



Guide to doing business in Brazil

Opportunity mapping

August 2022

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Opportunity mapping



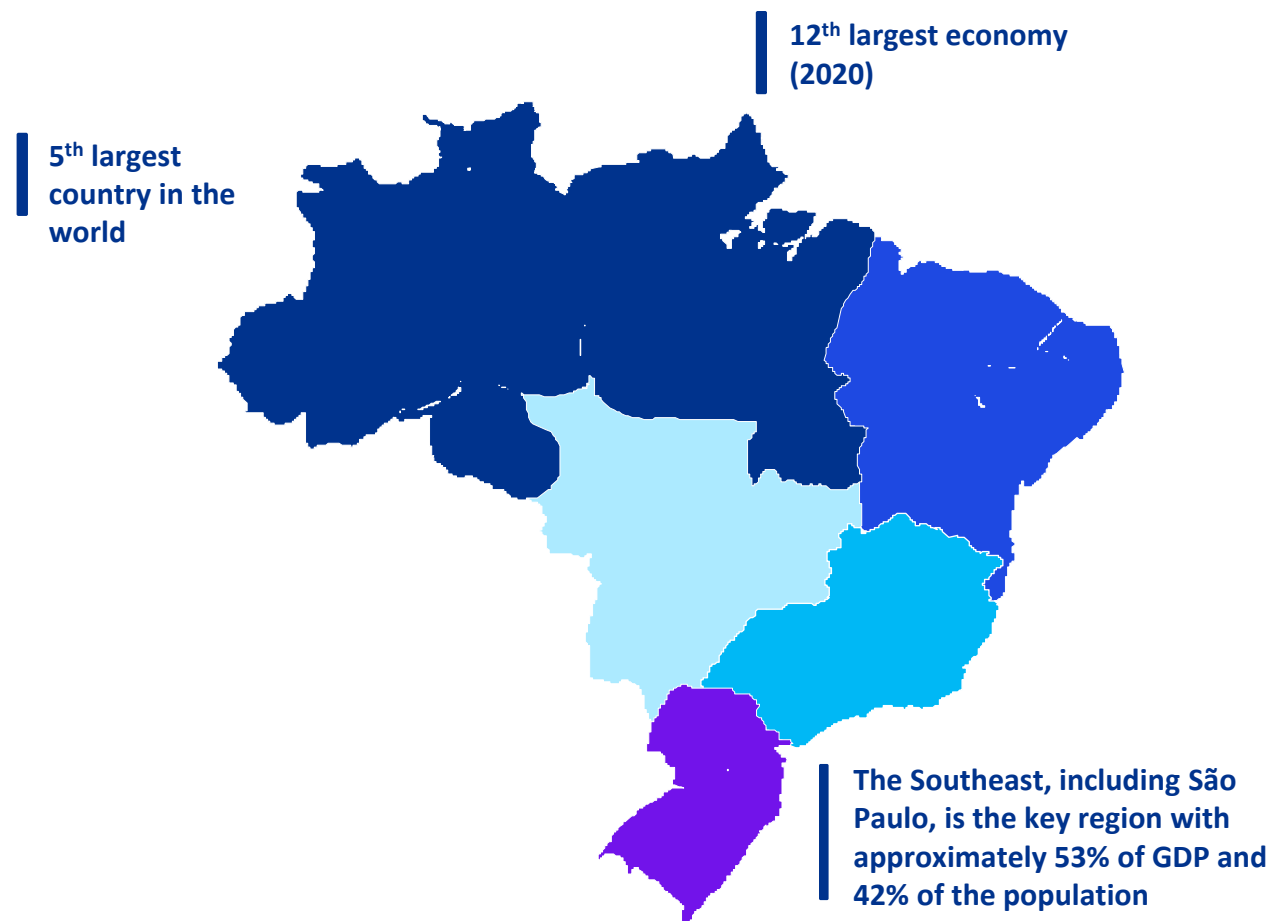
Regional Profile



Brazil

Source: IBGE and Bacen. Prepared by Pezco Economics.

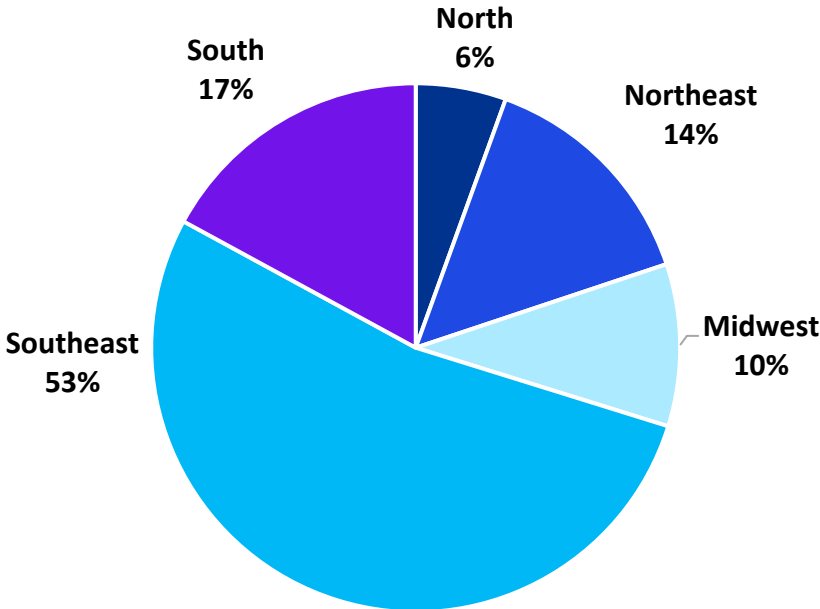
Population (number of people, 2021)	213,317,639
GDP per capita (R\$, 2020)	35,162
GDP (R\$ trillion, 2020)	7.4
Exports (US\$ million, 2020)	209.8
Imports (US\$ million, 2020)	158,9
Unemployment rate (3Q21)	12.6%



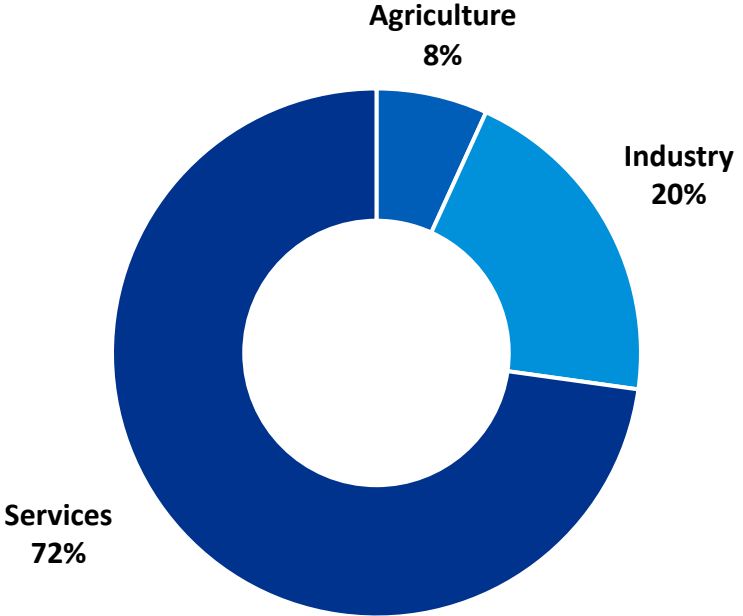
Brazil

Source: IBGE and Bacen. Prepared by Pezco Economics.

GDP contribution by region (2020)



Breakdown of GDP (Brazil, 2020)



North region

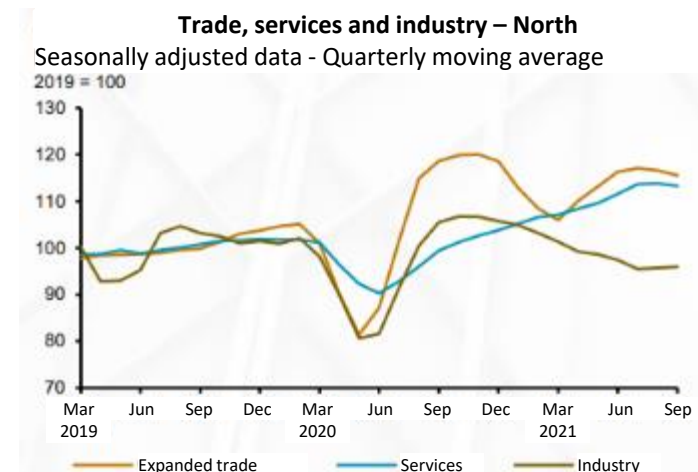
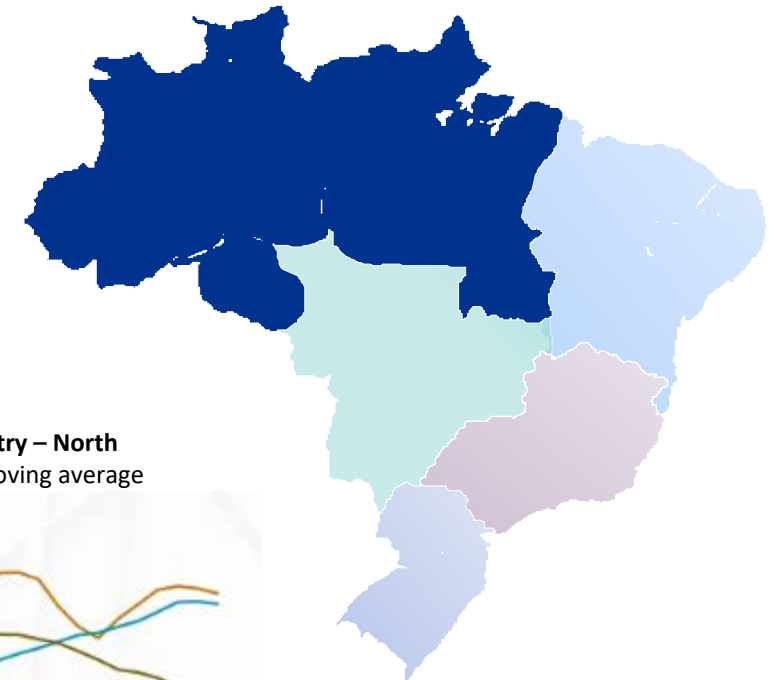
The North Region has 3.85 million square kilometers and represents about 45% of the national territory. The Amazon rainforest represents about 86% of this territory.

The region's economic activity revolves around the Manaus Free Trade Zone.

Here we find large rivers, such as the Amazon River, which have great potential for generating hydroelectric energy, but logistics integration is still precarious.

Population (2020)	18,430,980
GDP per capita (R\$, 2019)	22,810
GDP (R\$ million, 2020)	420,424
Export (US\$ million, 2020)	21,439
Import (US\$ million, 2020)	12,662
Unemployment rate (2019 average)	12.3%
Mass of income (R\$ million, 2020)	12,174
Credit inventory (% of GDP)	32.3%

Source: IBGE and Bacen. Prepared by Pezco Economics.



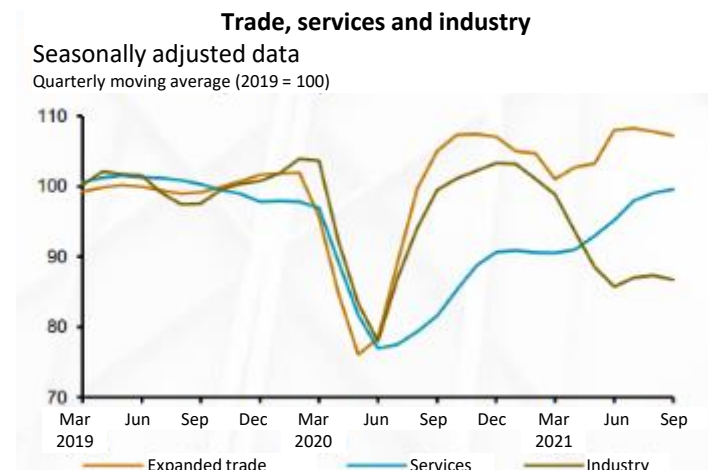
Northeast region

The Northeast Region covers an area of 1.55 million km² and represents about 18% of the national territory. About 1.1 million km² (71.3%) of the region's territory is in the “Draught Polygon” (Polígono das Secas), spread over 1,348 municipalities in eight states (AL, BA, CE, PB, PE, PI, RN and SE).

High poverty region, with the lowest GDP per capita within the country and an unemployment rate above the national average. It concentrates the largest number of beneficiaries of social assistance programs.

Population (number of people, 2020)	57,071,654
GDP per capita (R\$, 2020)	18,358
GDP (R\$ million, 2020)	1,047,766
Exports (US\$ million, 2020)	16,887
Imports (US\$ million, 2020)	20,208
Unemployment rate (2020 average)	14.5%
Mass of income (R\$ million, 2020)	33,645
Credit inventory (% of GDP)	42.3%

Source: IBGE and Bacen.



Midwest region

The Midwest Region has an area of 1.6 million km² and represents about 19% of the national territory. The region concentrates the largest areas for agricultural activity.

The region's economic activity is concentrated on agriculture and livestock. Despite this, the region holds 19% of the agricultural GDP, behind the South (with a 27% share) and Southeast (with a 24% share) regions.

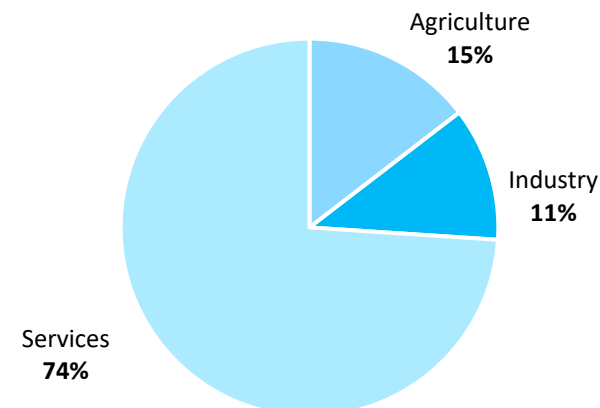
Region with the highest GDP per capita in the country and the second lowest unemployment rate. Despite this, the logistics infrastructure remains precarious, especially for the outflow of agricultural production.

Population (number of people, 2020)	16,496,340
GDP per capita (R\$, 2020)	35,653
GDP (R\$ million, 2020)	542,632
Exports (US\$ million, 2020)	29,744
Imports (US\$ million, 2020)	9,064
Unemployment rate (2019 average)	10.1%
Mass of income (R\$ million, 2020)	20,223
Credit inventory (% of GDP)	51.4%

Source: IBGE and Bacen. Prepared by Pezco Economics.



**Breakdown of GDP
(Mid-west region)**



Southeast region

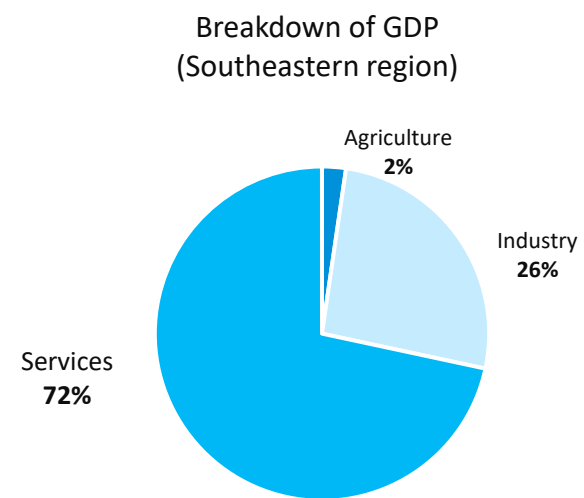
The Southeast Region has an area of 0.9 million km² and represents about 11% of the national territory. As it is the most developed region of the country, about 42% of the population lives in this region.

The region represents approximately 52% of the national GDP and the economic activity is based on industry and services. It is an important financial hub for the country and Latin America. It is the region with the best available economic infrastructure.

It has the largest supply of qualified labor and important educational centers. The high number of people and the scarcity of space keep the price of real estate and the cost of living high.

Population (number of people, 2021)	89,632,912
GDP per capita (R\$, 2019)	46,398
GDP (R\$ million, 2019)	3,917,484
Exports (US\$ million, 2021)	125,578
Imports (US\$ million, 2021)	99,242
Unemployment rate (3Q21)	13.10%
Mass of earnings (real monthly average, R\$ million, 3Q21)	114,979
Credit inventory (% of GDP, 2019)	45.20%

Source: IBGE and Bacen.



South region

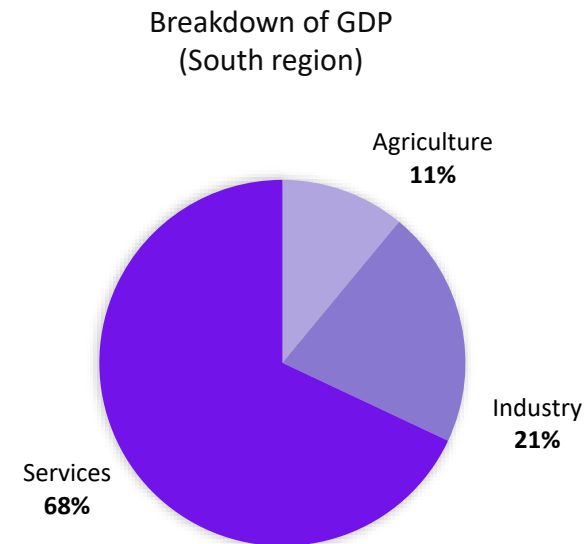
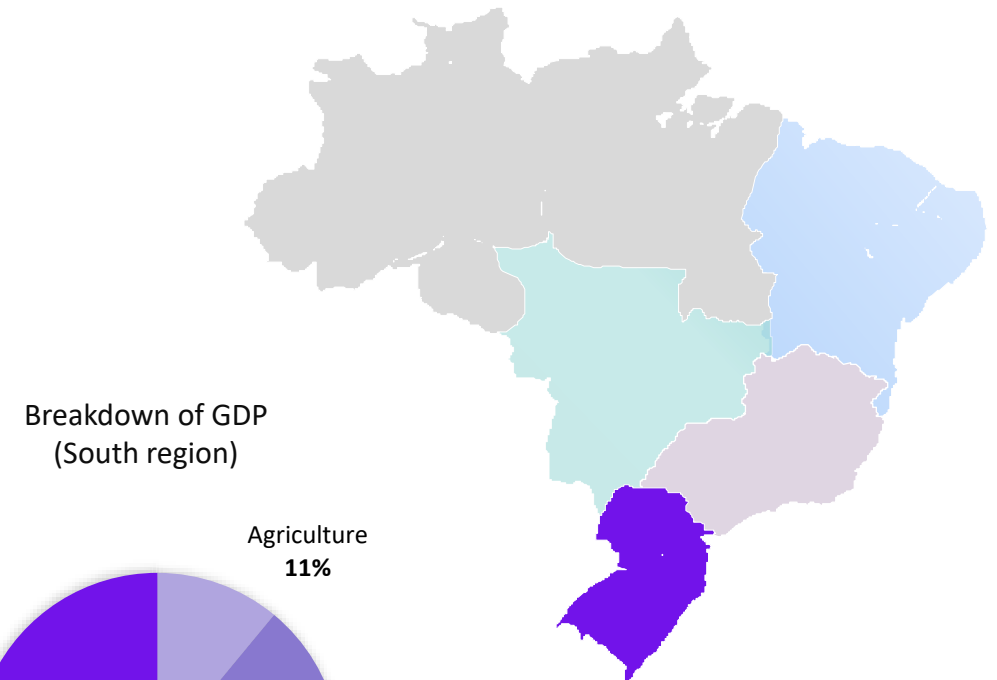
The South Region has an area of 0.6 million km² and represents about 7% of the national territory. It is the second region with the highest population density in the country (52 inhab./km²).

The region represents approximately 17.6% of the national GDP and economic activity is based on industry and agriculture. It has good logistics and economic infrastructure.

It has a good supply of qualified labor and educational centers. It has the second highest GDP per capita and the lowest unemployment rate.

Population (number of people, 2021)	30,192,315
GDP per capita (R\$, 2018)	42,771
GDP (R\$ million, 2018)	1,195,550
Exports (US\$ million, 2021)	38,443
Imports (US\$ million, 2020)	35,827
Unemployment rate (2021 average)	15.3%
Mass of earnings (real monthly average, R\$ million, 2020)	38,569
Credit inventory (% of GDP, 2018)	52.1%

Source: IBGE and Bacen. Prepared by Pezco Economics.



North and Northeast – Hot Topics

The Northeast Financing Constitutional Fund (FNE) will finance up to R\$ 26,600,000,000 for urban entrepreneurs and rural producers in the region in 2022. FNE funds are managed by the Ministry of Regional Development (MDR) and by Sudene and granted through Banco do Nordeste, boosting the economy and generating employment and income. Financing can be used in projects to open own businesses, invest in the expansion of activities, purchase inventory and even covering expenses related to the management of the enterprise. [Source: www.gov.br/mdr](http://www.gov.br/mdr)

The renewable energy generation market has gained new traction with the regulation decree for offshore wind farms released by the federal government. The initiative, which should unlock at least R\$ 110 billion in investments in Ceará, was celebrated by market members, politicians and government representatives, as it should boost the new green hydrogen hub. Six undertakings already have projects that were awaiting regulation, together they have a potential of 11 gigawatts: Camocim (1.2 gW), Asa Branca (400 MW), Jangada (3 gW), Caucaia (576 MW), Dragão do Mar (1,216 gW), and Alpha Wind (5.1 gW). [Source: www.diariodonordeste.com.br](http://www.diariodonordeste.com.br)

The optimism of Brazilian merchants and entrepreneurs recorded the highest level since March 2020, reaching 121.1 points out of a possible 200 in the Trade Entrepreneur Confidence Index (Icec). The North Region led the indicators with 125.2 points, while the Brazilian Northeast region recorded the lowest confidence level, with 118.9 points. [Source: www.oliberal.com](http://www.oliberal.com)

The expansion of wind and solar energy generation in the south of the Northeast Region will require investments of R\$ 18.2 billion in new facilities for the flow of energy to other locations within the country, according to studies presented by the Ministry of Mines and Energy and Empresa de Pesquisa Energética. Works to reinforce transmission are recommended for the medium term, and most of them are expected to be tendered in 2023, said a government official. [Source: www.cnnbrasil.com.br](http://www.cnnbrasil.com.br)

Federal District / GO / TO – Hot Topics

The Federal District government published a decree that regulates the concession of public lighting service to Companhia Energética de Brasília (CEB) for 30 years, covering planning, investment and management activities for the implementation, installation and modernization of public lighting system assets. CEB already provided this service through contracts and agreements with the Department of Works and Infrastructure.

Social isolation reduced the federal government's expenses with daily allowances, tickets and transport of civil servants in the Federal District, from R\$ 265.2 million to R\$ 65.7 million between March and May 2020 compared to the same period in 2019, according to data of the Ministry of Economy. The largest reduction was in international trips (down 86% YoY), followed by domestic trips (-72.9% YoY).

Banco de Brasília (BRB) is preparing a real estate fund of up to R\$ 5 billion to invest in Biotic, a project to create a technology park in the Federal District in an effort by the government to change the economic matrix and reduce reliance on public services. In addition to the technology park, the project includes the development of residential, commercial, leisure and hotel areas.

The Legislative Assembly of the state of Goiás approved a bill that requires gas stations to place signs with the phrase “When filling up, choose ethanol”, to encourage the use of hydrated ethanol in the state. The project also provides that state public agencies must prioritize the use of this fuel in the supply of their flex-fuel vehicle fleet.

After signing the early renovation of Malha Paulista, which will require R\$ 6.1 billion in new investments, Rumo announced the plan to build a line between the cities of Rondonópolis and Lucas do Rio Verde, which can reach 600 km. The plan is to create a large corridor to transport production from Mato Grosso through the Port of Santos. The renovation of Malha Paulista was a first step and the company will currently start negotiating rounds with the government and regulatory agencies.

The demand for modular warehouse structures to store sugar has grown recently, due to the strong pace of production of the commodity in the Center-South region. Most of the contracting of temporary warehouses takes place until June, when the size of the production is clearer for the plants. According to Tópico (a company that installs modular warehouses), about 60% of demand is for plants in São Paulo, followed by Minas Gerais (30%) and Mato Grosso do Sul (10%). According to Unica, the plants have the capacity to store 40% of the production projected for this year.

Rumo's executive board confirmed to the president of the FIEMT System, Gustavo de Oliveira, that it will expand the railroad that makes up Malha Norte in Mato Grosso.

Mato Grosso closed the first semester with 58% of exports from the Midwest region and in fourth place in the national ranking. Compared to last year, Mato Grosso rose one position in the national ranking and became the fourth largest exporter in Brazil, with a growth of 6.62% in revenue, while the national trend was a retraction of 7.36%. Moreover, one of the sectors of the industry that grew the most was beef, which increased 40.52% in this first semester.

Source: Agência Brasília, Valor, Goiás Government, Portal Agronegócio, Mato Grosso Econômico and G1

SP / MT / MS – Hot topics

São Paulo, in partnership with the Ellen MacArthur Foundation, is on the way to becoming a more circular city. One step in this direction was joining the global commitment by the plastics pact to create mechanisms for the elimination and reuse of problematic, single-use plastics. The city also joined the food circularity initiative, committing to transform the food system into a circular and regenerative system. Furthermore, there are already existing relevant actions such as the Ligue os Pontos (Connect the Dots) project, which strengthens sustainable local agriculture, and the electrification of the city's bus fleet.

With the 14th largest GDP in Brazil among Brazilian cities, São Bernardo do Campo, in the São Paulo metropolitan region, broke export records in the first semester of 2021, with over US\$ 410 million sold in tractors, US\$ 330 million in chassis, US\$ 300 million in transport vehicles and US\$ 180 million in passenger vehicles. The ranking prepared by the consulting firm Urban Systems analyzes the best Brazilian cities to do business in education, commerce, services, industry, real estate and agriculture.

Responsible for a grain production of over 70 million tons in the 2020/2021 harvest, the state of Mato Grosso announced a public call for the construction of the first railway authorized by a Brazilian state by 2028. The planned investment is R\$ 12 billion, for the account and risk of the operator, which will have a period of 45 years to operate — this is the private exploration model, without any contribution of public funds. It is estimated that Mato Grosso will produce 120 million tons per year by 2030.

Suzano, one of the largest pulp and paper companies in the world, decides to invest R\$ 14.7 billion in the construction of a new plant in Mato Grosso do Sul. The new plant has the capacity to produce 2.3 million tons of eucalyptus pulp per year. The unit will be built in the municipality of Ribas do Rio Pardo, 100 kilometers from Campo Grande, the capital city of Mato Grosso do Sul, and should start production by the end of the first quarter of 2024. The initiative was named “Cerrado Project”, in reference to its geographic location in Mato Grosso do Sul, and increases Suzano’s current pulp production capacity of 10.9 million tons by approximately 20%.

Source: Exame, Suzano, 2022

Minas Gerais – Hot topics

Minas Gerais is a pioneer in the implantation of hydroelectric plants in South America, giving the state major prominence in the supply of energy to the country. Companhia Energética de Minas Gerais (CEMIG) is one of the main energy distributors in the country, operating in the generation, transmission and distribution of electric power and natural gas. Since 1998, CEMIG has invested over R\$ 725 million in energy efficiency initiatives. For the five-year period 2020-2024, R\$ 457 million is expected to be invested in projects.

CEMIG has invested in photovoltaic energy due to the increase in the costs of hydroelectric plants. Thus, in 2018, it created the Cemig Distributed Generation project, with the purpose of implementing, installing, operating, maintaining and leasing projects and equipment that use solar energy.

Although the international price of iron ore remains above US\$ 100 per ton (ore with 62% purity at the port of Qingdao), analysts expect the normalization of supply to pressure prices down in the second semester of this year and early 2021. Projections indicate that the price of iron ore should fall to the range between US\$ 80 and US\$ 90 per ton in the next 12 months. Vale's production is expected to reach 90 million tons per quarter in the second semester of the year, well above the 59 million tons in the first quarter of 2020.

Uberlândia completed the first five months of 2021 with a positive balance in job creation and ranked among the 20 Brazilian cities that offered the most jobs in the period. Data from the General Registry of Admissions and Terminations (CAGED), released on 01/06/21 by the Ministry of Economy, show that the municipality

accumulated 6,490 jobs from January to May. The result is about twice as high as the total for 2020, affected by the start of the COVID-19 pandemic and which accounted for a balance of 2,720 vacancies. In May alone, 710 jobs were created.

Sigma Lithium obtained a financing of US\$ 45 million with the bank Société Générale to start the construction of the lithium battery plant for electric cars in Minas Gerais. The company is listed on the Canadian Stock Exchange, but 70% of its share capital belongs to the private equity fund A10. Sigma has signed an agreement to supply 55,000 tons of lithium per year for six years, with the Japanese group Mitsui – which will provide US\$ 27 million for the plant construction – the construction cost is estimated at US\$ 74 million.

Anglo American signed an agreement with Casa dos Ventos for the supply of wind energy for 20 years. Casa dos Ventos will supply 195 MW (95 MW of firm energy) of energy produced in the Rio do Vento (RN) complex – accounting for around 30% of Anglo American's consumption in its iron ore and nickel operations. Energy represents 30% of the total nickel production cost and 20% of the total iron ore production cost. The mining company forecasts production of between 22-24 million tons of pellet-feed iron ore – of which 40% is exported to China – and between 42-44 thousand tons of ferronickel.

Source: ACMinas, Cemig, Estado de Minas, Infomoney, Anglo American, 2022

South – Hot topics

Despite facing the consequences of the pandemic, the South Region ended last year with a performance far beyond satisfactory in terms of the volume of mergers and acquisitions. According to a recent survey conducted by KPMG, there were 297 operations in the three states, and Paraná alone was responsible for more than a third (121) of these transactions. The number is a record and represents an increase of 95% compared to 2020. Interestingly, more than half (53%) of such transactions involved the technology and internet industries, and many of them occurred between companies in the region itself.

Furthermore, the South region presents the lowest unemployment rates in Brazil, especially Santa Catarina. While the state registers 5.3% of unemployed people, the national average is 11.6%, according to the IBGE. Over the past year, over 480,000 jobs were created in the region as a whole, most of them in the technology area.

Despite this, the retail and consumption industry began the year in an environment of uncertainty caused by high inflation and the resulting loss of income of the Brazilian population. Moreover, lower levels of consumer confidence turn out to be a pullback factor in expectations for 2022. Agribusiness, the industry that grew the most in the last year, will also face a more challenging period. If, in 2021, the high productivity levels and the exchange rate favoring exports brought good times, the forecast for the coming months is not so optimistic. Due to the lack of rain, some areas of the South Region are suffering more from the drought. On the other hand, the animal protein segment continues to record growth and should end the year with a positive balance.

Considering the manufacturing industry, the economic scenario and the lack of some inputs have impacted the business. The constant problems in maritime transport, resulting from the stoppage of ports, the lack of containers and, recently, the slow operation of some public agencies affected the foreign trade of southern companies. But it is not all bad news. There are extremely interesting levels of market demand, such as in the automotive sector, caused partially by the consumption retraction that occurred in the last two years as a result of the pandemic.

Furthermore, both local and multinational companies present in the region have presented relevant investment plans, following the development of infrastructure in the region, which are fundamental for the flow of production. In the last year, important concessions in rail transport were renewed, with planned investments above R\$ 40 billion. In highways, new auctions in Paraná are expected this year, that could generate another R\$ 42 billion in investments. For ports, the three states are working on projects for new leases, privatization, concessions and integration with waterways and railroads.

As in 2021, with more companies looking to go public and investing in several startups, it is easy to imagine that this year will record an increase in deals and in the growth of innovation ecosystems. This can provide the inclusion of more companies in the list of Brazilian unicorns and strengthen the investment orbit in the South Region, thus generating interesting opportunities for this and the coming years.

Source: IBGE and Bacen. Prepared by Pezco Economics.

Rio de Janeiro – Hot topics

The municipal government of Macaé celebrated, on Thursday (02/24/2022), the maintenance of the veto, by the Legislative Assembly of the State of Rio de Janeiro (Alerj), of Bill 5.190/2021. This Bill establishes the Environmental Control, Monitoring and Inspection Fee for Research, Mining, Exploration and Production of Oil and Gas. The institutions that represent the productive arrangement of oil and gas and the municipalities highlighted, throughout the movement against the Bill, the legal uncertainty it would generate on the regulatory frameworks of offshore activity in the state, which could, with the fee, disrupt the business cycle for the development of new exploration and production projects, preventing the hiring of labor and services. [Source: www.clickmacae.com.br](http://www.clickmacae.com.br)

The government of the state of Rio de Janeiro won, in an auction held on Wednesday (03/16/2022), the area of the Caneco shipyard, in the Caju district, in the port region of Rio de Janeiro. The aim is to implement a fishing complex and an industrial condominium on the site. The area was sold for R\$ 96 million. According to the Secretary of Economic Development, Energy and International Relations, Vinícius Farah, the implementation of a fishing warehouse will be the beginning of the industry's recovery. The centralization of fish landings will allow for better statistics and management, as well as better promotion of public policies for the sector. [Source: www.terra.com.br](http://www.terra.com.br)

The Government of Rio de Janeiro started the mobilization for Rio2030 this Tuesday (03/22/2022). It is the largest initiative to implement the 2030 Agenda in the country, an invitation to society to take action and unite efforts around the Sustainable Development Goals. In the International Year of Sustainable Development in the state of Rio de Janeiro, Rio2030 seeks to establish a global platform to foster the topic, as well as strengthen public policies focused on sustainability. The international event will place Rio de Janeiro as a hub for sustainable development mobilization with Brazilian society and the international community, focusing on the United Nations (UN) 2030 Agenda. [Source: www.diariodorio.com](http://www.diariodorio.com)

Espírito Santo – Hot topics

The State Government, through the Secretary of Culture (Secult), announced this Thursday (03/03/2022) the 46 municipalities qualified for the Fund to Fund Culture Program. The total co-investment of the State Government is R\$ 5 million. Added to the funds of the municipalities, the total amount invested through this program in the culture in 2022 is around R\$ 8.3 million. With this action, hundreds of cultural projects will be supported in all the micro-regions of Espírito Santo. [Source: www.jornalfato.com.br](http://www.jornalfato.com.br)

The Federal University of Espírito Santo (Ufes) inaugurated a laboratory with the maximum level of biosafety on 03/03/2022. This laboratory allows to carry out research with microorganisms that represent a high risk in the handling process, for example, the virus that causes COVID-19. Level 3 for laboratories represents the highest level for educational institutions, as classified by the National Health Surveillance Agency (Anvisa). In addition to projects on the coronavirus, the laboratory will be used in research in the areas of tuberculosis, leprosy, Ebola virus and HIV, in addition to supporting research activities linked to eight graduate programs at the University: Infectious Diseases, Biotechnology, Physiological Sciences, Public Health, Physical Education, Chemistry, Environmental Engineering and Biochemistry. [Source: www.ufes.br](http://www.ufes.br)

The National Bank for Economic and Social Development (BNDES) published, on Monday (02/21/2022), the Relevant Communiqué 3/2022, setting a new date for the privatization auction of Companhia Docas do Espírito Santo (Codesa) and the Organized Ports of Vitória and Barra do Riacho, in the state of Espírito Santo. The project is the first port privatization in the country's history and was approved at the 3rd Meeting of the Investment Partnership Program Council (CPPI), through Decree 9.852, of June 25, 2019, and provides for investments of R\$ 334.8 million in port management. [Source: www.gov.br](http://www.gov.br)

Industry Profile

Automotive



Overview

The Segment ended the year 2021 with a slight improvement compared to the critical year of 2020, but still below the potential for domestic and foreign demand for auto vehicles. The global semiconductor crisis caused several plant shutdowns throughout the year for lack of electronic components, leading to an estimated loss of 300,000 vehicles. For 2022, the forecast is still of supply restrictions due to lack of components, but to a lesser degree than in 2021.

Production – The year ended with 2,248.3 thousand units, accounting for an increase of 11.6% over 2020. In the global ranking of producers, Brazil regained the eighth position lost in the previous year to Spain. For 2022, the expectation is for an increase of 9.4%, with 2.46 million units produced.

Domestic market – The accumulated for 2021 reached 2.12 million units, just 3% above 2020, which kept Brazil in the seventh place in the global ranking, by a few units behind France. For this year, the National Association of Motor Vehicles Manufacturers (ANFAVEA) projects sales of 2.3 million vehicles, accounting for an increase of 8.5% over 2021.

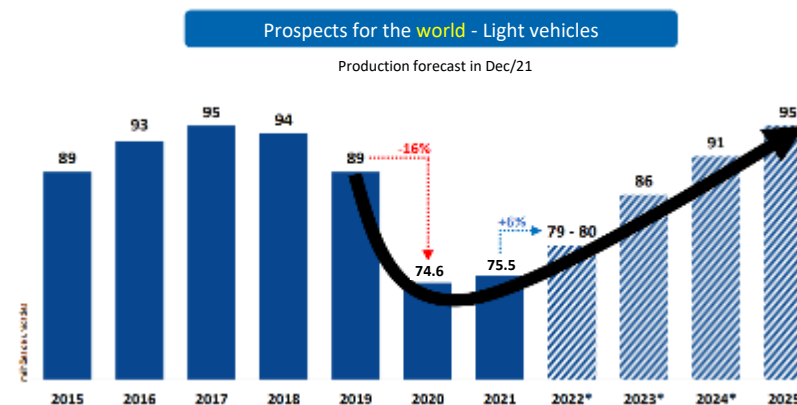
Exports – The fast recovery after the peak of the pandemic in markets such as Chile, Colombia, Peru and Uruguay helped boost Brazilian vehicle exports, despite trade restrictions imposed by the Argentine government. Thus, the 376,400 units exported represented growth of 16% over the previous year. Regarding values, exports recorded an even greater increase of 37.8%, due to the representation of vehicles with higher added value, such as trucks and SUVs. For 2022, the country is expected to export 390,000 units, an increase of 3.6% over the previous year.

Jobs – The industry ended the year with 101,100 employees. The scenario is stable, despite the closure of some plants in early 2021 and ongoing production stoppages due to the lack of electronic components in the assembly lines.

The truck segment, driven by agribusiness and the growth of e-commerce, recorded a very positive performance in 2021 and is expected to reach good results in 2022.

Expectations – Optimistic/moderate outlook, despite the following challenges impacting the industry: election year; fiscal balance; increase in costs, exchange rates, interest and tax burden; fragility of the labor market; logistics and input supply issues and the extent of the health crisis.

Source: ANFAVEA - National Association of Motor Vehicles Manufacturers.

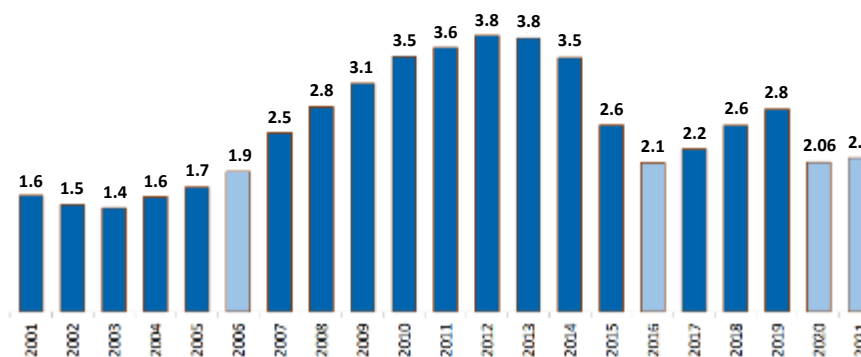


Source: IHS/BCG

Overview

Market Performance of Vehicles from 2001 to 2021

Vehicles (thousand units)



The crisis in the supply of products, caused by the unavailability of semiconductors globally, continues to have a direct impact on vehicle production. This shortage of new vehicles caused a growth in the market of used cars and, consequently, an increase in price (demand greater than supply), in addition to the maturation of new lines of business: subscription cars, for example.

Automakers have focused their portfolios on vehicles with higher added value (SUVs) and, consequently, greater profitability. With this strategy, there was a significant reduction of entry models (popular cars). To buy the cheapest car on the market today, consumers need 40 minimum wages.

Another important factor in the segment is the local effort of the industry towards the decarbonization process, accelerated after COP26.

Discussions and announcements by automakers about their portfolios of products following the decarbonization process, hybrid vehicles, electric vehicles, ethanol, hydrogen, biomass, vis a vis the Brazilian energy matrix and infrastructure.

Acceleration of discussions on the 5G applicability in the industry, focus on monetization, delivery of new services, process optimization, customer relationship.

Source: ANFAVEA - National Association of Motor Vehicles Manufacturers.

Vehicles: Cars, Light Commercial Vehicles, Trucks and Buses		Realized 2020	Realized 2021		Expectation 2022	
		Thousand units	Thousand units	Δ %	Thousand units	Δ %
Licensing	TOTAL	2,058	2,058	3.0	2,300	8.5
	Light vehicles	1,955	1,977	1.1	2,143	8.4
	Heavy vehicles	104	143	37.8	157	10.0
Exports	TOTAL	324	376	16.0	390	3.6
	Light vehicles	307	349	13.8	361	3.3
	Heavy vehicles	17	27	55.1	29	7.7
Production	TOTAL	2,014	2,248	11.6	2,460	9.4
	Light vehicles	1,905	2,071	8.7	2,268	9.5
	Heavy vehicles	109	178	62.5	192	8.2

Source: ANFAVEA

Trends

According to the SAE/KPMG/AutoData Survey on Mobility 2021, we have the following trends:

Strategy: Regarding short-term strategies, the survey identifies new mantras of the industries in the sector, such as the focus of investments in digital transformation at the service of productivity and improving customer experience. There is also a strong need for strategic partnerships, alliances and mergers to bear the cost of this transformation. Not to mention the growing role of services linked to mobility, which end up shaping even the definition of each company's product portfolio.

The decarbonization of the automotive sector is a preponderant factor, stressing the need for all links in the automotive chain to be clear about the technological and energy routes that Brazil will have in the next two decades.

Business model: The automotive industry's distribution process is undergoing an ongoing transformation to adapt to the new needs and consumption habits of the customer in Brazil. The survey shows an expectation of reduction in the number of concessionaires operating in the traditional model. The trend is for showrooms to get smaller and more digitalized and the focus of the operation is increasingly on the aftersales area. Consumers have been looking for new mobility alternatives such as car sharing, rental, subscription car, etc., which should accelerate direct sales through the emergence of new companies providing such types of services.

Consumer experience: Consumers are changing and their journey can start months before the purchase is made. The offer of specialized content on the automotive sector is growing and customers have the opportunity to access a variety of information even before arriving at the dealerships.

Energy efficiency, emissions reduction, electrification, autonomous driving, cars connected with content platforms, e-commerce, and subscription car service are part of the new market demands.

The survey also mentions that most consumers already know the new technologies available in cars.

Receptiveness to innovation: Mobility as a Service (MaaS) appears as a growing demand and potential among the services offered. A new group of consumers is opting for mobility services. Considering this scenario, the industry has been reviewing processes and deeply adapting the way it operates, applying new possibilities to the portfolio. It will be fundamental to maintain the same quality and attention given to products and services in this offer of mobility solutions.

Electric vehicles: The global focus shifted to decarbonization and, as of this occurred, Brazil became a global player in the use of biomass. The findings of the survey confirm: decarbonization is a very important topic today. The hybrid vehicle goes in that direction. Electric cars are still expensive, even the smallest ones. Automakers are already working on offers to meet efficiency targets and there are several projects in the direction of hybrid models, especially in conjunction with the use of ethanol.

The process of transforming the powertrain from internal combustion to electric necessarily involves incentive policies, both for trading and local production.

Source: SAE/KPMG/Auto Data Mobility Survey

Hot topics

The new reality driven by COVID-19, the global scenario of restriction of inputs and logistics challenges, with a significant increase in costs, makes companies have to go a long way, requiring capital reserves to resist and transform operational and business models to emerge stronger and more aligned with shifting priorities and consumer behavioral patterns.

Business model:

Creation of new revenue streams through service offerings related to mobility, connectivity and aftersales. Creation of offers that reduce the entry ticket and the TCO of the products (subscription). Creation of offers that balance product customization and greater operational efficiency (just in time). Creation of a digital culture in the relationship with consumers throughout the journey. Strengthening customer experience and export strategy (more products and more markets).

Operating model:

Reduction of operational costs (RPA in the back office, remote work, where applicable). Increase in operational efficiency (just in time), Industry 4.0 solutions. Reduction in the number of dealers and suppliers, both of which are larger, and reliance on imported parts and components (exchange risk).

Changes in consumer habits:

Search for products with a lower entry ticket and TCO. Raising awareness of health safety. Reevaluation of own vehicle ownership and rationalization of the use of mobility/public transport services.

Lean strategy:

Strengthen the financial/operational indicators dashboard using new technologies.

Source: KPMG – New COVID-19 reality after 1 year

Hot topics

Employees:

Elevation of the remote work dynamics.

Capital structure:

Strengthen commercial/operational/financial strategies that offer a better margin and lower risk.

Risk management:

Improved monitoring of the financial and operational health of dealers and suppliers, reduction of reliance on revenue from the sale of products.

Technology

Governance models, security solutions (Cyber), digitalization; solutions adjacent to ERP such as WMS, Transportation.



Source: Material 1-year post Covid (adapted)

Opportunities and Challenges

Opportunities

Rota 2030:

At the end of 2018, the federal government approved a new policy to stimulate the industry, called Route 2030. This program grants tax benefits not only to vehicle automakers (OEMs), but also to parts and systems suppliers. The program will be effective for 15 years. The granting of tax benefits is strongly based on investments to be made in innovation, research and development of new products, vehicle safety and energy efficiency.

Tax benefits are strongly associated with corporate income tax, which in practical terms means that benefits are effectively exploited if companies are profitable.

Source: ANPEI

Challenges

Production: social distancing led to the closure of plants across the entire chain, where smaller players feel the cash woes even more. The retention of people and high exchange rates in the import of parts (not to mention shortages), as well as logistics costs, put pressure on the profit margin and the resumption of operations.

Sales: social distancing led to the closing of stores, amplifying the problem of the lack of alternative services (mobility-related) and a more robust online strategy.

Exports: demand from the largest export destination (Argentina) which was already weak due to the economic crisis, worsened even more. The lack of a more robust and diversified export strategy makes it difficult to search for alternatives, as local products are competitive in several target markets.

Source: Material 1-year post Covid (adapted)



Major Players

Major Players

According to data from the National Federation of Automotive Vehicle Distribution (Fenabrave), the 10 largest Brazilian companies account for more than 90% of the automotive market. Ford's departure from Brazil had a huge impact on the brand's sales, leaving the company's market share at around 1%. Fiat (of the FCA group) gained territory by taking first place in market share in 2021, surpassing General Motors.

Source: ANFAVEA

Market share

The table below shows the breakdown of market share by players in the 2019-2021 triennium.

	Market player	2019	2020	2021
Market Share	General Motors	19.1%	19%	13%
	Volkswagen	16.6%	18%	17%
	Renault	10.1%	8%	7%
	Hyundai	8.6%	10%	11%
	FCA	8.6%	17%	24%
	Toyota	8.2%	7%	8%
	Ford	7.8%	7%	1%
	Honda	5.3%	5%	5%
	Nissan	4.2%	3%	3%
	Other	6.0%	6%	11%

Source: ANFAVEA

Industrial Manufacturing



Overview

After a recession in 2020, economic growth has not reached the levels expected in 2021. However, according to projections from the National Confederation of Industry (CNI), the Gross Domestic Product (GDP) is expected to increase 4.5% for 2021, below the expectations of the most optimistic projections.

Given said growth forecasts, the Brazilian scenario can vary according to two possibilities: in a more unfavorable scenario, due to the pandemic, with persistent inflation and slower and incomplete normalization of production chains, the economy can grow by only 0.3%. In the most optimistic scenario, with controlled inflation and a more dynamic monetary policy, growth could reach 1.8% in 2022.

The major challenges this year, according to the CNI, are high inflation, consequent rises in interest rates, higher household indebtedness, scarcity of inputs and raw materials, and rising energy costs. Furthermore, there are uncertainties about the progress of the pandemic and the fear of setbacks, as has been observed in Europe.

The recovery of the manufacturing industry in 2021 was far below the projections for the year. If before the expectation was to close 2021 with a rise of 7.9%, the CNI projection is that it will increase by only 5.3%, directly affecting the forecasts for 2022. Considering a baseline scenario, the manufacturing industry is expected to grow 0.5% next year. In an optimistic scenario, it could increase by 1.5% and, in a pessimistic scenario, fall by 2.5%.

Source: CNI

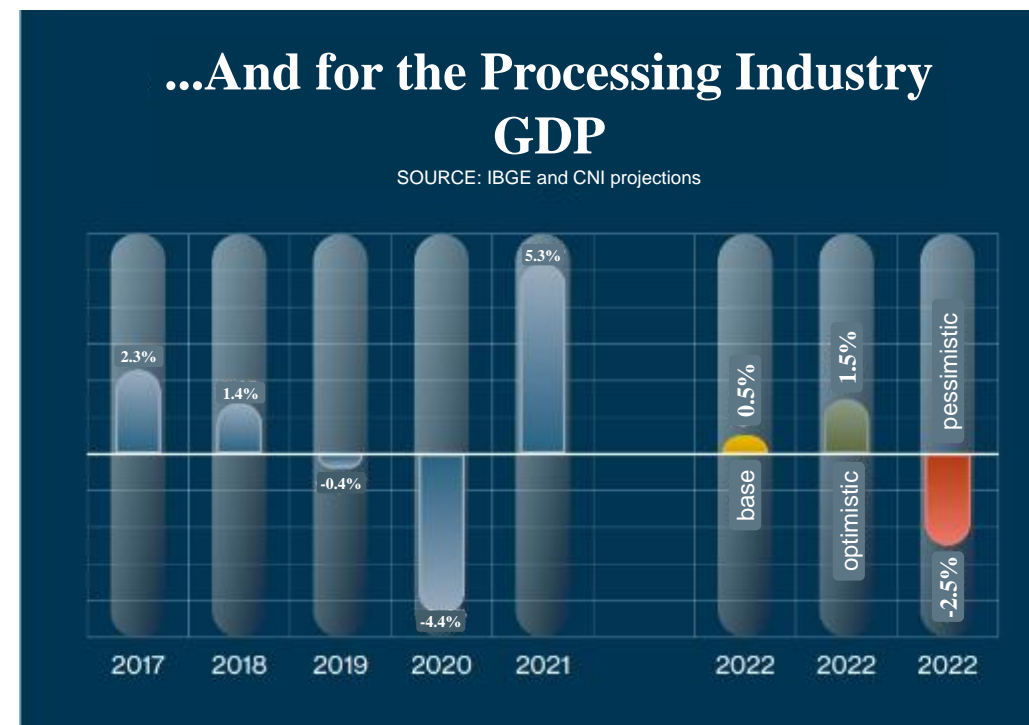
Overview

On the other hand, the construction sector reacted in a positively unexpected way, causing CNI to review its growth forecast for 2021: from 5% to 8.2%. However, as it is one of the sectors that suffer the most from high interest rates, for 2022, the expectation is to reach a rise of only 0.6% in a baseline scenario. In the optimistic scenario, growth could reach 2%, and in the pessimistic scenario, with more restrictive monetary policy and more persistent input difficulties, growth would be close to zero in 2022.

In 2021, the unemployment rate should reach 13.4%. CNI projections show that it will be slightly lower in 2022, falling to 13%.

Inflation, which ended this year at 10.06%, could slow down next year, but stay around 8%, while the exchange rate should end 2022 at the same level as 2021, subject to strong variations.

Source: CNI



Source: CNI

Trends & hot topics

Revenue generation and new business models

- Diversify lines of business and revenue generation.
- New business models based on services and data from the operation.
- Adequacy of the workforce and people management.
- Negotiations with government authorities, aiming at developing incentive programs for the industry.
- Business diversification (conglomerates).
- ESG as a fundamental drive of strategic industry management.
- Workforce profile: focus on digital transformation.

Operating Efficiency

- Industry 4.0: IT & OT integration.
- Supply Chain + Third Party Risk Management, expansion of the discussion on the nationalization of parts and components.
- Workforce profile: focus on digital transformation.
- Operational acceleration through digitization.
- Cash management strengthening.
- Greater investment in the use of technology for chain integration.

Opportunities and Challenges

Opportunities

- Acceleration of production through Industry 4.0, acting as an accelerator of operational efficiency and generator of new business models.
- Approve the tax reform - taxation on consumption.
- Regulate the National System of Credit Guarantees.
- Accelerate the deployment of 5G networks in Brazil.
- Reduce bureaucracy and foreign trade costs.

Challenges

- Improvement of the production model to accommodate the hybrid work model.
- Management of inputs and raw materials to feed the production chain.
- Possible reduction in the supply of working capital in the financial system.
- Maintenance of operational health, in the face of the impacts of the Brazil Cost, even more aggravated in the pandemic.
- Brazilian tax situation impacts the cost of financing production.
- Training of human capital with the ability to define and develop new products and introduce digitalization in the industry.



Major Players

Top 10 manufacturing industries (in revenue) according to the 2021 Valor Econômico ranking:

TOP 10 Manufacturing Industries (Billion)		
1	Suzano Papel e Celulose	R\$ 30.46
2	WEG	R\$ 17.46
3	Votorantim Cimentos	R\$ 16.73
4	Klabin	R\$ 11.94
5	Saint-Gobain	R\$ 8.86
6	Dexco	R\$ 5.87
7	Eldorado Brazil	R\$ 4.42
8	IP Brasil	R\$ 4.02
9	CMPC	R\$ 3.88
10	Tigre	R\$ 3.33

Source: Valor Econômico (2021)



Agribusiness



Overview

Despite being hit by the 2021 water crisis, Brazilian agribusiness managed to maintain high production levels, contributing to domestic supply, the maintenance of the economy and the positive performance of the trade balance. Furthermore, the sector continues to be a major exporter, reaching a record value of US\$ 120.59 billion (+19.7%), which was due to the increase in the price index of products (+21.2%). Thus, it is evident that, although our agribusiness maintains a very relevant share of production in domestic supply, its role in the world market is increasingly consolidated. Exports are essential for agribusiness itself and for Brazil as a whole. Moreover, it is a fact that, despite the adversities faced in the previous year, the Brazilian agribusiness sector not only resisted remarkably to the setbacks caused by the lack of rain, but has also positioned itself in a very strategic manner as a net food exporter.

For 2022, although expectations are lower compared to the previous year, the forecast remains positive and of clear expansion in most agribusiness segments.

Internally, for example, the expected growth for the current year is 4.4% (Gross Value of Production – GVP), with emphasis on the strength of agriculture.

Therefore, the challenges facing Brazilian agribusiness are to continue growing, preserving profitability, sustainability and creating new paradigms of trust with the consumer. To this end, the sector relies on biological, physical and, currently, digital technologies. The digital transformation of agribusiness has promoted disruptive changes in the agri-food value chain, which has the consumer as its focal point. Connectivity, Agricultural 4.0, Backoffice 4.0, predictive digital solutions, digital platforms, traceability technologies, innovation HUBs are being diffused in the agribusiness sector in Brazil. 5G technology, changes in rural credit and the new regulation of credit payments in Brazil are potential accelerators of positive agribusiness agendas in the country.

Source: Cepea/Esalq-UPS; MAP

Overview

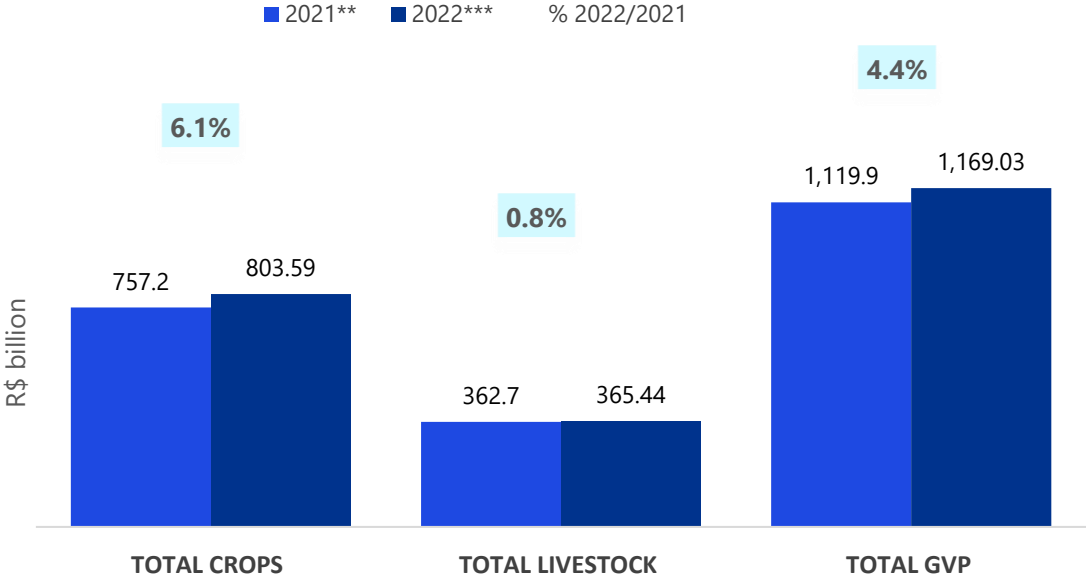
Gross Value of Production (GVP) – Agriculture

The best performing agricultural products in 2021 were soybeans, corn, sugarcane, coffee and cotton, accounting for 87% of the GVP of crops. In livestock, the highlights were beef and chicken, which, in addition to the benefits obtained in the domestic market, recorded good results in exports.

As for expectations for 2022, the industry estimates that, in crops, the indices of corn, sugarcane, coffee and cotton will continue to grow. However, soybeans will have a negative change of -2.3% in relation to the previous year. Regarding livestock, chicken will continue to rise, with a change of 9.6% compared to 2021. On the other hand, beef, which previously occupied the first position in the ranking of livestock products, will have a drop of -8% in relation to the previous year.

Source: KPMG, MAPA

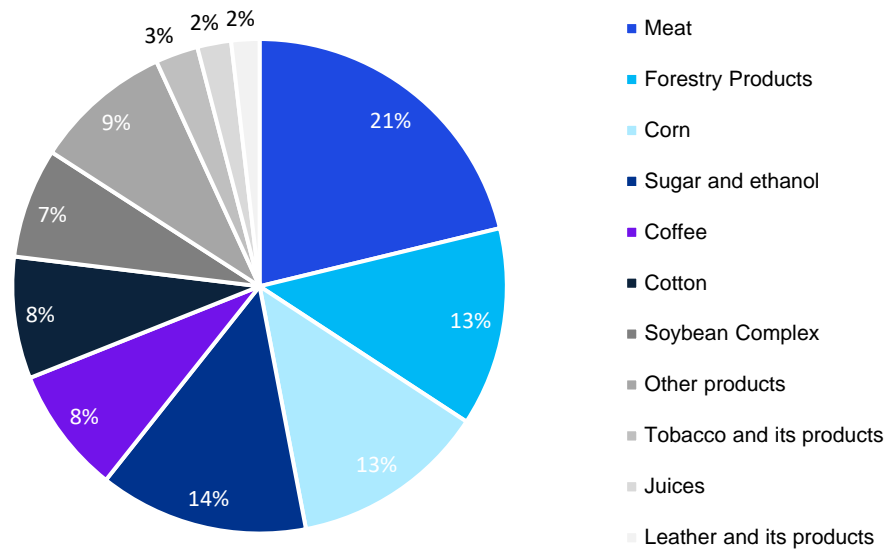
GVP - Agriculture – Brazil



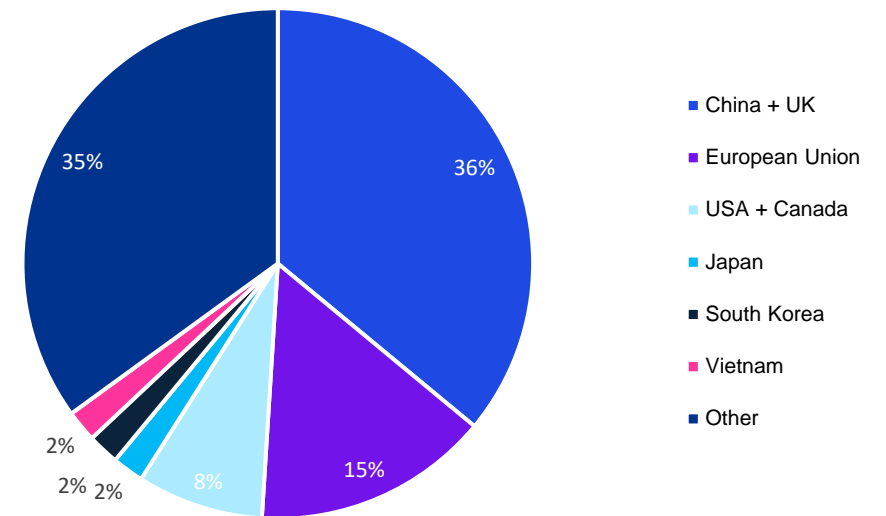
Overview

Brazil's role in global agribusiness

Products from Brazil's exports



Destinations of Brazil's exports



Source: MAP

Trends

| Expectations for agribusiness growth

Estimates for agribusiness GDP in 2022

Despite the good agriculture recovery in 2021, Brazil's Gross Domestic Product (GDP) is expected to grow by only 0.5%, according to a United Nations (UN) report. However, when focusing specifically on the agribusiness sector, we find good expectations for the future, which is an extremely relevant fact, since the sector is responsible for 20% of the country's GDP on average.






Source: CEPEA and CNA, 2021

According to projections from Cepea and Fundação Getúlio Vargas (FGV), it is estimated that Brazilian agribusiness will be the main lever of the Brazilian economy in 2022, with an expected growth of 5% by the end of that year.

The positive outlook for the segment is linked to the improvement in the water scenario compared to last year, when the country faced the worst water crisis in the last 91 years.

Source: CEPEA and FGV, 2021

Forecasts for agribusiness production growth in Brazil (2019-2029)

	Corn	Production	51%
		Planted area	32%
		Productivity	15%
	Soybean	Production	44%
		Planted area	24%
		Productivity	17%
	Beef	Bovine herd	9%
	Pork	Production	35%
	Dairy products	Production	39%

Source: MAP

Opportunities and challenges

Challenge

Global and local agribusiness challenges

Global agribusiness will have to feed an additional 2.5 billion people over the next 30 years. To do so, commercial animal feed production will need to increase by 70% by 2050, according to estimates from the Food and Agriculture Organization (FAO) of the United Nations.

The immediate challenge for agribusiness is to increase agricultural production profitably, given the growing competition for arable areas and land use.

In addition to producing more and increasing the production profitability, it is necessary to do so by meeting the growing demands of end consumers regarding how food is produced.

Global agribusiness will have to feed in the next 30 years:

- **+2.5 million people**

Commercial animal feed production will need to increase by:

- **+70%**

The use of productive land for agriculture will be under increasing pressure, not only by the demand for more production, but by the increasing environmental and ethical demands of end consumers regarding the way food is produced. The threat of value destruction caused by negative narratives is growing daily.

Source: FAO, 2021



Opportunities and challenges

Opportunities

Agribusiness value generation journey in Brazil

Profitability

- Generating more value on the asset base;
- Precision farming tools;
- Crop-livestock integration and trends involving this association;
- Digital and IoT solutions that increase process intuition;
- Rethink ownership of fixed assets.

Sustainability

- More production with fewer inputs;
- Sustainable and efficient management of resources;
- Reduction in the use of water and land, fertilizers, pesticides, biological solutions;
- Suitability for a low carbon economy;
- Circular Economy.

Diversification of funding sources

- Increase in private agribusiness financing;
- Dissemination of agribusiness bills: Digital Rural Product Bill (CPR), CRA for medium-sized companies in the sector, CDCA for agro-industries;
- “Green” financing
- Capturing agricultural machinery financing through digital platforms;
- Modernization and debureaucratization of rural credit — pre-approved systems on digital channels.

New trust paradigms

- Agribusiness value network shaped by the perception of consumers and other stakeholders;
- Trust seals — Certifications, trust audits;
- Data/information transparency;
- Cyber security;
- Incorporation of environmental, social and governance (ESG) aspects into business models to meet the growing demands of consumers and stakeholders.

TMT

Technology, Media and Telecommunications



Overview

The telecommunications sector around the world is generally organized around the competition of private entities, regulated and supervised through regulatory agencies managed by the public power. Brazil also follows this logic, having practically four operators that dominate telecommunications, subject to the regulation/inspection of the National Telecommunications Agency (ANATEL), and operate within a competitive environment, which makes frequent dispute over the price of services offered. The companies' focus on offering mobile data and fixed broadband services follows the global trend. In Brazil, telecommunications services are segmented through the acronyms STFC, SeaC, SCM and SMP; there are other segments, but these are the most targeted by the market.

Fixed Switched Telephone Service (STFC):

The service that, through the transmission of voice and other signals, is intended for communication between determined fixed points, using telephony processes. In a simplified manner, it is fixed telephony.

Conditional Access Service (SeAC):

The service whose reception is subject to paid contracting by subscribers and intended for the distribution of audiovisual content in the form of packages. It is the traditional pay TV. In recent years, this service has been under strong pressure from the competition with streaming services such as Netflix and Amazon Prime.

Multimedia Communication Service (SCM):

It is a fixed service, provided nationally and internationally, which enables the provision of transmission, emission and reception capacity of multimedia information, even allowing the provision of internet connection. These are fixed broadband connections.

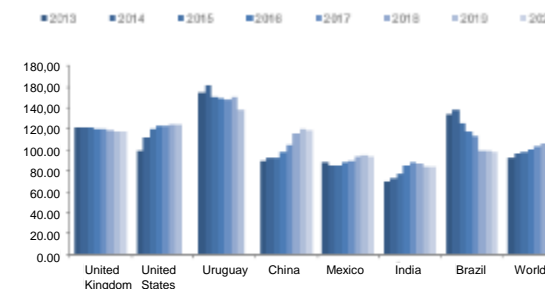
Personal Mobile Service (SMP):

It is the land mobile service that enables communication from mobile stations and to other stations (switching centers). It is the cell phone communication. In the near future, this service will be deeply modified by 5G.

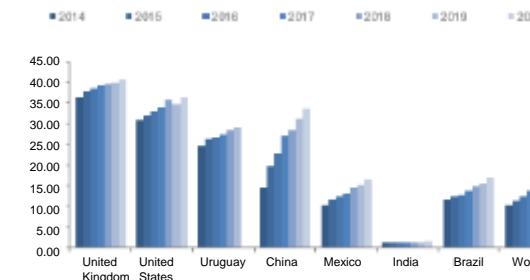
Source: LAFIS



Mobile telephone lines - accesses per 100 inhabitants



Fixed broadband lines - accesses per 100 inhabitants



Trends

Source: LAFIS

Businesses in continuous consolidation, transformation and disruption that challenge brands to keep their commitment to deliver on promises in a differentiated experience for their customers.

- From a legal point of view, the changes to the LGT represent an advance, considering that currently it makes more sense to invest to expand fixed broadband coverage and not fixed telephony, considering that the trend already observed in recent years points to a greater use of the internet and not of fixed voice services, a fact that becomes evident in consumer behavior today.
- We can observe that the penetration of TVA services is lower than that of fixed and mobile broadband services, in addition to showing a trend to replace similar services, as is the case of streaming services, which, on the one hand, present themselves as complementary to the use of the internet and, on the other hand, are considered to be substitutes for TVA services.
- Another telecommunications segment that has been showing a downward trend in the number of accesses is pay TV (14.9 million accesses in 2020), the result of a trend by customers to choose the programming they want to consume and not depend on programming and of pay TV channel schedules. It is worth highlighting that companies in the telecom sector are trying to adapt to this reality, through on-demand content and greater flexibility in their service packages.
- The improvement in Customer Experience and Fraud Prevention services, and the consolidation of ISPs across the country are also an agenda for discussions on general trends in the sector.

New reality

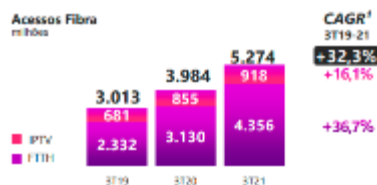
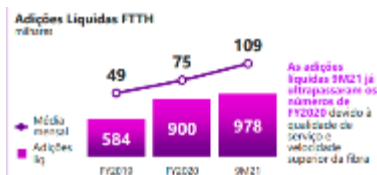
Focus on High Value Segments

Expanding FTTH and 4.5G footprint

Source: ri.telefonica.com.br; ri.tim.com.br; ri.oi.com.br

VIVO

“Fiber revenues reach R\$ 1.5 billion with significant fixed compound growth, driven by the acceleration of monthly net additions.”



TIM

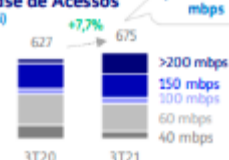
- The FiberCo deal will usher in a new era of fiber expansion, preparing for the acceleration of FTTH rollout in 2022.

Receita Líquida da TIM Live (R\$ mi)



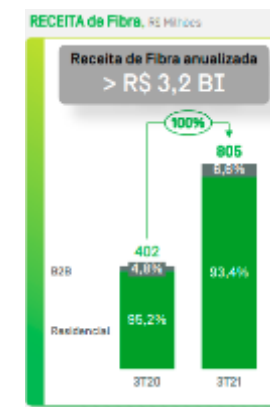
Tendência do 4T mostrando sinais de melhora

Base de Acessos (mi)



OI

- 109,000 homes are connected via fiber monthly, totaling 3.2 million homes connected.



New reality

| New investments and partnerships

Source: <https://vocea.abril.com.br/> and <https://investidor.estadao.com.br>

Oi

Oi has 1.3 million individual investors. It is the second with the largest number of shareholders. However, according to Rodrigo Abreu (Oi's CEO), one of the least understood plans is precisely the fiber operation. The network infrastructure was separated into a new company, called V.tal. Oi sold 58% of this company to BTG Pactual. According to the CEO, with a partner, the new company will have a multiplied growth capacity. If it keeps the infrastructure operation within Oi, it would not appreciate in the same way because it would not be able to invest the R\$ 30 billion that V.tal will disburse over the next five years.

TIM

The telecommunications group TIM assesses to make an additional investment of R\$ 2.2 billion in 2022 in relation to the previous plan that did not include the future result of the 5G auction. According to the company's CEOs, TIM already has equipment supply contracts agreed with Ericsson and Huawei, which expire at the end of 2022. They said that the company, which has been testing 5G service in some parts of the country for a few months now, wants to launch the service "as soon as possible".

TIM should also announce, between January and February 2022, three to five additional partnerships similar to those already made with the C6. The operator works to leverage its business by offering content to users and business customers and, in addition to digital banking and education, is evaluating agreements in the areas of telemedicine, content and marketplaces with a financial function, as well as energy.

In addition to partnerships, TIM is studying possible business spin-offs in areas that include Internet of Things (IoT) and advertising on mobile devices.

New reality

Digital Innovation

Source: LAFIS and Telesintese

New IoT services, SVAs and multi-sector services, massive low-cost solutions

VIVO

- VIVO is moving beyond telco services to become a partner hub for digital solutions

TIM

- **Develop IoT at scale and monetize verticals**

ConectarAGRO - The only operator in this initiative developing agribusiness solutions

- **New partnership with C6 Bank**

First partnership between a telco and bank to develop joint solutions

- **Mobile Advertising**

TIM Ads testing campaign for prepaid customers: data package reward for video views

CLARO

- **Claro + Plug and Play**

Claro joins the global innovation platform to seek new business opportunities with startups

“The partnership with Plug and Play establishes a great ecosystem of collaboration, acceleration and co-creation with startups, mainly in the areas of IoT, Smartcities, connected homes and cars, Industry 4.0, connected agriculture and fintechs”

Claro Marketing Director, Marcio Carvalho

- **GM connected car with 4.5G in partnership with Claro**

With “Wi-Fi Powered by Claro”, passengers can use the vehicle itself as a hotspot to access the operator's mobile internet, without consuming smartphone data.

New reality

Transformation

The migration from 4G to 5G

Source: Neofeed; Telesíntese and Globo Investe Valor

VIVO

- Vivo promised automatic migration of all its users from 4G to 5G as soon as the frequencies are released and the antennas are connected. At Futurecom, the Vice-President of B2B at Telefónica Brasil, Alex Salgado, said that the operator has plans to update the terminals that have been on the market for almost two years and support 5G. Customers will be able, after the upgrade, to use the new network. 5G will be for available both individuals and small businesses.

TIM

- TIM will invest around R\$ 5 billion until 2029 to deploy its 5G network, according to CEO Pietro Labriola, in an interview with NeoFeed. The telecommunications company was one of the winners of the 5G auction held by the National Telecommunications Agency (Anatel), including the payment of frequencies and the obligations provided for in the public notice. Anatel's main determinations include the following:
 - Migrate the satellite TV signal to free up the 3.5GHz band for 5G, bearing the costs.
 - Build a private communication network for the federal administration.
 - Install the fiber optic network (waterway) in the Amazon region.
 - Take optical fiber to the interior of the country.
 - Make 5G available in all capital cities by July 2022.

OI

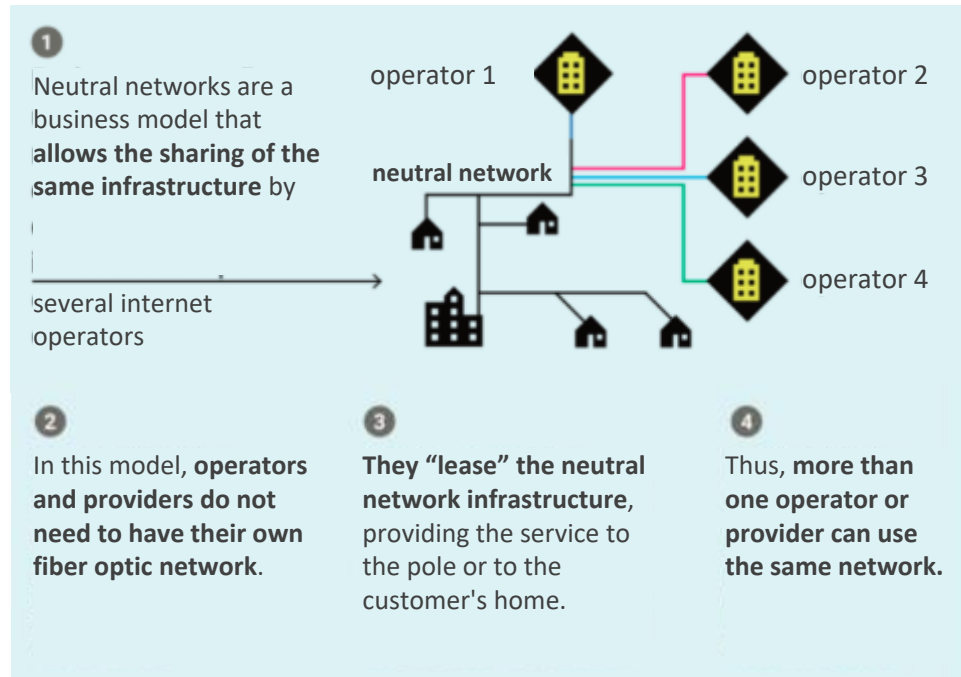
- OI reached 195 cities with FTTH in the third quarter. However, it is looking for an accelerated version already starting investments in 2022. V.tal is not only an FTTH company, but also a company for 5G, which will need a lot of fiber and is prepared to meet this demand.

CLARO

Grupo América Móvil intends to invest R\$ 30 billion in Brazil over the next three years. The investment project covers the development and application of 5G mobile data technology, reaching 1 million 5G devices in 2022.

New reality

Opportunity for neutral network player



Optimization of resources for operators, providers and infrastructure holders.

Greater ease and agility in expanding fiber optic networks.

Progress towards digital inclusion.

"Neutral networks can be the path to digital inclusion"

Benefits generated by neutral host infrastructure

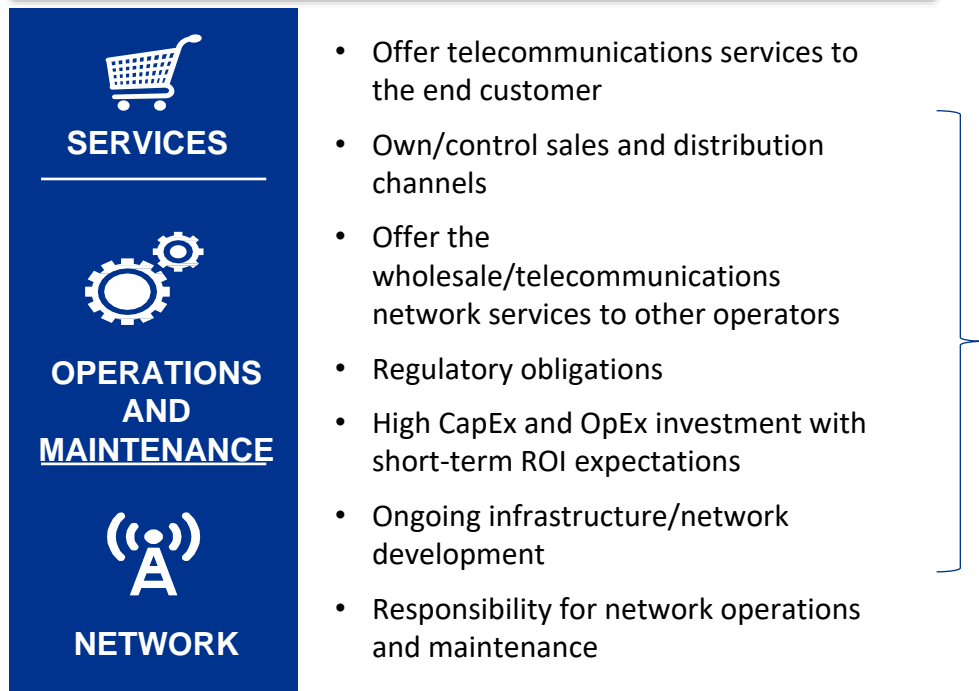


New reality

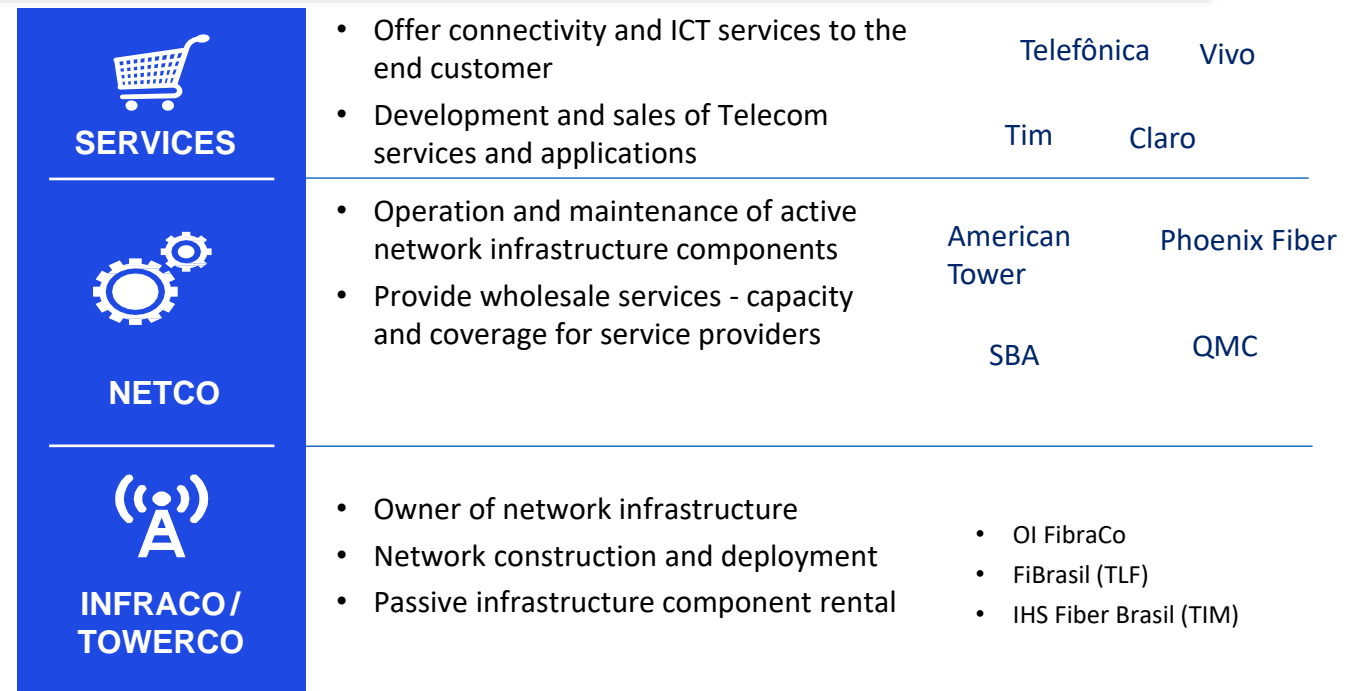
5G arrival and its opportunities in B2B

“To meet the demand shift towards data-centric usage, telcos have split their businesses into infrastructure and services to “monetize” their assets and disintegrated their business between providing infrastructure and connectivity services”

Traditional Integrated Model



New Disintegrated Model (Network as a Service)



Source: Capgemini's telecom, media & entertainment journal

New reality

| Digital Customer and Digital Business

Digital customer relationship for B2C and B2B segments, RPA and AI/ML, Blockchain

Since the beginning of the pandemic, a lot has changed and the way to communicate with the customer has also evolved:

80%

of customers consider speed, convenience and proactive service as decisive factor

76%

of customers started to prioritize the experience with the company after the pandemic, compared to data recorded before 2020

94%

of companies invested in new service channels after the pandemic

Source: Gazeta do Povo, Forbes

Also in 2020, data released by Anatel recorded an increase between 40% and 50% in internet use in the country. In 2021, Anatel also recorded a 6.8% growth in mobile telephony in Brazil, which accounts for 14 million new lines. One of the major challenges of the telecommunications sector is the qualified workforce to implement and support innovative services and the multichannel achieved so far. Operators' delivery must go beyond connectivity, as it becomes their role to deliver a complete communication solution tailored to the needs of each customer.

New reality

Competitive Positioning

Consolidation of competitive ISPs

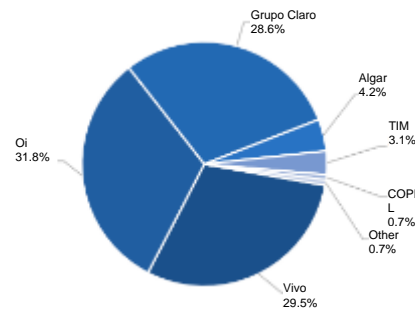
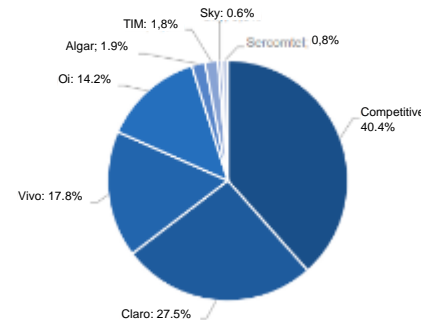
Fixed Broadband

(Fiber + Coaxial + Metallic Cable)

- In 2020, regional internet service providers (or ISPs) have the most relevant percentage of customers, followed by Claro in 2nd place.

Fixed Broadband – Fiber

- Such companies are known as “regional/competitive providers” and make internet available, usually via fiber optic network, in municipalities not served by large companies in the market. It is worth highlighting that there are a considerable number of companies operating in this telecommunication market niche.



Source: LAFIS

Market Trends

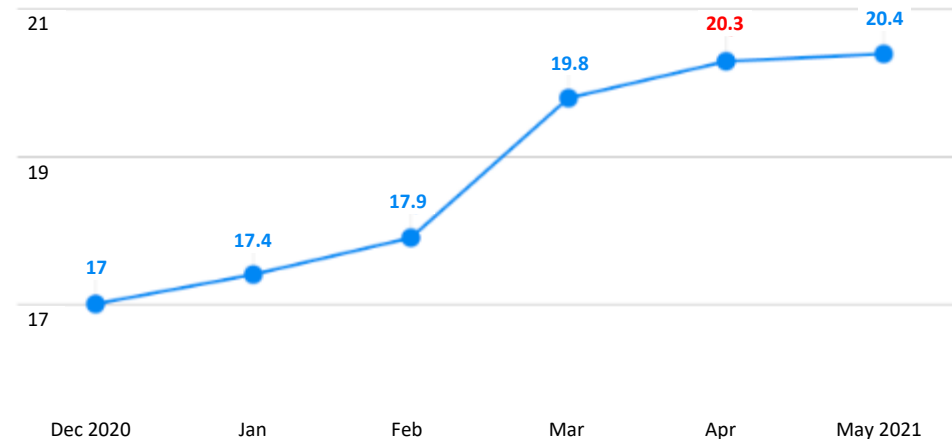
- Oi’s repositioning will be on the radar of major global players
- Private equity funds
 - Warburg Pincus, which has a global portfolio of more than US\$ 60 billion and this year joined the capital of AmericaNet
 - Vinci Partners, a Brazilian manager with over R\$ 20 billion, formed the operator Vero
 - B Capital, which is expanding strongly through its operator, Sumicity
 - The Acon group, which acquired six operators, remains in negotiations with other regional operators
- Consolidators
 - Mob Telecom recently launched debentures in a demonstration that it has a lot of appetite for expansion.
 - The leader, Brisagnet, decided to adopt an even more aggressive strategy: it left the backlands of the Northeast region to start competing with the major telecoms in the big cities
- Torreiros
 - American Tower, which bought Cemig Telecom, and Fênix show signs of further expansion

New reality

Fiber is already a reality in Brazil

- The Brazilian fixed broadband market reached 20 million fixed broadband contracts based on optical fiber. In May, 20.401 million customers relied on the technology-based service, 3.4 million more than at the end of 2020. The public is equivalent to 54% of the national base.
 - According to data from Anatel, which readjusted fixed broadband data reported in April, it was still in the fourth month of the year that fiber optic contracts reached the 20 million level, totaling 20.369 million in that month.
-
- Oi: 607,000+, to 3.033 million contracts in optical fiber
 - Vivo: 508,000+, to 3.999 million
 - Algar: 102,000+, to 619,000
 - Brisanet: 94,000+, to 716,000
 - TIM: 46,000+, to 361,000
 - Claro: 19,800+, to 478,900 thousand fiber accesses.

Fixed broadband contracts via fiber optics, in millions



Source: Federal Government of Brazil website; and Teletime.

New reality

| New Laws and Regulations

LGT, LGPD and PLC79

General Telecommunications Law (LGT)

In December 2019, President Jair Bolsonaro sanctioned the new text of the General Telecommunications Law (LGT). The rules in force so far have not changed since 1997. Fundamental principles:

- Guaranteed access to telecommunications for the entire population, at adequate prices and quality;
- Consumers have the right to respond to complaints and have their lines of communication repaired by providers;
- Public authorities need to encourage the expansion of communications networks;
- Strengthening the regulatory role of the state in the sector;
- Public authorities have a duty to encourage competition and diversity in the provision of telecommunications services.

GDPR or LGPD

- The General Data Protection Regulation came into force on September 18, 2020 and regulates the handling of personal data by public and private companies. Therefore, any company that includes information on its customers in its database, however basic it may be —such as name and email address—, must follow the procedures of the new law.

PLC79/RBR

- Controversial topic driven by the proximity of the termination of concession contracts

Main Changes:

- Review of new broadband investments
- New calculation of reversible assets of the concessionaires that would be reverted to the Federal Government
- Authorization to create a secondary spectrum market, in which private companies will be able to sell or lease frequencies
- Fixed telephony commercial offers in areas without competition
- Allows for successive renewals by the same operator of the frequencies.

Consumption and retail



Overview

The consumer and retail industry is a major driver for the country in terms of investments, growth and transformation of the business environment, directly related to socioeconomic development. In 2020, the food and beverage segment recorded revenues of R\$ 789.2 billion, representing 10.6% of GDP and 24.2% of jobs in the manufacturing industry.

Source: Abre and ABIA, 2021.

The alcoholic beverage segment is still on the rise in Brazil, a trend recorded since the beginning of the pandemic. From the moment that social isolation measures came into force in most cities, the migration of consumption from bars and restaurants to homes was latent. According to the Brazilian Beverage Association (ABRABE), the segment's revenue in 2020 reached R\$ 141.1 billion, compared to R\$ 137 billion in 2019, representing 1.9% of Brazilian GDP. Beers represent about 90% of the volume consumed in the country. The huge evolution of e-commerce led to a rise in numbers.

Source: ABRABE, 2021

Food consumed outside the home, or Food Service (FS), which comprises restaurants, bars, cafeterias, bakeries, catering services, vending machines and fast food chains grew by about 11% a year in the ten years before the pandemic, according to survey by the Brazilian Food Industry Association (ABIA). For 2022, ABIA projects a turnover of around R\$ 166.9 billion, accounting for a growth of 28%.

Source: ABIA, 2021

One of the results of the restrictive measures imposed by the COVID-19 pandemic was the change in the way of consuming. Online sales reached a record increase of 68% in 2020, according to data from the Brazilian Electronic Commerce Association (ABComm) in partnership with Neotrust. It is also estimated that 20.2 million consumers made an online purchase for the first time in 2020 and 150,000 stores also started selling through digital platforms. There were over more than 301 million purchases over the internet, with an average value of R\$ 419, according to the data made available. For 2021, the National Confederation of Trade estimates that e-commerce in Brazil ended the year with an increase of 38%, with projected revenue of R\$ 304 billion.

Source: ABCOM, 20201

Overview

The mass vaccination of the global population against COVID-19 has fueled prospects for the end of the pandemic for the retail industry. The decrease in the rate of contagion of the disease resulted in optimistic expectations for the recovery of the economy. This is one of the findings of the KPMG 2021 CEO Outlook study: Consumption and retail. The survey heard CEOs in the retail industry between the months of June and July this year.

Seven Brazilian executives were interviewed, 31 from South America (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, Uruguay and Venezuela), and 149 from the group called “Core Countries” (Germany, Australia, Canada, China, Spain, United States, France, India, Italy, Japan and United Kingdom).

The optimism regarding the economy allowed retail executives to have a diversified view of plans for growth. Among Brazilians, 14% of CEOs were interested in mergers and acquisitions (M&A) operations for the next three years. Joint ventures are also important for the sector in Brazil, with 29% of leaders interested in this strategy. Organic growth is the choice of 14% of Brazilian retail CEOs.

Investments in technology will be a priority among the country's leading retailers. For 58% of them, partnerships with third-party data providers will gain more attention, and for 42%, there will be a greater dedication to advancing digitalization and connectivity across all functional areas. Digital innovation is another item that will gain strength in the Brazilian retail sector: 86% of the country's CEOs see technological disruption more as an opportunity than a threat.

One of the changes brought about by the responses to the fight against COVID-19 is related to the ESG (environmental, social and governance) strategy of companies. For 86% of Brazilian leaders in the retail sector, the new scenario promoted a shift in focus to the social component of ESG.

However, two challenges are in the minds of 29% of Brazilian executives in the sector: the absence of an accepted global framework for measuring and reporting ESG performance, and stakeholder skepticism around the green washing of ESG performance disclosures.

Source: KPMG 2021 CEO Outlook Study: Consumption and retail

4 Global Macrotrends for C&R



New business environment

- The pandemic changed consumption habits and brought new forms of working.
- Acceleration in technology adoption, making the industry move towards digitalization, with significant investments in CX and front office systems.
- The exponential growth of digital commerce, marketplaces and ecosystems accelerated technology and data architecture revisions.
- Evaluation of formats in food retail, with the supermarkets losing space for cash-and-carry, in addition to strengthening proximity retail.
- Re-signification of spaces, appreciation of experiences, phygital integration.
- Metaverse challenging the concept of scarcity and driving the creation of a new reality.



Rethink the Cost of Doing Business

- Global supply chains are still constrained and struggling to re-establish themselves at pre-pandemic levels. Freight values are much higher than historical values, especially in the case of sea freight.
- Inflationary pressures inside and outside Brazil have led the monetary authorities to take measures that directly impact retail, such as higher interest rates and, consequently, credit restrictions.
- The cost of doing business is getting higher and traditional cost reduction actions are not enough, thus making it necessary to look for other options. The use of artificial intelligence and data is increasingly common to reduce costs.



Positioning & Purpose

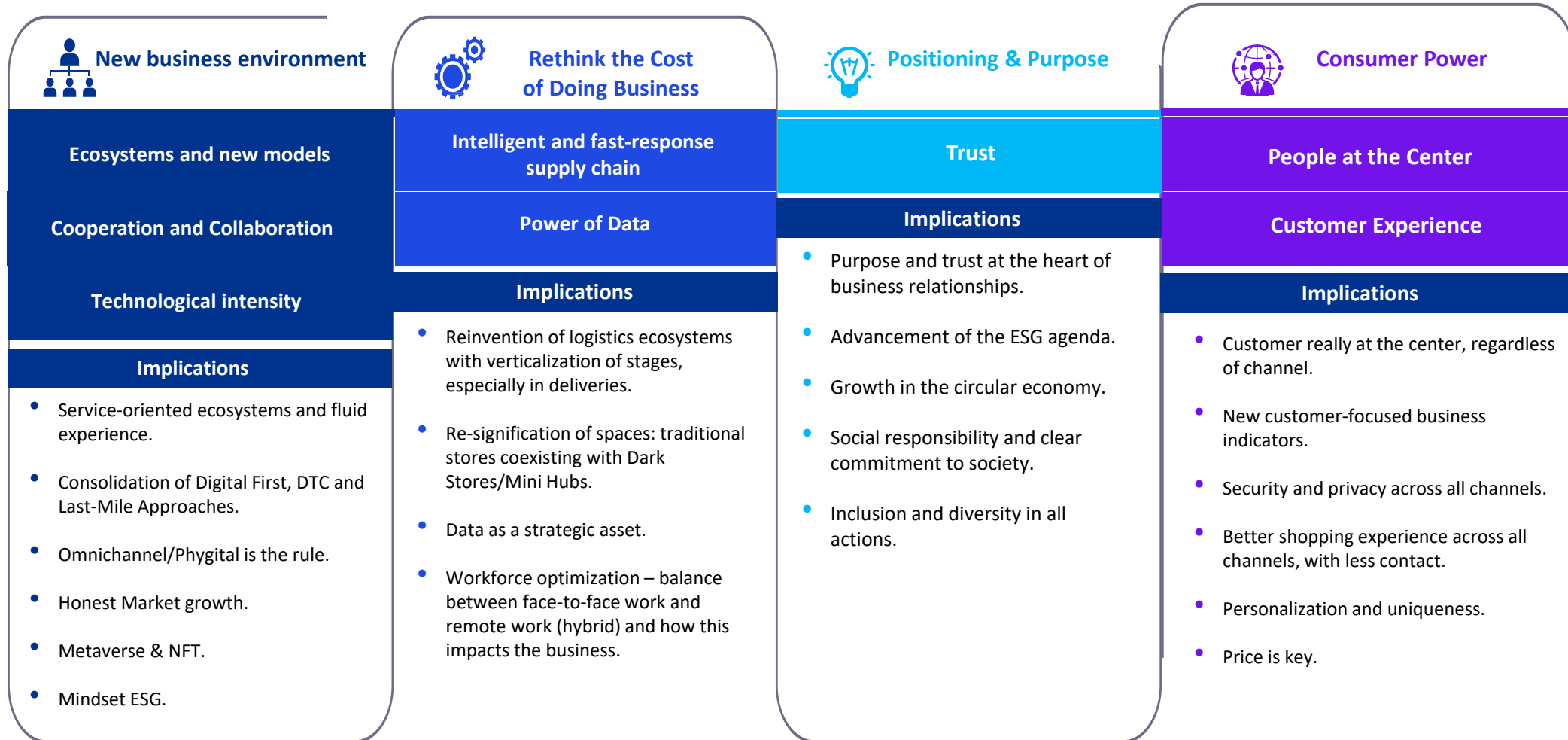
- Consumer relationships are increasingly based on trust, the purpose and positioning of the brand are core elements for creating this connection with the consumer and society.
- In line with the purpose, ESG must be present throughout the value chain, from the relationship with suppliers and partners to the final consumer.
- Consumers value not only the product or service, but the experience, the product origin, correct disposal, employees paid according to the market.
- Inclusion and diversity included in all actions as a way of expanding organizational cognitive capacity.
- Talking about ESG is not enough. The purpose has to be genuine.



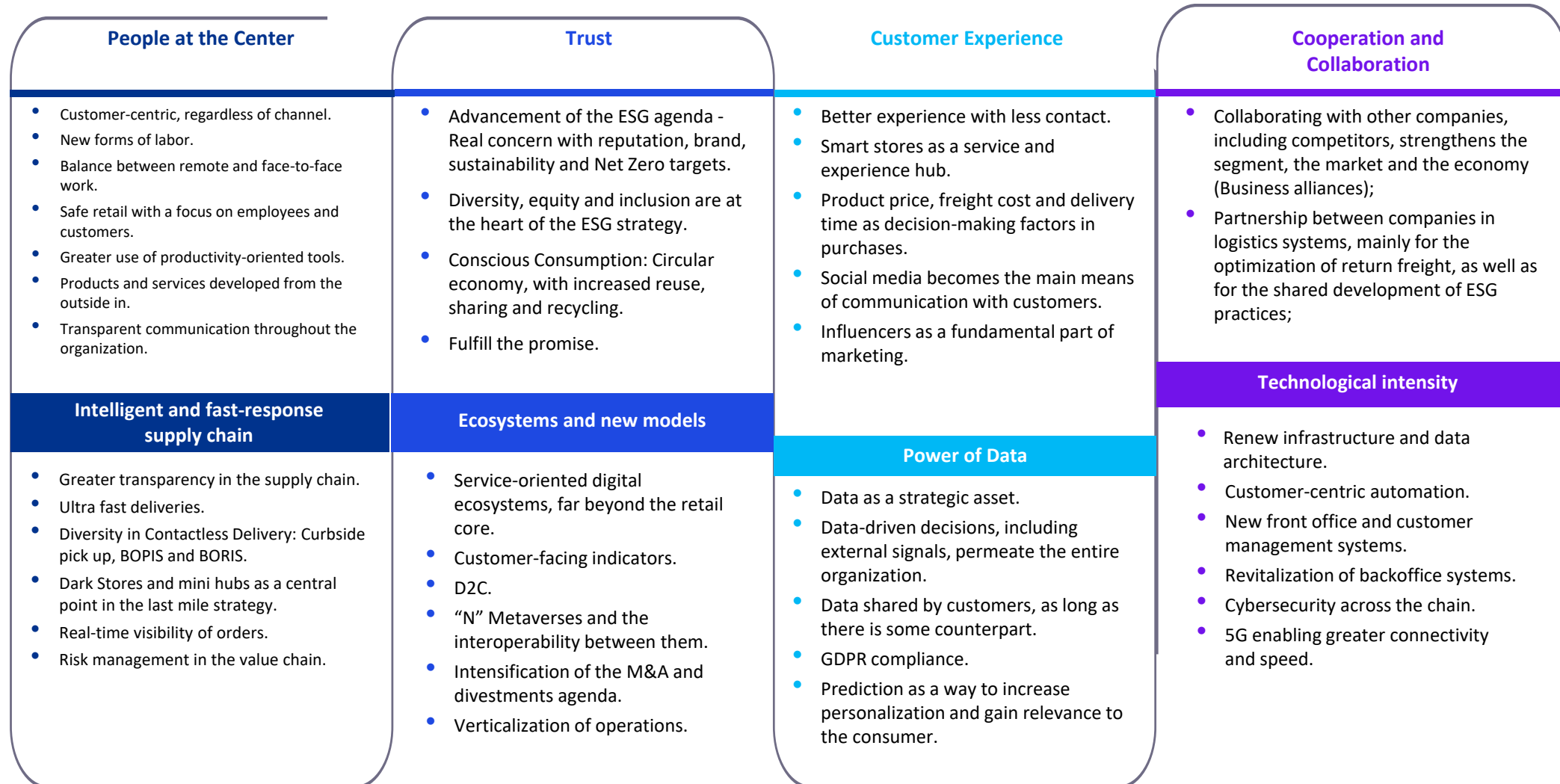
Consumer Power

- The post-COVID consumer is still very demanding, seeking customization, acting in co-creation with manufacturers.
- Consumer choice is growing exponentially, making it a constant challenge for brands to stay relevant and profitable at the same time.
- The use of artificial intelligence is increasingly common to attract new customers, understand their consumption habits and provide a more assertive and memorable shopping experience.
- Conscious consumers and protagonists carrying out social media advocacy for ethical and socially responsible brands.
- The movement from customer journey to life journey, requiring the brand to be part of the consumer's life, as a way of retaining and expanding the lifetime value cycle.

Macro Global Trends translated to South America



South America trends



Opportunities and challenges

Opportunities

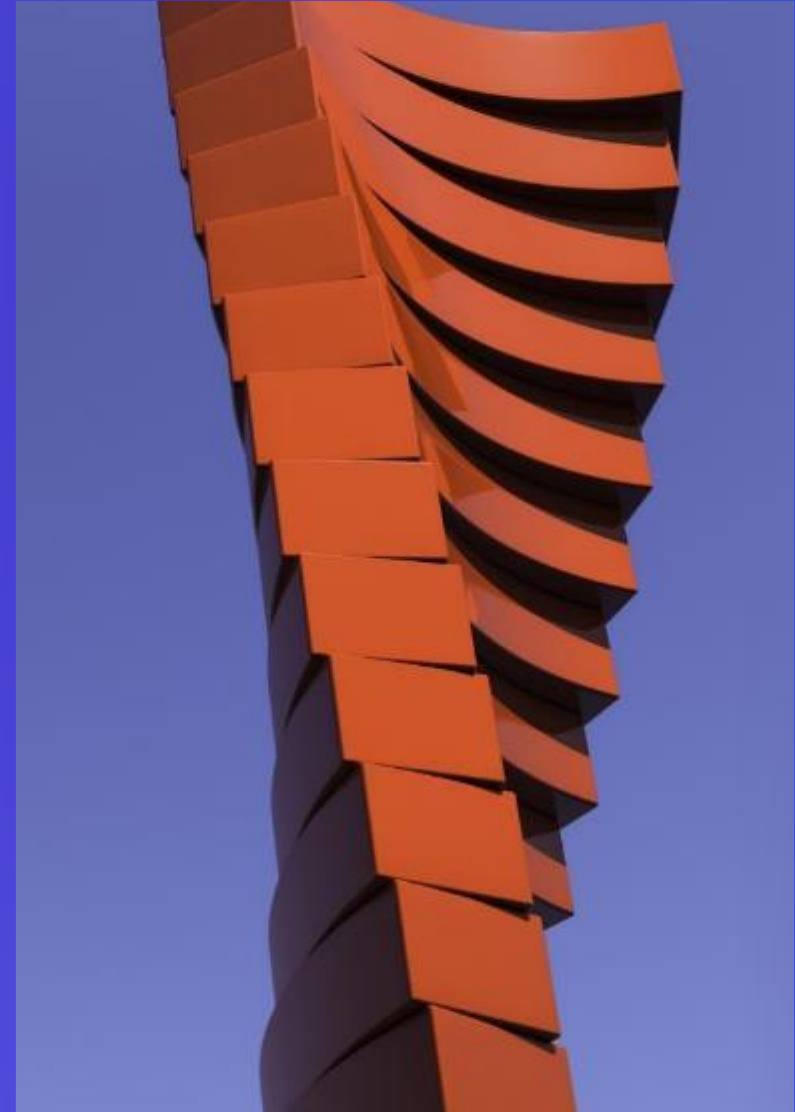
- **Customer centricity** – Knowing consumer habits (B2B and B2C) and knowing when and what to offer (data, experience...), in addition to gaining relevance with the consumer. The use of artificial intelligence and data is increasingly common to reduce costs.
- **Multi-channel journey** – Customer can place orders and interact across multiple channels. Start an order on one channel and follow it on another (Omini-Time-In-Full). Application, Mobile and WhatsApp enhancing e-commerce.
- **Availability and visibility** – B2B x B2C deliveries in up to 1h and that allow traceability (where and with whom is my order?).
- **Predictive S&OP** – based on AI, Responsive SCM & Control Tower.
- **Digital transformation** – Technology as a strategy, both to obtain greater efficiency (digitization) or improve customer relationships, as well as to create new ways of generating value. 5G enabling greater connectivity and speed.
- **New business models** – D2C & Digital Shopping Clubs New Models Enabler – M&A or partners to enable Last-Mile, Diversified Delivery Models (E.g.: UBER, Zé Delivery, Individuals on the go - etc.), in addition to Mini Hubs and Dark Stores, enabling last mile. Dark Stores using virtual and augmented reality for better visualization of products.
- **ESG Mindset** – Packaging, supply chain, waste, fair labor throughout the chain, team diversity.
- **Collaborative mindset** – Customer/maturity oriented and correct attitude without prejudice to results (startup communities, new partnerships).
- **Changes in consumption** – In-app purchases driven by videos, social media and influencers.
- **Service changes** – New exchange and returns policies – first exchange with free shipping; adaptation to enable voice search; shopping clubs or subscription services — subscription and frequent replenishment; increased service via chatbots, mainly for FAQs.
- **Cybersecurity** - Cybersecurity in conjunction with other factors such as supply and supplier chain, talent retention and inflationary pressure are some of the threats that concern industry executives.

Opportunities and challenges

Challenges

- Manage portfolio, aiming to divest in underperforming or non-core businesses.
- Reduce costs in all areas of the production chain (production optimization, leverage of scale in acquisition, streamlining and standardizing processes).
- Global supply chains are still constrained and struggling to re-establish themselves at pre-pandemic levels. Freight values are much higher than historical values, especially in the case of sea freight.
- Sudden acceleration of the digital channel, with new players every day. Urban logistics and cybersecurity have advanced, but at a slower pace.
- Go digital, increase skills and develop digital platforms.
- Invest in growth levers in the form of R&D investment, brand support and capital expenditures to support profitable organic growth, with a strong focus on working capital.
- Household consumption was not enough to compensate for the loss of revenue with the closing of restaurants and bars. Consumption habits, more conscious and healthy, led to changes in the portfolio and portion sizes.
- Assessment of food retail formats, with hypermarkets losing space for cash-and-carry, , in addition to strengthening proximity retail.
- Inflationary pressures inside and outside Brazil have led the monetary authorities to take measures that directly impact retail, such as higher interest rates and, consequently, credit restrictions.
- The cost of doing business is getting higher and traditional cost reduction actions are not enough, thus making it necessary to look for other options.

Infrastructure



Overview

Inadequate infrastructure has been widely seen as one of the main barriers to development in Brazil.

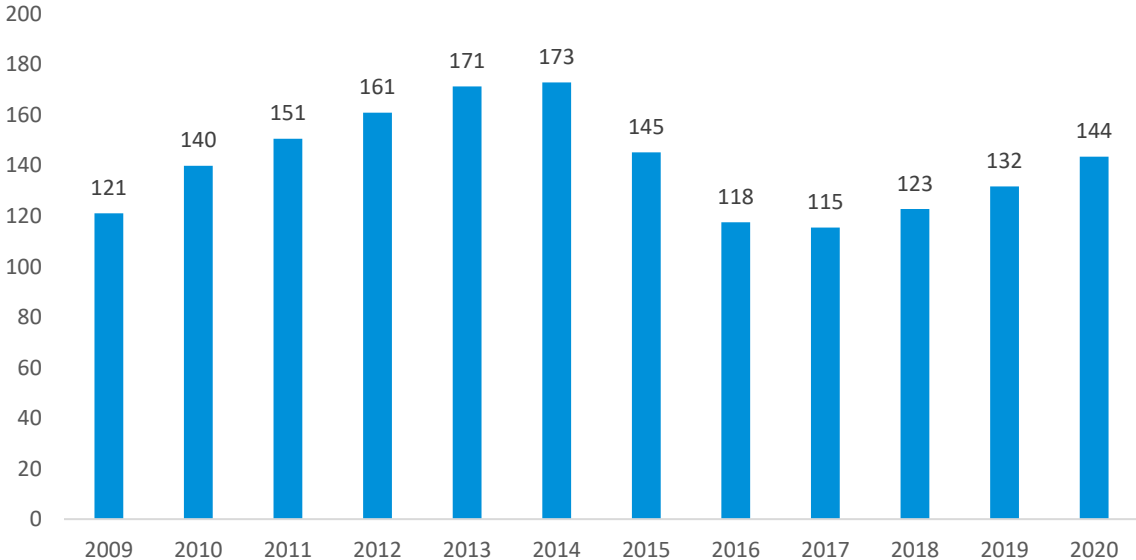
Brazilian GDP and Infrastructure

1.86% GDP investment in Infrastructure between 2008 and 2019

2% Estimated to cover asset depreciation and maintenance

4% Level required for sustainable development

Evolution of Investments in Infrastructure
(In constant values updated by the IPCA 2018. In R\$ billion)



Sources: ABDIB (2019 and 2020), World Bank

Overview

Brazilian infrastructure in 2021

Concessions of public assets to the private sector are expected to yield the country around R\$ 260 billion in infrastructure investments by the end of 2022, with large auctions in 2021 and 2022, with the concession being extremely important to leverage investments in infrastructure in Brazil. Infrastructure Minister Tarcísio de Freitas said that the economic impacts will not be immediate, but that in the years 2024 to 2026 Brazil will become a major “construction site”.

In 2021, the Pró Trilhos program was created, which will boost the emergence of new railroads in a more agile and simple way based on the authorization instrument.

The government also launched the 2035 National Logistics Plan (NLP), which points to investments of at least R\$ 400 billion, in addition to decisions and actions to meet the needs of the transport sector over the next few years.

One of the main objectives of 2035 PNL is the transformation of Brazil's transport matrix to make it more rational and sustainable, providing for a 14% reduction in greenhouse gases in the atmosphere.

Source: Portal da Industria and Agência Brasil

R\$ 37.6 billion
in investments



2,050km
renovated highways



76 Orders for railway
construction



108
public works
completed

39
Asset concessions

Source: Ministry of Infrastructure, 2022

Overview

The private sector has invested in infrastructure in Brazil through concession auctions; on the other hand, public investment in infrastructure continues to decline.

Source: National Transport Confederation

R\$ 789 billion

Need for investment in transport infrastructure by 2035

Source: Gov.br

The transport sector in Brazil continues to grow, despite the slow pace of the economy. The transport Gross Domestic Product (GDP) grew 1.2% compared to the second quarter of 2021 and increased 13.1% when compared to the same quarter of the previous year.

Source: National Transport Confederation

According to Antaq, the Federal Government has been working on the elaboration of policies to expand the use of the waterway modal. One of these initiatives is the “BR do Mar” Bill, sent to the National Congress, to encourage the use of cabotage, increase the national fleet and balance the Brazilian transport matrix.

Source: Antaq

Overview

Air transport is important for national integration, as it promotes several benefits, such as competitive advantage for regions; induction of business; new ventures; expansion of business relations and expansion of tourism and leisure activities. In Brazil, the modal is mainly focused on the locomotion of passengers and has experienced an important expansion in recent years, to the point of becoming as popular as road transport. However, the transport of cargo by this modal has not reflected this movement. The Federal Government is studying ways to stimulate advances in this area.



Source: IPEA and Gov.br

Overview

The railway modal in Brazil follows a period of great financial support thanks to the Railway Framework, approved as a provisional measure in December 2021, which changed the rules for railroad transport in the country. As a result, the Pró-Trilhos Program was created, which institutes the granting of authorization for the railway sector, allowing free initiative in the railway market.

Now new railways can be designed, developed and operated by the private sector without any bidding.

The existing concession regime will continue in force, but there will be a new form of operation, which is authorization. In this format, a private company will be able to suggest a new railroad project on its own account to the government, with investment and operation plans. It will be up to the government to authorize the project.

The program, in addition to modernizing the Brazilian railroad network, tends to reduce transport costs and reduce CO2 emissions.

The program is expected to generate 2.6 million direct and indirect jobs.

Source: Ministry of Infrastructure

Pro-Trilhos data *

76

Number of applications received for construction authorization.

16

States will be impacted

R\$ 224 billion

Investments in railways

19,000 km

Extension of new private railways

* Data related to requests received by the Ministries of Infrastructure until January 2022

Overview



Deceleration of growth for 2022, forecast at 2%, supported by what is already contracted and, especially, by the increase in infrastructure investment.

Source: CNN Brazil, 2021

Popularization of ESG practices in the sector: companies will increase their investments in ecological materials that have a lower environmental impact, in addition to reusing materials. The use of renewable energies, such as the installation of photovoltaic panels, is a major trend for the sector.

Source: Satal, 2022

Investment in technology: the use of process robotization will make the construction stages more agile and safer.

Source: Satal, 2022

Trends



Modular construction the industrialized construction of concrete guarantees applicability both in residential and infrastructure constructions, ensuring less waste, more safety and agility in the works.

Source: Abcic, 2022

Road modal: Fleet electrification is a trend. Environmental impacts with carbon emissions will be substantially reduced.

Source: Estadão

Nearshore: it is an alternative to avoid disrupting the supply chain and avoiding the high costs of international freight. The need to have close suppliers and decentralize dependence on just one country was enhanced in the pandemic.

Source: Porto Gente, 2022

Hot Topic

Forecast to hold 14 highway auctions in 2022. Expectations are good due to the large contracting of works, including road maintenance and duplication of roads, of approximately R\$ 300 to R\$ 600 million in contracts. Source: CIESP, 2022

Inflation: Faced with a scenario of accelerating inflation, also observed in the construction sector inputs, the Central Bank started to raise the basic interest rate, a trend that should continue in the coming months. Thus, we should observe a trend towards an increase in costs for financing production and the purchase of properties, which could negatively impact the sector in the medium term. Source: Lafis

The first privatization of the port sector in Brazil was approved. The model was prepared by the Ministry of Infrastructure in partnership with BNDES and provides for R\$ 335 million in investments, in addition to approximately R\$ 1 billion for the operation of the ports of Vitória and Barra do Riacho Source: Ministry of Infrastructure

Source: CIESP, Lafis, Ministry of Infrastructure

Hot Topic

Public transport crisis: During the pandemic, urban buses lost 50% of their passengers, generating the need for flexible contracts and a search for new forms of financing for public transport. Despite the electrification of the bus fleet being a trend for the sector, the crisis in passenger transport can delay the change in the energy matrix of the means of transport.

Regulation and inspection in the road logistics sector in Brazil: the Electronic Transport Document (DTE) and increased inspections over the use of freight letters and non-payment of toll vouchers will have a positive impact on truck drivers and will require carriers to comply with the new legislation.

Railway sector: The new regulatory framework for railways is innovative as it allows granting through authorization.

Entrepreneurs in the infrastructure area criticized President Jair Bolsonaro's decision to veto the return of Reporto, a tax regime that exempts investments in ports and railways.

Water crisis threatens waterway transport.

Auction forecast for 50 infrastructure assets in 2022, with emphasis on 16 airports; 14 highway concessions; privatization of Companhia Docas do Espírito Santos (Codesa) and the Organized Port of Santos.

Source: Estadão, Agência Infra, Portal Dedução

Source: Ministry of Infrastructure, O Globo

Opportunities

Attracting foreign investment for infrastructure through privatization and partnerships. PPI actions raised the projection of investments in Brazil to R\$ 1.2 trillion in the coming years.

Air Transportation

- Provisional Measure facilitates entry of foreign airlines in Brazil
- Authorized use of cheaper kerosene
- The sector will reach 50 airports granted to the private sector by the end of 2022
- Lack of shipping containers boosts air transport.

Sea transportation

- Antaq approves the first call for privatization of ports in the history of Brazil
- Decree amends regulation of the operation of ports and port facilities
- Concession projects in the country will have higher returns. The federal government will offer higher rates of return than in previous rounds as a way to stimulate the appetite of entrepreneurs in the sector.

Road Transportation

- Technologies seek the expansion of omnichannel and last mile operations.
- ANTT published Resolution 5.950/2021, which establishes the first rule of the Highway Concessions Regulation, applicable to concession contracts for the exploitation of road infrastructure under ANTT's competence.
- Sanctioned law that creates "MEI Caminhoneiro".
- Payroll exemption for the sector is extended until 2023.
- Concession projects in the country will have higher returns.
- Online freight platforms promise to improve the efficiency of the freight transport market.

Rail Transportation

- New Regulatory Framework is approved in the form of a Law and is already heating up the modal as never seen before.
- Online freight platforms promise to improve the efficiency of the freight transport market. With the tool, carriers speed up deliveries and the truck driver can, with a simple click, find a load within the location and in the conditions they want.

Source: Exame, 2021

ENR

Energy and Natural Resources



Global and Brazilian context of the sector

- Comprises the area of Power & Utilities, Chemicals, Oil & Gas, Metals & Ores and Renewables.
- Represents approximately 25% of the national GDP.
- Source of economic and social development in the country.
- Control of the inflation target.
- FDI – US\$ 768 billion (source: BCB) of which 21% went to the ENR sector.
- Technologies in favor of greater operational efficiency (e.g.: digital twin, artificial intelligence, among others).
- Liberal agendas — space for new entrants — structural reforms on the agenda: Infrastructure and regulation.
- Onerous assignment, distributed generation, renewable generation.
- Privatization of relevant assets in the oil, gas and electric power sector.
- Quality of Brazilian assets – pre-salt, northeasterly winds, technology for wind farms, etc.

Source: ANP and Poder 360, 2022; BACEN, 2019

Global and Brazilian context of the sector

- Different aspects being considered for the energy transition, new market designs and ongoing regulatory framework.
- Improved living standards in countries like India, China and other Asian countries.
- Increase in industrial and commercial (buildings) energy consumption.
- Use of autonomous vehicles and shared transport.
- Renewable consumption will account for half of global energy consumption by 2040.
- Gradual reduction in coal consumption.
- Gas as protagonist of the energy transition – relevant pre-salt effect.
- Transformation of the electric power sector segment and the inversion of the chain: the consumer takes the lead and starts generating energy.
- Pressure on energy policies: more energy and less carbon.
- Race to exploit oil / prospects for auctions and divestments.
- Beware of sustainability – ESG concept being priced at wind farms etc.

Source: Empresa de Pesquisa Energética, 2020 and Trends and the new reality – 1 year of COVID-19, KPMG 2020

General information and trends of ENR segments

Oil & Gas

- According to the National Agency of Petroleum, Natural Gas and Biofuels (ANP), average oil production in 2021 totaled 2.905 million barrels per day (bpd), a decrease of 1.18% compared to the 2.940 million bpd recorded in 2020. The production of natural gas reached a record 134 million m³ per day, growth of 5% in the year. Another important fact is that 133 wells in activity in the pre-salt were responsible for 73.8% of all oil and gas produced in Brazil.
- USA, Europe and China Geopolitics.
- Falling fossil demand.
- Increase in pre-salt production.
- Focus on cash preservation.
- Digitization – automation of manual processes.
- Cyber security – protection of sensitive data.
- Asset portfolio management – the more diverse the smaller the impact.
- Environmental, Social and Governance (ESG) indicators on the agenda.
- Divestment projects are back at the top of the agenda, attracting new companies.
- Companies work on managing their asset portfolios, but with a more integrated focus, seeking automated, digital and sustainable solutions.

Power

- Impact on energy tariff (increase).
- Regulatory progress towards the energy transition/modernization of the electric power sector.
- Progress in the privatization process.
- ESG drives renewable energy even further.
- Cyber security enters the priority agenda of all companies.
- Sophistication of the energy trading process management (hourly PLD), and gradual maturation of the derivatives market.
- Greater attention to transmission assets (obsolescence) and expansion (opportunity) to ensure energy security.

General information and trends of ENR segments

Renewables

- ESG driving investments in renewable energy.
- Market transformation, resilience, innovation and collaboration.
- High volume of M&A transactions, especially of pre-operating assets or greenfield projects.
- ESG driving investment in renewable energy and other clean technologies such as batteries, clean hydrogen and carbon capture.
- The continued growth of clean energy in Brazil, despite the downturn in the economy and the challenges presented by the pandemic, demonstrates that the market is maturing and that the portfolio is highly resilient.
- Review process of REN 482 with ANEEL, in which dialogue leads to more balanced options.

Source: Portal Solar, ADBG and Trends and the new reality – 1 year of COVID-19, KPMG 2020

Metals & Mining

- Increased demand in recent months and the price of mineral commodities.
- The Mining sector is increasingly consolidated and globalized and companies seek recognition in the global market and compete for the critical capital needed to identify new mineral opportunities. According to data from the Brazilian Mining Institute (Ibram), the balance of exports was almost US\$ 49 billion in 2021, accounting for a growth of 51% compared to 2020 and was essential to guarantee the positive balance of the country's trade balance.
- The Brazilian foundry industry in Brazil, represented by the Brazilian Foundry Association (ABIFA), estimates a growth of +15% in 2022 compared to 2021, exceeding 3 million tons of cast parts. The installed capacity of the Brazilian foundry industry is 4 million tons.
- Expansion of debates on health, safety and the environment.
- Recovery in the prices of the main commodities favors the resumption of projects to expand production.
- Supply chain risks remain due to the possibility of new lockdown measures.
- Opportunities for M&A in the medium and long term, with emphasis on operations involving gold assets.
- Re-discussion of the relationship with stakeholders, including communities and government authorities.
- Environmental, Social and Governance (ESG) indicators on the agenda.
- High level of liquidity, but there are still challenges in accessing funding sources.

Source: Gazeta do Povo, Ibram, ABIFA and Trends and the new reality – 1 year of COVID-19, KPMG 2020

General information and trends of ENR segments

Chemicals & Petrochemicals

- The chemical industry is present in almost all economic activities – agriculture, the automotive sector, electronics and health services are some examples. Companies in the segment are also responsible for creating sustainable solutions that help preserving the planet and improving people's quality of life and longevity. Chemical production had a record domestic demand in 2021, growing by 20.5% between 2020 and 2021, reaching the best result in the historical series since 1990, according to the Brazilian Chemical Industry Association (Abiquim). This data is accompanied by a large increase in imports, occupying 46% of the full domestic market in 2021, against 7% in the early 1990s. The lack of competitiveness, discontinuity of several production lines in recent years and the Brazil Cost are some of the factors that justify the high level of penetration of imports.
- Great dependence on other sectors (automotive, hospital, etc.).
- Reduction in the use of installed capacity, which was already at low levels in previous years.
- They seek alternatives that mitigate impacts on exchange rate change.
- Fall in the automotive sector drastically affects the chemical segment.
- The industry will review its production model and logistics chain to incorporate feasible alternatives in a timely manner at a justifiable cost that allows for revenue projection and sustainable sales growth.
- Greater availability of products in the market and lower prices of raw materials in petrochemicals causes an increase in sales in volume.
- Lower prices in the intermediates division mainly reflected continued weak demand.
- More disciplined conduct in investments in increasing capacity.
- More compressed margins due to the sector's scenario.

Source: Abiquim and Trends and the new reality – 1 year of COVID-19, KPMG 2020

Sanitation

- The New Legal Sanitation Framework (Law 14.26/2020), enacted on July 15, 2020, established goals for the universalization of basic sanitation services by 2033 (covering 99% of the Brazilian population with drinking water and 90% with and sewage treatment), the elaboration of new national norms for the provision of sanitation services by the National Water and Basic Sanitation Agency (ANA) and the opening of the sector to competition and private investments.
- In 2021, the Brazilian basic sanitation sector contracted around R\$ 40 billion in investments for the universalization of services, in addition to R\$ 30 billion in grants in the concession auctions of sanitation services in the states of Alagoas, Amapá, Mato Grosso do Sul, Espírito Santo and Rio de Janeiro.
- A further R\$ 700 billion in investments will be needed to universalize sanitation in Brazil by 2033.

Source: Brazilian Government and Trends and the new reality – 1 year of COVID-19, KPMG 2020

Opportunities in the ENR segments

Oil & Gas

- Business model: Rethink the fuel consumption model — customer experience; collaborative material platforms; offshore contracting model — daily rate vs. performance etc.
- Operating model: Digitization of manual processes, mainly offshore, and operation automation; intensification of the use of artificial intelligence in the maintenance process; intensified use of D&E for reservoir assessment, etc.
- Changing consumer habits: Reduction of urban mobility vs. greater use of e-commerce.
- Lean Strategy: Rethinking the Asset Light model — technology company.
- Employees: Job resumption, market reheating.
- Capital structure: Focus on diversifying the asset portfolio.
- Risk management: Low impact.

Power

- Business model: Expansion of platforms linked to the trading of financial solutions linked to energy contracts.
- Operating model: Modernization of management, including the digitization and automation of operations and administration.
- Changing consumer habits: Growing focus on energy efficiency, greater participation in the free market.
- Lean Strategy: Impact for large generators.
- Employees: Staff with more analytical profiles and market vision.
- Capital structure: Alternative investments in renewable assets in line with the energy transition.
- Risk management: Growing concern about cyber, business (climate, regulatory, ESG) and market risks.

Source: Trends and the new reality – 1 year of COVID-19, KPMG 2020

Opportunities in the ENR segments

Renewables

- Business model: Resumption of new energy auctions.
- Operating model: Declining costs and increasing competitiveness of battery storage.
- Changing consumer habits: Consumers more aware and demanding in relation to the service level.
- Lean Strategy: Impact on large generators.
- Employees: Staff with more analytical profiles.
- Capital structure: Alternatives for investing in assets to not miss the wave of renewable energy, infrastructure debentures.
- Risk management: Business (climate, regulatory) and market risk.
- Segment-specific ESG aspects: Circular economy (solar and wind), traceability (biogas) etc.

Metals & Mining

- Business model/risk management: Review of the companies' relationship with regulatory agents and impacted communities, impacting the operating model in mining projects. Greater transparency. Better management of stakeholder relations.
- Operating model: Expansion of operational automation, electrification of vehicles/equipment and alternatives for remote control of the production process through the use of new technologies.
- Changing consumer habits: Increased demand for strategic minerals applied in new technologies, such as electric vehicles and batteries.
- Lean Strategy: Low impact.
- Employees: Implementing strategies to protect employees from exposure to COVID-19 and limit the risk of disruption to operations.
- Capital structure: Challenges for accessing new sources of capital.

Source: Trends and the new reality – 1 year of COVID-19, KPMG 2020

Opportunities in the ENR segments

Chemicals & Petrochemicals

- Business model: opening up the gas market in Brazil will stimulate investments in the chemical sector.
- Operating model: search for alternatives in the supply chain.
- Circular production model: advocates the reduction of consumption of raw materials, reuse, recycling and the use of renewable energies and new materials.
- Changing consumer habits: wide variation as it depends on several segments.
- Lean Strategy: Low impact.
- Employees: moderately affected by the several sectors that consume the raw material.
- Capital structure: consolidations in the market in large groups.
- Risk management: alternatives that mitigate impacts on exchange rate change.
- Oil and gas companies are looking for nanotechnology applications to push the constraints that heavier, bulkier structures and tools place on the costs of oil and gas exploration and production. Some applications are being studied, for example, in hydraulic fracturing.
- Oil and gas companies are using artificial intelligence and cognitive technology to help them make decisions. Some benefits: accurately predict incidents such as stuck bits, inform system engineers to take the best actions to improve maintenance operations, predict optimal time to drill, troubleshoot underperforming wells and improve reservoir modeling and perform preventive maintenance before problems arise.

Sanitation

- Business model: Restructuring of the business model of state sanitation companies for the bidding and universalization of services (concession, PPP, IPO).
- Operating model: Reduction of losses in water distribution, automation of water production and sewage treatment processes, digital transformation of the front and back office; expansion of electronic metering, adoption of digital twins in asset management and compliance with the new standards for the provision of services by the ANA/Local Regulatory Agency.
- Changing consumer habits: Consumers more aware and demanding in relation to service and quality of services.
- Lean Strategy: More centralized structures, automation master plans and remote operations.
- Employees: Professionals with a client-centric view and attention to service quality.
- Capital structure: Trend of new entrants and partnerships with new investors for equity and greater leverage with financing.
- Risk management: Improved measurement and monitoring of performance indicators, including ESG.

Source: Trends and the new reality – 1 year of COVID-19, KPMG 2020



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Financial services



Overview

The Brazilian National Financial System (SFN) is mainly formed by banks, savings banks, exchange brokers, fintechs, consortium administrators, credit cooperatives, payment institutions, brokers and distributors, all under the supervision of the Central Bank of Brazil and under the structure of the National Monetary Council.

It is considered a system with advanced technological infrastructure and its formation over the years has participants of different profiles and operations. Among the largest banks in the country there are public, national and international banks, in addition to large banks, others with operations in niches, international, banks with regional operations and, more recently, fintechs have emerged with specific service offerings.

Large banks have a bancassurance structure, in which, through investees or alliances, they operate in the insurance market. Banks also have Asset Management activities in their structures and, more recently, fintechs have expanded their operations in the financial system. A few years ago, physical presence, through the branch network, was a relevant factor for retail banking, which created a challenge due to the territorial extension of Brazil. This has naturally changed, whether due to new technologies, new entrants and the recent context of the pandemic.

According to the regulation of the Central Bank of Brazil, the financial system is segmented into five levels, namely: S1, S2, S3, S4 and S5; based on its representativeness in relation to GDP, if greater than or equal to 10% of GDP in the case of S1, and so on, up to those with a size lower than 0.1% of GDP, S5. Between the end of 2019 and the beginning of 2020, about 50 institutions were classified in the three major levels S1, S2 and S3 and about 1,200 institutions in the levels S4 and S5, which include credit cooperatives.

The concentration observed in the Brazilian banking sector has not been very different from the concentration observed in other sectors of the economy and the Central Bank's action has been in the sense of fostering the entry of new participants, while maintaining the regulatory demands to guarantee the system stability.

Source: BACEN

Trends

Source: KPMG – Trends and new reality: 1 year of COVID-19

The Brazilian Financial System has followed many of the trends in the international banking market and over the last few years the market has addressed some topics, such as:

- **Digital transformation:** The Brazilian Financial System (SFN) has undergone continuous evolution and digital transformation, especially in the form of customer experience. More recently, an instant payment system (PIX) was implemented by the Central Bank of Brazil and, in addition, the phased implementation of Open Banking, which generates an expectation of reconfiguration of the market with the entry of new players.
- **ESG – Environmental, Social and Governance:** The ESG agenda has become increasingly a priority and can be considered a success factor for players that operate in the market and have greater capacity to meet the ESG agenda.
- **Banking:** Increase the number of people with banking relationships has been one of the major challenges and opportunities in the market, which has revealed new business models with successful projects.
- **Regulatory Environment:** The transition of the regulatory environment increasingly closer to international precepts has increased interest in the Brazilian financial system and contributed to the analysis of performance and business management. There are some regulatory asymmetries that must be compensated with reviews of regulations and their application to different types of market participants.
- **Economic environment:** The current economic environment with basic interest rates at levels much lower than the historical ones, coupled with a strong demand for infrastructure and sanitation projects, as well as driven by financing related to the agribusiness and real estate sector, are other examples of opportunities related to the Brazilian financial system.

Non-financial players increasingly entering the segment and offering services typically offered by financial institutions, insurance companies and payment method companies.

New reality

The new reality imposed by the COVID-19 pandemic crisis has generated important challenges for the sector, although many of them demonstrate a certain acceleration of what was already being planned for the coming years, of which the following stand out:

Review of business models that consider the operational flow in remote mode and are more digital, the increasing relevance on the customer experience, digital transformation and the entry of new competitors;

Customer service and relationship structure, favoring the migration of relationships to digital channels and revisiting physical structures, such as the branch network and service stations;

Digital transformation enhances the management of cyber security risks and fraud monitoring in a digital environment;

In this new environment, it is expected a greater movement of acquisitions or mainly partnerships that enable a better composition to offer to customers.

Source: KPMG – Trends and new reality: 1 year of COVID-19

Opportunities and Challenges



Digital transformation

- The main opportunities and challenges of the financial system are related to digital transformation, particularly with the focus on improving the customer experience and, more recently, on reviewing more efficient and effective operating models to serve the customer. This movement is expected to be driven by the implementation of Open Banking, reconfiguring the financial system with new players and alliances.

Source: KPMG – Trends and new reality: 1 year of COVID-19

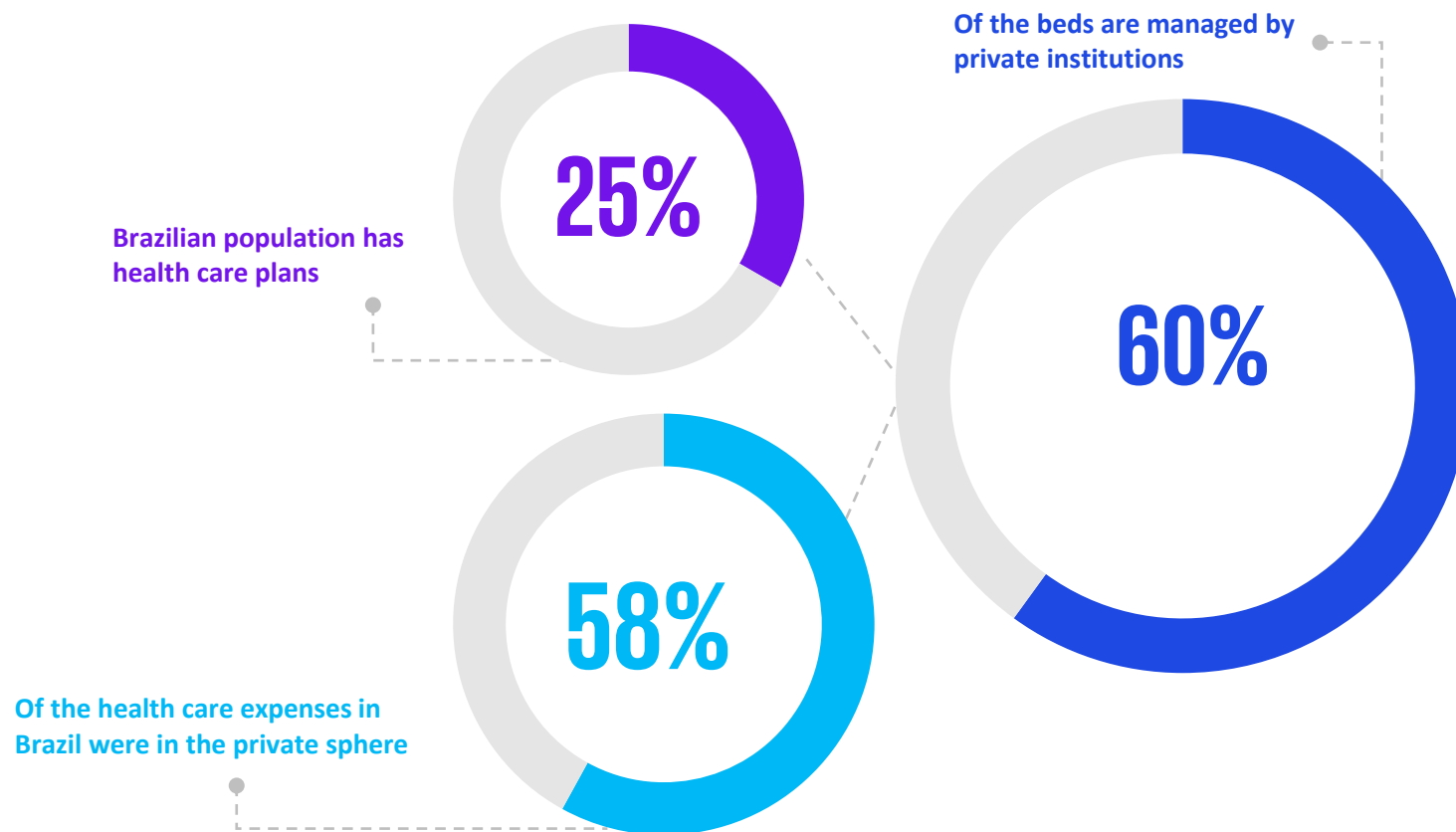
Healthcare



Overview

I Private Health Insurance

- Private healthcare accounted for 58% of total healthcare spending in Brazil in 2018, according to WHO data. More than half of this private expense comes from private health insurance. The Brazilian private health insurance market is the second largest in terms of worldwide population. Private plans covered 47 million people in 2018 — roughly a quarter of the country's population.
- Supplementary health accounts for half of the medical treatments performed in the country; that is, it not only complements, but contributes to national health alongside the Unified Health System (SUS), the public medical assistance.



Source: IESS

Trends

- Investment in technology and innovation: use and implementation of software, Big Data and Artificial Intelligence will be a trend for the sector. The need to comply with legislation, the implementation and maintenance of new technological practices that make the patient's life easier, such as telemedicine, drive investments.
- ESG: ESG growth will be remarkable in the Healthcare area. The implementation of political actions that demonstrate affinity with environmental and social responsibility topics will be extremely important for companies to gain visibility and authority in the market.
- Adaptation to new legislation: the General Data Protection Law (LGPD) and Normative Resolution 443 of the National Supplementary Health Agency (ANS) require attention and adequacy from organizations, as the infractions committed can lead to exponential fines. Adaptation to the so-called New Secrecy Preservation Law, approved in January 2022, will also require several adjustments and attention from the industry.

Source: SEGS



Hot topics

- **Open Health:** the Minister of Health, Mr. Marcelo Queiroga, stated that he intends to create open health, sharing beneficiary data between health care plan companies, with the objective of “increasing competition in the supplementary health care sector”.
- **Telemedicine:** With the pandemic, around 5.1 million teleservices were carried out in Brazil between April 2020 and November 2021. The current challenge is the regulation of the practice.



Source: Valor Econômico, Medicina S/A and Estadão.

Opportunities



The private sector is responsible for 50% of medical and hospital care on average, which means that there is an important demand to be met. The SUS offers free services. However, it has many inconveniences, such as discomfort and service delay (inefficiency), which leads part of the population to seek private health care plans.



The premium segment of the health care plans is not being affected by the crisis, which shows resilience in this niche, even in a crisis scenario.



National Supplementary Health Agency (ANS) is launching the Hospital Indicators System (SIHOSP), a data collection platform developed to monitor the performance and assess the quality of hospitals operating in the health insurance sector. The initiative is a further step in the Hospital Care Quality Monitoring Program, created to analyze and give visibility to data on the provision of care services and the management of hospitals in supplementary health.

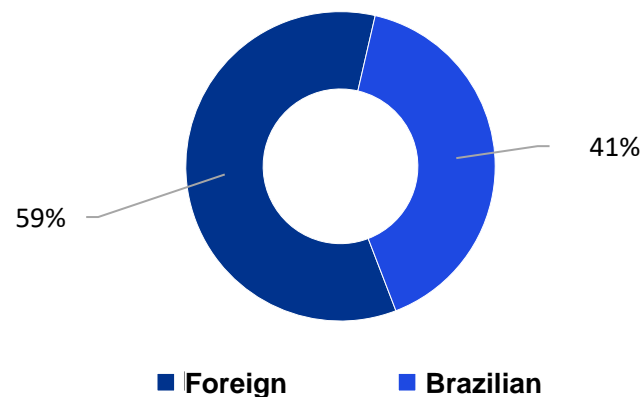
Source: Lafis, ANS

Life sciences

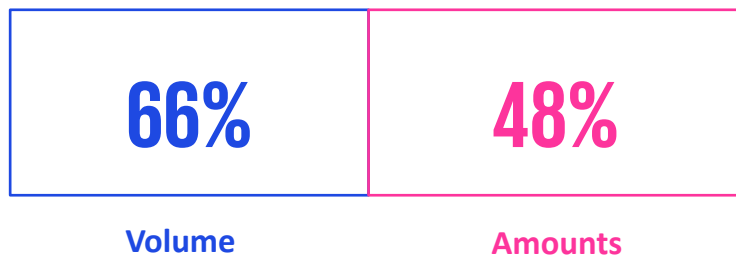


Overview

Pharmaceutical industry in Brazil



Representativeness of the Brazilian industry in domestic sales in 2019



- The Brazilian pharmaceutical industry is focused on serving the domestic market, especially considering that the public health system is one of the major buyers of medicines.
- The supply of pharmaceutical ingredients from local production is insufficient, thus leading to great dependence on imported pharminochemicals and adjuvants.
- Many of the medicines produced do not have a high added value since they are generic medicines or similar; that is, they are not new or innovative products, and they can be easily copied.
- The international market to be explored by the Brazilian pharmaceutical industry is the developing market, as in Bolivia, Chile, Argentina and Venezuela.

Source: Sindusfarma, Lafis SECEX, 2021

Trends

- Traceability – this process maps and generates a history of each medicine, from production to arrival at the end consumer. It has the advantage for the industry of offering quick access to batches of medicines and the final consumer will have more security about authenticity, avoiding counterfeiting and loss of medicines. This feature is so important to the pharmaceutical industry that the National Medicine Control System (SNCM) will become a law in April 2022.
- Artificial intelligence – Artificial Intelligence (AI) in the pharmaceutical industry allows systems to make decisions independently, accurately, allows the capture and analysis of a large amount of information to help companies in their development, for example, in the creation of new drugs and their logistics.
- Studies and development of 3D bioprinting – the printing of artificial cells or stem cells to reproduce living tissue, a technique that can produce human tissue. Currently, the technology is used for drug testing in tissues created through bioprinting, being able to extinguish animal tests and simulate the efficiency of drugs in “printed” tumors, in addition to producing living tissue without great complexities for use in burn treatments..

Source: Guia da Farmácia and G1



Trends

- **Genomic data in product development aid:** through genomic data, there is great potential for drug formulas to be created, reformulated and developed in a customized way for the patient at a competitive cost.

Source: Driving value from genomics in Life Sciences, KPMG

- **Implementation of Big Data:** through the crossing of genomic, genetic and electronic medical record data, it is possible to have a source of quality information for the design and development of new products. The use of Big Data allows the information generated to be used in clinical trials, in simulations that can collaborate in the generation of discoveries with lower risk and cost. The methodology is also applicable to other processes in the pharmaceutical industry, such as sales strategies, penetration and market segmentation.

Source: Engine, 2022; Viceri, 2022

- **D2C Strategy:** the direct-to-customer (D2C) model, in addition to eliminating intermediaries, allows for a closer relationship with the public, reaching the consumer directly.

Source: BiotechTown, 2022



Hot topics

The National Medicine Control System (SNCM) will become law in 2022.

With the reform of the Income Tax, medicines no longer enjoy the tax benefit and can rise up to 12%.

Scarcity of inputs and a devalued exchange rate raise the sector's production costs.

Difficulty in importing medical devices: 77% of companies in the sector face difficulties in customs processes.

Source: Sindusfarma, Anvisa, ABRAIDI

Opportunities

With the population constantly exposed to knowledge of the national and global health and epidemiological situation, the intention to purchase medicines grows. In the same sense, public and private medical institutes, as well as government agencies, will demand more medicines, supplies, devices, among others, given the growing number of patients served and hospitalized throughout the year, especially in the most critical months of the pandemic. The following opportunities can be highlighted:

- Growth of online sales in the Brazilian market. During the pandemic there was a 37% increase in online consumption of medicines.
- Provisional Measure 1.040 of 2021, the well-known Business Environment PM, was approved. If approved in the Senate, it will eliminate the requirement for prior authorization from Anvisa for drug patent applications with the INPI (National Institute of Intellectual Property).
- The vaccine against COVID-19 is the opportunity to improve the reputation of pharmaceutical companies with the population. Pharmaceutical companies are often blamed for raising the price of life-saving drugs and for having enriched themselves at the expense of the population's health. Now, with pharmaceutical companies developing effective vaccines to end the coronavirus pandemic, this industry hopes to redeem itself in the public eye.

Source: Guia da Farmácia, Exame, Lafis

Education



Brazilian educational system

I Structure

Education is a social right in Brazil, and the country's Federal Constitution guarantees access to free public education at all levels. Brazil divides its education system into **Basic Education and Higher Education**. **The basic level includes: Child education; Initial and Final Years of Elementary School; and High School**. Compulsory schooling begins at age four, in preschool, and lasts for 14 years, until the end of High School.

I The different levels of governance of the Brazilian federative system

Brazil has a federal system of government in three spheres, including the Federal Government and the federative entities (26 States, the Federal District and 5,570 Municipalities), **and responsibility for education is shared among the three levels**, as can be seen in the table at side.

Observations:

- The different levels that make up Elementary Education are called “years”; the term “grade” is used for High School.
- The levels of education, in lilac color, refer to **those that are part of compulsory education**. **High School is recognized as an exit point from the educational system**.

Sources: A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original OECD publication.

Structure of the Brazilian educational system

Start age	Administrative unit (primary responsibility)	Series/Year	Teaching level		
23-26	Federal Government	Higher education	PhD		Specialization course, <i>lato sensu</i>
22			Master's degree, <i>stricto sensu</i>	Professional Master's degree, <i>stricto sensu</i>	
18			Bachelor's degree	Graduation	Technological graduation
18	Federal Government and States				Subsequent high school technical course
15	States	Series 3 Series 2 Series 1	High School		
11	Municipalities and States	9 th year 8 th year 7 th year 6 th year	Final years of Elementary School		
6	Municipalities	5 th year 4 th year 3 rd year 2 nd year 1 st year	Initial Years of Elementary School		
4	Municipalities		Pre school		
0			Day care centers		

Brazilian educational system

I Responsibilities of the Federal Government in Education

The roles of the Federal Government in education include:

- Define national norms and general objectives for the country (for example, the PNE – National Education Plan).
- Directly manage institutions such as federal universities and federal professional education schools.
- Coordinate educational policies and practices at different levels of government.
- Provide technical and financial assistance to states and municipalities.

The Ministry of Education (MEC) is also responsible for regulating all educational phases in Brazil, from Early Childhood Education to Higher Education. The MEC evaluates the education system through the Anísio Teixeira National Institute for Educational Studies and Research (Inep), whose main focus is Basic Education, and the Coordination for the Improvement of Higher Education Personnel (Capes), with a focus on Higher Education.

In collaboration with state and municipal governments, the MEC determines the curriculum guidelines (i.e., common skills and subjects) to be taught in schools. The three main associated bodies are:

The National Council of Education (CNE):

Collegiate body of the Ministry of Education, responsible for advising and monitoring the formulation and implementation of the National Education Policy.

Inep:

Semi-autonomous body responsible for performing assessments and examinations of Basic and Higher Education in Brazil and for establishing quality performance indicators. It is responsible, among other matters, for the evaluations: Saeb – Basic Education Assessment System; Enade – National Student Performance Exam (Higher Education); Ideb – Basic Education Development Index; Enem – National High School Exam (the main way of entering higher education). In addition to collecting and disseminating reference information and statistics about the education system.

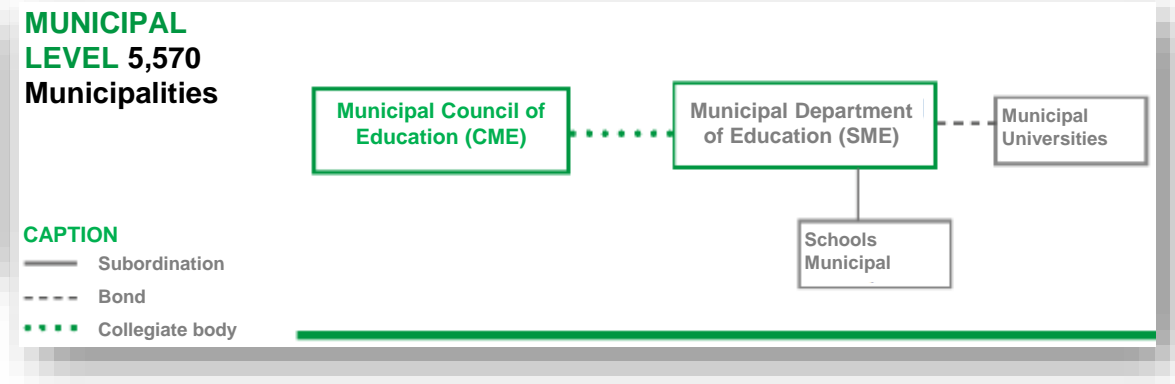
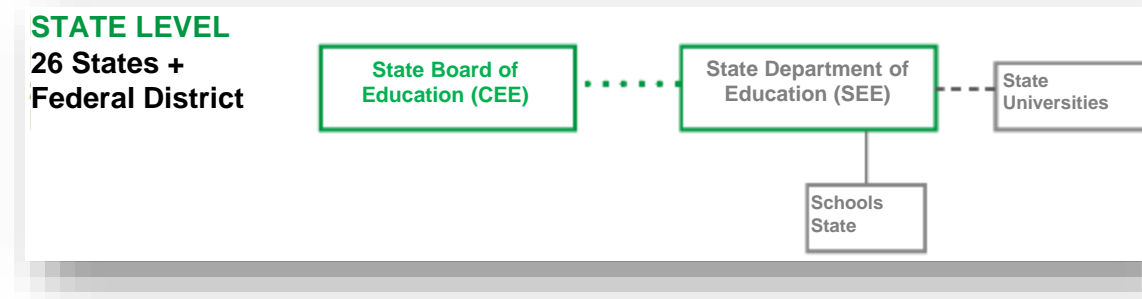
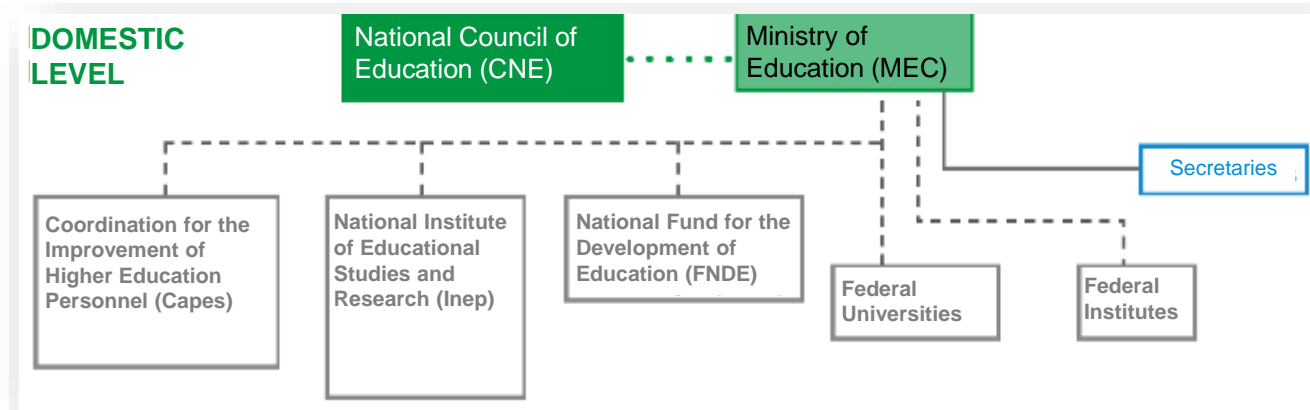
National Fund for the Development of Education (FNDE):

Semi-autonomous body responsible for allocating funds and providing technical support to states and municipalities.

Sources: A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original OECD publication.

Brazilian educational system

Organizational chart of the main education bodies at the national, state and municipal levels



Sources: A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original OECD publication.

Brazilian educational system

I Legal frameworks and policies that structure and guide education in Brazil

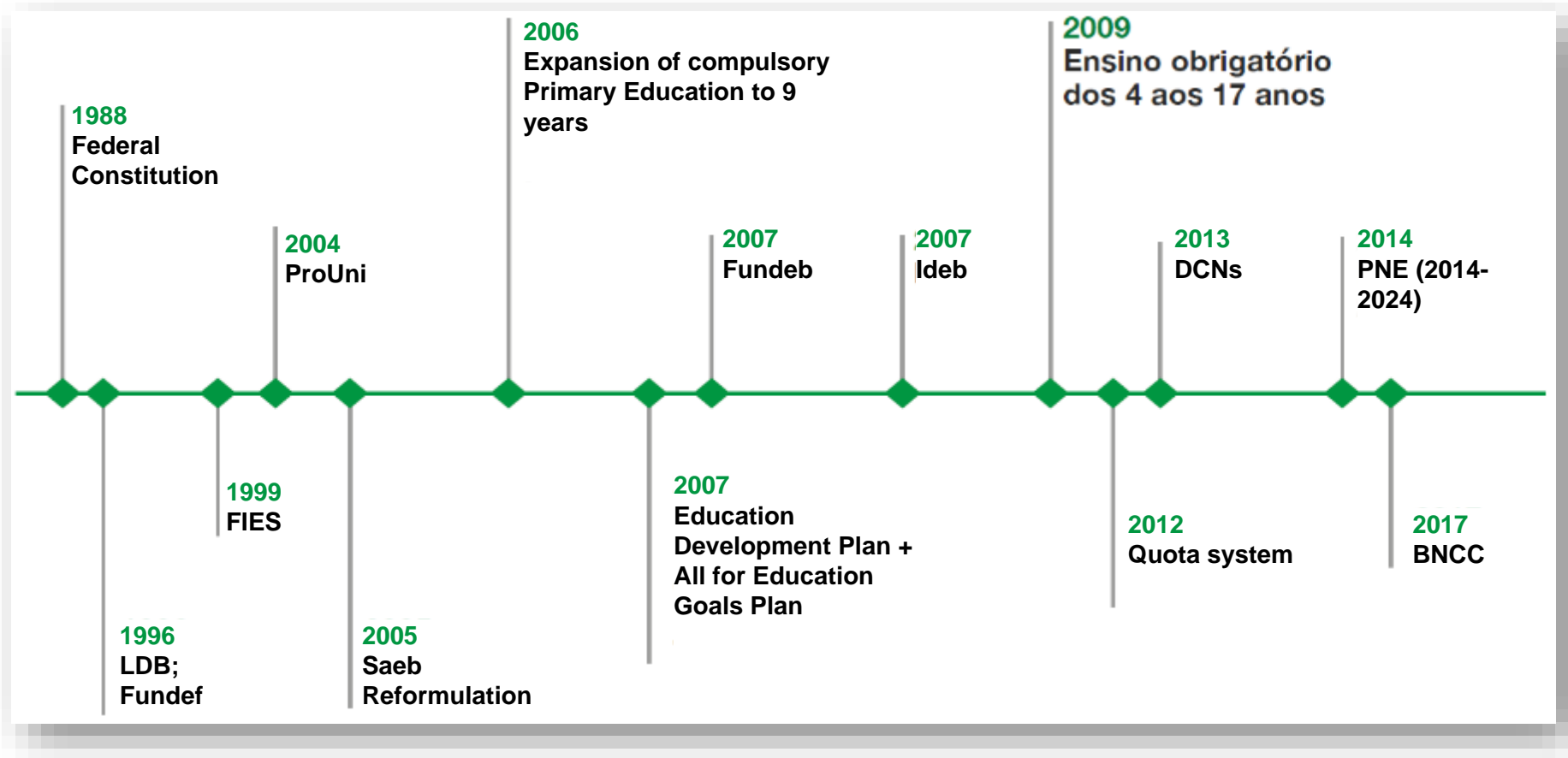
Brazil enshrines certain rights and guidelines for education in law and in central norms, helping to ensure consistency and minimum service standards. The main elements include:

- **The Federal Constitution of 1988** established public education as a right to be offered, free of charge, at all levels of education, from Early Childhood Education to Higher Education.
- **The Law on Brazilian Education Guidelines and Bases (LDB), of 1996**, defines the structure of Basic Education in Brazil and its levels of education; it determines the main responsibilities of the Federal Government, states and municipalities in education, and establishes minimum qualification levels for teachers.
- **The 2014-2024 National Education Plan (PNE) sets 20 goals to be achieved by the Brazilian education system by 2024.** According to the Plan, each state and municipality in Brazil had to develop its own educational plan to support the achievement of the goals established in the PNE, considering their own local needs and demands. Every two years, Inep publishes a monitoring report, evaluating the progress of the goals established in the PNE.
- **The National Curriculum Guidelines (DCNs), of 2013**, which cover the entire basic education, establish the curricular structure for all its stages and for each one of them individually (Primary, Elementary and High School), as well as for specific modalities, such as Quilombola Schools and Indigenous School Education. The DCNs establish the curriculum framework to be followed by all schools.
- The recently introduced **National Common Curriculum Base (BNCC)** defines the national minimum learning objectives at each stage of Basic Education in Brazil. The BNCC is not a curriculum in itself, but provides content guidelines for curriculum planning.
- **Fund for the Maintenance and Development of Basic Education (Fundeb)**, formerly Fundef, redistributes financial funds among the states, backed by a contribution from the Federal Government.

Sources: A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original OECD publication.

Brazilian educational system

Some of the key legal frameworks, policies and education reforms in the last three decades



Sources: A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original OECD publication.

The private sector in Basic Education

The participation of the private sector in basic education in number of enrollments

In Brazilian Basic Education, most students are enrolled in public institutions (81%) (Inep, 2020)*. Private institutions charge students a monthly fee, and the amounts are not regulated. Grants and scholarships at private schools are not common, nor are they publicly funded, unlike higher education.

Demographic changes in Brazil show that there is a decline in the number of children and young people. As a result, in 2020, 47.3 million students were enrolled in the country's basic education network, about 8% less than in 2010 (Inep, 2020). In the same period, public sector enrollments fell by around 12%, while private sector participation increased by 16% (Inep, 2020).

* The data presented by Inep are prior to the beginning of the pandemic; that is, it cannot be related to the results of the new coronavirus.

History of the number of enrollments in Basic Education by administrative facility.

Year	Public	Private	Total
2006	48,595,844	7,346,203	55,942,047
2007	46,643,406	6,385,522	53,028,928
2008	46,131,825	7,101,043	53,232,868
2009	45,270,710	7,309,742	52,580,452
2010	43,989,507	7,560,382	51,549,889
2011	43,053,942	7,918,677	50,972,619
2012	42,222,831	8,322,219	50,545,050
2013	41,432,416	8,610,032	50,042,448
2014	40,680,590	9,090,781	49,771,371
2015	39,738,780	9,057,732	48,796,512
2016	39,834,378	8,983,101	48,817,479
2017	39,721,032	8,887,061	48,608,093
2018	39,460,618	8,995,249	48,455,867
2019	38,739,461	9,134,785	47,874,246
2020	38,504,108	8,791,186	47,295,294
% Interest	81%	19%	

Sources: A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original OECD publication. INEP, Statistical Synopses of Basic Education

The private sector in Higher Education

I A sequence of reforms sought to expand Higher Education

Brazil has made major efforts to increase access to Higher Education. Between 2003 and 2010, 16 new federal public universities were created, and enrollment at federal universities increased by 47%. However, **much of the expansion took place through the growth of private higher education institutions, which more than doubled in number in the 1990s and early 2000s. This movement was facilitated by federal funding (Fies) and scholarships, such as the ProUni program.**

Evolution of the number of Higher Education Institutions (HEIs) in the period between 2010 and 2019

Year	IES Brasil		Private IES	
	Number	Evolution	Number	Evolution
2010	2,378		2,100	
2011	2,365	-0.55%	2,081	-0.90%
2012	2,416	2.16%	2,112	1.49%
2013	2,391	-1.03%	2,090	-1.04%
2014	2,368	-0.96%	2,070	-0.96%
2015	2,364	-0.17%	2,069	-0.05%
2016	2,407	1.82%	2,111	2.03%
2017	2,448	1.70%	2,152	1.94%
2018	2,537	3.64%	2,238	4.00%
2019	2,608	2.80%	2,306	3.04%

The private sector accounts for 88.4% of Brazilian HEIs.

The private network offered 94.9% of the total vacancies for graduation in 2019.

386,073 professors work in Higher Education in Brazil. Of these, 54.3% are linked to private institutions.

Over 6.3 million students study in private institutions, which means a participation of 75.8% of the higher education system. Thus, for every four undergraduate students, three attend private educational establishments. *ABMES, 2020

Sources: Numbers of Private Higher Education in Brazil 2020, ABMES, 20th Edition – Commemorative Publication A Educação no Brasil – Uma perspectiva Internacional, Todos Pela Educação, 2021. Original publication OECD

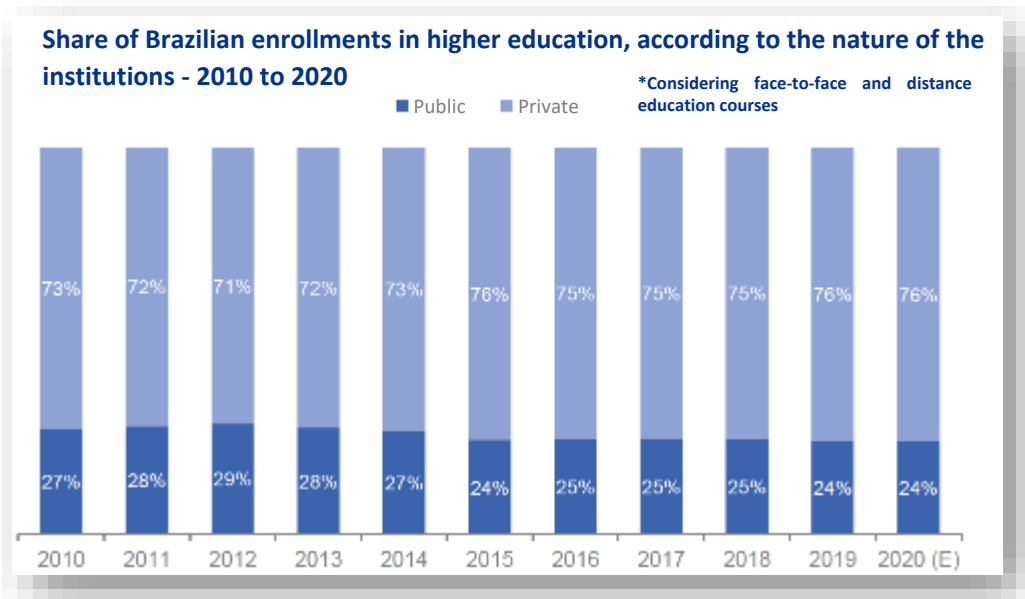
*The data presented by ABMES/Inep is prior to the beginning of the pandemic; that is, it cannot be related to the results of the new coronavirus.

The private sector in Higher Education

I The participation of private institutions by number of enrollments

According to the sector analysis consulting firm, Lafis, it is possible to trace a trend towards an increase in the participation of private institutions in Brazilian Higher Education. The reasons for this trend are diverse. However, it can be briefly highlighted that there was a significant growth of a young part of the Brazilian population that pressured the demand. Moreover, there were important initiatives made by the Federal Government to expand the offer of higher education courses.

As can be seen in the chart below, over a decade, it is possible to follow the history of participation of the private sector, relatively stable over the last few years.



Sources: Lafis, Relatório Setorial – Nov.2021 e Números do Ensino Superior Privado no Brasil 2020, ABMES, 20ª Edição – Publicação Comemorativa



Evolution of the number of enrollments in on-site Higher Education courses – 2010 to 2019

Year	IES Brasil		Private IES	
	Number	Evolution	Number	Evolution
2010	6,449,120		3,987,424	
2011	5,746,762	-10.89%	4,151,371	4.11%
2012	5,923,838	3.08%	4,208,086	1.3%
2013	6,152,405	3.86%	4,374,431	3.95%
2014	6,486,171	5.42%	4,664,542	6.63%
2015	6,633,545	2.27%	4,809,793	3.11%
2016	6,554,283	-1.19%	4,686,806	-2.56%
2017	6,529,681	-0.38%	4,649,897	-0.79%
2018	6,394,244	-2.07%	4,489,690	-3.45%
2019	6,153,560	-3.76%	4,231,071	-5.76%

*The data presented by Lafis/Inep are prior to the beginning of the pandemic; that is, it cannot be related to the results of the new coronavirus.

The private sector in Higher Education - Distance education

I Definition of Distance Higher Education and Regulation

Distance education is the **educational modality in which the didactic-pedagogical mediation in the teaching and learning processes occurs with the use of information and communication means and technologies, with students and teachers developing educational activities in different places or times.** This definition is present in Decree 5.622, of December 19, 2005, which regulates Art. 80 of Law 9.394/96 (LDB).

As provided for in Article 80 of Law 9.394/96 (LDB), the institution interested in offering distance higher education courses must request specific accreditation from the Federal Government.

I Distance education in numbers

According to a survey released in 2020 by the Brazilian Association of Higher Education Maintainers (ABMES), **for the first time in history, the number of students in distance education courses exceeded the number of students who started their on-site graduation** in the private network. Altogether, 50.7% (1,559,725) of students who entered private institutions opted for distance learning courses. On the other hand, 49.3% (1,514,302) of students chose to enter presential higher education courses.

Between 2009 and 2019, the number of enrollments in distance learning courses increased by 378.9%. Entrants to distance learning courses corresponded to 16.1% of the total number of freshmen in 2009. In 2019, this public represents 43.8% of the total number of students starting higher education. At the same time, in this decade, there was an increase of 17.8% of those who opted for on-site courses to start their graduation.

Such growth is due to several factors, such as cheaper tuition fees, flexible study hours and places, reduced transport and food costs, time gain, among others.

*The data presented by ABMES/Inep is prior to the beginning of the pandemic; that is, it cannot be related to the results of the new coronavirus.

Sources: Numbers of Private Higher Education in Brazil 2020, ABMES, 20th Edition – Commemorative Publication
<http://portal.mec.gov.br/instituicoes-credenciadas/educacao-superior-a-distancia>, accessed on 01/27/22

The private sector in Higher Education - Distance education

I Distance education in numbers

Evolution in the **number of enrollments** in higher education distance courses between 2010 and 2019

Year	IES Brasil		Private IES	
	Number	Evolution	Number	Evolution
2010	380,328		340,154	
2011	431,597	13.48%	397,552	16.87%
2012	542,633	25.73%	494,106	24.29%
2013	474,120	-12.63%	440,507	-10.85%
2014	691,731	45.90%	649,638	47.48%
2015	639,519	-7.55%	612,831	-5.67%
2016	781,708	22.23%	758,254	23.73%
2017	991,714	26.87%	907,957	19.74%
2018	1,373,321	38.48%	1,310,678	44.35%
2019	1,592,184	15.94%	1,559,725	19.00%

Evolution in the **number of enrollments** in higher education distance courses between 2010 and 2019

Year	IES Brasil		Private IES	
	Number	Evolution	Number	Evolution
2010	930,179		748,577	
2011	992,927	6.75%	815,003	8.87%
2012	1,113,850	12.18%	932,226	14.38%
2013	1,153,572	3.57%	999,019	7.16%
2014	1,341,842	16.32%	1,202,469	20.36%
2015	1,393,752	3.87%	1,265,359	5.23%
2016	1,494,418	7.22%	1,371,817	8.41%
2017	1,756,982	17.57%	1,591,410	16.01%
2018	2,056,511	17.05%	1,883,584	18.36%
2019	2,450,264	19.15%	2,292,607	21.72%

*The data presented by ABMES/Inep is prior to the beginning of the pandemic; that is, it cannot be related to the results of the new coronavirus.

Sources: Numbers of Private Higher Education in Brazil 2020, ABMES, 20th Edition – Commemorative Publication

Programs for access to Higher Education

Main federal programs for access to higher education

The proliferation of initiatives to access and improve higher education in Brazil stemmed from the measures initiated in the first Lula administration (2003-2006), whose prominence remained in the University for All Program (PROUNI); however, it is worth highlighting that there were other important initiatives, including those prior to this administration. This space displays these programs and some of their aspects.

National High School Exam (ENEM)

It is worth highlighting that Enem is not a program, but an assessment tool. The grade obtained through Enem is the basis for entry into programs such as ProUni, FIES and Sisu. Furthermore, ENEM proves to be an extremely valuable initiative for private higher education institutions, especially those that have recently entered this market, as it reduces costs inherent to the selection process at the institution.

Programa Universidade para Todos (PROUNI)

This Federal Government program is based on the simple granting of full or partial scholarships in undergraduate courses offered by private higher education institutions, and, since its implementation, it has been successful and effective.

Unified Selection System (Sisu)

The Unified Selection System (Sisu) is a program of the Ministry of Education (MEC) that offers places in public universities without having to take the institution's own entrance exam.

The Sisu selection process is fully automated and uses Enem scores to classify candidates. Participation is free and selection takes place twice a year.

Sources: MEC, organization, Lafis

Programs for access to Higher Education

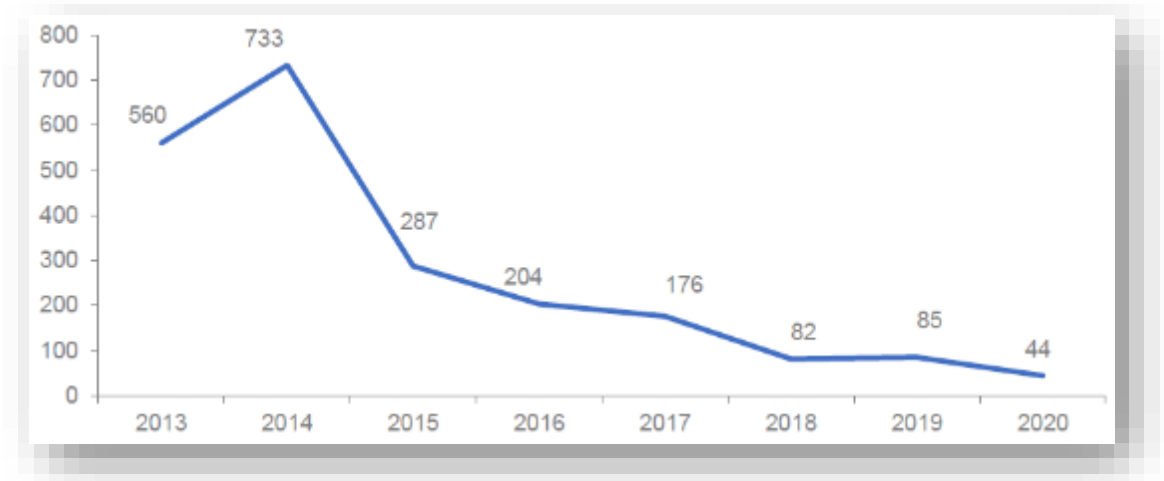
I Main federal programs for Higher Education

Higher Education Student Financing Fund (FIES)

This Federal Government initiative emerged in 2001 with Law 10.260/2001 and consisted of using the funds of Caixa Econômica Federal and MEC to create a fund to finance higher education for students enrolled in paid institutions. The management of the FIES is operated by the MEC and the National Fund for the Development of Education (FNDE), the former of which supervises and formulates credit supply policies, and the latter manages the assets and liabilities of the FIES. Until 2014, the program had many resources and financed several enrollments in private universities. However, the fiscal crisis of 2015 started to bring increasing restrictions to the program, especially with the delinquency that started to increase with unemployment caused by the recession.

The program has undergone changes since then, which together with economic factors impacted the number of vacancies offered by the government and contracts signed.

Number of student loan agreements signed via FIES (thousand) - 2013 to 2020



Sources: MEC, organization, Lafis

Post-pandemic impacts and effects

I Basic Education

After almost two years of the pandemic, education professionals and students in the country still face several challenges daily. Lack of structure to continue classes, difficulty adapting to remote education, loss of coexistence with the school environment, lack of adequate study for the Enem, not to mention those who had one of the few nutritious meals made on the day in their school lunch.

To get an idea of the devastating impact of COVID-19 on education, [...] in Brazil alone, in August 2020, 4 million elementary school students were left without access to any school activity. The data were released by UNICEF's "Education in Pause" study.

A survey carried out by Inep and released in 2021, referring to the 2020 school year (after restrictions and closure) with public and private institutions of basic education points out that:

- **99.3% of Brazilian schools suspended face-to-face activities.** As a result, part of them also adjusted the end date of the 2020 school year, to address the pedagogical issues arising from this suspension. **Public schools felt a greater need to adapt. Just over 53% of them kept the calendar. On the other hand, about 70% of private schools followed the planned schedule.**
- **The percentage of Brazilian schools that did not return to face-to-face activities in the 2020 school year was 90.1%;** in the federal network, this percentage was 98.4%, followed by municipal (97.5%), state (85.9%) and private (70.9%) schools. **Considering this context, over 98% of schools in the country have adopted non-face-to-face teaching strategies.**
- **Altogether, 43.4% of state schools made equipment such as computers, notebooks, tablets and smartphones available to teachers.** In the case of municipalities, this percentage is 19.7%.
- Regarding strategies and tools for the development of teaching-learning activities, **the availability of printed materials for collection at school stands out among the most used. Then there is the offer of teaching and learning materials on the internet.**

Sources: O impacto da pandemia na educação brasileira | Gente | Uma conexão Globo e INEP

Post-pandemic impacts and effects

I Higher education

As good as the teaching and learning tools and possibilities used to carry out classes and other virtual activities are, it is still impossible to transfer the full teaching experience in Higher Education to the screen of a cell phone or computer. It is also important to highlight that the transformations that occurred at a smoother pace in most institutions, such as the virtualization of learning processes, have become top priority issues.

I Disconnected

According to ABMES, the adoption of available tools among Information and Communication Technologies (ICT's) in the educational environment was the most common attempt to remedy the consequences of social isolation. However, in a country like Brazil, where several inequalities still persist, this solution served only a part of the public that attends the country's colleges and universities.

ABMES also highlights that the socioeconomic questionnaires, answered upon Enem registration in the last five years, indicate that **one in three students does not have access to the internet or devices that allow access to distance education programs.** The analysis, carried out by the interactive platform Quero Bolsa, points out the difficulty of universalizing this educational model. This stems from socioeconomic barriers and the precariousness of the telecommunications infrastructure in some parts of Brazil.

Both education at its basic levels and Higher Education face similar difficulties and run into common problems, whether socioeconomic (mainly), infrastructure, professional training or adaptability on the part of students.

Sources: O impacto da pandemia na educação brasileira | Gente | Uma conexão Globo e ABMES, Covid-19 obriga mudanças profundas no ensino superior (abmes.org.br)

Opportunities and challenges

I Opportunities and initiatives for education

- **Higher Education Institutions have been looking for ways to face the crisis, 76% of students “received some benefit for enrollment”,** such as discounts for advance payment, financing, installment payment and educational insurance.
- **From 2009 to 2019, admissions to higher education in the distance learning modality grew 378.9%.**
- **A census carried out by ABED points out that the distance learning market has the potential to be even more competitive,** with the entry of new players studying to offer higher education, technologists, lato and stricto sensu.
- **Increasing use of technologies** (software, apps, AI, data etc. for didactic and management purposes in Basic Education institutions and IES).
- **New technologies raise concerns both at the strategic level and at Compliance, with risk and LGPD,** for example.
- **ESG topic is still developed by few educational groups.**
- **M&A in the education sector grows 42% in the 1st semester of 2021 in the annual comparison.**
- **Blended learning:** The demand for this modality comes from both undergraduate and graduate students due to the ease of managing study time.

Sources: Lafis, Sectoral Report - Nov.2021 and KPMG, study for internal purposes, 2021

Opportunities and challenges

I Challenge for the education sector

- **The sector recorded a retraction in the number of students and there is still a trend of retraction due to the change in the demographic profile of Brazilian families with the decrease in the number of children per family.**
- The sector has broad tax benefits. If there is a change in any rule, the sector and its profitability would be extremely impacted.
- **The tax reform and the Tax on Operations of Goods and Services, if approved, could have an impact on the monthly fee** (the reform also provides for a possible exemption for some sectors, such as education).
- **Scholarships offered by ProUni had a reduction of 29.5% in 2021.**
- If there is no growth in employment and income, the sector will go through a period of recession.
- **The year 2020 ended with more than 1M defaulters. More than half of Fies contracts are overdue for more than 90 days.**
- Post-COVID impacts, such as political/economic instability, causing uncertainties in the recovery process regarding the maintenance of income, employment and inflation.
- Edtechs and specialized consulting firms that, in addition to being focused on the sector, have partnerships with technology companies (such as Google), thus offering their educational solutions.
- **Dropout in Higher Education sets record:** in 2021, the dropout rate reached 36.6% in the distance learning and face-to-face modality.
- **Big4 competitors can structure themselves and choose education as a priority sector, creating specialized service groups.**

Sources: KPMG, Study for Internal Purposes, 2021 and Education Challenges: challengesdaeducacao.grupoa.com.br

Trends

I The innovation brought by Edtechs

There are many startups in Brazil supporting schools and universities. According to a survey carried out by the Brazilian Education Innovation Center (CIEB) together with the Brazilian Startups Association (Abstartups), **there were 566 active edtechs (education startups) in Brazil, 50.7% of them offering solutions for the basic education** (primary, elementary and high school). Among the services offered by these startups, those that offer online content platforms (with courses, games, audios, interactive content), tools to support the academic, administrative and financial management of schools and educational games stand out.

I Digital transformation in educational institutions

Technology has been an important ally for the educational sector, whether through management systems or for didactic purposes, helping students and teachers throughout their teaching and learning journeys.

The main point for a successful digital transformation is the implementation of a digital culture and mindset change, empowering teachers, students and employees in this process.

I Cyber security

Brazilian educational institutions need to invest more in data protection, hacker attacks, fraud, among others. Due to the digitization process, the high volume of information, ranging from student and family identification data, through school records, end up being targeted.

I M&A

The number of mergers and acquisitions carried out by education companies in the first semester of the year grew 42% compared to the same period of last year, according to a quarterly survey by KPMG. In the first six months of 2020, there were 14 operations, compared to the 20 carried out this year.

I ESG

Consumers are more concerned than ever about this topic. Thus, they pressure companies for higher standards of social, environmental and governance ethics.

On the other hand, investors have paid special attention — and provided resources — to companies that meet these standards. Global net inflow of ESG funds reached a record level in the first semester of 2021: of US\$95 billion, according to Credit Suisse's report “Global ESG Research – What ESG investors buy and sell”.

Sources: 2020 Edtech Mapping – Research on Brazilian educational technologies, <https://revistaeducacao.com.br/2021/05/24/educacao-ciberseguranca-master/> e <https://desafiosdaeducacao.grupoa.com.br/a-importancia-do-esg-no-ensino-superior/>

Major Players

Company	Learning modality
Cogna Educação S.A.	Basic and higher education
Yduqs Participações S.A.	Higher education
Cruzeiro do Sul Educacional S.A.	Higher education
Anhanguera Educacional Participações S.A.	Higher education
Anima Holding S.A.	Higher education
Ser Educacional S.A.	Higher education
Associação Educacional Nove de Julho	Higher education
Fundação Getulio Vargas	Higher education
União Brasileira de Educação e Assistência	Higher education
Instituto Presbiteriano Mackenzie	Basic and higher education

Source: Data based on the report provided by the EMIS platform, in January 2022. Refers to revenue for the last year, when disclosed.

Talk to our team



Jean Paraskevopoulos

Lead partner of Clients & Markets at KPMG Brazil and South America

+55 11 3940-8207

jparaskevopoulos@kpmg.com.br



Adriana Barreto

Partner director of Market Intelligence at KPMG Brazil

+55 11 3940-4713

adrianabarreto@kpmg.com.br



Rodrigo Sersante

Senior manager of Market Intelligence at KPMG Brazil

+55 19 9 8174-7054

rsersante@kpmg.com.br



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