



Inclusive Future of Work

Brazil

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Abstract

The future of work in Brazil is being shaped by a variety of factors, including technological innovations, trends in education, vocational training and skills, the demographic transition and climate change. The inclusiveness of these transformations will be largely affected by labour market dynamics surrounding informal work, emerging non-standard forms of employment (NSE) and income inequalities.

These transformations open opportunities to modernize important segments of the economy, foster widespread upgrading of educational levels and skills and ensure a just transition to an even lower-carbon energy mix.

At the same time, Brazil is faced with a number of challenges, in different domains related to the key drivers of the future of work. These challenges include: accelerating the diffusion of new technologies to spur productivity, innovation and competitiveness; promoting quality education, vocational training and digital skills while leaving no one behind; ensuring social protection and pension coverage in the transition to an ageing society; staying on track in combating deforestation and reducing emissions; and reconceiving policies, institutions and regulatory instruments to extend rights, protection and representation to informal, own-account and NSE workers.

The Brazilian government has many successful policy experiences, and will need to continue innovating in order to confront these new challenges with policies and regulatory frameworks that are suited to promoting an inclusive, human-centred future of work.

Main drivers of the future of work and expected developments

The future of work in Brazil is being shaped by a variety of converging factors, including the dissemination of technological innovations, trends in education, vocational training and skills, the demographic transition and climate change. The inclusiveness of these transformations is also affected by labour market dynamics surrounding informal work, emerging non-standard forms of employment and income inequalities. The following discussion will examine these megatrends that are driving the future economic, social and labour market transformations in Brazil.

Dissemination of technological innovations

Many dimensions of the future of work are being driven by new technological innovations based on information technology and automation, but applied in ways that involve deeper and wider integration, enhanced with smart and autonomous systems. These technological innovations are distinguished by three main characteristics that shape their impacts: the speed of transformation; the scope of the activities that can be automated and transformed; and their systemic nature (Schwab, 2015). As a result, technological change is evolving at an exponential rather than linear pace. The breadth and depth of these changes are disruptive for enterprises and workers and raise the need for policies to support their wider dissemination together with frameworks to address the need for protection and regulation of the impacts upon workers.

In Brazil, the dissemination of automation is advancing gradually, particularly through investments by larger companies and in leading sectors (CNI, 2016). Investments in software averaged annual growth rates of 6 per cent and information technology at 4 per cent between 2016 and 2018 (McKinsey, 2019).

E-commerce and digital publicity are expanding at double digits and the 32 per cent growth of e-commerce was achieved largely via mobile phone apps in 2018. Two out of three Brazilians use smartphones and have internet access (McKinsey & Company, 2019). But large inequalities exist. Households with the highest income have nearly four times the level of internet penetration than lower income households. Digital access and proficiency vary greatly by region, social class and age, signalling the need for more rapid and broad expansion to overcome potential digital exclusion.

Another major driver of change involves the platform economy, or “gig” economy, in which short-term or temporary activities are performed by independent contractors and self-employed workers. The platform economy is expanding in Brazil, stimulating entrepreneurship, as the number of start-ups that develop apps with earnings over US\$250,000 doubled between 2017 and 2018. Co-working arrangements are expanding in 169 cities, with 1,200 co-working spaces and generated over US\$32 million in revenue in 2018. When counted together, the two market leading driver apps have more than 40 million users and 1.1 million drivers (ibid).

Education, vocational training and skills

Educational levels have risen in recent years in Brazil together with the requirements in the labour market. The supply and demand dimensions of skills development are key drivers toward more active participation in the future of work. According to the World Bank, the expenditure on education as a percentage of GDP was 6.2% in 2015 and 4.92% in 2017.¹

The minimum skill requirements for new recruits in the Brazilian labour market have risen in the 2000s. Now nearly 95 per cent of new jobs in the formal labour market require, at a minimum, a secondary school degree. The number of workers in formal employment with less than elementary school education has declined. Years of study have risen, but challenges remain to continue raising quantity and quality of education offered, as well as more equal access and schooling attainment across different socio-economic groups and regions.

Digital technology can contribute toward meeting the rising demand for vocational and educational training (VET) as well as the trend toward lifelong learning for adult workers. Distance learning can help raise access to learning, providing flexibility for those who work but would like to also study in their free time, enabling access to courses for those in rural areas and reaching NEETs who might not otherwise attend face-to-face classes. Distance learning has grown in Brazil: up to 25 per cent of students enrolled in higher education were distance learners in 2017 – which follows the international trend – due to the private sector educational institutions primarily. More than 350 start-up firms are developing educational innovations, primarily in content management, educational management systems, educational games, and platforms adapted for learning.

Demographic transition

The demographic transition in Brazil has implications for the labour market and age structure of the labour force (IBGE, 2018). The Dependency Ratio² reached its lowest value of 44% in 2017 and is projected to reach 48% in 2030, at which point 48 of 100 individuals will be considered economically dependent (children younger than 15 years and adults 65 and older). In 2039, the Dependency Ratio will be 51.5%. The population is projected to peak by 2047 (233 million) and then decline gradually until reaching 228 million in 2060. Meanwhile, dependency will continue rising due to the growth of the elderly population, with the Dependency Ratio reaching 67.2 per cent in 2060.

The greatest pressure on the labour market to absorb new entrants will continue until 2025, at which point the working age population (15 to 64 years) will reach about 69 per cent of the total population (or 150 million people). Thereafter, the pressure on the labour market will ease, as the population 15-64 years will decline to 67.5 per cent of the total population in 2030 and continue to fall to 59.8 per cent in 2060. The youth population (15-29 years, using the Brazilian definition) was 52 million in 2010 (26.7 per cent of total population) and is projected to decline to 45 million in 2030 (20 per cent) and 37 million in 2060 (16 per cent) and will continue declining also in relative terms.

¹<https://data.worldbank.org/indicator/SE.XPD.TOTL.GD.ZS?locations=BR> (accessed 28 August 2019).

² Dependency ratio is the number of dependents in the population (those aged 0 to 14 years and those 65 and older) divided by the number of working age people (15 to 64).

Climate Change

Brazil achieved a reduction of its CO₂ emissions by 41 per cent in 2012 in relation to 2005 levels. Moreover, Brazil voluntarily agreed to follow a more stringent modality of contribution to reduce greenhouse gas emissions of 37 per cent by 2025 and 43 per cent by 2030 (in relation to 2005 levels) in its intended nationally determined contribution (NDC). Actions include: raising to 45 per cent the share of renewable sources (wind and solar power) in the country's energy mix, with a strong role of renewable, non-hydraulic sources, increasing sustainable bioenergy (biofuels and biomass); increasing energy efficiency; reaching zero illegal deforestation in the Brazilian Amazonia by 2030; and restoring and reforesting 12 million hectares of forests.³ Brazil's ambitious NDC commitments have attracted international support to achieve these goals through projects and climate investment in priority areas, such as clean energy, low carbon agriculture and reduced deforestation.

Labour Market Dynamics

Labour market dynamics in Brazil have worsened following the recession that started in 2014 and subsequent economic slowdown. Consequently, indicators regarding unemployment, underemployment and discouraged workers have risen. The labour market shed an estimated 3.7 million formal jobs between 2014 and 2018 (a reduction of 10.1 per cent) according to the National Household Survey (PNAD-C). The unemployment rate in December 2018 was 11.6 per cent and did not register higher levels due to the rise in informal and own-account work that lack social protection and benefits of formal sector work. Income inequality has also risen, after a long period over the early 2000s in which the Gini coefficient declined continuously.

Meanwhile, new forms of employment associated with the platform economy are emerging, which involves rising numbers of own-account workers that are considered service providers, not employees. These trends raise the spectre of a rising cadre of unprotected workers in the gig economy, often earning low and irregular forms of income, and lacking access to collective interest representation.

These existing mega-trends of rising informality, unprotected work and income inequality converge with emerging forms of non-standard employment (NSE) pose urgent challenges for formulating responses that ensure transformations linked to an inclusive future of work.

³ <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Brazil%20First/BRAZIL%20iNDC%20english%20FINAL.pdf> (accessed 20 August 2019).

Opportunities and challenges for workers, enterprises and labour institutions

Efforts to accelerate the rate and scope of technological diffusion in Brazilian industry will provide the opportunity to raise productivity and competitiveness of the productive sector. In turn, a more technologically advanced productive sector will require a labour force that is well-equipped with digital skills. Attaining a more technologically capable workforce raises important implications for both enhancing the quality and raising the supply of education and technical training (with particular attention to boosting the so-called STEM subjects of science, technology, engineering and mathematics). The structure of the Brazilian population, and hence its future labour force, will change as the “demographic dividend” closes, with a declining proportion of the youth population and rising proportion of the elderly in society. Brazil has initiatives for alternative energy sources that can ease the burden on fossil fuels, as well as provide new jobs, which are important as the risk of climate change could impact negatively on several economic sectors, including agriculture.

Together with the benefits of technological advancements, there are also challenges as many occupations are eliminated or reshaped, and new forms of employment emerge, which may contribute toward higher rates of informality and income inequalities and add further pressures for public regulation and policies in order to ensure a more inclusive and human-centred future of work.

Dissemination of technological innovations

The stimulation of a faster rate and broader scope of dissemination of advanced technologies and automation in Brazilian industry would offer important opportunities for raising productivity and competitiveness. In recent decades, productivity has risen slowly and shown uneven performance across Brazilian industry. Total productivity rose 18 per cent between 2000 and 2013, led primarily by services and to a lesser extent by agricultural production, while manufacturing and discrete process industry productivity declined by 5 per cent over the period (Silva et al, 2016). The introduction of fourth generation automation is still incipient in Brazilian industry, due largely to deficiencies in the communications infrastructure, high import tariffs for machines and equipment and a low degree of technological innovation (PINTEC).⁴ Low wages for lower-skilled workers in Brazil could be a potential deterrent to wider investments in automation in labour-intensive sectors. Raising the diffusion of automation in Brazil is crucial for productivity, but raises important labour challenges; one estimate forecasts that automation will eliminate nearly 16 million jobs by 2030, representing 14 per cent of the current workforce (McKinsey, 2017).

Larger companies are taking the lead in making investments in automation and technological upgrading. According to a recent survey, 73 per cent of large companies in

⁴ The Research of Technological Innovation (PINTEC) is conducted by the Brazilian National Statistical Office (IBGE) with the support of the Fund for Studies and Projects (FINEP) and the Ministry of Science and Technology. PINTEC data enables construction of sectoral, national and regional indicators regarding technological innovation activities of Brazilian enterprises with 10 or more employees, in selected extractive, manufacturing and service industries and research and development (R&D) activities.

Brazil used at least one digital technology in 2016 (CNI, 2016). Meanwhile, medium and small enterprises (which include many informal firms) often lack adequate information regarding the introduction of new technologies and limited capital reserves inhibit their ability to invest in technological innovations in the short to medium term (ibid). As concerns robotics, the adoption rate in Brazil is estimated at between 0.1 and 0.2 robots per 100 workers, whereas the rate in Sweden, Germany, Japan and South Korea is over 2 per 100 workers (IDB, 2017).

At a sectoral level, digital technologies are diffusing faster in IT industries, machinery, electric materials and petroleum derivatives, versus slower adoption in pharmaceutical products, clothing and footwear and non-metallic minerals (CNI, 2016). Innovative sectors, including extractive industries, food, tobacco, metal-working and petroleum derivatives display strong productivity gains above the international average (ibid). Meanwhile, the lower use of automation in retail and commerce is opening competitive opportunities for the expansion of e-commerce: the market for e-commerce grew over 13 per cent per annum from 2013 to 2017 and home delivery services are growing at double-digits (McKinsey & Company, 2019).

In order to raise competitiveness, it is important not only to adopt new technologies, but also to foster the endogenous technological capabilities to develop new knowledge, equipment and products. The Brazilian government and private firms invested 1.3 per cent of GDP in research and development (R&D) activities in 2015 (versus 2.7 per cent in the United States, 2.2 per cent in France in the same year, and 2.1 per cent in China and 1.1 per cent in Russia in 2016) (McKinsey, 2019). The ability to conduct basic research as well as apply scientific and technological inventions are crucial determinants for upgrading, innovating and maintaining competitiveness with global players. Universities and institutions of science and technology play a key role for generating scientific knowledge and products and also for engaging strategically with producers and for stimulating the origin of start-ups (CNI, 2017). There is an appetite for start-ups in Brazil, as more than 39 per cent of the economically active population works in entrepreneurial initiatives, with an increasing number in areas dedicated to digital technology and innovation (McKinsey, 2019).

As concerns the platform economy in Brazil, the broad expansion of internet access has enabled a growing number of individuals to use platforms as an opportunity for generating or complementing income through different forms of service provision. These new job arrangements involve a high degree of flexibility in terms of work organization, working time, earnings, duration of work assignment and location where work is performed. Furthermore, the platform owner interacts with self-employed workers who are regarded as service providers and therefore involves no standard employment relationship.

As such, platform workers are unprotected and must pay their own health insurance, pension and other benefits if these are not provided through public social protection or other benefit scheme.⁵ These flexible labour practices and unprotected work arrangements are defining features in the platform or “gig” economy. This raises

⁵ Cooperatives could be an alternative form of work organization in the platform economy, involving trust and co-participation among members in decision-making on operations, investment, strategy and profit-sharing.

significant new challenges for public policies and regulation of work, in Brazil as elsewhere, highlighting the urgent need to formulate adequate regulatory and social protection regimes suited to NSE (ILO, 2016).

The model of a “standard employment relationship” is the basis of most employment legislation, characterized as continuous, full-time and part of a subordinate and bilateral (or direct) employment relationship between employer and employee, and in which the employer provides important protections for workers (ILO, 2016). In contrast, the lack of an employment relationship in the platform economy means this is considered a “non-standard form of employment” (NSE). This involves gaps in the law and regulation of work and raises challenges in terms of enforceable labour rights for these workers, income security and social protection among many other related issues. Web-based digital platform workers generally working separately and in different locations (and often in different countries), result in little bargaining power amongst themselves and sometimes fear that joining a trade union could cause retaliation. Thus, a fundamental challenge emerges to devise new frameworks in which to promote voice and representation for platform workers, and to enforce labour rights for growing forms of NSE (Johnston and Land-Kazlauskas 2018; ILO, 2016).

Skills, education and vocational training

The expansion of automation was originally expected to impact primarily on routine tasks and lower-skilled workers. However, the development of algorithms and artificial intelligence increasingly allows for automation of non-routine, specialized cognitive activities, in addition to more repetitive and manual tasks, thereby raising the range of activities that potentially could be conducted by machines or computers (Ernst et al, 2018; Frey and Osborne, 2017). These trends raise important considerations regarding the design and delivery of vocational training, the role and understanding of what comprises digital skills as well as embedding the concept of lifelong learning in curricula design. Workers with “digital skills” (including statistical analysis, data mining, web architecture and mobile development) are more likely to have the ability to adapt over time, as technological transformations change skill requirements and jobs. Complementary to technical know-how are so-called “human skills” (such as communication, working in groups, emotional intelligence and leadership), which cannot easily be automated.

The evidence indicates that there is a skills mismatch in Brazil between the skills of graduates and the requirements of the labour market. For example, in terms of skills supply, it is estimated that 68 per cent of employers in Brazil have difficulties finding professionals with the skills they seek (Dias and Mayol, 2018). Similarly, despite a growing number of graduates in engineering, science, technology and mathematics in Brazil, companies report it is a challenge to recruit and develop digital talent (McKinsey, 2019). However, exploring the other side of the equation in terms of skills demand, studies indicate that only 40 per cent of technical school graduates in Brazil are working in their area of education. Educational levels of the formal labour force rose 18 per cent over 2005-2015, yet the educational levels required for these occupations increased only 3 per cent, revealing the low absorption rate of advanced technology (Maciente, 2016). Addressing this skills mismatch creates an important opportunity to spur a closer

connection between classroom education and emerging labour market needs, so that young people are well suited to professional requirements when they graduate.

Brazilian policies have been successful in raising school enrolment and total years of schooling. However, despite the positive trend of rising schooling levels, and a record number of students enrolled in secondary and tertiary education, there remain other points of exclusion that need to be addressed: nearly 12 million illiterates and more than half of adults between 25 and 64 years have not concluded secondary school. Moreover, nearly two million children and youth from 4 to 17 years do not attend school (Economist Intelligence Unit).

While new technologies create opportunities for higher-skilled job creation, at the same time this creates the need for an expanded and improved public employment system (PES) that offers the various services of unemployment insurance, training/retraining, and referral to new jobs and professions, in order to offset the social costs involved in the modernization process. In particular, the public labour intermediation service (SINE) could improve its capacity and speed, as meanwhile private intermediation agencies emerge to fill this gap. Particularly for adult workers displaced by technological change and adaptation to climate change, policies and programmes toward reskilling (in the framework of lifelong learning), career guidance and professional counselling and re-insertion into new productive employment will become a growing area of demand.

Demographic transition

Brazil is nearing the end of its “demographic dividend”, due to increased life expectancy and declining birth rates. Brazil is now considered a “late-dividend” country, which will be facing a declining share of its working-age population (World Bank, 2016). Brazil can no longer rely upon its population growth for economic expansion. Whereas over the last 15 years, the annual growth of the labour force was 2.1 per cent, in the next 15 years, the projected labour force growth is 0.8 per cent per annum. Hence, a strategic focus on quality education and knowledge-intensive, digital skills for the youth is crucial to pave the path to the future of work. In addition to joining more technologically advanced sectors, new job opportunities will also emerge in the growing care economy.

This situation of a declining working-age population raises the challenge to increase productivity per worker, which requires a policy focus on sustaining productivity growth among the working population. This focus on higher-skilled, cognitive and knowledge workers is in line with the profile of a more technologically sophisticated and automated economy, which has been described earlier in this text as part of the future of work.

The demographic transition toward an ageing population also raises the challenges of older workers, as they will increase in numbers in coming years. Moreover, there are important issues related to adequate social protection coverage for the older population. The current structure in Brazil is a three-pillar system, which includes the mandatory public General Social Security Regime, the pension regime for government workers, and the private pension regime in employer-linked and individual plans. A law on pension reform is, at the time of writing, being examined by the Senate. Meanwhile, it is important to recall the high number of informal economy workers who do not make individual

contributions and will have no access to a pension in old age. Care for the elderly is based primarily in the family and predominantly provided by women. Families may also rely upon domestic workers for lighter care needs, and trained nurses for more intensive care provision. Private provision of long-term care in institutions is relatively limited and costly.

Climate Change

The expansion of renewable energy sources constitutes an important driver of change in Brazil and presents significant opportunities for new investments and expansion, which would in turn contribute toward economic growth and green jobs creation, as well as contribute to reduction of greenhouse gas emissions.

The ILO estimated that 2.6 million green jobs existed in Brazil in 2007 and, with the transition to an economy based upon lower emissions of greenhouse gases, the renewable energy sector alone could generate another potential 730,000 new green jobs (Muçouçah, 2009). Other promising sectors identified for green job creation included biofuels, protection of conservation areas, biofuels and construction of energy efficient buildings (ibid). Slow rates of economic growth have not yielded the scale of green jobs that was originally forecast, however, more limited initiatives exist of technical and vocational education and training (TVET) in green job skills and wider mainstreaming of basic sustainability concepts (ILO, 2018a).

Climate change can have important impacts; some of which are not yet fully understood. However, scientific knowledge has confirmed that climate change can cause changes in weather patterns that may impact negatively on human settlements as well as economic sectors, such as agriculture which is an important sector in Brazil. The agricultural sector has experienced rapid growth in recent years, attaining a 6.4 per cent compound annual growth rate between 2010 and 2018 (versus 3.3 per cent for services and -1.2 per cent for industry)(McKinsey & Company, 2019).

Already in 2002, the Ministry for Mines and Energy created a programme to promote alternative and renewable energy sources for electricity production and to invest in the reduction of greenhouse gas emissions (Proinfa). In 2007, Brazil's National Energy Plan for 2030 identified the need for an integrated domestic energy structure and promoted important investments, including in renewable energy sources. As a result, at present, Brazil possesses a large renewable energy mix, with the majority of its energy production arising from hydroelectric, biofuels and ethanol, as well as a growing production of wind and solar energy. Renewable energy comprised 45.3 per cent of Brazil's energy mix, with solar energy growing by nearly 300 per cent between 2017 and 2018. According to the Energy Research Enterprise (*Empresa de Pesquisa Energética*- EPE),⁶ 83 per cent of electric energy is provided from renewable sources (with 66.7 per cent from hydroelectric plants), placing Brazil as a low producer of carbon emissions from energy use.

⁶ <http://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/balanco-energetico-nacional-2019> (accessed 21 August 2019).

In this regard, the Brazilian government has participated actively and made important commitments, expressed in international agreements and national policy documents to reduce deforestation and emissions levels. A failure to maintain these commitments could unleash a number of crucial challenges for the environment, human and animal life, and also a number of economic sectors. Not the least among these impacted sectors could be agriculture, which is sensitive to rising temperatures and water scarcity – increased deforestation would impact the large quantities of water vapor (sometimes referred to as “aerial rivers”) which are transported in the atmosphere from the Amazon Basin to lower Brazil and other parts of South America.

Brazil’s engagement with the Green Climate Fund (GCF) requires the development of a National Strategy, which provides the opportunity to set national priorities and develop a strategy for engagement, often involving a process of consultation with various stakeholders, including the public sector (federal and subnational), private sector and civil society.⁷

Labour market dynamics

Significant labour market challenges include rising forms of informal and unprotected work due to slowed economy growth as well as emerging NSE, in the context of increasing income inequalities. Roughly 44 per cent of the economically active population was working informally in 2018. The rate of informal workers and own-account workers has grown, compensating for the decline in formal jobs. Income inequality in Brazil declined continuously from a Gini coefficient of 59.3 in 2001 to 51.3 in 2014, yet has reversed and taken an upward trend to 53.3 in 2017 (World Bank estimates).⁸ The increase in both informality and income inequality, together with insufficient overall educational performance, generate important structural challenges to the goal of achieving a more inclusive and human-centred future of work.

The minimum wage has not been adjusted above the rate of inflation in recent years. Moreover, the significant increase in the number of years of study, particularly among Brazilian youth, has had little effect on average hourly earnings for workers. Furthermore, gender inequalities persist in earnings, with the pay gap between men and women standing at 20.1 per cent (ILO, 2018b).

⁷ Brazil Country Program for the Green Climate Fund (GCF), March 2018
<http://www.fazenda.gov.br/assuntos/atuacao-internacional/fundo-verde-do-clima/arquivos/brazil-gcf-country-program-english.pdf>

⁸ World Bank estimates, various years.
(<https://data.worldbank.org/indicator/SI.POV.GINI?end=2017&locations=BR&start=1981&view=chart>)
last accessed 11 August 2019.

Policy responses

The future of work is being driven by technological change that promises growth of new economic activities and jobs. However, seizing these opportunities requires further policies and investments to boost skills, infrastructure and ensure greater numbers of people and firms are able to share in these gains.

Public policies in Brazil are actively promoting the diffusion of new technologies as well as greater digital integration in public systems and attention toward raising the productivity of small and medium enterprises. Policies in place seek to expand supply of schooling, ensure access and raise the quality of instruction and facilities, while also providing greater inclusion, for example in rural areas or for households of lower socio-economic status and students with learning disabilities.

The demographic transition, climate change and the emergence of new forms of work linked to digital technologies, however, create an urgent need for policies and new regulatory measures to ensure an inclusive and human-centred future of work.

Dissemination of technological innovations

In order to capture opportunities arising from rapid technological change, the Brazilian government has taken important steps to leverage public and private investment (including measures to facilitate access and reduce the cost of capital) and create a broader national system of innovation (including R&D centres, incubators and networks of technological services), stimulate the diffusion of technologies, upgrade wide bandwidth communications networks and boost systemic competitiveness with the launch of the Brazilian Strategy for Digital Transformation (E-Digital) in August 2019 (MCTIC, 2019a).⁹ In addition, one of the pillars of E-Digital is the National Plan of the Internet of Things (IoT) which was launched in June 2019, to spur investments, new business activities, productivity and competitiveness (MCTIC, 2019b).¹⁰

The Brazilian government is adopting digital innovations to improve the efficiency and quality of public services, for instance by developing public service apps for citizens. For example, the Federal Income Tax Authority (*Receita Federal*) app helps people to prepare their income tax declarations. Low-income families can check the dates of their benefit payments and other information through the *Bolsa Familia* app developed by the Federal Savings Bank. The Connected Education app (*Educação Conectada*) allows users to see the stage of technological adoption of their school. For university students, the e-Proinfo app allows students to view their courses, provides detailed information about institutions and courses and has an online discussion forum. There are many other “GovTech” apps emerging to assist citizens, including transparency, communication, statistics and data analysis. The Colab-I initiative of the Court of Auditors (*Tribunal de*

⁹ The development of the strategy was coordinated by the Ministry of Science, Technology, Innovations and Communications, with the active participation of members of an Inter-Ministerial Working Group, working with more than 30 entities of the federal government throughout the process, as well as involvement of the productive sector, scientific and academic community and civil society.

¹⁰ This is an initiative of the Ministry of Science, Technology, Innovations and Communications (MCTIC), the Ministry of the Economy (ME) and the National Bank for Economic and Social Development (BNDES), together with the business sector, academia, development agencies and other organs.

Contas da União) promotes innovative projects through cooperation and training and iGovLab seeks to raise efficiency and scope of policies for the State of São Paulo.

The greater integration and systemic efficiencies offered by digital platforms offer positive applications for government to increase efficiency in service provision and facilitate intra-governmental coordination between different public agencies. Two important examples include the E-Social system in Brazil which has facilitated inter-ministerial coordination and eased information sharing and action among tax, social security and employment agencies (<http://portal.esocial.gov.br>). Another example is Siscomex, the single gateway of the Integrated System for Foreign Trade (<http://www.portalsiscomex.gov.br>).

Skills, education and vocational training

Aiming to ensure alignment and coordination between the different levels of government and stakeholders to deliver quality education, Brazil's National Education Plan (2014-2024)¹¹ has defined educational goals for ten years and set out 20 goals and broad strategies for states and municipalities to develop in their Educational Development Plans. Key goals include: achieving universal education for 4-17 year-olds; raising the quality of compulsory education and teachers at all levels; increasing enrollment and attainment of secondary and tertiary education; improving enrollment rates in vocational and educational training (VET); and increasing public investment in public education to 10 per cent of GDP.

With the objective of ensuring the quality of public and private tertiary institutions, the Secretariat of Regulation and Supervision of Higher Education (SERES) was instituted to regulate the quality of public and private higher education institutions.

In terms of improving quality and access to upper secondary education and initial VET, the government launched a National Vocational Education and Employment Programme (Pronatec) in 2011 (initially for four years), offering vocational and technological education to scale-up and diversify training infrastructure and curricula to provide technical and some digital skills particularly among low-income youth and adults. Pronatec also expanded the network of federal and state technical schools and provided access to courses online. Special modalities of Pronatec were created to meet the needs of specific groups of workers and youth. Over eight million students took technical courses or participated in initial and continuing education by the end of its first cycle. Activities under Pronatec has been renewed and continued by the present government.

In this light, both public and private investments in education have increased significantly (in absolute terms, as well as percentage of GDP). The Brazilian government is raising the quantity and quality of compulsory education and teachers at all levels. This implies increasing public investment in public education, introducing measures to maintain school attendance, and ensuring the inclusiveness of education for those with various types of difficulty to access, progress and stay in education. At the same time, a continued focus is required to prepare the vocational and educational training infrastructure and curricula that will provide youth with digital skills. Brazil already counts upon an

¹¹ <http://pne.mec.gov.br/18-planos-subnacionais-de-educacao/543-plano-nacional-de-educacao-lei-n-13-005-2014> (accessed 19 August 2019).

extensive and high-quality training network through the so-called “S System”¹² and the federal and state technical schools, although the scale and diversity of demand for vocational and technical training in Brazil is great and would need even greater supply from public and private training institutions. In order to improve educational access, Constitutional Amendment number 59 (2009) increased the duration of compulsory education from nine to fourteen years of schooling. Law number 12796, from April 2013, made enrollment compulsory of four-year-olds in early childhood education and care (ECEC).

Responding to concern about supporting at-risk students to complete schooling, the National Programme for Age/School Year Adjustment (2013) provides individual support to 15-17 year-olds in order to successfully complete lower secondary education (grade 9), in response to the high level of grade repetition. Expressing a concern to ensure greater integration of youth with special needs, the Inclusive Education (*Educação Inclusiva*) (2008) programme was introduced under the National Policy of Special Education to enroll children and youth with disabilities in common classes in regular schools.

Recognizing the need to improve the supply and quality of schooling in rural areas, the National Programme for Rural Education (*Pronacampo*) was created to provide technical and financial support in rural areas through teacher training, materials for teaching and learning and infrastructure.

Among Brazil’s most internationally-recognized programmes is the *Bolsa Escola* programme in 1995 and *Bolsa Família* programme in 2003 which is a conditional cash transfer programme aiming to combat poverty by providing incentives for families to send their children to school and with monitoring of school attendance. Over one-third of students enrolled in primary and secondary education received the *Bolsa Família* stipend in 2012, totalling 17.9 million primary students and secondary students who benefitted from the programme, and, importantly, recipients demonstrated lower school dropout rates (7.2%) than those who did not (14.3%) (OECD, 2015). *Bolsa Família* continues to operate and currently transfers monetary resources to 45 million people (14 million families) (Ferreira de Souza et al, 2019).

Finally, initiatives to raise the quality of teaching include an emphasis on training, qualifications and improved remuneration. The government has also sought to ensure that teachers have a career plan along with professional development opportunities (OECD, 2015).

Demographic transition

In the context of transition to an ageing society, Brazilian public policies also are shifting from a narrower focus on assistance and pensions for the elderly toward a more

¹² The “S System” is composed of parastatal institutions created by employers of productive sectors (in industry, commerce, agriculture, transport, cooperatives and for micro and small enterprises – and the acronym of the institution for each sector begins with the letter ‘S’ for ‘Service’, hence the nickname ‘S System’). These institutions provide free training of employees, via a nationwide network of schools, laboratories and technology centres, in addition to paid courses. The S System is operated by employer organizations, and funded by a mandatory contribution on the wage bill of all formally registered companies.

integrated view of the elderly as having rights to health, education, employment, leisure activities and housing, among others. The National Policy of the Elderly (*Política Nacional do Idoso*), embodies a step toward this more integrated perspective. There also exists a National Council of the Rights of the Elderly, which joins representatives from 14 ministries as well as civil society and non-governmental agencies, with the aim to ensure the rights of the elderly and create conditions for their autonomy, social inclusion and effective participation in society.

In 2019, the Programme Alive: Active and Healthy Ageing¹³ has further advanced on this new approach by referring to the risk of a “digital divide for the elderly”, particularly those with lower incomes. This programme puts forward initiatives organized around four pillars: introduction to digital technologies to promote “digital inclusion”; education regarding quality of life; health; and the importance of physical activity.

To boost higher quality of care provision, a number of training courses are being provided by public and private institutions to prepare care providers who will develop careers in this growing field. As concerns older workers, there remains scope to further strengthen policies around the concept of lifelong learning that would enable workers to up-skill and extend their economically active period.

In terms of care for the elderly, the Better at Home Programme (*Programa Melhor em Casa*)¹⁴ provides home-based attention through the Health Care Network (*Redes de Atenção à Saúde – RAS*), since 2011, involving prevention, treatment of diseases, rehabilitation and health promotion provided at home (Possoli and Oliveira Cecílio, 2017). Treatment is provided through the Home-Based Attention Service, with Multidisciplinary Teams for Assistance (EMAP) or for home-based care (EMAD), according to the level of dependency and care required. The aim is to provide long-term care for the dependent person until they either leave the programme, or are hospitalized, or die. These systems are still limited, and long-term, home-based care could be enhanced with the development of social support services primarily for dependant elderly generally due to chronic disease, similar to home care services in Europe and the United States. There also is a need to extend support to care-providers.

In a broader framework, the demographic transition creates the need for economic policies that are geared toward productive investment and generation of higher quality jobs. Such upgrading of production and jobs would stimulate the emergence of a more knowledge and skill intensive economy, which in turn would help translate current investments in education and training into increased productivity and wealth creation in the future. The generation of better quality employment, in the formal economy, would raise pension coverage and contributions to the pension system, which is essential to finance part of the expenditures for the ageing population, especially when those currently active workers retire and become dependents.

¹³ <https://www.mdh.gov.br/todas-as-noticias/2019/marco/ProgramaViver.pdf> (accessed 29 August, 2019).

¹⁴ Portaria GM/MS number 825, 25 April 2016.

Climate Change

Brazil introduced a National Policy on Climate Change in 2009 (law number 12.187)¹⁵, which established the voluntary goal of reducing greenhouse gas emissions between 36.1 per cent and 38.9 per cent by 2020. To support these goals for emissions reductions, the law also established for the development of sectoral mitigation and adaptation plans at the local, regional and national levels.

In 2009, the National Bank for Economic and Social Development (BNDES) created a National Climate Change Fund (Law 12.114), linked to the Ministry of the Environment, to support studies, projects and businesses aiming to mitigate climate change and adaptation to the effects of climate change. In July 2019, BNDES was approved by the United Nations Green Climate Fund (GCF) to access resources from the GCF in order to fund activities to combat climate change, after demonstrating that it meets BNDES “international standards of analysis and monitoring of projects related to climate change”.

The Brazilian government’s National Institute for Space Research (INPI) implemented a Real Time Deforestation Detection System, (known as Deter) in 2004. The Deter system provides daily alerts that are used by institutions such as IBAMA (the Brazilian Institute of the Environment and Renewable Natural Resources), founded in 1989, enabling them to send environmental law enforcement teams to locations where environmental damage is detected. Data from the Deter system has been considered one of the key factors contributing to reduction of Amazonian deforestation by 83% between 2004 and 2012.¹⁶

The Law for the Protection of Native Forests (Law 12.651), which was last modified in 2012 (also known as the Forest Code), establishes general rules regarding where, and in what ways, native vegetation can be used. As part of its protection mechanisms, two types of areas are distinguished: a Legal Reserve (which is property that can only be developed in a sustainable way according to the bioma in which it is located); and an Area of Permanent Preservation (which protects fragile areas such as river banks and hilltops) which are subject to erosion and also protect important flora, fauna and biodiversity.

Brazil was the only BASIC country (Brazil, South Africa, India and China) to join the high Ambition Coalition during the Paris negotiations. Brazil has also fulfilled its ambitions to reduce greenhouse gas emissions from deforestation drastically since 2004, and is one of the few developing countries with absolute mitigation targets in their NDC to the 2015 Paris Agreement. For example, Brazil has complied by submitting its Biennial Update Report (BUR) to the United Nations Framework on Climate Change in December 2014, 2017 and 2019, reporting upon results from the reduction of emissions from deforestation (RED) in the Amazonian bioma (and the Savannah (*Cerrado*) bioma in 2019). Each report has demonstrated progress in reductions, and a positive evaluation of these reports would enable Brazil to increase its potential resource allocation from the REDD+ resources (Ministry of the Environment 2019).

¹⁵ <https://www.mma.gov.br/clima/politica-nacional-sobre-mudanca-do-clima> (accessed 20 August 2019). This Law number 12.187/2009 is regulated by Decree number 7.390/2010.

¹⁶ <http://www.observatoriodoclima.eco.br/desmatamento-subiu-50-em-2019-indicam-alertas-inpe>(accessed 20 August 2019).

The National Energy Plan for 2030 has made important advances in the planning of an integrated energy mix, with an emphasis on the expansion of renewable energy sources. A proposed National Energy Plan for 2050 is currently being prepared, involving broad consultations and studies, including considerations on the expansion of technological innovations in the energy sector.

Brazil has been an active participant in climate discussions including at the annual Conference of the Parties (COPs). Brazil has given important attention to domestic climate science and has made important contributions to the intergovernmental Panel on Climate Change (IPCC). Brazil is a signatory of the Paris Agreement on Climate Change.

Labour market institutions for the future of work

In 2017, a labour law reform, which took effect on 11 November 2017, introduced important changes in the Brazilian labour code (known as the CLT – *Consolidação das Leis do Trabalho*), with the aim of raising job creation.¹⁷ An outsourcing law (no. 13.429/2017) was sanctioned on 31 March 2017, allowing companies to hire outsourced workers to perform primary activities (linked to the core business of the enterprise), as well as secondary activities (such as cleaning and security).¹⁸

Efforts toward real growth in the minimum wage were active as of 2004, and a Minimum Wage Policy, implemented in 2011, included annual adjustments in line with inflation and GDP growth, which contributed to a real minimum wage growth, particularly important for low-wage workers. In recent years, the minimum wage has been corrected for inflation, and a new policy for minimum wage adjustments will depend upon the outcome of the Pension Reform.

Two important policy initiatives, SIMPLES and Individual Micro-Entrepreneur (MEI), have integrated and simplified the registration of small productive units, while also reducing tax rates and offering social security at a subsidized rate. These two programmes have made a significant contribution to raising the formalization of smaller productive units through simplification of registration, reduced tax rates and access to social security at a subsidized rate.¹⁹ (ILO, 2019).

Informal, own-account and NSE workers are in precarious and unprotected situations, earning low pay and working irregular hours without health insurance, social protection or other benefits associated with formal employment. Many do not make independent pension contributions (ILO, 2016; Manyika et al., 2016). For workers who are not eligible for public programmes, new initiatives may be required to facilitate and encourage social security contributions. Some possible policies could include eliminating or lowering thresholds on minimum hours, earnings or duration of employment so that workers in NSE are not excluded. Other policy options could make systems more flexible with regard to contributions required to qualify for benefits, allowing for interruptions in

¹⁷ <https://www2.camara.leg.br/atividade-legislativa/comissoes/comissoes-temporarias/especiais/55a-legislatura/pl-6787-16-reforma-trabalhista> (accessed 15 August 2019).

¹⁸ http://www.planalto.gov.br/ccivil_03/ Ato2015-2018/2017/Lei/L13429.htm (accessed 15 August 2019).

¹⁹ <http://www8.receita.fazenda.gov.br/SimplesNacional> and <http://www.portaldoempreendedor.gov.br> (last accessed 12 August 2019).

contributions, and enhancing the portability of benefits between different social security systems and employment statuses.

Furthermore, efforts could be directed to strengthen the capacity of trade unions to design initiatives for the organization and representation of workers in NSE. Where collective bargaining agreements exist, trade unions may seek to extend these to all workers in a sector or occupational category, in order to reduce inequalities and include NSE workers. Alliances between unions and other organizations could be part of collective action to address issues of concern to both standard and non-standard workers.

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