BRAZIL

Recent trends

Brazil continues to perform better than the Latin America and the Caribbean (LAC) average in selected indicators related to shaping an inclusive digital economy and society. However, despite some progress, the country remains below the Organisation for Economic Co-operation and Development (OECD) averages in some of these indicators. The country has made efforts to enhance access to communication infrastructure and services, although a significant digital divide still exists. Internet users, active mobile broadband and fixed broadband subscriptions increased in the last decade, albeit still below the OECD average. Brazil rose in the E-Government Development Index from 0.57 in 2008 to 0.73 in 2018, which is above the LAC average (0.65) but below the OECD (0.82). The index measures national administrations' willingness and capacity to use information and communications technology (ICT). Additional open data indicators show that Brazil ranks relatively well regionally and globally (Open Knowledge Foundation, 2019; World Wide Web Foundation, 2017). The UNCTAD B2C E-commerce Index shows that the economy's support for online shopping was constant between 2015 and 2019 and is above the LAC average but below the OECD.

The country outperforms LAC in digital innovation metrics but remains below OECD averages. High-technology exports as a share of total manufactured exports rose to 13% in 2018, which is above the LAC average (8.6%) but below the OECD (15.1%). In terms of promoting an inclusive digital society, the number of students per computer rose, from 3.7 in 2015 to 6.0 in 2018, which is above LAC and OECD averages. The Global Cybersecurity Index shows that, despite a lower ranking in 2019 than in 2016, Brazil is above the LAC average but below the OECD average. Performance in the 2019 OECD OURdata Index, which measures open government data policies, was above LAC and OECD averages.

National strategies and international co-operation for digital transformation

The digital transformation strategy *E-Digital* is the central policy document for the digital transformation of the country. It adopts a whole-of-government approach to a data-driven economy, co-ordinating state initiatives related to the digital transformation in order to harness digital technologies' potential to promote sustainable and inclusive growth and to increase competitiveness, productivity and employment. The strategy foresees three ICT sector action plans: the National Internet of Things Plan (IoT.Br), Science at School programme and *Brasil Conectado* (Connected Brazil) programme, part of the Brazilian Digital Transformation Strategy. In April of this year, the country launched the Digital Government Strategy that will guide the actions of federal agencies to transform the digital government and offer better, more affordable services at a lower cost.

IoT.Br focuses on fostering partnerships between public and private organisations and improving connectivity for all. It evaluates local supply, demand and capacity to help formulate IoT solutions and strengthen the digital start-up ecosystem. Science at School aims to strengthen science education with a focus on problem solving. In 2019, Brazil selected 19 projects from federal universities, institutes of science, cultural organisations and other sources to improve science teaching in 22 states. The Connected Brazil programme aims to foster connectivity, promote technological diffusion and digital inclusion, reform the institutional framework and prioritise co-operation among different ministries and stakeholders in education, health, agriculture and national defence. This includes a broad range of initiatives to expand broadband connectivity nationwide, such as installing broadband satellite connection points to expand digital inclusion, especially among socially vulnerable communities and in remote areas. To respond to the coronavirus (Covid-19) crisis, the Ministry of Science, Technology, Innovation and Communications created a crisis committee for the supervision and monitoring of communications, named the Connected Network. The committee co-ordinates actions of telecommunications and broadcasting services, promotes continuity of telecommunications services, allows users to access value-added services and provides access to information (CAF, 2020). The Ministry of Health also developed the Coronavirus-SUS app which provides information about Covid-19 and virtual screening tools. The telecommunications legal framework underwent a reform with Law No. 13 879 of 2019.

In terms of international co-operation, Brazil has collaborated on 5G research and development projects, for instance, the EU-Brazil Agreement for Scientific and Technological Cooperation, formed in 2016 to reach global consensus on a 5G vision, standards and spectrum requirements. Since 2008, Brazil and the European Union have worked within the framework of an agreement for scientific and technological co-operation: countries agreed to expand bilateral dialogue and co-operation on ICT matters encompassing policy, regulation and research.

	Digital indicators - Brazil[1]					
Enhancing access	**Brazil**		**LAC[2]**		**OECD[3]**	
	2008	**2018**	**2008**	**2018**	**2008**	**2018**
Fixed broadband subscriptions (per 100 inhabitants)[4]	5.2	14.9	4.1	13.9	22.7	32.9
Active mobile-broadband subscriptions (per 100 inhabitants)[4]	1.8	88.1	0.5	73.5	19.4	103.6
	2015	**2018**	**2015**	**2018**	**2015**	**2018**
Proportion of population covered by at least 3G network[5]	93.5	95.5	86.1	94.6	98.2	98.8
	2008	**2017**	**2008**	**2017**	**2008**	**2007**
Fixed broadband speed (in Mbit/s)[4]	0.51	0.50	0.58	5.1	2.2	27.7
Strengthening their effective use	**Brazil**		**LAC**		**OECD**	
	2008	**2018**	**2008**	**2018**	**2008**	**2018**
E-Government Development Index (EGDI)[6]	0.57	0.73	0.52	0.65	0.72	0.82
Share of Internet users (% of population)[4]	33.8	70.4	25.3	67.7	65.0	84.3
	2015	**2019**	**2015**	**2019**	**2015**	**2019**
UNCTAD B2C E-Commerce Index[7]	56.2	56.9	46.4	51.5	73.9	85.0
	2017		**2017**		**2017**	
Share of individuals engaging in online shopping[8]	22.3		14.8		N/A	
Enabling digital innovation	**Brazil**		**LAC**		**OECD**	
	2008	**2018**	**2008**	**2018**	**2008**	**2018**
High-technology exports (% of manufactured exports)[9]	12.2	13.0	9.3	8.6	15.6	15.1
Share of ICT service imports, as % of total trade in services[7]	6.36	6.37	3.1	3.9	4.6	6.7
	2012	**2016**	**2012**	**2016**	**2012**	**2016**
ICT patent applications filed under the Patent Cooperation Treaty (per million people)[10]	0.34	0.52	0.14	0.34	30.9	38.2
	2006	**2016**	**2006**	**2016**	**2006**	**2016**
R&D expenditures, as % of GDP[11]	0.99	1.3	0.35	0.42	1.7	1.9
	2019		**2019**		**2019**	
OECD OURdata Index[12]	0.63		0.43		0.61	
Ensuring quality jobs for all	**Brazil**		**LAC**		**OECD**	
	2006-15		**2006-15**		**2006-15**	
Contributions to changes in total employment, by digital intensity of sectors, 2006-16[13]	1.3		6.9		4.8	
	2015		**2018**		**2018**	
Share of informal employment to total employment[14]	45.0		54.9		N/A	
	2007	**2017**	**2007**	**2017**	**2007**	**2017**
Tertiary gross enrolment rate (%)[9]	30.8	51.3	37.5	60.5	66.6	74.3
	2016		**2016**		**2016**	
Tertiary graduates by field (%) - Education[11]	19.7		16.0		9.8	
Tertiary graduates by field (%) - Health[11]	13.9		13.8		14.5	
Tertiary graduates by field (%) - Engineering[11]	11.0		12.5		14.6	
Promoting an inclusive digital society	**Brazil**		**LAC**		**OECD**	
	2015	**2016**	**2015**	**2016**	**2015**	**2016**
E-waste generated, kilograms per inhabitant[15]	7.3	7.4	6.9	7.2	17.7	17.7
	2015	**2018**	**2015**	**2018**	**2015**	**2018**
Number of students per computer[16]	3.7	6.0	2.4	1.6	1.8	1.1
	2018		**2018**		**2018**	
Percentage of women scoring at Level 2 or 3 in problem solving in technology-rich environments[17]	N/A		7.7		27.7	
Strengthening trust	**Brazil**		**LAC**		**OECD**	
	2020		**2020**		**2020**	
CAF GovTech Index[18]	5.3		4.4		N/A	
	2016	**2018**	**2016**	**2018**	**2016**	**2018**
Global Cybersecurity Index (ITU)[19]	0.71	0.56	0.36	0.43	0.56	0.79
	2018	**2019**	**2018**	**2019**	**2018**	**2019**
E-commerce safety (%)[20]	93.6	73.5	72.0	63.1	61.7	58.3
Trust in online privacy (%)[20]	60.0	38.0	52.8	54.9	41.7	45.6
Fostering market openness	**Brazil**		**LAC**		**OECD**	
	2015	**2019**	**2015**	**2019**	**2015**	**2019**
OECD Digital Services Trade Restrictiveness Index[13]	0.25	0.29	0.24	0.24	0.13	0.15
	2018		**2018**		**2018**	
OECD FDI RRI[13]	0.09		0.07		0.06	

Sources, footnotes and technical details can be found at the end of the country notes.

Technical notes

1. The table as best as possible follows the seven key areas identified in the OECD Going Digital project: 1) enhancing access to digital technologies; 2) strengthening their effective use; 3) enabling digital innovation; 4) ensuring quality jobs for all; 5) promoting an inclusive digital society; 6) strengthening trust; and 7) fostering market openness (OECD, 2019a). Indicators are chosen depending on data availability for LAC countries. Potential bias exists from the way components have been aggregated on index indicators.

2. LAC average is a simple average. Composition of countries depends on availability of country data. Each average includes as many LAC countries as possible.

3. OECD average is a simple average that includes all OECD member countries as of May 2020.

4. Data from ITU (2020), *World Telecommunication/ICT Indicators Database 2020* (database). Fixed broadband speed in Mbit/s refers to the advertised maximum theoretical download speed guaranteed to users associated with a fixed broadband Internet monthly subscription.

5. Data from UN Statistics Division, UN Global SDG Database (database). Data for 2015 and 2018 or latest available year.

6. Data from UN E-government Knowledgebase (2019), *Data Center* (database). The E-Government Development Index is a composite indicator that consists of three indexes (Online Service Index, Telecommunication Infrastructure Index and Human Capital Index), which are equally weighted. It ranges from 0 to 1, with 1 being the most developed.

7. Data from UNCTAD (2020), *UNCTADSTAT* (database). The UNCTAD B2C E-commerce Index measures an economy's preparedness to support online shopping. It ranges from 0 to 100, with 100 being the highest support.

8. Own calculations based on data from Latinobarómetro (2019), *Libros de Códigos por País/Año* (database). Data for 2017. Data from public opinion surveys using randomly selected, nationally representative samples.

9. Data from World Bank (2020a), *World Bank DataBank* (database).

10. Data from World Bank (2020b), *TCdata360*. Data for 2012 and 2016 or latest available year.

11. Data from UNESCO (2019), *UNESCO Institute for Statistics* (database). R&D Expenditures, as % of GDP data from 2006 and 2016 or latest available year.

12. Data from OECD (2020a), *OECD.Stat* (database); and OECD (2020b). The OECD OURdata Index assesses governments' efforts to implement open data in three critical areas: openness, usefulness and re-usability of government data. It ranges from 0 to 1, with 1 being the highest score.

13. Data from OECD (2020a), *OECD.Stat* (database). The OECD Digital Services Trade Restrictiveness Index identifies, catalogues and quantifies barriers that affect trade in digitally enabled services across 46 countries. It ranges from 0 to 1, with 1 being the most restrictive. The Foreign Direct Investment Regulatory Restrictiveness Index (FDI RRI) measures four types of statutory restrictions on foreign direct investment: 1) foreign equity restrictions; 2) screening and prior approval requirements; 3) rules for key personnel; and 4) other restrictions on the operation of foreign enterprises. The FDI RRI is a composite index, which ranges from 0 to 1, with 1 being the most restrictive.

14. Data from ILOSTAT, data from 2018 or latest available year.

15. Data from the Global E-waste Statistics Partnership.

16. OECD calculations based on OECD (2020c), *Programme for International Student Assessment* (database). Data for 2015 and 2018.

17. Data from the OECD (2019d), *Survey of Adult Skills (2018)*. Percentages for problem solving in technology-rich environments are computed so that the sum of percentages for the following mutually exhaustive categories equals 100%: opted out of the computer-based assessment; no computer experience; failed ICT core test; below Level 1, at Level 1, at Level 2 and at Level 3.

18. Data from CAF (2020), *The GovTech Index 2020: Unlocking the Potential of GovTech Ecosystems in Latin America, Spain and Portugal*. The GovTech Index 2020 measures the maturity of the GovTech ecosystem. It is based on 28 indicators across 7 dimensions, which on aggregate form 3 equally weighted pillars: start-up industry, government policies and procurement systems.

19. The Global Cybersecurity Index measures countries' commitment to cybersecurity at a global level. It has five pillars: 1) legal measures; 2) technical measures; 3) organisational measures; 4) capacity building; and 5) co-operation. It ranges from 0 to 1, with 1 being the highest level of cybersecurity.

20. Data from The Economist Intelligence Unit (2019), *EIU Inclusive Internet Index* (database). Indicators present perceived e-commerce safety and trust in online privacy among randomly sampled individuals in selected countries. It ranges from 0% to 100%, with 100% indicating absolute confidence in e-commerce safety and trust in online privacy.

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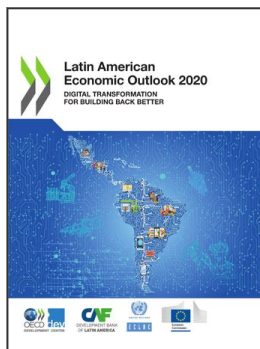
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