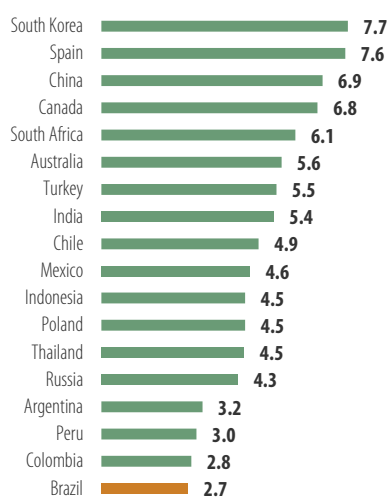
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

6.1 Quality of roads (2015-2016 weighted average)
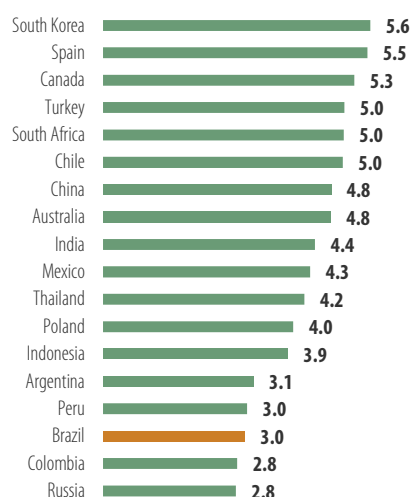
Country	Value
South Korea	5.6
Spain	5.5
Canada	5.3
Turkey	5.0
South Africa	5.0
Chile	5.0
China	4.8
Australia	4.8
India	4.4
Mexico	4.3
Thailand	4.2
Poland	4.0
Indonesia	3.9
Argentina	3.1
Peru	3.0
Brazil	3.0
Colombia	2.8
Russia	2.8

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]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

6.2 Quality of railroad infrastructure (2015-2016 weighted average)
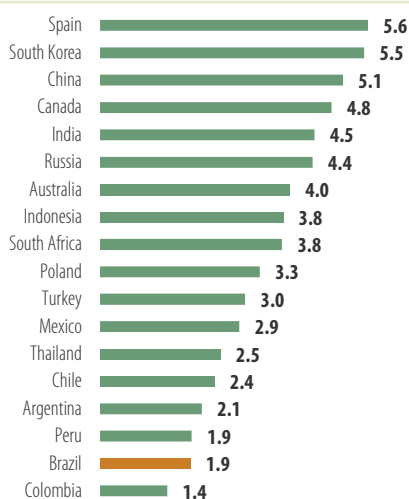
Country	Value
Spain	5.6
South Korea	5.5
China	5.1
Canada	4.8
India	4.5
Russia	4.4
Australia	4.0
Indonesia	3.8
South Africa	3.8
Poland	3.3
Turkey	3.0
Mexico	2.9
Thailand	2.5
Chile	2.4
Argentina	2.1
Peru	1.9
Brazil	1.9
Colombia	1.4

Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of the railroad system [1 = extremely poor--among the worst in the world; 7 = extremely good-among the best in the world]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

6.3 Quality of port infrastructure (2015-2016 weighted average)

Spain	5.5
Canada	5.4
South Korea	5.2
Chile	4.9
Australia	4.9
South Africa	4.9
China	4.6
India	4.5
Turkey	4.5
Mexico	4.4
Thailand	4.2
Poland	4.1
Russia	4.0
Indonesia	3.9
Argentina	3.8
Colombia	3.7
Peru	3.6
Brazil	2.9

Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of seaports (for landlocked countries, assess access to seaports) [1 = extremely poor-among the worst in the world; 7 = extremely good-among the best in the world]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

6.4 Liner shipping connectivity (2016)
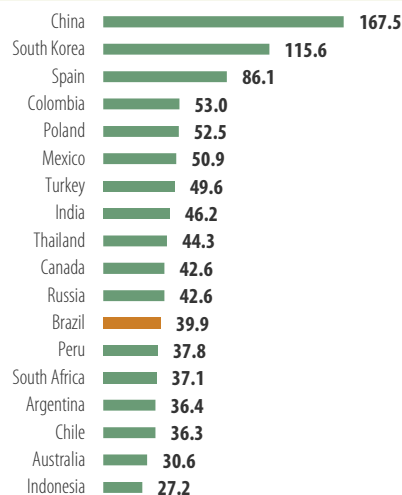
China	167.5
South Korea	115.6
Spain	86.1
Colombia	53.0
Poland	52.5
Mexico	50.9
Turkey	49.6
India	46.2
Thailand	44.3
Canada	42.6
Russia	42.6
Brazil	39.9
Peru	37.8
South Africa	37.1
Argentina	36.4
Chile	36.3
Australia	30.6
Indonesia	27.2

Index generated from the average of five components: (a) the number of ships; (b) the total container-carrying capacity of those ships; (c) the maximum vessel size; (d) the number of services; and (e) the number of companies that deploy container ships on services from and to a country's ports. The base year is 2004 and the base value is the maximum value in 2004.
Source: UNCTAD, Division on Technology and Logistics

6.5 Quality of air transport infrastructure (2015-2016 weighted average)

South Africa	5.99
Spain	5.85
Canada	5.84
South Korea	5.69
Turkey	5.41
Australia	5.28
Thailand	4.95
Chile	4.85
China	4.81
Mexico	4.58
Indonesia	4.52
India	4.49
Russia	4.44
Poland	4.32
Colombia	4.21
Peru	4.13
Argentina	4.06
Brazil	3.92

Variable generated from answers to the question: In your country, how is the quality (extensiveness and condition) of airports [1 = extremely poor-among the worst in the world; 7 = extremely good-among the best in the world]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

7 Telecommunications infrastructure sub-factor

South Korea	9.4
Australia	8.4
Canada	7.7
Spain	7.7
Russia	6.6
Poland	6.2
Argentina	6.1
Brazil	5.9
Chile	5.8
Turkey	4.9
China	4.7
Thailand	4.6
Colombia	4.5
South Africa	4.3
Mexico	4.2
Peru	3.3
Indonesia	2.8
India	1.3

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

7.1 ICT Use (2016)

South Korea	8.57
Australia	7.70
Spain	6.93
Canada	6.85
Russia	5.87
Brazil	5.60
Argentina	5.45
Poland	5.35
Chile	4.91
China	4.58
Thailand	4.33
Mexico	4.24
Turkey	4.18
South Africa	4.00
Colombia	3.85
Peru	2.94
Indonesia	2.19
India	1.25
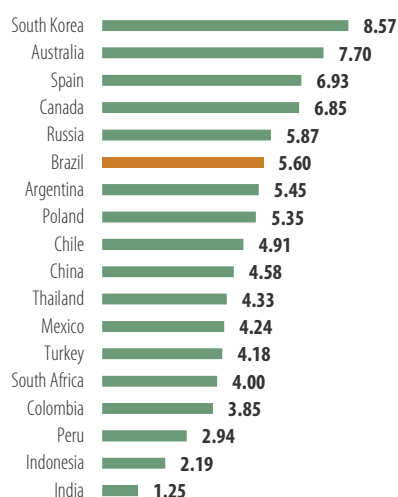
Aggregation of the weighted values of three indicators: (1) percentage of individuals using the Internet; (2) fixed (wired)-broadband Internet subscriptions per 100 inhabitants; (3) active mobile-broadband subscriptions per 100 inhabitants.
Source: International Telecommunication Union (ITU)

7.2 ICT Access (2016)

South Korea	8.99
Australia	8.23
Canada	7.99
Spain	7.92
Russia	7.23
Poland	7.09
Chile	6.81
Argentina	6.77
Brazil	6.42
Turkey	6.20
Colombia	5.83
Thailand	5.50
South Africa	5.46
China	5.45
Mexico	5.08
Peru	4.80
Indonesia	4.71
India	3.32
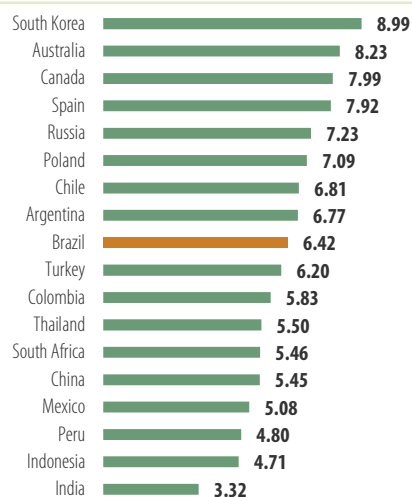
Aggregation of the weighted values of five indicators: (1) fixed telephone subscriptions per 100 inhabitants; (2) mobile cellular telephone subscriptions per 100 inhabitants; (3) international Internet bandwidth (bit/s) per Internet user; (4) percentage of households with a computer; and (5) percentage of households with Internet access.
Source: International Telecommunication Union (ITU)

8 Energy infrastructure sub-factor

Russia	5.1
Indonesia	4.3
Mexico	4.0
Poland	4.0
South Korea	3.9
Turkey	3.5
Chile	3.4
India	3.3
Colombia	3.0
Brazil	2.7
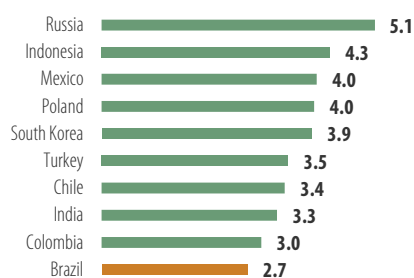
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

8.1 Electricity costs for industrial clients (2015)

Russia	0.07
Indonesia	0.08
Mexico	0.08
Poland	0.09
South Korea	0.09
Turkey	0.11
Chile	0.12
Colombia	0.13
India	0.14
Brazil	0.16
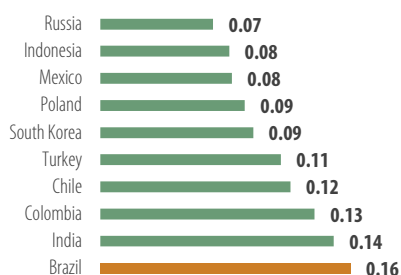
US$ per kwh
Source: IMD World Competitiveness Yearbook 2016
Note: Chile and India (2013)
*CNI estimate based on data provided by ANEEL and by the World Bank

8.2 Availability of electricity (2013)

China	1,118
Russia	1,064
India	801
South Africa	782
Thailand	719
Canada	491
Brazil	489
Indonesia	477
South Korea	449
Chile	425
Argentina	420
Poland	395
Turkey	367
Peru	348
Colombia	305
Mexico	285
Australia	262
Spain	238
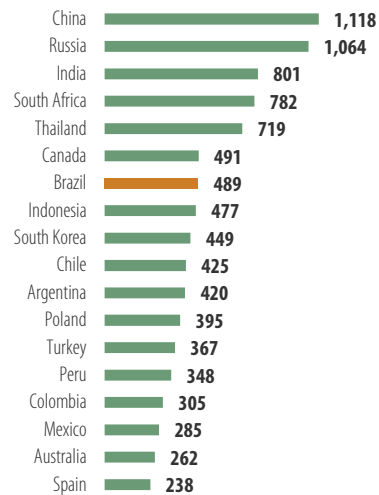
Ratio between electricity output and GDP, expressed in TWh/US$ trillion.
Source: Calculate based on data from CO2 Emissions from Fuel Combustion Highlights (2015 Edition), IEA, Paris.

9 International logistics sub-factor

Spain	9.1
Canada	8.9
South Korea	8.7
Poland	8.5
Australia	7.7
Turkey	7.5
China	7.4
Thailand	7.4
Chile	7.2
South Africa	7.0
Mexico	7.0
India	6.3
Peru	6.0
Indonesia	5.9
Brazil	5.5
Argentina	5.2
Colombia	5.1
Russia	3.7
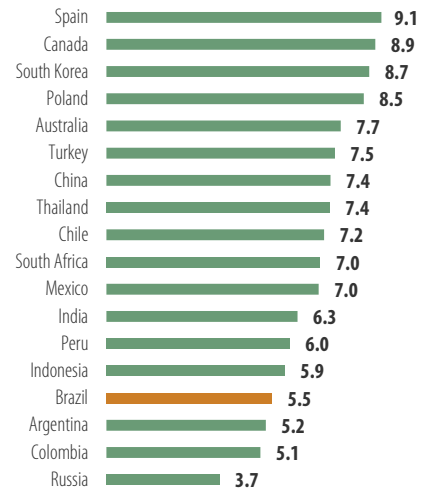
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

9.1 Logistic Performance Index (LPI) (2016)
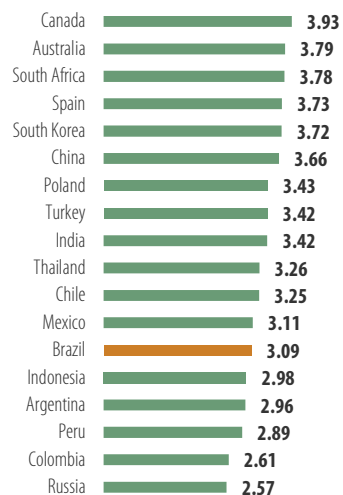
Canada	3.93
Australia	3.79
South Africa	3.78
Spain	3.73
South Korea	3.72
China	3.66
Poland	3.43
Turkey	3.42
India	3.42
Thailand	3.26
Chile	3.25
Mexico	3.11
Brazil	3.09
Indonesia	2.98
Argentina	2.96
Peru	2.89
Colombia	2.61
Russia	2.57

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.
Source: Connecting to Compete 2016. Trade Logistics in the Global Economy, World Bank, 2016

9.2 Time and cost to export and import (2015)
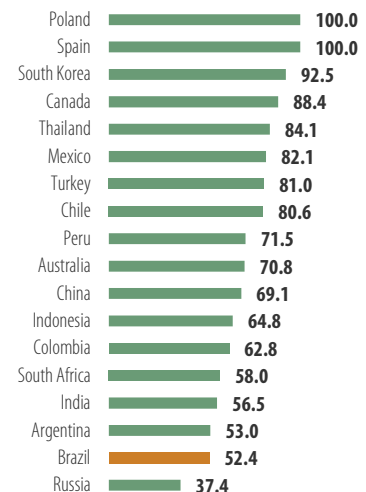
Poland	100.0
Spain	100.0
South Korea	92.5
Canada	88.4
Thailand	84.1
Mexico	82.1
Turkey	81.0
Chile	80.6
Peru	71.5
Australia	70.8
China	69.1
Indonesia	64.8
Colombia	62.8
South Africa	58.0
India	56.5
Argentina	53.0
Brazil	52.4
Russia	37.4

Distance to frontier (0-100 scale). Simple average of scores in eight indicators: (1) time and cost for documentary compliance when exporting; (2) time and cost for border compliance when exporting; (3) time and cost for documentary compliance when importing; (4) time and cost for border compliance when importing.
Source: World Bank, Doing Business 2016

10 Taxes sub-factor

Thailand	7.7
Indonesia	7.5
Canada	6.8
South Korea	6.7
Colombia	6.4
Russia	6.4
Turkey	6.3
Chile	6.2
Australia	6.2
South Africa	6.1
Peru	6.1
Mexico	5.9
China	5.9
India	5.8
Poland	5.2
Brazil	5.2
Spain	4.9
Argentina	3.5
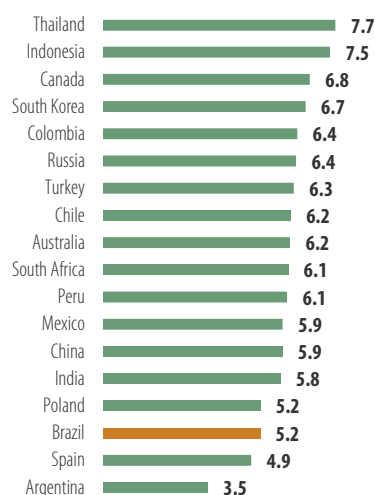
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

10.1 Collected total tax revenues (2014)

Indonesia	10.8
Colombia	11.6
Thailand	17.0
Russia	17.7
India	17.9
China	18.7
Peru	18.8
Mexico	19.6
Chile	19.8
Turkey	20.2
Brazil	20.9
South Korea	24.6
Australia	25.9
South Africa	26.0
Canada	31.0
Poland	32.0
Argentina	32.4
Spain	33.8
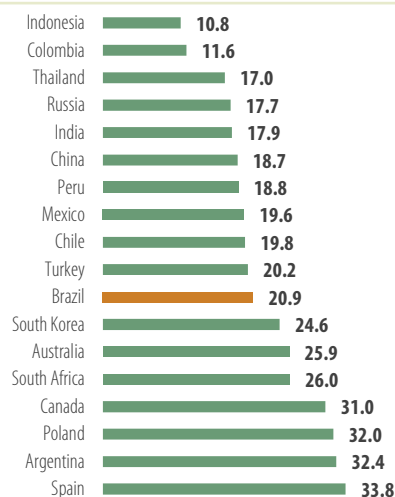
Percentage of GDP
Source: IMD World Competitiveness Yearbook 2016
Note: Mexico and Poland (2013); Australia (2012)

10.2 Total tax rate (% of profit) (2014)
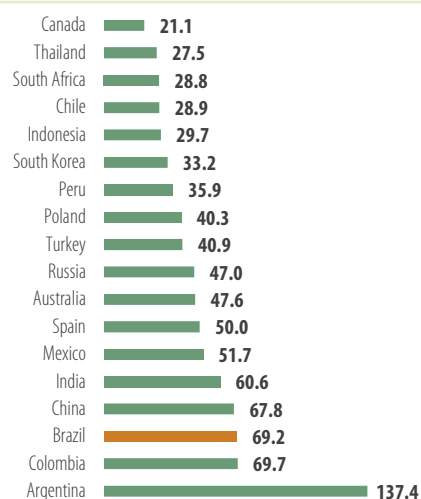
Canada	21.1
Thailand	27.5
South Africa	28.8
Chile	28.9
Indonesia	29.7
South Korea	33.2
Peru	35.9
Poland	40.3
Turkey	40.9
Russia	47.0
Australia	47.6
Spain	50.0
Mexico	51.7
India	60.6
China	67.8
Brazil	69.2
Colombia	69.7
Argentina	137.4

Total taxes paid by a company as a percentage of its profits (the profit or corporate income tax, social contributions and labor taxes paid by the employer, property taxes, property transfer taxes, dividend tax, capital gains tax, financial transactions tax, waste collection taxes, vehicle and road taxes, and any other small taxes or fees).
Source: World Bank, Doing Business 2016

10.3 Corporate tax rates (2016)

Poland	19.0
Thailand	20.0
Turkey	20.0
Russia	20.0
Chile	24.0
South Korea	24.2
China	25.0
Indonesia	25.0
Colombia	25.0
Spain	25.0
Canada	26.5
Peru	28.0
South Africa	28.0
Australia	30.0
Mexico	30.0
Brazil	34.0
India	34.6
Argentina	35.0
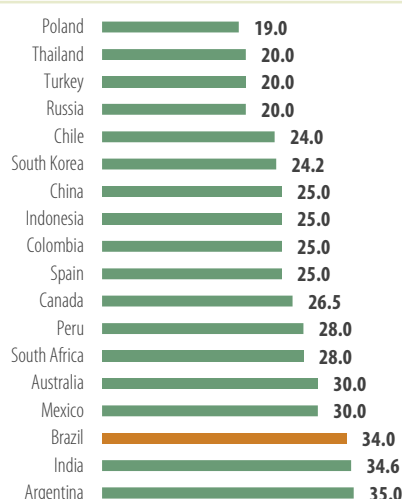
Corporate tax rates
Source: Tax Rates Online, KPMG
Note: Peru (2015)

10.4 Indirect tax rates (2016)

Canada	5.0
Thailand	7.0
Australia	10.0
South Korea	10.0
Indonesia	10.0
South Africa	14.0
India	14.5
Mexico	16.0
Colombia	16.0
China	17.0
Turkey	18.0
Russia	18.0
Peru	18.0
Chile	19.0
Brazil	19.0
Spain	21.0
Argentina	21.0
Poland	23.0
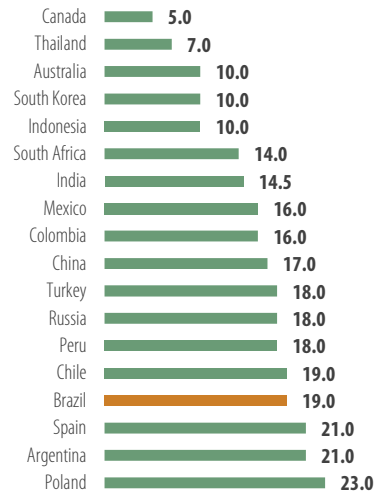
Indirect tax rates
Source: Tax Rates Online, KPMG

11 Macroeconomic indicators sub-factor

China	7.0
Indonesia	6.4
South Korea	6.2
Chile	6.2
Australia	6.1
Colombia	6.1
Thailand	6.0
Peru	6.0
Canada	5.8
India	5.8
Russia	5.7
Mexico	5.7
Poland	5.6
Turkey	5.6
South Africa	5.5
Spain	5.4
Brazil	5.2
Argentina	4.4

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

11.1 Inflation (2015)

Poland	-0.93
Thailand	-0.90
Spain	-0.50
South Korea	0.71
Canada	1.11
China	1.44
Australia	1.53
Mexico	2.72
Peru	3.53
Chile	4.30
South Africa	4.59
India	4.93
Colombia	4.99
Indonesia	6.36
Turkey	7.67
Brazil	9.03
Russia	15.53
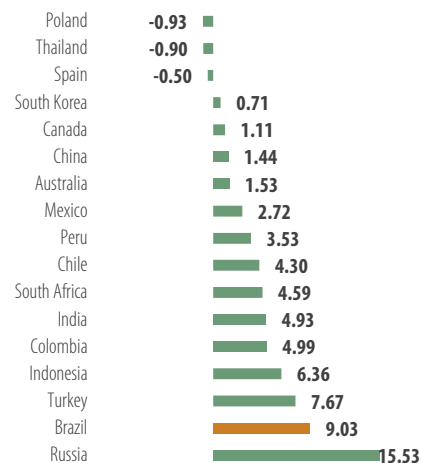
Annual percent change in consumer price index (year average)
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

11.2 General government debt (2015)

Chile	17.1
Russia	17.7
Peru	23.1
Indonesia	27.3
Turkey	32.6
South Korea	35.9
Australia	36.8
Thailand	43.1
China	43.9
Colombia	49.4
South Africa	50.1
Poland	51.3
Mexico	54.0
Argentina	56.5
India	67.2
Brazil	73.7
Canada	91.5
Spain	99.0
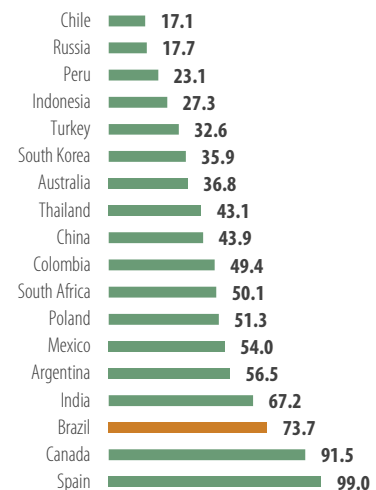
Percentage of GDP.
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

11.3 General government net debt interest payments (% GDP) (2015)
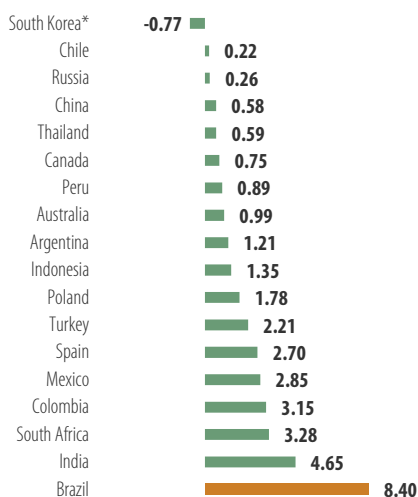
South Korea*	-0.77
Chile	0.22
Russia	0.26
China	0.58
Thailand	0.59
Canada	0.75
Peru	0.89
Australia	0.99
Argentina	1.21
Indonesia	1.35
Poland	1.78
Turkey	2.21
Spain	2.70
Mexico	2.85
Colombia	3.15
South Africa	3.28
India	4.65
Brazil	8.40

Interest payments on government debt, obtained by the difference between General government net lending/borrowing and General government primary net lending/borrowing. Percentage of GDP.
Source: CNI estimate based on data from World Economic Outlook Database, Oct. 2016, IMF.
*Interest revenues

11.4 Gross fixed capital formation (2015)

China	44.25
Indonesia	33.19
India	29.35
South Korea	29.08
Colombia	26.70
Australia	26.05
Thailand	24.93
Peru	24.35
Canada	23.48
Chile	22.72
Mexico	22.19
Russia	20.57
Spain	20.37
Turkey	20.30
Poland	20.13
South Africa	20.05
Brazil	18.16
Argentina	17.11
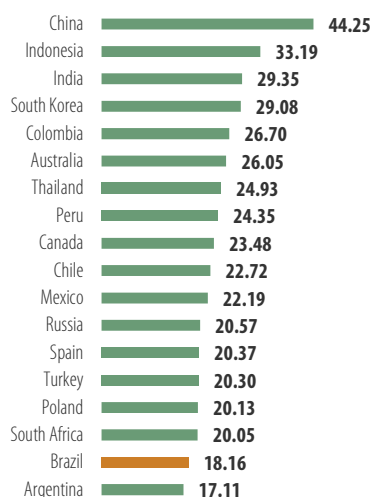
Percentage of GDP.
Source: IMD World Competitiveness Yearbook 2016
Note: China and Russia (2014)

11.5 Direct investment flows inward (2015)

Chile	8.52
Brazil	4.23
Colombia	4.15
Canada	4.07
Peru	3.57
Australia	3.08
Thailand	2.93
Mexico	2.48
Turkey	2.33
Argentina	2.18
Spain	2.18
Indonesia	1.80
Poland	1.31
China	1.17
India	1.09
South Africa	0.57
Russia	0.37
South Korea	0.37
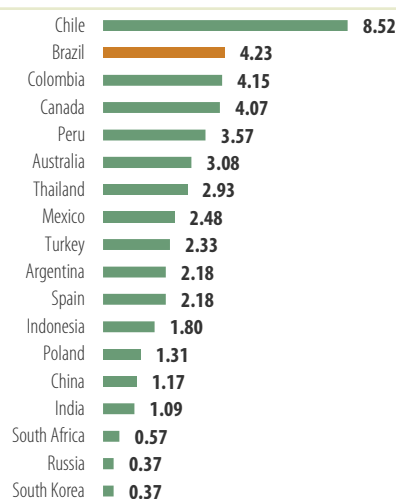
Percentage of GDP.
Source: IMD World Competitiveness Yearbook 2016
Note: Thailand (2014)

11.6 Real effective exchange rate (dec/2015)
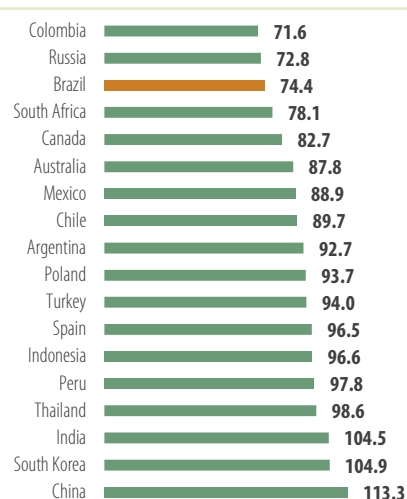
Colombia	71.6
Russia	72.8
Brazil	74.4
South Africa	78.1
Canada	82.7
Australia	87.8
Mexico	88.9
Chile	89.7
Argentina	92.7
Poland	93.7
Turkey	94.0
Spain	96.5
Indonesia	96.6
Peru	97.8
Thailand	98.6
India	104.5
South Korea	104.9
China	113.3

Real effective exchange rate (monthly average) on the reference date, expressed as a percentage of the arithmetic average of the monthly rates observed from January 2011 to December 2015.
Source: Prepared by CNI, based on the real effective exchange rate estimated by the Bank for International Settlements.

12 Competition sub-factor

Australia	9.2
Spain	9.0
Poland	8.5
Turkey	8.4
Canada	8.4
South Korea	8.3
Peru	8.2
Chile	8.0
Colombia	7.9
Indonesia	7.8
South Africa	7.8
Mexico	7.7
Thailand	7.5
Russia	7.1
China	6.9
Brazil	6.6
India	5.6
Argentina	5.4
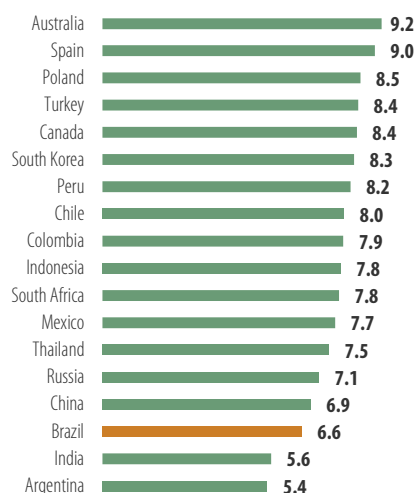
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

12.1 Trade tariffs (2015)
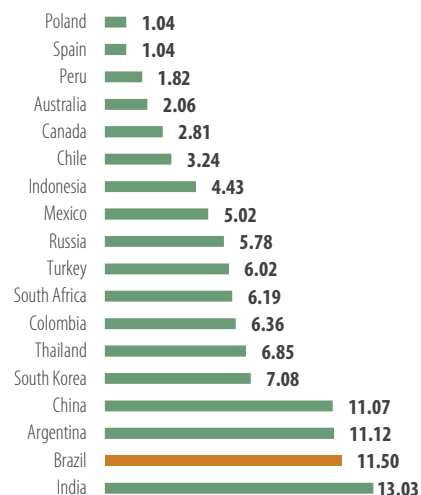
Poland	1.04
Spain	1.04
Peru	1.82
Australia	2.06
Canada	2.81
Chile	3.24
Indonesia	4.43
Mexico	5.02
Russia	5.78
Turkey	6.02
South Africa	6.19
Colombia	6.36
Thailand	6.85
South Korea	7.08
China	11.07
Argentina	11.12
Brazil	11.50
India	13.03

Trade-weighted average tariff rate. The weights are the trade patterns of the importing country's reference group.
Source: The Global Competitiveness Report 2016-2017, World Economic Forum
Note: Colombia, Mexico and Peru (2014); India (2009)

12.2 Intensity of local competition (2015-2016 weighted average)
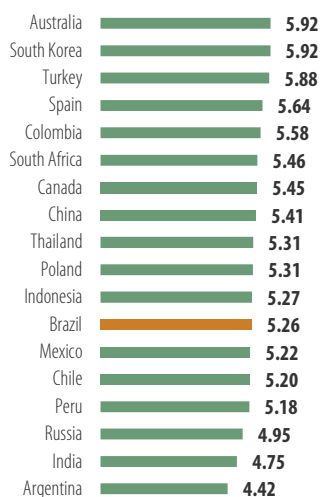
Australia	5.92
South Korea	5.92
Turkey	5.88
Spain	5.64
Colombia	5.58
South Africa	5.46
Canada	5.45
China	5.41
Thailand	5.31
Poland	5.31
Indonesia	5.27
Brazil	5.26
Mexico	5.22
Chile	5.20
Peru	5.18
Russia	4.95
India	4.75
Argentina	4.42

Variable generated from answers to the question: In your country, how intense is competition in the local markets? [1 = not intense at all; 7 = extremely intense]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

13 Scale sub-factor

China	10.0
India	9.0
Russia	8.0
Brazil	7.9
Indonesia	7.8
Mexico	7.5
South Korea	7.2
Canada	7.2
Turkey	7.2
Spain	7.1
Australia	6.7
Thailand	6.6
Argentina	6.5
Poland	6.5
South Africa	6.3
Colombia	6.2
Chile	5.5
Peru	5.5
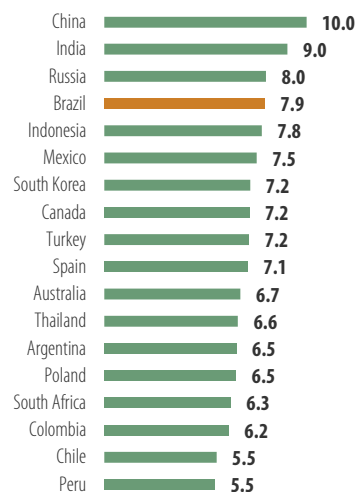
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

13.1 Domestic market size (2015 or most recent year available)
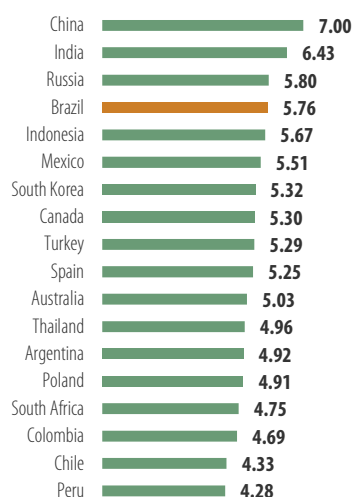
China	7.00
India	6.43
Russia	5.80
Brazil	5.76
Indonesia	5.67
Mexico	5.51
South Korea	5.32
Canada	5.30
Turkey	5.29
Spain	5.25
Australia	5.03
Thailand	4.96
Argentina	4.92
Poland	4.91
South Africa	4.75
Colombia	4.69
Chile	4.33
Peru	4.28

Sum of gross domestic product plus value of imports of goods and services, minus value of exports of goods and services, normalized on a 1-7 (best) scale
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

14 Government Efficiency sub-factor

Canada	8.3
Australia	8.3
Chile	7.1
Spain	5.9
Poland	5.6
South Africa	5.5
Turkey	5.5
South Korea	5.3
Peru	5.1
China	5.1
India	5.0
Colombia	4.6
Mexico	4.6
Thailand	4.5
Indonesia	4.4
Russia	4.0
Brazil	3.1
Argentina	2.8
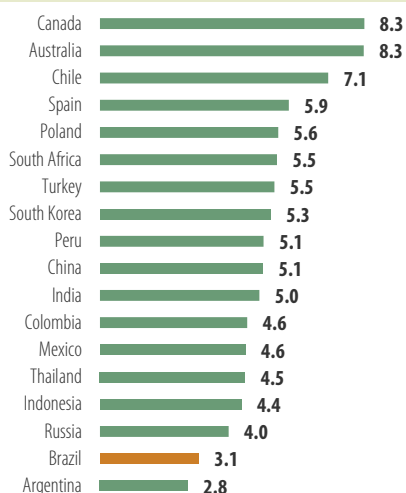
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

14.1 Irregular payments and bribes (2015-2016 weighted average)
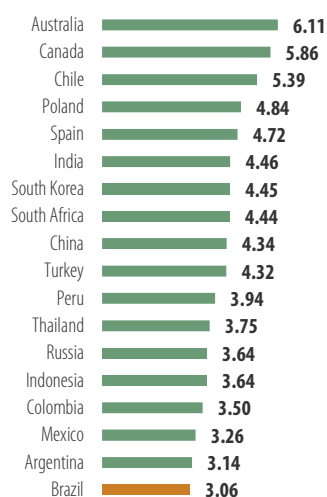
Australia	6.11
Canada	5.86
Chile	5.39
Poland	4.84
Spain	4.72
India	4.46
South Korea	4.45
South Africa	4.44
China	4.34
Turkey	4.32
Peru	3.94
Thailand	3.75
Russia	3.64
Indonesia	3.64
Colombia	3.50
Mexico	3.26
Argentina	3.14
Brazil	3.06

Variable generated from answers to the following questions: In your country, how common is it for firms to make undocumented extra payments or bribes connected with (a) imports and exports; (b) public utilities; (c) annual tax payments; (d) awarding of public contracts and licenses; (e) obtaining favorable judicial decisions? [1 = very common; 7 = never occurs]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

14.2 Regulatory Quality (2015)
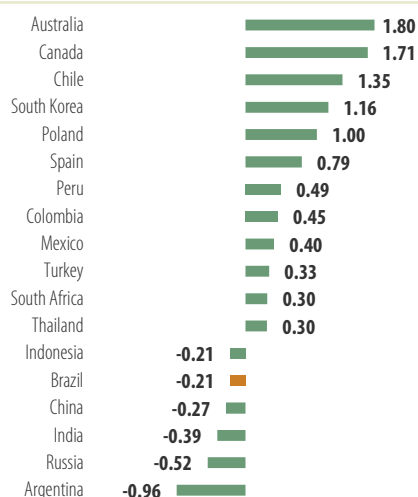
Australia	1.80
Canada	1.71
Chile	1.35
South Korea	1.16
Poland	1.00
Spain	0.79
Peru	0.49
Colombia	0.45
Mexico	0.40
Turkey	0.33
South Africa	0.30
Thailand	0.30
Indonesia	-0.21
Brazil	-0.21
China	-0.27
India	-0.39
Russia	-0.52
Argentina	-0.96

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. Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance.
Source: The Worldwide Governance Indicators, 2016

14.3 Transparency of government policymaking (2015-2016 weighted average)
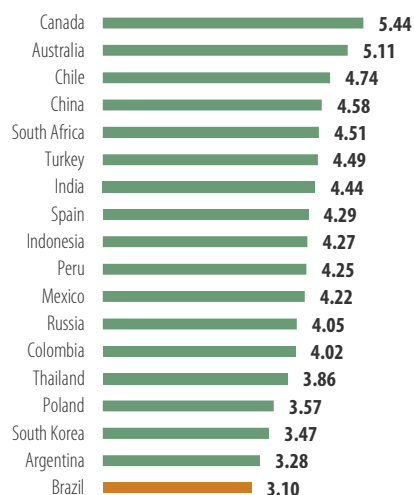
Canada	5.44
Australia	5.11
Chile	4.74
China	4.58
South Africa	4.51
Turkey	4.49
India	4.44
Spain	4.29
Indonesia	4.27
Peru	4.25
Mexico	4.22
Russia	4.05
Colombia	4.02
Thailand	3.86
Poland	3.57
South Korea	3.47
Argentina	3.28
Brazil	3.10

Variable generated from answers to the question: In your country, how easy is it for companies to obtain information about changes in government policies and regulations affecting their activities? [1 = extremely difficult; 7 = extremely easy]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

15 Legal certainty, red tape and labor relations sub-factor

Canada	9.0
Australia	7.8
Chile	7.8
South Korea	7.4
Poland	7.2
Spain	7.0
Russia	6.6
Turkey	6.3
Thailand	6.3
Mexico	6.3
Colombia	6.2
China	6.0
India	5.9
Peru	5.9
Indonesia	5.2
South Africa	4.8
Brazil	4.2
Argentina	3.9

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

15.1 Rule of Law (2015)

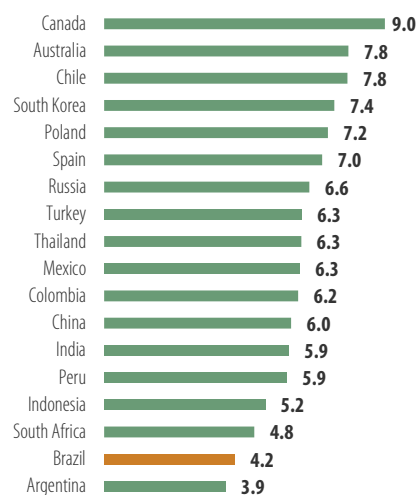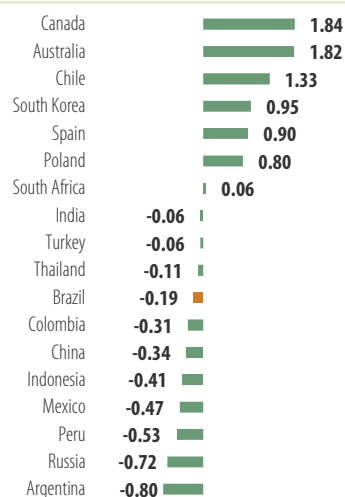|	
Canada	1.84
Australia	1.82
Chile	1.33
South Korea	0.95
Spain	0.90
Poland	0.80
South Africa	0.06
India	-0.06
Turkey	-0.06
Thailand	-0.11
Brazil	-0.19
Colombia	-0.31
China	-0.34
Indonesia	-0.41
Mexico	-0.47
Peru	-0.53
Russia	-0.72
Argentina	-0.80

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. Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance.
Source: The Worldwide Governance Indicators, 2016

15.2 Starting a business (2015)
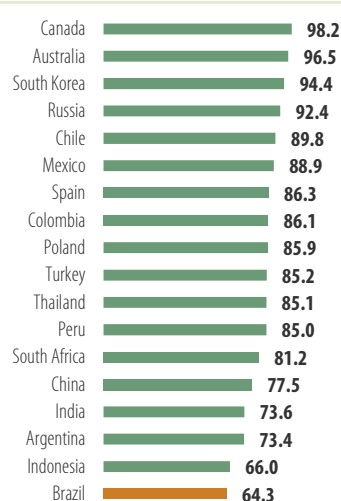
Canada	98.2
Australia	96.5
South Korea	94.4
Russia	92.4
Chile	89.8
Mexico	88.9
Spain	86.3
Colombia	86.1
Poland	85.9
Turkey	85.2
Thailand	85.1
Peru	85.0
South Africa	81.2
China	77.5
India	73.6
Argentina	73.4
Indonesia	66.0
Brazil	64.3

Distance to frontier (0-100 scale). Simple average of scores in four indicators: (1) procedures to legally start and formally operate a company (number); (2) time required to complete each procedure (calendar days); (3) cost required to complete each procedure (percentage of per capita income); (4) paid-in minimum capital (percentage of per capita income).
Source: World Bank, Doing Business 2016.

15.3 Flexibility of wage determination (2015-2016 weighted average)
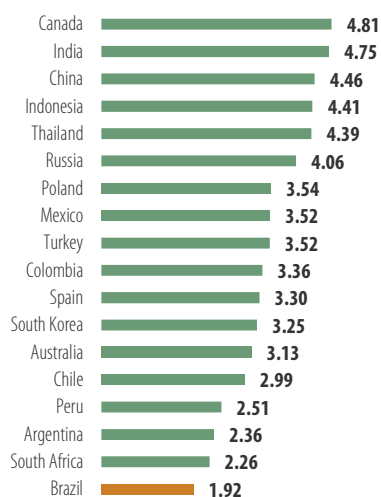
Canada	4.81
India	4.75
China	4.46
Indonesia	4.41
Thailand	4.39
Russia	4.06
Poland	3.54
Mexico	3.52
Turkey	3.52
Colombia	3.36
Spain	3.30
South Korea	3.25
Australia	3.13
Chile	2.99
Peru	2.51
Argentina	2.36
South Africa	2.26
Brazil	1.92

Variable generated from answers to the question: In your country, how are wages generally set? [1 = by a centralized bargaining process; 7 = by each individual company]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

15.4 Hiring and firing practices (2015-2016 weighted average)

Chile	6.08
Peru	5.78
Russia	5.59
Poland	5.48
Canada	5.40
Colombia	5.33
Mexico	5.28
Turkey	5.13
Spain	5.02
South Korea	4.97
China	4.85
Thailand	4.38
Indonesia	4.35
Australia	4.34
India	4.33
Brazil	4.09
Argentina	3.01
South Africa	2.85

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]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum

16 Educational attainment sub-factor

South Korea	8.5
Canada	7.9
Australia	7.7
Russia	7.6
Poland	6.8
Spain	6.2
Chile	5.7
Colombia	4.3
Turkey	4.3
Brazil	3.5
Mexico	2.4
South Africa	2.1
Indonesia	1.8
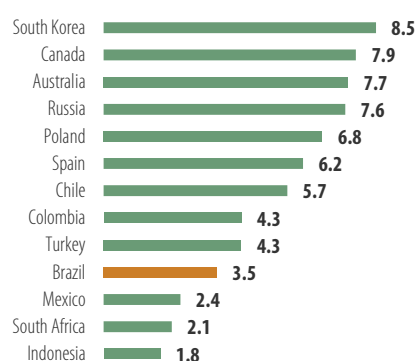
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

16.1 Gross enrolment ratio in secondary education (2014)
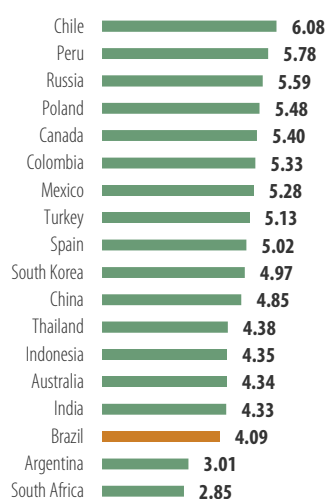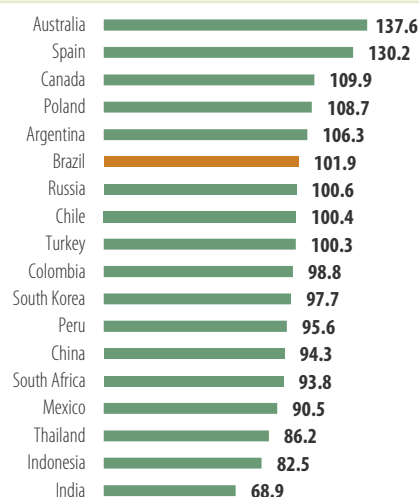
Australia	137.6
Spain	130.2
Canada	109.9
Poland	108.7
Argentina	106.3
Brazil	101.9
Russia	100.6
Chile	100.4
Turkey	100.3
Colombia	98.8
South Korea	97.7
Peru	95.6
China	94.3
South Africa	93.8
Mexico	90.5
Thailand	86.2
Indonesia	82.5
India	68.9

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.
Source: UNESCO Institute for Statistics
Note: Argentina, Australia, Brasil, Canada, India, South Korea, Poland, Turkey and Thailand (2013)

16.2 Gross enrolment ratio in tertiary education (2014)

South Korea	95.3
Spain	89.1
Chile	86.6
Australia	86.6
Argentina	80.0
Turkey	79.0
Russia	78.7
Poland	71.2
Thailand	52.5
Colombia	51.3
Brazil	46.4
China	39.4
Indonesia	31.1
Mexico	29.9
India	23.9
South Africa	19.7

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.
Source: UNESCO Institute for Statistics
Note: Argentina, Australia, Brasil, India, South Korea, Poland, South Africa and Turkey (2013)

16.3 Percentage of adults who have attained at least upper secondary education (2015)

South Korea	98
Russia	95
Poland	94
Canada	93
Australia	88
Chile	80
Colombia	67
Spain	66
Brazil	62
Turkey	52
South Africa	49
Mexico	45
Indonesia	43

Percentage of adults aged between 25 and 34 who have attained at least upper secondary education
Source: Education at a Glance 2016, OECD

16.4 Percentage of adults who have attained at least tertiary education (2015)

South Korea	69.0
Canada	59.2
Russia	58.2
Australia	48.5
Poland	43.2
Spain	41.0
Turkey	27.5
Colombia	27.4
Chile	27.3
Mexico	21.0
Brazil	16.3
South Africa	14.2
Indonesia	10.6
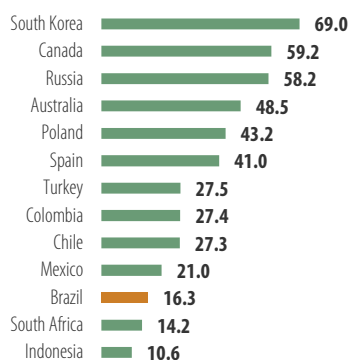
Percentage of adults aged between 25 and 34 who have attained tertiary education
Source: Education at a Glance 2016, OECD

17 Educational assessment sub-factor

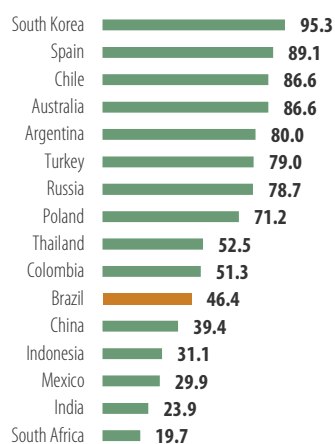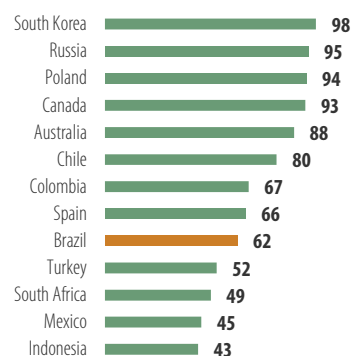|	
Canada	8.8
South Korea	8.5
Poland	7.8
Australia	7.8
Russia	7.3
Spain	7.3
Chile	5.0
Turkey	4.2
Mexico	3.7
Thailand	3.7
Colombia	3.5
Brazil	2.8
Indonesia	2.8
Peru	2.7
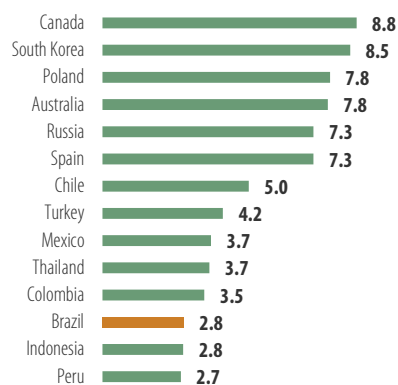
Source: CNI
Note: Average scores (0 = worst performance; 10 = best performance)

17.1 Performance in mathematics (2015)

Country	Score
South Korea	524.1
Canada	515.6
Poland	504.5
Russia	494.1
Australia	493.9
Spain	485.8
Chile	422.7
Turkey	420.5
Thailand	415.5
Mexico	408.0
Colombia	389.6
Peru	386.6
Indonesia	386.1
Brazil	377.1

Average scores in math tests, 15-year-old students
Source: PISA 2015, Excellence and Equity in Education

17.2 Performance in reading (2015)

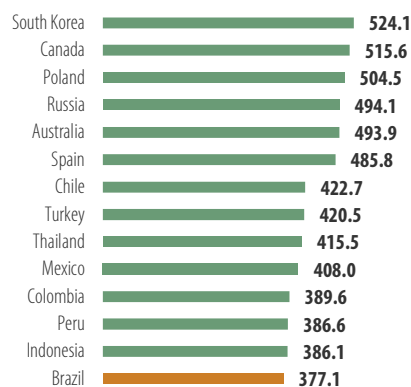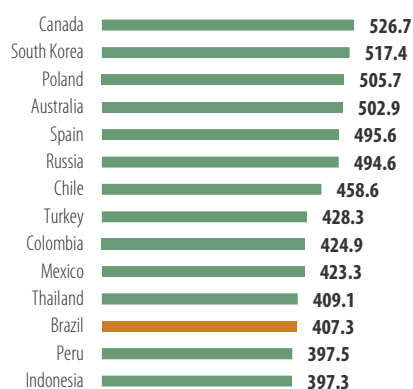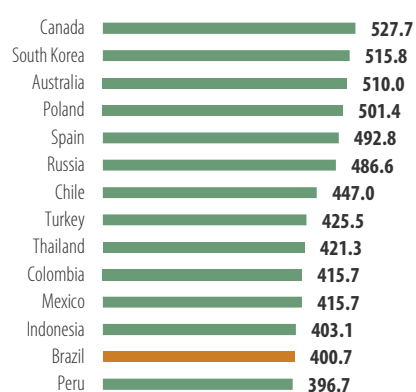| Country	Score
Canada	526.7
South Korea	517.4
Poland	505.7
Australia	502.9
Spain	495.6
Russia	494.6
Chile	458.6
Turkey	428.3
Colombia	424.9
Mexico	423.3
Thailand	409.1
Brazil	407.3
Peru	397.5
Indonesia	397.3

Average scores in reading tests, 15-year-old students
Source: PISA 2015, Excellence and Equity in Education

17.3 Performance in science (2015)

Country	Score
Canada	527.7
South Korea	515.8
Australia	510.0
Poland	501.4
Spain	492.8
Russia	486.6
Chile	447.0
Turkey	425.5
Thailand	421.3
Colombia	415.7
Mexico	415.7
Indonesia	403.1
Brazil	400.7
Peru	396.7

Average scores in science tests, 15-year-old students
Source: PISA 2015, Excellence and Equity in Education

18 Expenditure on education sub-factor

Country	Score
Australia	6.0
Canada	5.6
South Africa	5.1
Brazil	4.6
South Korea	3.8
Poland	3.7
Spain	3.6
Argentina	3.4
Colombia	3.0
Russia	2.8
Chile	2.7
Turkey	2.6
Thailand	2.3
Mexico	2.2
China	2.1
Indonesia	1.9
Peru	1.7
India	1.5

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

18.1 Total public expenditure on education (2014)
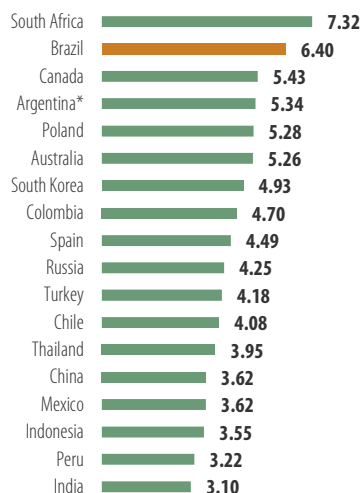
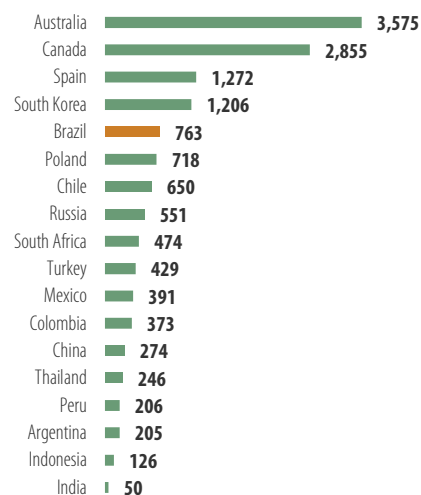|	
South Africa	7.32
Brazil	6.40
Canada	5.43
Argentina*	5.34
Poland	5.28
Australia	5.26
South Korea	4.93
Colombia	4.70
Spain	4.49
Russia	4.25
Turkey	4.18
Chile	4.08
Thailand	3.95
China	3.62
Mexico	3.62
Indonesia	3.55
Peru	3.22
India	3.10

Percentage of GDP.
Source: IMD World Competitiveness Yearbook 2016
Note: Australia, Canadá, Chile, South Korea, Spain and Peru (2012); Argentina and Poland (2013)
*Source is UNESCO Institute for Statistics

18.2 Total public expenditure on education per capita (2014)

Australia	3,575
Canada	2,855
Spain	1,272
South Korea	1,206
Brazil	763
Poland	718
Chile	650
Russia	551
South Africa	474
Turkey	429
Mexico	391
Colombia	373
China	274
Thailand	246
Peru	206
Argentina	205
Indonesia	126
India	50

US$ per capita
Source: IMD World Competitiveness Yearbook 2016
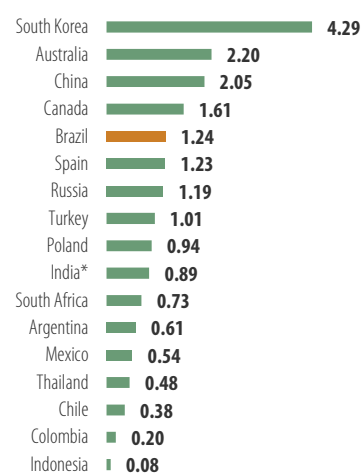Note: Australia, Canada, Chile, South Korea, Spain and Peru (2012); Poland (2013)

19 Government support sub-factor

South Korea	7.5
China	5.9
Australia	4.6
India	4.6
Canada	3.9
Indonesia	3.5
Spain	3.4
Russia	3.4
Turkey	3.3
Brazil	2.7
Poland	2.6
Thailand	2.6
South Africa	2.4
Mexico	2.3
Colombia	2.0
Argentina	1.8
Chile	1.7

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

19.1 Gross domestic expenditure on R&D (2014)

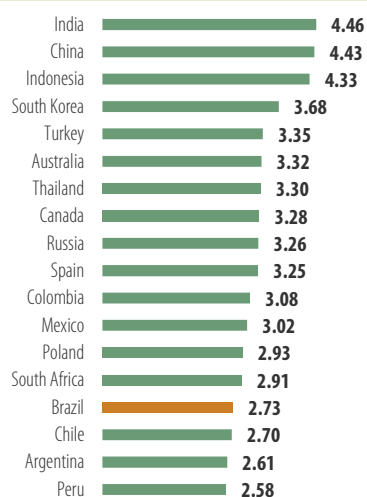|	
South Korea	4.29
Australia	2.20
China	2.05
Canada	1.61
Brazil	1.24
Spain	1.23
Russia	1.19
Turkey	1.01
Poland	0.94
India*	0.89
South Africa	0.73
Argentina	0.61
Mexico	0.54
Thailand	0.48
Chile	0.38
Colombia	0.20
Indonesia	0.08

Percentage of GDP.
Source: UNESCO Institute for Statistics
Note: Australia, Brazil, South Africa and Indonesia (2013)
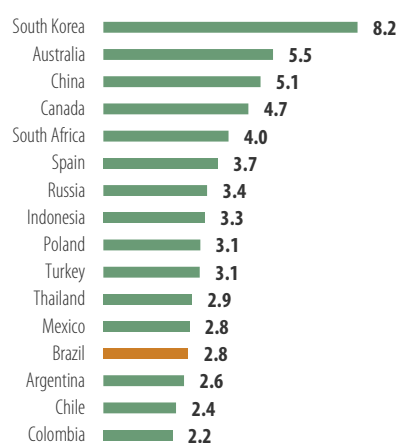*Source is IMD World Competitiveness Yearbook 2016

19.2 Government procurement of advanced tech products (2015-2016 weighted average)

Country	Value
India	4.46
China	4.43
Indonesia	4.33
South Korea	3.68
Turkey	3.35
Australia	3.32
Thailand	3.30
Canada	3.28
Russia	3.26
Spain	3.25
Colombia	3.08
Mexico	3.02
Poland	2.93
South Africa	2.91
Brazil	2.73
Chile	2.70
Argentina	2.61
Peru	2.58

Variable generated from answers to the question: In your country, to what extent do government purchasing decisions foster innovation? [1 = not at all; 7 = to a great extent]
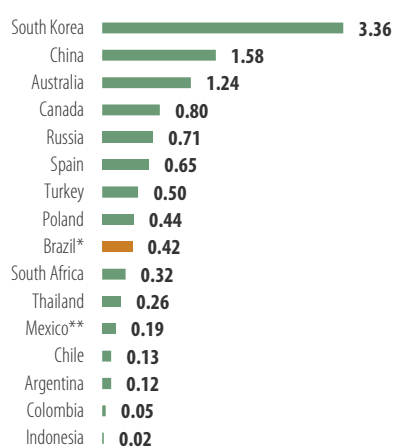Source: The Global Competitiveness Report 2016-2017, World Economic Forum

20 R&D and innovation in companies sub-factor

Country	Value
South Korea	8.2
Australia	5.5
China	5.1
Canada	4.7
South Africa	4.0
Spain	3.7
Russia	3.4
Indonesia	3.3
Poland	3.1
Turkey	3.1
Thailand	2.9
Mexico	2.8
Brazil	2.8
Argentina	2.6
Chile	2.4
Colombia	2.2

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

20.1 Gross expenditure on R&D performed by business enterprise (2014)

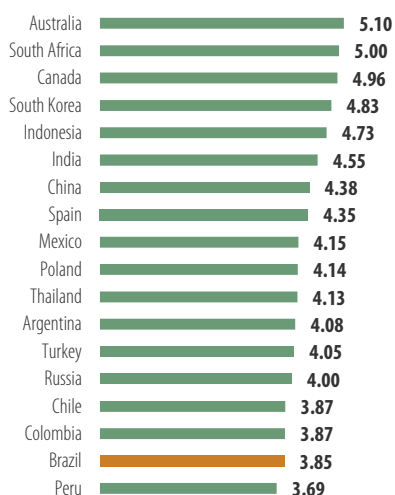| Country	Value
South Korea	3.36
China	1.58
Australia	1.24
Canada	0.80
Russia	0.71
Spain	0.65
Turkey	0.50
Poland	0.44
Brazil*	0.42
South Africa	0.32
Thailand	0.26
Mexico**	0.19
Chile	0.13
Argentina	0.12
Colombia	0.05
Indonesia	0.02

Percentage of GDP.
Source: UNESCO Institute for Statistics
Note: Australia, Mexico and Indonesia (2013); South Africa (2012)
*CNI estimate based on data from IBGE's National Accounts - reference year 2010
** Source is IMD Competitiveness Yearbook 2016

20.2 Capacity for innovation (2015-2016 weighted average)

Country	Value
Australia	5.10
South Africa	5.00
Canada	4.96
South Korea	4.83
Indonesia	4.73
India	4.55
China	4.38
Spain	4.35
Mexico	4.15
Poland	4.14
Thailand	4.13
Argentina	4.08
Turkey	4.05
Russia	4.00
Chile	3.87
Colombia	3.87
Brazil	3.85
Peru	3.69

Variable generated from answers to the question: In your country, to what extent do companies have the capacity to innovate? [1 = not at all; 7 = to a great extent]
Source: The Global Competitiveness Report 2016-2017, World Economic Forum