Getting Skills Right

Brazil



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Getting Skills Right: Brazil



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Foreword

The world of work is changing. Digitalisation, deepening globalisation and population ageing are having a profound impact on the type and quality of jobs that are available and the skills required to perform them. To what extent individuals, firms and economies can harness the benefits of these changes critically depends on the readiness of adult learning systems to help people develop relevant skills for this changing world of work.

To explore this issue, the OECD has undertaken an ambitious programme of work on the functioning, effectiveness and resilience of adult learning systems across countries. This includes the creation of the Priorities for Adult Learning (PAL) Dashboard for OECD countries, which facilitates between-country comparisons, and a series of in-depth country reviews to offer a comprehensive analysis of the key areas where policy action is required to spur the development of a future-ready adult learning system.

This report highlights the key challenges identified in the adult learning system in Brazil, and in particular, in the adult learning programme PRONATEC. It provides recommendations on how to address these challenges based on best practices internationally.

The work on this report was carried out by Priscilla Fialho, with research assistance from Diogo Amaro de Paula, from the Skills and Employability Division of the Directorate for Employment, Labour and Social Affairs, under the supervision of Glenda Quintini (Team Manager on Skills) and Mark Keese (Head of the Skills and Employability Division). The report has benefited from helpful comments provided by Jens Arnold and staff at the JPMorgan Chase Foundation.

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Acronyms and abbreviations

CAGED	*Cadastro Geral de Empregados e Desempregados* (General Register of Employed and Unemployed Workers)
CBO	Classificação Brasileira de Ocupações (Brazilian Occupational Classification)
CNI	Confederação Nacional da Indústria (National Confederation of Industry)
CRAS	Centro de Referência da Assistência Social (Social Assistance Reference Centre)
DIEESE	Departamento Intersindical de Estatística e Estudos Socioeconômicos (Trade Union Department of Statistics and Socioeconomic Studies)
EJA	Educação de Jovens e Adultos (Youth and Adult Education)
FGTS	Fundo de Garantia do Tempo e Serviço (Individual worker account based on accumulated tenure)
FIES	Fundo de Financiamento ao Estudante do Ensino Superior (Higher Education Student Support Fund)
IBGE	Instituto Brasileiro de Geografia e Estadística (Brazilian Institute of Geography and Statistics)
ICT	Information and Communications Technology
IPEA	Instituto de Pesquisa Econômica Aplicada (Institute of Applied Economic Research)
MAPA	Ministério da Agricultura, Pecuária e Abastecimento (Ministry of Agriculture, Livestock, and Supply)
MC	Ministério da Cultura (Ministry of Culture)
MCTIC	Ministério da Ciência, Tecnologia, Inovações e Comunicações (Ministry of Science, Technology, Innovation and Communication)
MD	Ministério da Defesa (Ministry of Defence)
MDH	Ministério dos Direitos Humanos (Ministry of Human Rights)
MDIC	Ministério da Indústria, Comércio Exterior e Serviços (Ministry of Industry, Foreign Trade and Services)
MDS	Ministério do Desenvolvimento Social (Ministry of Social Development)
MEC	Ministério da Educação (Ministry of Education)
MJ	Ministério da Justiça (Ministry of Justice)
MMA	Ministério do Meio Ambiente (Ministry of Environnent)
MPA	Ministério da Pesca e da Aquicultura (Ministry of Fishing and Aquaculture)
MPS	Ministério da Previdência Social (Ministry of Social Security)
MS	Ministério da Saúde (Ministry of Health)
MTb	Ministério do Trabalho (Ministry of Labour)
MTur	Ministério do Turismo (Ministry of Toursim)
PES	Public Employment Services
PME	Pesquisa Mensal de Emprego (Monthly Labour Force Survey)
PNAD	Pesquisa Nacional por Amostra de Domicílios (National Household Survey)
PRONATEC	Programa Nacional de Acesso ao Ensino Técnico e Emprego (National Vocational Education and Employment Programme)
RAIS	Relatório Annual de Informações Sociais (Annual Report on Social Indicators)
SAA	Skill Assessment and Anticipation
SEEDUCs	Secretarias de Estado da Educação (State departments of Education)
SECADI	Secretaria de Educação Continuada, Alfabetização, Diversidade e Inclusão (Department for lifelong education, alphabetisation, diversity and inclusivness)
SETEC	Secretaria de Educação Profissional e Tecnológica (Department for Professional and Technological Education)
SENAC	Serviço Nacional de Aprendizagem Comercial (National Service for Commercial Apprenticeship)
SENAI	Serviço Nacional de Aprendizagem Industrial (National Service for Industrial Apprenticeship)
SENAR	Serviço Nacional de Aprendizagem Rural (National Service for Agricultural Apprenticsehip)
SENAT	Serviço Nacional de Aprendizagem do Transporte (National Service for Transport Apprenticeship)
SESC	Serviço Social do Comércio (Commerce's Social Service)
SESI	Serviço Social da Indústria (Industry's Social Service)

SESCOOP	Serviço Nacional de Aprendizagem do Cooperativismo (National Service for Co-operative Apprenticeship)
SEST	Serviço Social do Transporte (Transport's Social Service)
SINE	Sistema Nacional de Emprego (Public Employment Service)
SISTEC	Sistema Nacional de Informações da Educação Profissional e Tecnológica (National Portal for Information on Vocational Education)
SISUTEC	Sistema de Seleção Unificada da Educação Profissional e Tecnológica (Centralised System for Students' Selection into Vocational Education)
UNESCO	United Nations Organisation for Education, Science and Culture

Executive summary

Throughout OECD countries, there is growing recognition that adult learning systems will be increasingly important to cope with ongoing structural changes in the labour market. Some sectors and occupations are declining, others are emerging and almost all jobs now require different skill sets than they used to. Given that a large share of the people affected have already left initial education, adult learning will play a fundamental role in ensuring a smooth reallocation of labour so as to minimise skill imbalances.

In Brazil, rapid population ageing is the most pressing factor at the moment. In fact, the speed of population ageing is projected to be significantly faster than what has been experienced by most developed economies. As a consequence, shortages of personal care workers and health professionals are already emerging. In addition, recent efforts to promote the participation of domestic firms into international trade and to foster the adoption of digital technologies will lead to stronger skill imbalances in the coming decades. Brazilian policy makers have a window of opportunity to anticipate these changes and future-ready their adult learning system.

Several initiatives have already been implemented to develop the Brazilian vocational education system and to promote adult training in the form of short and free-form technical courses. The Federal programme PRONATEC, launched in 2011, represented a substantial public investment in adult training. Nonetheless, further efforts are needed to develop an inclusive and effective adult learning system.

The OECD recommends that policy makers in Brazil:

- Develop a government-led Skill Assessment and Anticipation (SAA) system and devote resources to conduct systematic and regular SAA analyses. The development of SAA exercises is fundamental to improve the alignment of education and training policy with labour market needs.
- Promote regional-specific and sector-specific SAA exercises that can facilitate more targeted policy making. To minimise the costs, these could be carried out for two or three sectors and regions each year, following a rotating structure. Collaboration between the government and other stakeholders, as well as between different municipalities, is strongly advised.
- Merge the on-line platforms developed by different ministries to disseminate SAA information in a single interactive web portal that aggregates all functionalities and targets a wider audience.
- Develop restricted catalogues of subsidised training courses that strictly respond to labour market needs. These catalogues should be specific to each region and developed based on rigorous SAA analyses.

- Preserve the inter-ministerial collaboration established with the PRONATEC programme to identify individuals eligible for free training provision and financial help.
- Implement a training voucher system to let selected individuals choose their training course out of their regional-specific catalogue. The implementation of such training voucher system should be accompanied with the development of public career guidance services.
- Establish a list of requirements to be met by training providers authorised to offer subsidised training courses. Implement regular inspections to training providers so as to enforce compliance with these requirements.
- Simplify public hiring procedures so that public training providers can quickly adapt their training offer to frequently changing labour market needs.
- Adapt financial help to training participants to their economic and social background. Similarly, public funds transferred to training providers should be differentiated across regions and type of training institution, as well as based on the specific training courses offered.
- Expand the "*Rede CERTIFIC*" programme to recognise prior learning acquired informally.

Assessment and recommendations

Skill needs are shaped by structural and cyclical factors affecting the demand for and supply of skills. Economic growth, financial crisis, changes in the composition of economic output, as well as the so-called mega-trends (globalisation, population ageing and technological progress), are all important factors influencing the demand for skills. On the other hand, skill supply is influenced by labour market trends (namely participation rate, employment rate, duration of unemployment, average number of hours worked), education outcomes and investment in training activities.

Fast and frequent changes in these structural and cyclical factors call for a closer and continuous connection between employment and education. Research has shown that technological progress, for instance, only strengthens the case for more formal education and training: jobs made up of routine tasks that are easy to automate or offshore are in decline and jobs requiring cognitive skills have been growing. Even if jobs are not destroyed, in many occupations, it has become essential to periodically acquire additional skills as the ones already possessed become obsolete and the content of work changes. Coding skills, for example, are now being required well beyond the information and technology sector.

As career spans are lengthening, general education and vocational degrees acquired at the start of a working career do not provide all the skills need throughout one's working life. At the same time, employers now have a broader range of options to get the job done: automation, offshoring, outsourcing through the use of self-employed and freelance workers or contracting the services of temporary work agencies. Overall, skilled and unskilled workers alike face the prospect that their existing knowledge and abilities becoming obsolete, unless provided with lifelong re-skilling opportunities.

In Brazil, the speed of population aging is projected to be significantly faster than what has been experienced by most developed economies. This will significantly affect both demand for and supply of skills. On one hand, demand for health and personal care services are likely to increase. On the other, the longer working lives needed to compensate for a rising dependency ratio will change skill supply too: older workers have more experience but there is also some evidence that the ability to process information declines with age.

Brazil was particularly successful in developing and adopting new technologies during the third industrial revolution. In particular, production of hardware and software was higher than in other developing economies, as well as the use of automation in the banking sector, for example. But the country has still to catch-up with the current trends of artificial intelligence, machine learning, smart and autonomous systems or the internet of things. At the same time, increasing integration into the global economy will create new opportunities and propel growth. But it will also affect the content of exports and the stage at which Brazil contributes for Global Value Chains (GVCs). Profound changes in the industrial structure are to be expected in the coming decades.

As these changes have not yet fully materialised, Brazilian policymakers have a window of opportunity to prepare for the transformations ahead. This report aims at providing policy recommendations, based on best practices internationally, to prepare the Brazilian skill development system so that it is ready to support people in acquiring the relevant skills for a changing world of work. With the majority of people affected by these changes already in the workforce, the focus is placed on adult learning systems.

Mapping available adult learning opportunities is a complex task. Adult learning refers to a very broad range of activities related to the upskilling of individuals who have already left education, including formal (i.e. school-based and to obtain a formal qualification) and non-formal (i.e. participation in seminars, workshops, on-the-job training, short courses not leading to a qualification, etc.) training. In addition, adult learning systems are difficult to define and delineate. They consist of a range of sub-systems with different actors, objectives, inputs, activities and degrees of organisation. Each of these sub-systems overlaps with other areas, such as initial education or labour market policies.

Despite these difficulties, high-quality adult learning is as a major policy tool to ensure the labour force's adaptability in light of the changes expected to affect the quantity and quality of jobs that are available, as well as the skill-sets they require. As adult training courses tend to be of short duration and target the current generation of workers, adult learning is also a policy tool that allows for faster intervention and materialisation of results.

One key feature of the adult learning system in Brazil is precisely the provision of short training courses called "*Cursos de Formação Inicial e Continuada (Cursos FIC)*" (initial and continuing training programmes). Short training courses or "*Cursos FIC*" are professional qualification courses that do not necessarily fit within the Brazilian formal education system. Such courses do not lead to a certificate that can be considered equivalent to a secondary or tertiary educational degree. To that extent, these courses are sometimes considered free-form qualification ("*qualificação livre*") as opposed to formal qualification ("*qualificação formal*").

The Brazilian government has launched several initiatives in the recent years to promote participation in FIC courses. The latest of these initiatives was launched in 2011 and is called PRONATEC. A large part of this report is dedicated to assessing the pros and cons of this programme and, based on best practices internationally, to provide recommendations on how to address the key challenges identified.

Key challenges identified

There are no rigorous and systematic initiatives to carry out Skills Assessment and Anticipation (SAA) exercises.

SAA exercises are tools to generate information about the current and future skills needs of the labour market and about the available skill supply. The information produced by SAA exercises can inform policy makers in charge of designing employment, education and training, and migration policy. SAA information can also be useful to workers' unions, associations of employers and individuals.

In Brazil, there are good quality administrative data sources to track trends in the labour market by occupation, by sector and by region, such as RAIS and CAGED. There are also reliable sources of administrative information regarding enrolments and graduations to track trends in education and training, such as data from SISTEC. On the other hand, the

entries of the regularly updated Brazilian Classification of Occupations (CBO) cannot easily be linked to specific skill requirements. Consequently, any analysis of trends by occupations and field-of-study cannot be easily linked to particular competencies required on the job. In addition, there are no surveys following graduates or employers, vacancies or working conditions surveys, to collect more precise information on skill needs across the country. This makes it more difficult to interpret the information obtained and translate it into concrete recommendations for education and training, employment and migration policies.

Even with the existence of reliable sources of information, in Brazil, there is no system in place to conduct regular, consistent and nation-wide skills assessment analyses. Forward-looking approaches are missing entirely and there is no department in the government that has been specifically given the responsibility of conducting SAA exercises to inform policy makers.

Several ministries have developed web portals to disseminate some related SAA information to individuals and stakeholders. However, such initiatives have not been coordinated: they overlap in some of the information provided and none of them really connects skills needed, training courses available, career counselling and employment opportunities.

Finally, while there have been some good initiatives (such as, for example, the SAA analysis conducted by SENAI São Paulo, an employer association from the manufacturing sector), they have been scattered and have not been extended to all regions of Brazil, nor all sectors of activity. On top of that, due to lack of cooperation between government and employers' associations, the results coming out of these initiatives have not had any repercussions in terms of public policy.

As a consequence, large-scale adult training programmes, such as PRONATEC, have offered training courses that are not well aligned with labour market needs. A large number of training participants are enrolling in courses leading to occupations for which there are few work opportunities, or equipping them with skills that are no longer needed in the labour market.

There is no standard procedure to assess and recognise previous experience, as well as skills and knowledge acquired informally.

While there is a decentralised programme in Brazil for the formal recognition of prior learning, called "*Rede CERTIFIC*", this programme was never fully developed and implemented. Very few schools became members of the "CERTIFIC" network and the number of certificates issued remains very small. As a consequence, individuals have no means of proving that the experience and knowledge they have accumulated over time is sufficient to enrol for training courses with entry requirements. This could represent a barrier in access to adult learning, especially for the low skilled.

In particular, for the PRONATEC adult learning programme, the lack of a well-established framework for the formal recognition of prior learning means that assessment that candidates possess the level of skills needed to participate into training remains largely at the discretion of individual staff from different PRONATEC partners and based on formal qualifications. As a result, older workers, for instance, seem to have benefited less from the programme, although they might be the workers at higher risk of exclusion from the labour market due to technological changes.

There are some challenges with the implementation of the PRONATEC adult learning programme.

PRONATEC has a very interesting governance structure that favours collaboration between different ministries and administrative levels. This collaboration is one of the most successful aspects of the PRONATEC programme. Thanks to this governance structure and the involvement of several ministries and state departments of education, PRONATEC has been able to reach a wide public and to address training needs for all sectors of activity: health, defence, business and administration, industry, tourism, etc. The fact that all ministries coordinate towards a single programme also avoids the duplication of efforts and overlap of initiatives. With a single programme, several policy objectives, concerning the action of several ministries, can be pursued: broader coverage of adult training opportunities, promotion of inclusiveness, reduction of poverty, improvement of labour productivity, competitiveness and export capacity.

The programme was also designed to leverage some of the best features of its predecessors – PLANFOR and PNQ – and improve upon some of their limitations. For example, PRONATEC gives a less central role to state governments and municipalities by not transferring public funds directly to lower administrative levels. This makes it easier to control how the public funds are used. With the governance structure of PRONATEC, local authorities still have the opportunity to address local training needs by expressing their needs to the Ministry of Education or other relevant ministries.

PRONATEC has a very exhaustive geographical coverage, which is quite impressive for a large and diverse country like Brazil. The programme has reached remote areas of the Amazon, with the use of mobile training units from SENAI for example. However, there are still some challenges with the design and the implementation of PRONATEC at the geographical level.

First of all, the training subsidy transferred to training providers and training participants is fixed and independent of the individual's economic and social background, the location of the training course, the type of training provider and the specific training course being taught. With the PRONATEC programme, all training providers receive the fixed amount of BRL 10 (Brazilian reals) per student/hour taught. From that value, BRL 2 must be transferred to the student.

However, individuals have different capacities to save and invest in their own professional development. Individuals with different family situations also have more or less opportunities to enrol in lifelong learning opportunities. Training participants from different regions have different commuting costs to school as a function of local infra-structures.

Furthermore, the fixed subsidy generates significant variation in the incentives of training providers to adapt their methods and curricula, and in their ability to invest, expand and innovate their course offering. Large training providers have an advantage over small training providers. Providers with a wider variety of courses can more easily balance out losses on one course with benefits from another. Providers with a limited number of courses on offer are more constrained.

The fixed training subsidy value also means that training providers have incentives to offer training courses with the lowest provision costs, so as to maximise their benefits. These may not necessarily be the courses that are most needed in the labour market. This situation may lead to further distortions in the alignment of training offer and training needs.

Another challenge in the implementation of PRONATEC consist in the lack of investment in public awareness campaigns in recent years which used to play a key role in promoting the benefits of adult learning. Additionally, distance learning has not been really widespread for FIC courses, although it would be a cost-effective alternative to mobile training units to reach individuals living in remote regions of the country.

Finally, the process of enrolling in a PRONATEC training course can be lengthy and cumbersome, involving two layers of administrative procedures: pre-enrolment with a PRONATEC partner and confirmation of enrolment at the training school. At each stage, documentation has to be presented, forms filled, among other things. This excess bureaucracy and formality can be a potential barrier to access adult training for individuals who only have basic skills and/or those who lack time.

There is a lot of heterogeneity in the functioning of different types of training providers, potentially translating into significant differences in training quality.

Public training providers have to comply with formal procedures and legal formalities to hire new staff. Once hired, public employment contracts are highly protected. Private institutions and technical schools from the S-system have much more flexibility in the way they manage their teaching staff. Consequently, it is easier for them to adapt their training offer quickly to what is required by employers. This can have a substantial impact on re-employment rates and on teaching quality, leading to significant differences across training providers.

Additionally, not all training providers offer career guidance services to participants, assisting them on the transition to work after course completion. A small number of technical schools complement their professional qualification courses with training in soft skills, such as team work, work ethics, etc., but this is not a requirement and many training providers across the country do not offer this type of support. Finally, while training centres from the S-system have developed a formal framework to evaluate the quality of their short technical courses, not all training providers offering FIC courses subsidised by the government through programme like PRONATEC conduct such assessments. Such differences can eventually lead to large differences in the quality of training provision across schools.

Key policy recommendations

Develop a government-led Skill Assessment and Anticipation (SAA) system that could be complemented by independent initiatives from local authorities and other stakeholders.

To achieve robust and reliable results, SAA exercises should rely on a combination of both quantitative and qualitative data, as well as combining information from different sources. A good labour market information system and reliable information about education enrolment and graduation rates could be complemented with a survey of employers, which should be representative at the sectoral and sub-national levels.

The Brazilian government should devote resources to creating a team or department that would conduct systematic and regular SAA analyses. Approaches that build on recent trends or analyse the current situation and forward-looking approaches should be combined. While no particular method is better than the others, some of the methods that could be considered are the quantitative forecasting model developed by the Department

of Jobs and Small Business in Australia, or the method implemented by SENAI São Paulo, both discussed in this report. Developing a more detailed description of skills associated to each occupation listed in the CBO would be one possible way forward to translate results from an occupation-based SAA system into an outlook for particular skills.

Complementary regional and sectorial exercises are strongly recommended as they can facilitate more targeted policy making. To minimise the costs, these could be carried out for two or three sectors and regions each year, following a rotating structure.

Alternatively, to ensure regional coverage, several municipalities could team-up and pool resources so as to develop a local SAA structure. These regional-specific SAA structures would not necessarily need to stick to administrative state circumscriptions. For example, border municipalities from different states, but which are well-connected in terms of infra-structures, important flows of workers commuting across them, local firms trading with each other, etc. would be good candidates to team-up. State governments should support the creation of such local SAA networks, for example, through campaigns to raise awareness of their importance, or by organising training workshops where SAA methods are explained or taught. Staff involved in the development of local SAA frameworks could meet regularly across the country to share and learn from everyone's experience.

In terms of sectoral coverage, the government could collaborate and coordinate with institutions from the S-system that have developed their own sectoral SAA analyses, so as to benefit from their efforts.

Finally, regarding dissemination, having one single platform that centralises all the information has proved quite effective in other countries. Web platforms that are particularly successful tend to have more than one interface depending on the targeted audience or to allow for an interactive experience, tailoring the information to users' interests. MTb, MEC and MDIC could coordinate to develop links between their portals or develop together a unified platform that aggregates all the functionalities that their separated initiatives have.

Adult training programmes, such as PRONATEC, should rely on SAA exercises to determine the training courses to be offered and publicly subsidised.

If a government-led SAA system is developed, MEC could produce sector- and region-specific catalogues of FIC courses that would offer a restricted number of training courses but respond more adequately to skill needs. Only courses from such restricted catalogues would be subsidised. This would limit the extent to which training institutions are able to influence the course offer of PRONATEC, while at the same time, provide incentives for training institutions to develop courses that are in high demand.

The government could then consider implementing a training voucher system. Individuals entitled to a training voucher would be free to choose one of the training courses contemplated in such restricted FIC catalogues, carefully defined based on systematic SAA methods. Implementing a training voucher system would not invalidate the actual governance structure of PRONATEC. Different ministries and SEEDUCs could continue to collaborate, coordinate, and be involved in the (i) selection of individuals from their target population to attribute training vouchers; (ii) development, analysis and dissemination of SAA methods.

At the same time, the implementation of such training voucher system would contribute to: (i) simplify the procedure for participation in a PRONATEC training course, by

removing the two layers of administrative proceedings (pre-enrolment and confirmation of enrolment); and (ii) increase motivation levels and eventually reduce drop-out rates from subsidised FIC courses.

Nevertheless, the implementation of a training voucher system should be accompanied with the development of public career guidance services, to ensure that individuals have access to timely and accurate information about training opportunities and make adequate choices. Career guidance can be delivered by Public Employment Services, specialised public guidance services, or yet, career guidance websites. One-stop-shops, where individuals can get all the information they need in one place, such as the ones opened in Luxembourg, could also be considered.

Training providers should comply with some guidelines to be able to offer subsidised training courses. Compliant training providers should be certified by the government accordingly.

In order to minimise the heterogeneity in training quality across institutions and to improve the overall quality of FIC training courses, further requirements should be imposed on training centres to qualify for public funding and offer subsidised training courses. Such requirements should include:

- To organise induction sessions before the start of a training course so as to set expectations right and reduce drop-out rates;
- To offer career guidance services, assistance in looking for a job or a practical internship to gain experience in the field of study;
- To offer some training in soft skills, such as team work, corporate responsibility, professional behaviour, entrepreneurship, etc., in addition to technical skills;
- To develop a formal framework to evaluate training courses;
- To increase the offer of flexible learning opportunities – perhaps with a minimum threshold of FIC training courses offered via distance learning, part-time or in the evening. Alternatively, subsidised training courses could be structured in a modular or credit-based format.

Regular inspections of centres offering subsidised training courses could be conducted to ensure that these requirements are met. In Japan, clear guidelines are provided to training providers. Only training providers who can demonstrate that they comply with such guidelines are accredited and allowed to offer training courses subsidised by the government. The Japanese government conducts regular inspections to training providers and requires the submission of several documents to ensure that guidelines are effectively implemented. The Japanese government also offers workshops to staff at training institutions to clarify the content of such guidelines and provide concrete examples on how to implement them. Similar practices could be considered in Brazil.

If a training voucher system is implemented, only certified training providers, complying with all these requirements, and offering training courses from the restricted FIC catalogues, should be considered by individuals entitled to the voucher. This would also contribute to increase overall training quality, by fostering competition between different training institutions.

Finally, public hiring of professors for PRONATEC courses should be made simpler so that public providers are not lagging behind other training providers and can respond quickly to new training demands.

Training subsidies to individuals and training institutions should be adapted to the economic and social background of the participant, as well as differentiated across regions, training providers and training courses.

One argument in favour of a constant training subsidy across regions, training providers and individuals is that it simplifies the administrative burden of transferring public funds to training participants and institutions. Additionally, differentiating the value of the subsidy across individuals or institutions could lead to undesirable situations of discrimination or personal favours. However, there are other ways of avoiding abuses of power and misuse of public funds.

The government could consider differentiating the amount of the subsidy that is transferred to training institutions and participants based on clearly defined criteria. For example, groups that tend to participate less, who live in remote areas with poorer infra-structures or far from training institutions, could receive higher individual subsidies ("*Bolsa-formação*"). Training providers that are located in remote areas and struggle to attract professors or develop good-quality infra-structures, could receive a higher subsidy per student/hour taught. Finally, training courses that are identified as being in high demand in the labour market (based on SAA exercises), but that are costly to provide because they require specific equipment or specialised instructors, could also be subsidised by the government at a higher student/hour value. As long as the overall procedure is kept transparent, it becomes easier to detect possible frauds and abuses of power. This system of multiple values for the training subsidy - depending on clearly defined and observable individual and institutional characteristics, as well as the particular training course taken - could be accompanied with regular audits to partners and staff attributing them, as well as schools and participating individuals. The government could set up a computerised management system of the training subsidies attributed, where information about individual participants could be cross-checked with administrative databases on earnings, wealth and the receipt of other social benefits.

If a voucher system is implemented, individuals could choose their training provider and training course freely and hand-in the attributed voucher to the training institution of their choice. The training institution could then claim the funding to the government by returning all training voucher collected and specifying the training courses chosen by the participants. The government would transfer to the training providers an amount based on that information. Such amount should cover the costs of training provision, as well as transportation costs and a meal per day for the participants. The former would remain with the institution, while the later would be paid by the institution to the training participant – following the current financing procedures of PRONATEC.

Whenever participants pick training courses that are highly demanded in the labour market, but more costly to provide for requiring specific equipment or specialised instructors, the student/hour taught of that course could be funded at a higher value. Similarly, training institutions in areas of the country where it is more difficult to attract instructors or develop high-quality training infra-structures, could also receive a higher value per student/hour. Finally, training voucher could have a unique identifier linked to the individual who benefits from it and has handed it over to the institution. Based on family, social and economic conditions, as well as living area, the amount transferred to

the training provider to cover for transportation costs and a meal per day for the participants should also be higher.

Training providers eligible for a higher student/hour value should be clearly identified based on objective and transparent criteria. Training courses that are considered particularly in high-demand in the labour market, but more costly to provide, should also be clearly identified within the restricted list of courses available in a region-specific FIC catalogue developed based on systematic SAA methods.

A large-scale programme for the recognition of prior learning should be developed and effectively implemented. Public awareness campaigns to highlight the benefits of participation in adult training should also be conducted.

Developing a full-scale system to recognise prior learning could improve the Brazilian adult learning system, and in particular, the PRONATEC programme in two aspects: (i) it would contribute to engage older workers into adult learning, who might be excluded from the programme on the basis that they lack entry requirements; and (ii) it would establish a standardised framework to select candidates who do not possess formal qualifications, minimising the amount of discretion by staff working for different PRONATEC partners. One possibility would be to promote further the already existing programme "*Rede CERTIFIC*".

The government should also resume public awareness campaigns for participation in adult learning opportunities. Public awareness campaigns can come in many forms and do not necessarily need to be linked with a particular adult training programme. Public awareness campaigns can use media channels, the organisation of public events, direct mail, etc.

Chapter 1. Skills needs and skills imbalances

This chapter provides a brief overview of the economic and labour market situation in Brazil, followed by a discussion about educational and training outcomes, while stressing which factors have been mostly responsible for changes in skill needs. It proceeds by describing skill surpluses and skill shortages in Brazil, drawing from the Skills for Jobs Database 2018, and in comparison with other OECD and non-OECD countries.

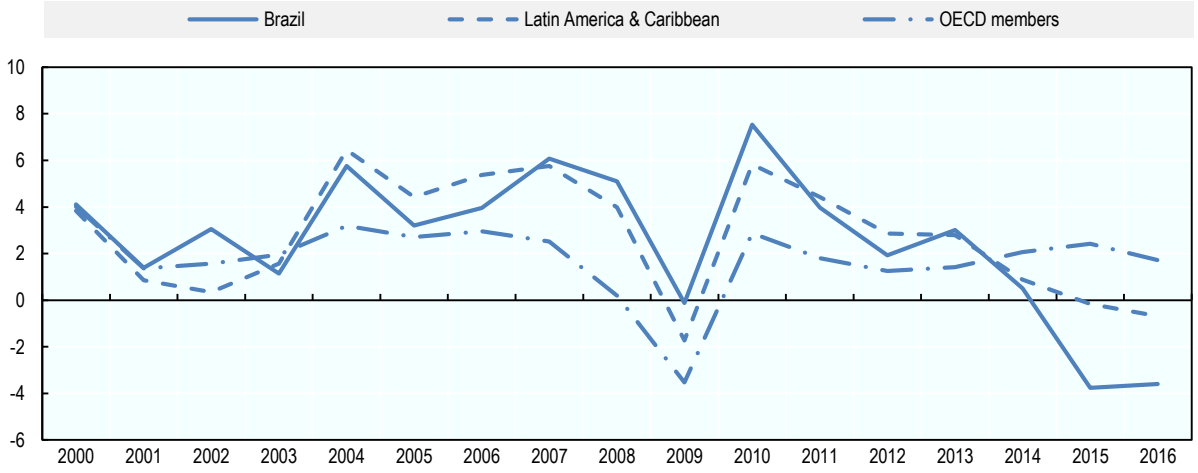
Increased globalisation and rapid technological change, but also demographic developments, have considerably changed skill requirements and skills supplied in most OECD countries in recent decades. These trends are expected to continue in the coming decades. In Brazil, some of these structural mega-trends are not yet fully widespread. Digital technology adoption, for instance, has been slower than in the most advanced OECD economies. Nonetheless, other structural factors are already having a profound impact on skills mismatch and shortages.

1.1. Factors underneath changing skill needs

1.1.1. The economic and labour market situation in Brazil

Between 2000 and 2014, Brazil experienced strong economic growth and social progress. GDP per capita was growing at an average of 3.5% per year (Figure 1.1), in line with most of Latin America, but significantly above the OECD average, making Brazil one of the world's most promising economies.

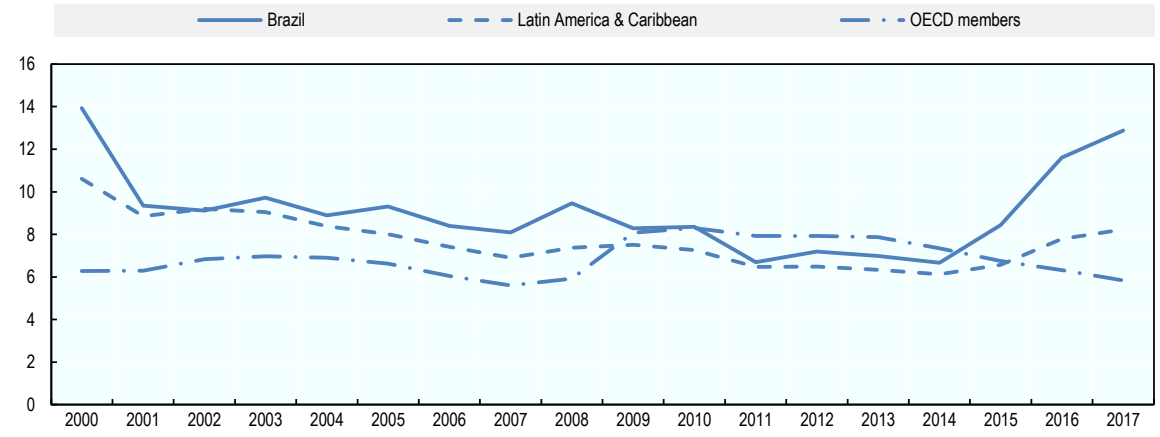
Figure 1.1. GDP growth from 2000 to 2016



Source: World Bank National Accounts Database.

However, in 2014, the country entered into a long economic recession from which it is now only slowly emerging. During that period, negative GDP growth rates were accompanied by raising unemployment rates above two digits (Figure 1.2). Rising public spending at the cost of private investment, deterioration of the terms of trade, political turmoil, corruption allegations and rising inflation, were all factors behind the economic recession. Although the government has promoted fiscal adjustment and tighter monetary policy, more reforms are needed to help the country sustainably bounce back from recession (OECD, 2018a). Recent fiscal and monetary policies have started paying off but job creation, particularly in the formal sector, remains very weak (Figure 1.3).

Figure 1.2. Unemployment rate from 2000 to 2017



Source: World Bank National Accounts Database.

Figure 1.3. Employment in the formal and informal labour market from 2010 to 2018

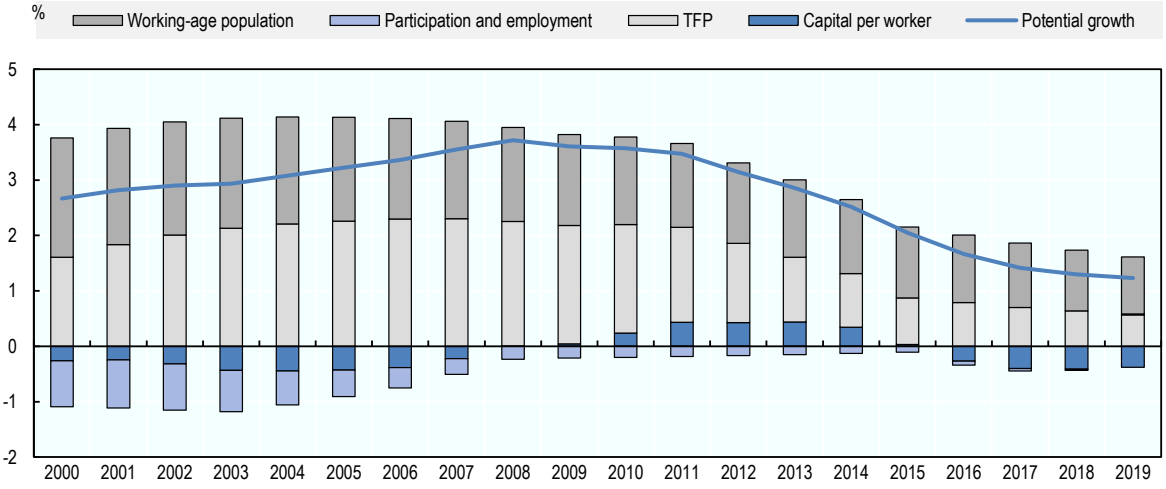


Source: IBGE.

Economic recessions are usually associated with with more underskilling (Zago, 2015), i.e. with few jobs available, workers accept jobs below their qualification level: high-skilled workers downgrade to middle-skill jobs and middle-skilled workers downgrade to low-skill jobs, leading to stronger skill imbalances. Additionally, recessions are also thought to lower the opportunity cost for adjustments to technological changes and for boosting creative destruction (Hershbein and Kahn, 2017).

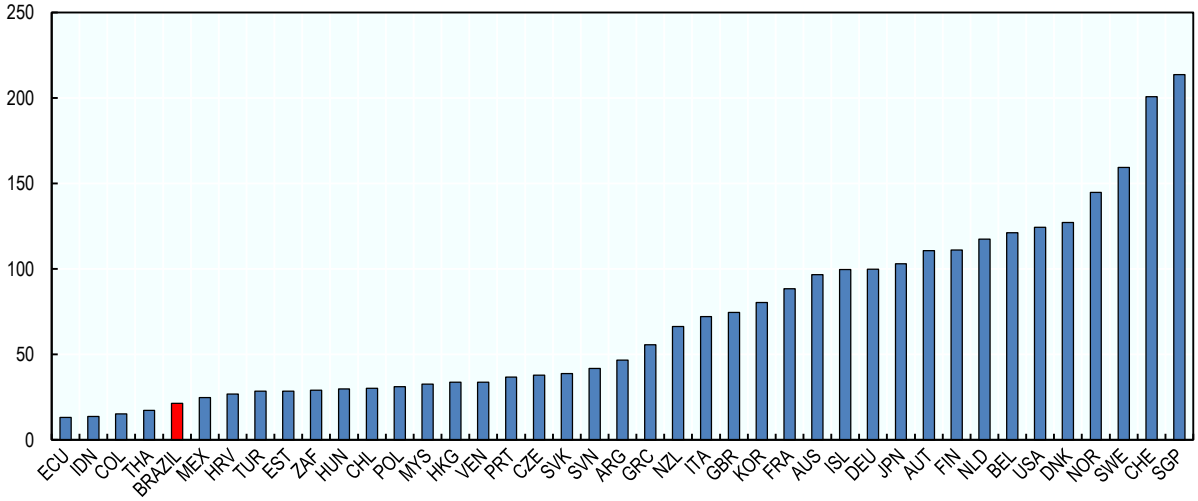
Worryingly, growth potential, which measures how fast GDP can grow over a long time horizon, has also substantially declined. This is mainly due to weak labour and total factor productivity (OECD, 2018a), partly due to a large share of the workforce having only basic skills. In fact, productivity growth started to stagnate in 2007, even before the start of the recession (Figure 1.4 and Figure 1.5). Low productivity growth and low productivity levels hinder firms' competitiveness, especially in global markets. As a result of this lack of competitiveness, over the past two decades, Brazil's manufacturing sector has shrunk significantly, and relatively more than in other Latin American countries and OECD countries in terms of value added out of GDP (Figure 1.6).

Figure 1.4. Growth potential and total factor productivity growth from 2000 to 2019



Note: Growth rates expressed in percentage. Potential growth rate decomposed in the working age population growth, participation and employment growth, Total Factor Productivity (TFP) growth and capital per worker growth.
Source: OECD Economic Outlook 102 database.

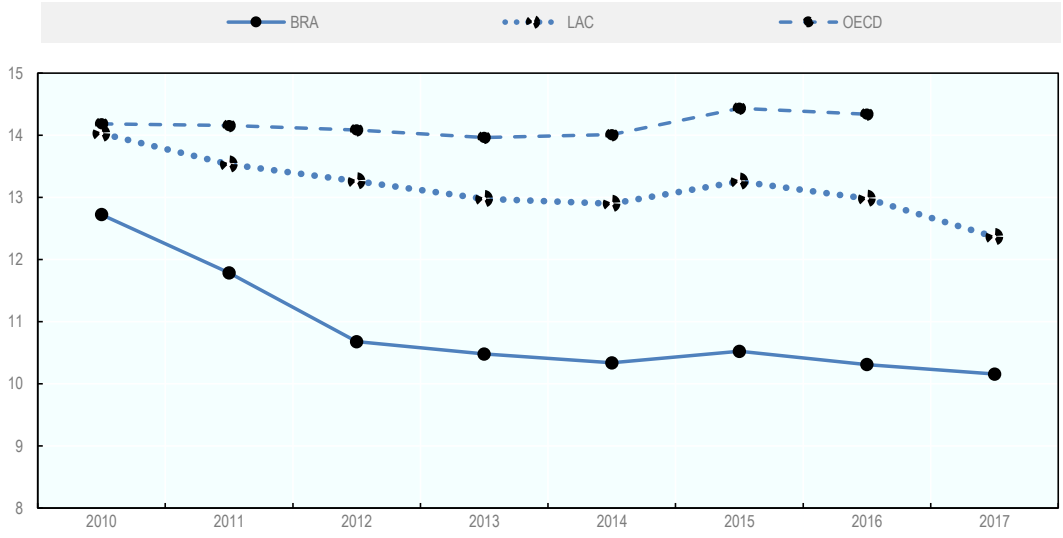
Figure 1.5. Labour productivity in 2015



Note: Labour productivity in thousands of 2010 USD per employee.
Source: World Bank, ILO, IBGE.

One of the consequences of the fall in the relative importance of manufacturing out of GDP is that it can lead to a fall in the demand for manufacturing and production skills. In fact, employment in the manufacturing sector in Brazil has stagnated, while employment in services increased at the expenses of employment in the agricultural sector (Figure 1.7). Such structural transformations inevitably affect the demand for skills. The rise of services will most likely be accompanied with an increase in the demand for skills such as social skills, communication skills, or customer services skills, for example.

Figure 1.6. Value added of the manufacturing sector as % of GDP from 2010 to 2017

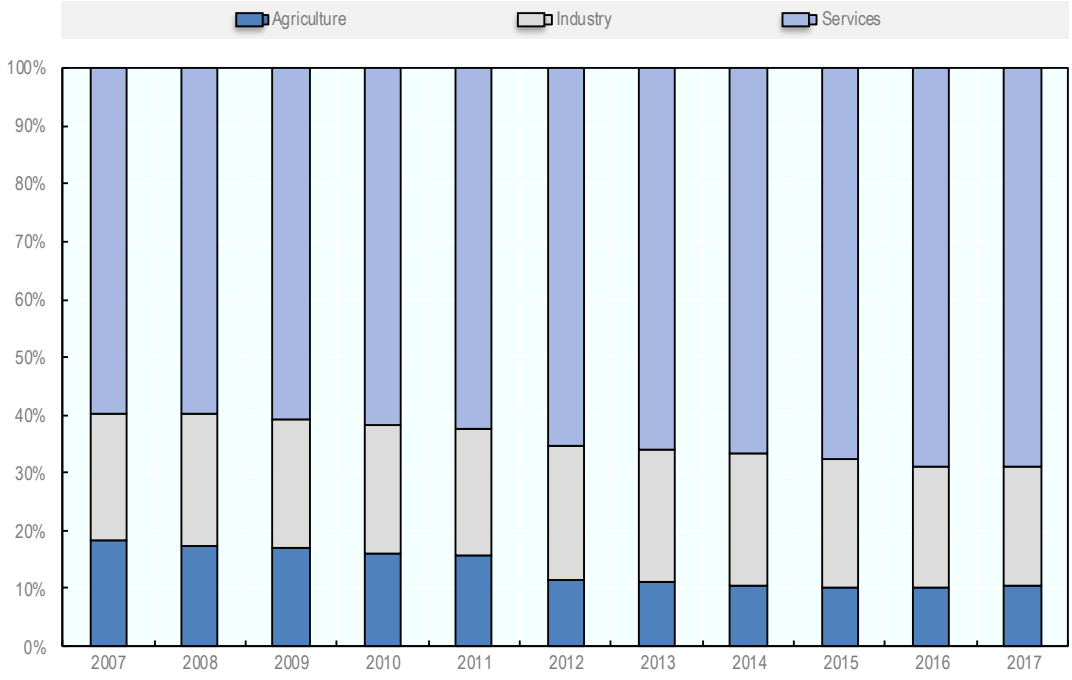


Source: World Development Indicators.

So far, Brazil has not fully reaped the benefits that integrating into the world economy can offer, remaining on the side lines of an increasingly integrated world economy, compared to other emerging economies (OECD, 2018a). Nevertheless, several measures have been implemented so as to increase Brazil's participation in global trade, such as relaxing measures that favour the domestic industry at the expenses of foreign competitors (Local content rules or LCRs). Opening to global markets will induce several changes to the type of skills that are needed by employers. For instance, if Brazilian firms start offshoring, non-tradable services are expected to grow in importance. Such services include food preparation and hospitality, for example. As these changes have not yet fully materialised, Brazilian policymakers have a window of opportunity to prepare for these transformations.

Brazil was particularly successful in developing and adopting new technologies during the third industrial revolution. In particular, production of hardware and software was higher than in other developing economies, as well as the use of automation in the banking sector, for example (Frischtak, 1992). The country has still to catch-up with the current trends of artificial intelligence, machine learning, smart and autonomous systems or the internet of things (Zanotto, 2002). Profound changes in the industrial structure are to be expected in the coming decades.

Figure 1.7. Distribution of employment by economic sector from 2007 to 2017



Source: World Bank.

In countries that have already adopted some of these new technologies, low and middle-skilled occupations have become less important. Cognitive non-routine skills that are associated with occupations such as managers and analysts will become in high demand, driven by substantial work reorganisation (NESTA, 2017). Other skill shortages that can be expected to emerge with automation are communication skills, social perceptiveness, and instructing, persuasion and negotiation skills. In fact, these are all skills related to human interactions that are, so far, difficult to automate through the use of artificial intelligence or robotics. On the other hand, control precision abilities (e.g. the ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions), finger dexterity, peripheral vision or depth perception, are examples of skills that lost importance with the adoption of technologies such as smart sensors and sophisticated robots (OECD, 2017c).

1.1.2. Demographic changes

A worsening demographic dividend is also putting pressure on the Brazilian labour market. Brazil's demographics is much less favourable than it used to be (OECD, 2017a). The country now has a total fertility rate below replacement level, at 1.75 children per woman, and the population growth rate is decreasing every year. Low fertility and an increasing life expectancy jointly contribute to Brazil's increasingly high old-age dependency ratio. In Brazil there are currently about 13 individuals aged 65 and over per 100 people of working age defined as those aged between 20 and 64. However, this number is set to increase strongly in the next decades and Brazil is projected to have a higher dependency rate than most OECD and G20 countries by 2075 (Table 1.1).

Population aging will call for longer working lives and lifelong learning to maintain and upgrade workers skills. There is evidence that the speed at which people can process

information declines with age, while experience and general knowledge increase. This will affect the stock of available skills in the labour market. Moreover, a shrinking workforce will require a better use of human resources available, meaning that employees should be well matched in occupations where they are able to use their competencies more effectively.

On the other hand, demand for health and personal care services are likely to increase. Skills usually required in the health care sector comprise communication and interpersonal skills, but also, the ability to listen attentively, to show empathy, to work in teams, to deal with pressure and to have a strong work ethic.

Table 1.1. Old-age dependency ratios: historical and projected values, 1950-2075

	1950	1975	2000	2015	2025	2050	2075
OECD	13.9	19.5	22.5	27.9	35.2	53.2	58.6
Argentina	7.5	14.1	18.6	19.5	21.8	31.8	44.6
Brazil	**6.5**	**8.0**	**9.3**	**13.0**	**18.3**	**40.1**	**62.3**
China	8.5	8.8	11.4	14.5	22.3	47.9	58.8
India	6.4	7.6	8.7	10.0	12.7	22.0	37.0
Indonesia	8.6	7.9	8.7	8.7	11.6	23.1	32.5
Russian Federation	8.7	15.5	20.4	20.7	30.1	40.0	37.6
Saudi Arabia	7.5	7.6	6.1	4.8	7.5	27.4	40.6
South Africa	8.5	8.1	7.8	9.0	11.1	17.8	29.0
EU28	14.7	21.2	24.3	29.9	37.5	55.9	59.7

Note: The demographic old-age dependency ratio is defined as the number of individuals aged 65 and over per 100 people of working age defined as those aged between 20 and 64.
Source: United Nations, World Population Prospects – 2017 Revision.

1.1.3. Educational outcomes and lifelong training

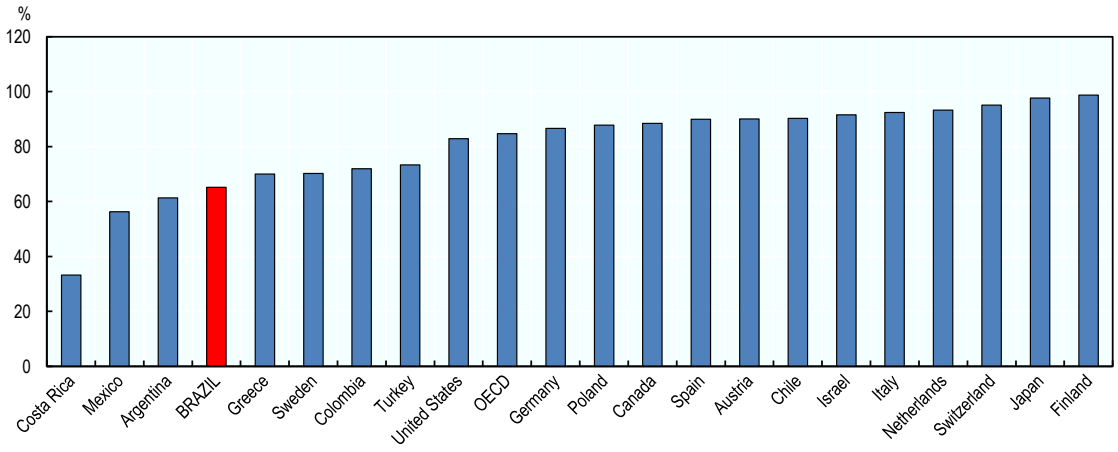
Strong basic skills acquired in initial education are key for participation in further education and training throughout one's working life. Education in Brazil faces challenges in terms of reach and quality. Only 59% of Brazilians are expected to complete upper secondary education before they turn 25 (OECD, 2017b). The share of tertiary graduates is also relatively low, when compared with other countries (Figure 1.8 and Figure 1.9). Moreover, quality is not assured for those who do enrol in secondary education. PISA, which evaluates the performance of 15 year olds in reading, mathematics and sciences, shows that adolescents in Brazil perform poorly in all three subjects, even when comparing to other middle-income countries (Figure 1.10).

Not only is initial education a fundamental building block for further learning, it also has the potential to respond to existing skill shortages by providing skills that can be put to immediate good use in the labour market, particularly through vocational education.

Unfortunately, only 4% of Brazilians enrolled in upper secondary education opt for a vocational track (Figure 1.11). This is in sharp contrast with the OECD where one out of four upper secondary students on average are enrolled in a vocational programme. There is a strong need for expansion of vocational training at secondary level to guarantee better integration of high school graduates in the labour market, especially in a context where tertiary education is inaccessible to most individuals. Moreover, the unmet supply of vocational graduates at upper secondary level is not compensated by technical training at tertiary level. Only 14% of tertiary students are enrolled in fields such as Engineering,

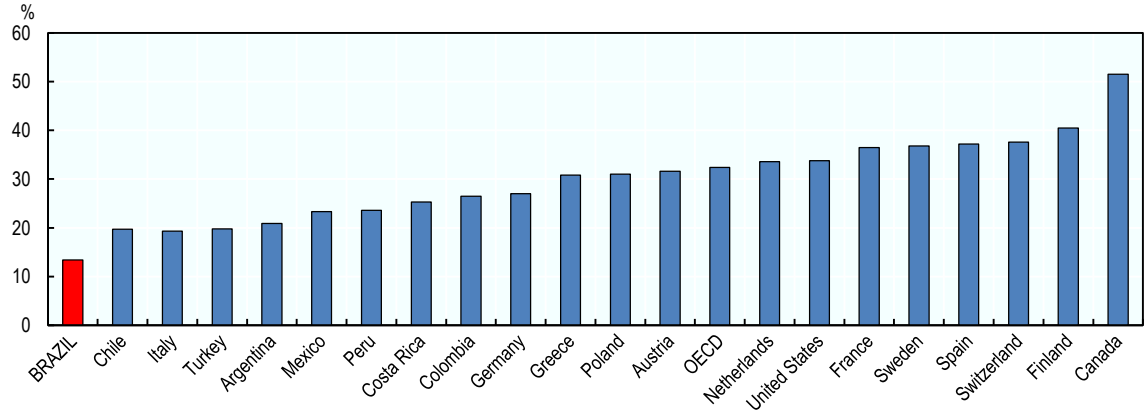
Manufacturing, Construction, Natural Sciences, Mathematics or Statistics (OECD, 2018a).

Figure 1.8. Graduation rate in upper secondary education, 2015 or latest year available



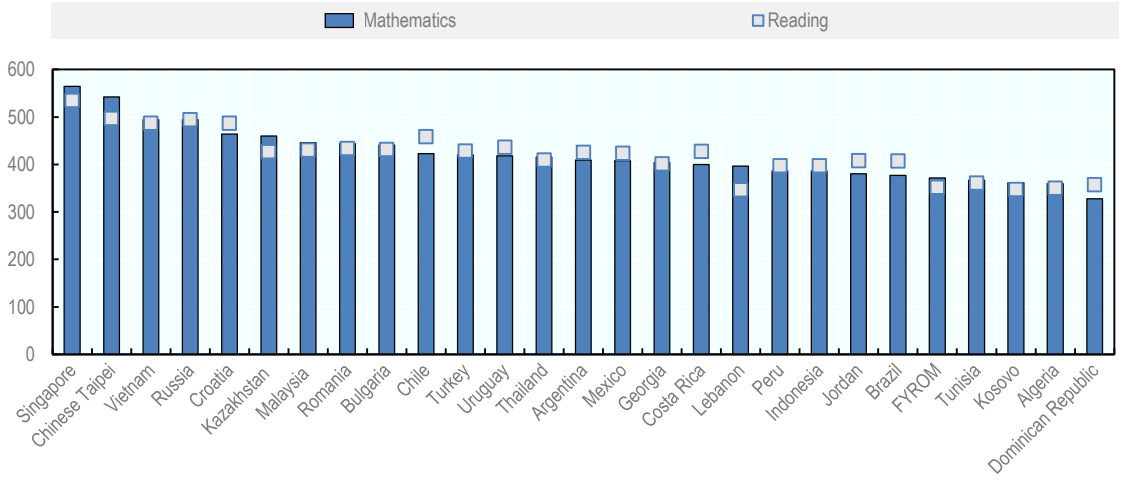
Source: World Bank World Development Indicators database; OECD Education at a Glance database; UNESCO Education database.

Figure 1.9. Total Labour force with tertiary education, 2014 or latest year available



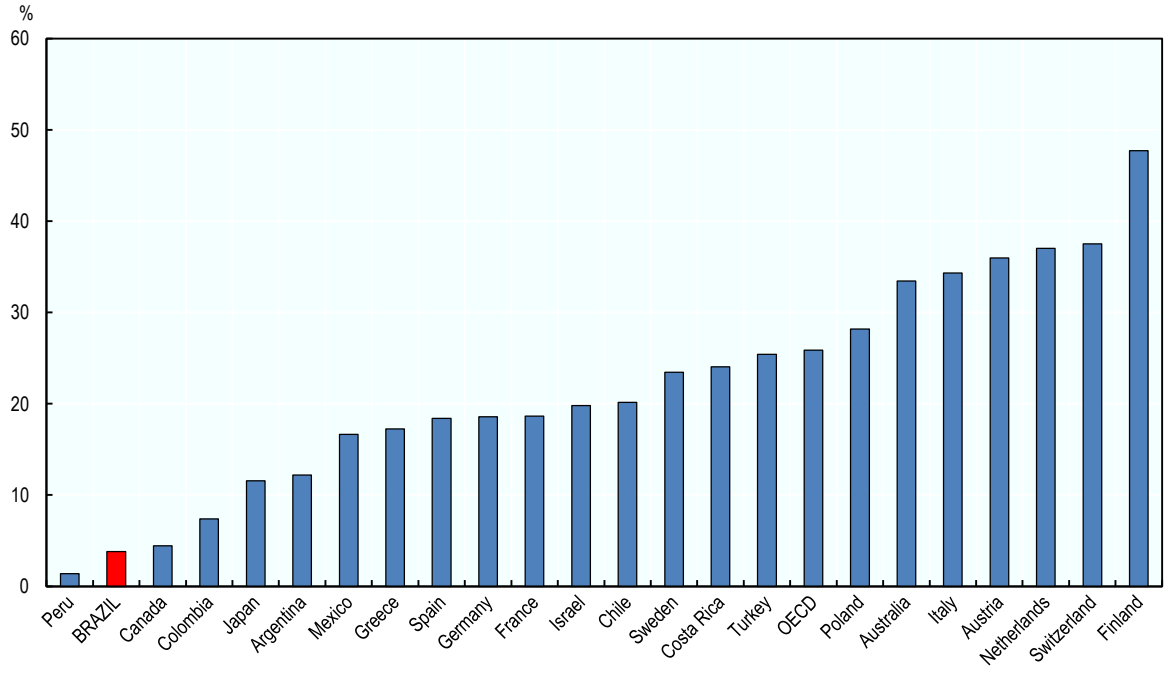
Source: World Bank World Development Indicators database; OECD Education at a Glance database; and UNESCO Education database

Figure 1.10. PISA performance for selected countries, latest year available



Source: PISA (2015).

Figure 1.11. Percentage of secondary education enrolled in vocational programmes, 2015 or latest year available



Source: UNESCO Institute for Statistics.

Although there is still limited enrolment in vocational education, technical and vocational training exhibit higher wage return than general education degrees. Individuals who complete a vocational training course at the upper secondary level enjoy a wage premium of 9.7% compared to those who completed the general education track (Almeida et al., 2015). In the manufacturing sector only, wage returns to vocational training can go up to

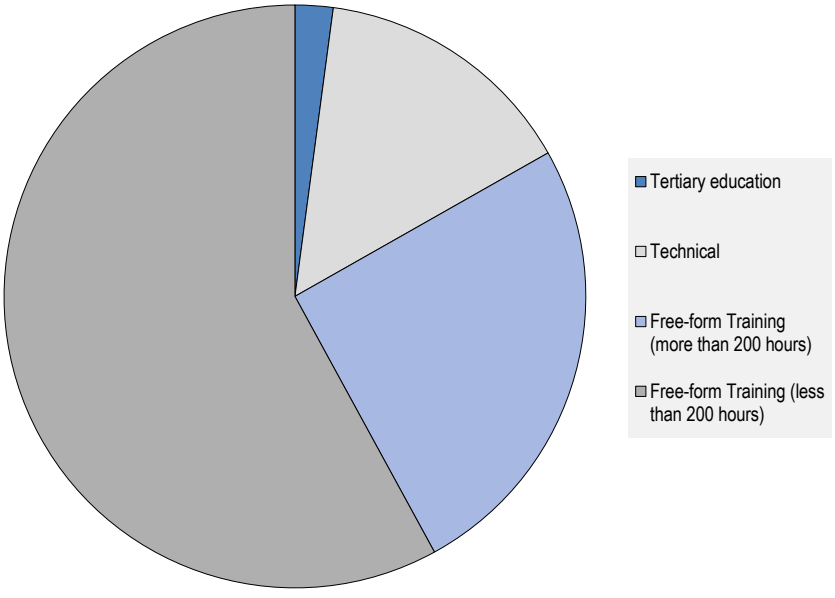
20% (CNI, 2013). These high wage returns can be interpreted as a market signal for the shortage of vocational graduates.

Currently, vocational education in Brazil is mostly dominated by technical schools from "*Sistema S*". Technical schools from "*Sistema S*" (S-system) are private, non-profit organisation, financed, managed and led by firms (Box 1.1). These schools – just as public technical schools - offer vocational education at the secondary and tertiary level, as well as short training courses called "*Cursos de Formação Inicial e Continuada (Cursos FIC)*" (initial and continuing training programmes).

Empirical evidence suggests that S-system trainees are disproportionately male, non-enrolled in the formal schooling system, heads of households, with bi-parental families, living mostly in the northern and southern parts of the country, and likely to be affiliated to a workers' union (Villalobos Barría and Klasen, 2016). Among individuals aged 15 to 29 years old, technical schools from the S-system yield a considerably higher return than those trained in other institutions: 28.3% versus 10.4%. The difference in returns between technical schools from the S-system and other institutions seems to be higher in rural areas, compared to urban areas. Finally, training has been shown to increase monthly labour earnings by improving hourly pay, rather than by increasing the monthly hours of work (Villalobos Barría and Klasen, 2016).

Short training courses or "*Cursos FIC*" are professional qualification courses that do not necessarily fit within the formal education system. Such courses do not lead to a certificate that can be considered equivalent to a secondary or tertiary educational degree. To that extent, these courses are sometimes considered free-form qualification ("*qualificação livre*") as opposed to formal qualification ("*qualificação formal*"). Since these courses are structured independently of the formal education system (general and vocational), they are aimed at individuals who have already left education and represent an opportunity for lifelong learning. Wage returns to "*Cursos FIC*" have been estimated at 2.2% on average (Almeida et al., 2015).

Figure 1.12. Qualifications possessed by workers in the manufacturing sector in 2015

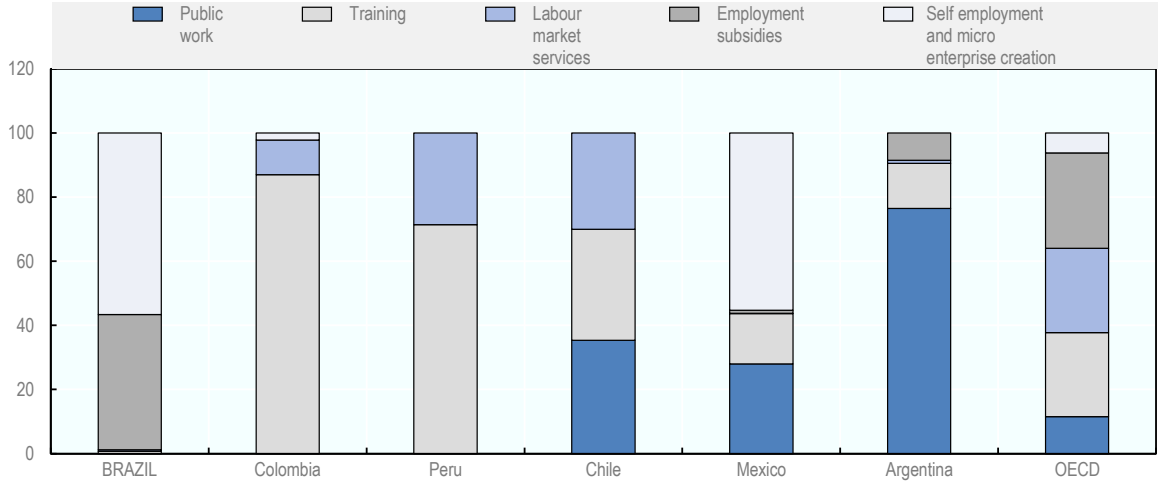


Source: SENAI.

Figure 1.12 shows the share of workers in the manufacturing sector that possess a general education degree, a vocational education degree and who attended a free-form professional qualification course (disentangling professional courses with less than 200 hours and those with more than 200 hours). Most workers only possess a short free-form training course. Therefore, for many workers, these short professional courses are the only opportunity to acquire technical skills. Despite that, up until recently, out of all public expenditures on Active Labour Market Policies (ALMPs), funding allocated to boost training was almost inexistent in Brazil (Figure 1.13).

The government has started to address the lack of a well-developed public vocational and technical education system by developing federal programmes that promote technical training and that are directly funded by the Federal budget. The latest of these programmes, PRONATEC, will be extensively reviewed in this report.

Figure 1.13. Break-down of ALMPs expenditures, 2013 or latest year available



Note: ALMPs expenditures do not include funding transferred to the S-system levy-scheme, nor Federal funding directly allocated to large-scale Federal training programmes.
Source: OECD Public expenditure and participant stocks on LMP database; ILO; and ILO (2016) "What works? Active labour market policies in Latin America and the Caribbean."

Box 1.1. The S-System ("*Sistema S*")

"*Sistema S*" was established by the Brazilian government in the early 1940s. The establishment of this system was meant to encourage vocational and technical training through a collective arrangement where all employers fund training through a levy. This levy scheme requires that firms in each sector (agriculture, trade, manufacturing and transportation) transfer a share of their revenues to the institution supporting training in their area of activity. The system includes nine institutions in total (Table 1.2). These institutions are organised at the national and state level.

Originally, institutions from the S-system would provide training courses in institutions and firms directly. However, the arrangement was considered overregulated, making it unattractive for many companies (Schartzmann and DeMoura Castro, 2013). As a consequence, it was difficult to find firms willing to offer training positions and employers took little advantage of the levy-scheme. Institutions from the S-system then moved away from this structure and developed their own training schools as a stand-alone operation not linked to any particular job or firm (Almeida et al., 2015). Courses are open to current and prospective workers in each sector of activity.

Table 1.2. Branches of "*Sistema S*"

Institution	Support	Educational branch	Participation in PRONATEC
National Service for Rural Learning (SENAR)	Confederation for Agriculture and Livestock	X	X
National Service for Commercial Learning (SENAC)	Confederation for Commerce	X	X
Social Service for Commerce (SESC)	Confederation for Commerce		
National Service for Learning on Cooperatives (SESCOOP)	National cooperatives service	X	
National Service for Industrial Learning (SENAI)	Confederation for Industry	X	X
Social Service for the Industry (SESI)	Confederation for Industry		
National Service for Learning on Transportation (SENAT)	Confederation for Transportation	X	X
Social Service for Transportation (SEST)	Confederation for Transportation		
Brazilian Service of Support to SMEs (SEBRAE)	Small and Medium Enterprises	X	

Source: SENAI.

Following an agreement signed with the Brazilian government in 2008 and called "*Acordo de Gratuidade*" (gratuity agreement), technical schools from "*Sistema S*" have an obligation to use parts of the funding received through levies to provide training for free to certain segments of the population. Individuals who qualify for free training courses must satisfy some criteria, such as being in receipt of welfare benefits, for example. Therefore, despite charging a tuition fee to the remaining enrolled students, training activities from S-system technical schools are not meant for profit.

Contribution rates for the levy-scheme are different across sector of activity (Table 1.3). This contribution rates are in line with other OECD and non-OECD countries' training levies (Table 1.4). In 2016, these contribution rates represented a transfer of funds of about BRL 16 billion to institutions from the S-system. This corresponds to half the Federal budget allocated to the conditional cash transfer programme "*Bolsa Família*" in 2017.

Table 1.3. Contribution rates for the training levy-scheme

SESI	1.5%
SENAI	1%
SENAC	1%
SESC	1.5%
SEBRAE	Between 0.3% and 0.6%
SENAR	Between 0.2% and 2.5%
SEST	1.5%
SENAT	1%
SESCOOP	2.5%

Source: SENAI.

Table 1.4. Training levies in selected OECD and non-OECD countries

Country	Levy-rate (% of payroll)	Differentiation	Type
		OECD	
Australia	1.5%	No	Levy-exemption
Belgium	0.1% to 0.6%	By sector	Levy-exemption
Canada (Quebec)	1%	No*	Levy-exemption
Denmark	DKK 2 702 **	No	Revenue-generating/cost-reimbursement
France	0.55% to 1%	By firm size	Levy-exemption
Greece	0.24%	No	Levy-exemption
Hungary	1.5%	No	Levy-exemption/revenue-generating/levy-grant
Ireland	0.7%	No	Ley-exemption/revenue-generating
Italy	0.3%	No	Levy-grant
Korea	0.1% to 0.7%	By firm size	Levy-grant
Netherlands	Up to 2%	By sector	Levy-grant
Poland	0.25%	No	Levy-grant
Spain	0.7% (of which 0.1% on workers)	No	Levy-exemption
United Kingdom	0.5% to 2.5%	By fund	Levy exemption
		Non-OECD	
South Africa	1%	No*	Levy-grant/revenue-generating

Note: *Canada (Quebec) and South Africa exempt the obligatory 1% of payroll contribution for firms with a payroll under a certain threshold. **Denmark has a lump sum of DKK 2 702 per full-time employee per year paid to the AUB, which reimburse wages paid to employees undergoing off-the-job training.
Source: OECD (2018b).

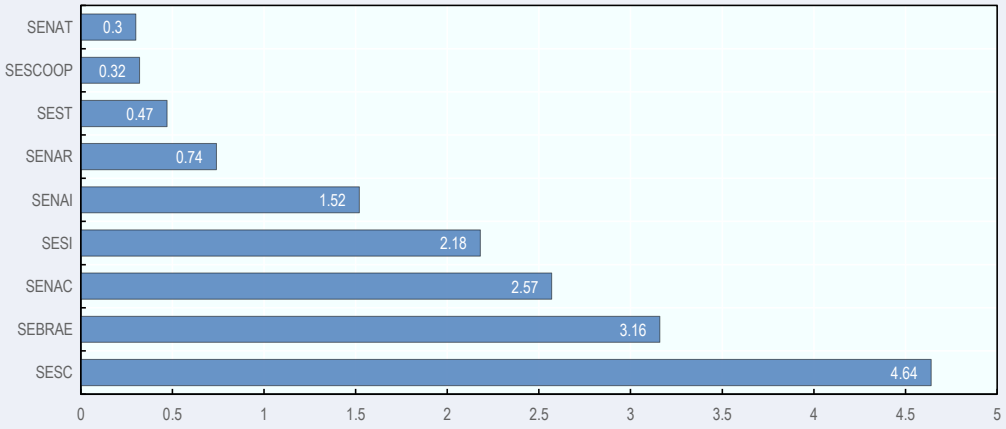
In the last decade, technical schools from the S-system have diversified their funding structure. On top of training courses funded by the levy-scheme and tuition fees, schools have started to offer consultancy and privately-mandated research services. They have also started to sign training agreements with particular firms directly – without passing through the levy-scheme – so as to sale job-specific training services that meet firms' particular needs.

Funding coming from the levy-scheme is protected against inflation and it provides a secure and stable income to S-system training institutions. Funding towards training in the public system is much more dependent on economic and political fluctuations. This is a critical advantage for "*Sistema S*" technical schools. On the other hand, the fact that these institutions were able to diversify their sources of funding, in particular through the offer of training services to firms directly, means that this system does not suffer from the pitfalls of a fully levy-based financing model. For instance, there is no monopoly in the

training market and enterprises are not bounded to specific training institutions. Furthermore, training courses offered by S-system technical schools under the gratuity agreement are also accessible to unemployed workers and workers in the informal sector.

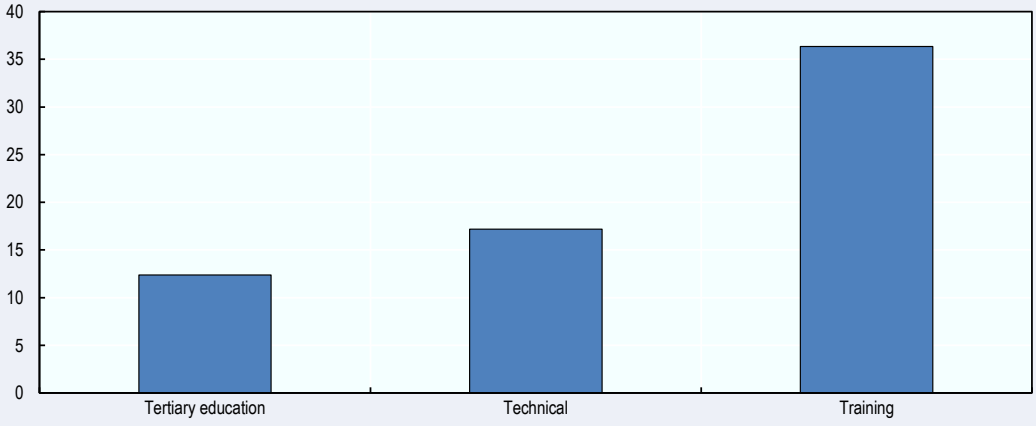
Currently, SENAI alone has over one thousand training units across the country, including 442 mobile ones. Indeed, SENAI, is the largest "*Sistema S*" institution in terms of training capacity. SENAI has provided training to over 35% of the manufacturing sector's workers. Even among those with tertiary education, despite being a minority in the industry, almost 15% studied at a training unit of SENAI (Figure 1.15). Almost 40% of the FIC course training received by workers in manufacturing was provided by a SENAI technical school.

Figure 1.14. Total transferred through the levy-scheme to S-system institutions in 2016



Note: Values expressed in billion Brazilian Reals.
Source: Federal budget.

Figure 1.15. Share of workers in manufacturing who received training at SENAI in 2015



Source: SENAI.

1.1.4. Employer-provided on-the-job training

Employers are usually reluctant to provide general skills training as they fear that workers will leave the firm and earn a premium for their skills elsewhere. As a result, general skills training is underprovided by firms. Employers may have stronger incentives to provide training for job-specific skills. But even so, there are several market failures that can lead employers and employees to sub-optimally invest in job-specific skills. For example, problems with credit markets can prevent firms from financing their investment in training. If employers have market power and are able to keep wages down, workers are also less likely to invest in their own training.

In Brazil, employers remain reluctant to provide on-the-job training. Only 42% of the firms enquired by the World Bank Enterprise Survey in 2009 offered formal training to their employees. From the firms that provided formal training, on average, less than 62% of their workforce took advantage of that training. Both figures lie well below the average for all Latin American and Caribbean countries. In 2016, Brazilian firms offered an average of 22 hours of training per employee, compared to 32 hours in the United States. Furthermore, multinational firms settled in Brazil offered 38% more hours of on-the-job training than domestic firms. In terms of financial investment, Brazilian firms invested in 2016 about 0.46% of their volume of sales on training and personnel development, compared to 1.5% for firms in the United States (ABTB/Integração/Carvalho & Mello/Inteligência Corporativa, 2016). One key barrier for employer-provided training in Brazil is high job turnover rates, which significantly reduce incentives for employers to invest in training of any kind. In Brazil, less than 20% of jobs have a tenure of more than two years (OECD, 2018a).

A sub-optimal level of investment in job-specific skills calls for government intervention to build and upgrade job relevant skills amongst the Brazilian workforce. Solutions can include subsidizing training, tax benefits for firms who invest in on-the-job training, or designing contracts that reduce the likelihood of poaching (payback clauses or apprenticeship contracts), for example.

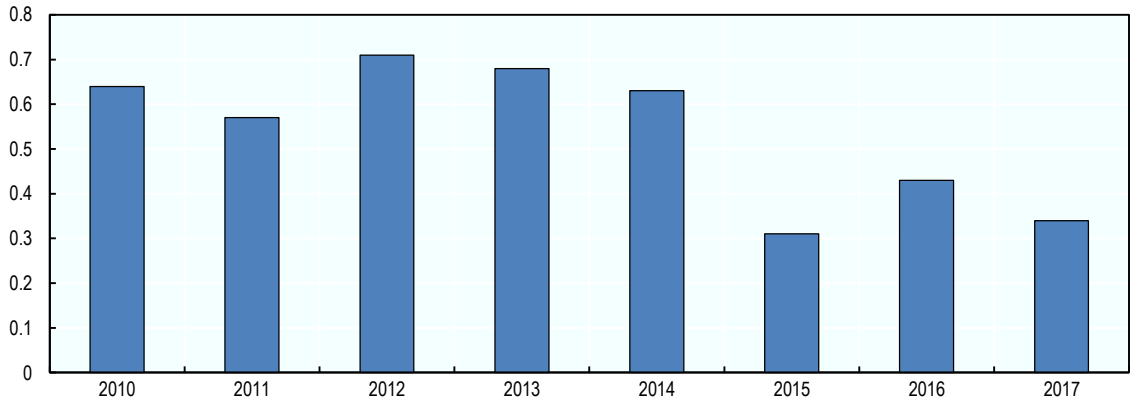
Government intervention is even more necessary since Brazilian employers report notoriously high levels of hiring difficulties. Before the crisis, over 60% of employers reported difficulties filling out jobs. This figure decreased, but in 2017, despite high unemployment, still one-third of employers kept reporting hiring difficulties (Figure 1.16). This indicates that employers cannot find among the large number of unemployed people, those with the necessary skills set.

Lack of skills is the most important reason why those employers experience hiring difficulties. In fact, 41% of employers cannot find the hard skills they need and another 17% reports difficulties recruiting workers with the necessary set of soft skills (Figure 1.17). Based on the World Bank Enterprise Survey, in 2009, 75% of firms in Brazil identified an inadequately educated workforce as a major constraint to their activity. In comparison, the share of firms identifying an inadequately educated workforce as a major constraint over all Latin and Caribbean countries was less than 32%.

Overall, the conjugation of the economic and labour market situation in Brazil, the demographic pressure, the low educational attainment, the lack of a solid vocational training system and the sub-optimal investment in on-the-job training, will most likely induce several skill imbalances in the form of skill mismatch and skill shortages. The next

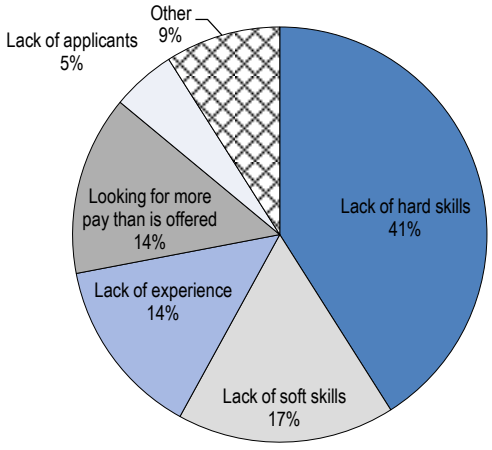
section highlights the current skill imbalances in Brazil, based on the OECD Skills for Jobs Database 2018.

Figure 1.16. Share of employers reporting difficulty filling jobs in 2015



Source: Talent Shortage Survey 2015 - Manpower Group.

Figure 1.17. Why employers say it is hard to fill positions



Source: Talent Shortage Survey 2015 - Manpower Group.

1.2. Skill shortages and mismatch in Brazil: highlights from the OECD Skills for Jobs database

The effectiveness of skills policies in addressing existing skill imbalances, promoting employment and fostering firms' innovation and growth strategies depends on their alignment to labour market needs. That is, whatever policies governments decide to put in place - subsidizing training, tax benefits for firms who invest in on-the-job training, designing contracts that reduce the likelihood of poaching, etc. - their effectiveness will depend upon their capacity to ultimately equip individuals with the skills needed to find jobs.

For that purpose, understanding what these skill imbalances are, whether they come in the form of mismatch or shortages, who experiences skill mismatch and where skill shortages are mostly felt, is crucial to design effective programmes and policies. Brazil already faces several skills shortages, which are unequally spread across its regions. In this section, the current skill shortages in Brazil are underlined using the OECD Skills for Jobs Database 2018.

The Skills for Jobs Database (OECD, 2017c) provides regularly-updated international evidence on skill shortages, surpluses and mismatch. It includes over 30 OECD and partner countries. Two indicators are constructed: an occupational-level indicator and skill-level indicator. The occupational-level indicator measures the extent of shortage/surplus for each occupation at the two-digit ISCO-08 (International Standard Classification of Occupations) level[1]. However, the use of occupational dynamics to approximate for skill needs does not usually provide the necessary granularity to truly understand the phenomenon (OECD, 2017c). Therefore, occupations are mapped into skill requirements using the O*NET database and another indicator is constructed at the skill-level (further details about the methodology in Box 1.2).

Box 1.2. OECD Skills for Jobs database: Methodology

In order to draw a multidimensional picture of the surplus and shortage of workers in specific occupations, the OECD skill needs indicator is made up of five complementary sub-indices capturing different signals of mismatch:

Wage pressure

Wages can be interpreted as the price measure attached to the scarcity of workers and to the skills they possess, which vary according to supply and demand pressures. If wages grow significantly and above the national trend in a specific occupation, this points towards the direction of shortage of skills used in that occupation. Therefore, wage pressure is measured using **hourly wage growth** by occupation.

Employment pressure

If wages can be interpreted as the price attached to workers' skills, employment levels are the volumes or quantities. An increase in the quantity of employed workers in a particular occupation or possessing a particular skill can be interpreted as an indication that demand for this occupation or skill is rising.

Nevertheless, statistics about the number of employed individuals are only an imperfect proxy for the volume of services supplied as workers in different jobs often also work different hours. When facing shortages, employers may respond by incentivising over-time or by increasing the hours worked of the available workforce. Hence, an increase in the hours worked by individuals employed in a certain occupation is interpreted as a signal of stronger demand for that occupation and for the associated skills.

Finally, information about skill shortages or surpluses can be extracted from the analysis of unemployment rates at the occupational level. Unemployment provides information about the relative difficulty for specific workers in re-entering the labour market, functioning as a proxy for the demand for the skills of these workers. As such, low unemployment rates signal shortages.

Therefore, employment pressure is measured using **total employment growth**, **growth**

in hours worked and the **unemployment rate**, by occupation.

Talent pressure

Pronounced increases in the share of workers with qualifications that are lower than those required by their jobs can be interpreted as a situation where employers are unable to find well-matched candidates and, as a result, revert to hiring underqualified workers. Hence, a sustained increase in under qualification in specific occupations can be signalling the existence of a relatively small pool of candidates with the adequate skills. Therefore, talent pressure is measured using the **percentage point difference in the share of workers who are underqualified** by occupation.

No single sub-index provides, on its own, a perfect signal for skill needs. Wage growth, for example, might be driven by collective bargaining agreements, rather than by skills imbalances, and employment growth may signal demand for labour, but not necessarily a shortage of skills. By combining all sub-indices into one final composite indicator, the impact of confounding signals is minimised and the power of the final indicator amplified. The value of this index signals the extent of the shortage (positive values) or surplus (negative values) in the occupation.

The composite indicator of surplus and shortage at the occupational level is then translated into skill needs by mapping the occupations to their skill requirements. This mapping is carried out by attaching to occupational results the information provided by O*NET on both the level and importance of different skill dimensions for each one of the occupations analysed (for more information on O*NET). For each skill dimension, the final skill shortage/surplus indicator takes the average of the occupational indicators, weighted by how much they require that particular skill dimension (taking the product of the importance and level for each skill dimension) and by their employment share.

A given skill will be in shortage if occupations in shortage use this skill intensively. In contrast, another skill will be in surplus if occupations do not require the skill as much or the occupations that use the skill intensively are in surplus. The final skill needs indicator provides information about the direction – surplus (negative values) or shortage (positive values) - and the magnitude of the need for a range of skill dimensions.

For Brazil, the indicators were constructed using data from the "*Pesquisa Nacional por Amostra de Domicílios*" (PNAD), which is an annual national household survey that aims at producing longitudinal information about the population's participation in the labour market in association with demographic and educational characteristics. The data used refers to 2014. Data from PNAD is collected and statistically treated by the "*Instituto Brasileiro de Geografia e Estatística*" (IBGE) or the Brazilian Institute for Geography and Statistics.

Administrative data from RAIS ("*Relação Annual de Informações Sociais*") could have also been used, however, it is only representative of the formal labour market. Formally employed workers make up only 54% of the entire workforce (Santiago and Vasconcelos, 2017). Therefore, although the sample size in RAIS is much larger than PNAD and data on earnings might be more reliable for not being self-reported, using data that is representative of the entire labour market in Brazil is preferable.

1.2.1. Occupational shortages

According to the 2018 OECD Skills for Jobs database, the occupations that are currently in shortage in Brazil are mostly occupations in the services, health and Information and Communications Technology (ICT) sectors (Figure 1.18).

To begin with, personal care workers, personal services workers and protective services workers, all appear to be in high shortage in Brazil. This includes workers in tourism and hospitality, domestic services, and public safety. Curiously, these are all occupations whose importance is expected to rise further with population ageing, automation and globalisation. For instance, health care assistants and home-based personal care workers are expected to be increasingly needed as life expectancy increases. Travel attendants, touristic guides, cooks, waiters and bartenders, hairdressers and beautician workers, as well as protective services workers, are all related to non-tradable services, that is, services that cannot be off-shored or imported from abroad. Finally, tasks carried out by child care workers and individuals working in teaching or instruction cannot be easily automated.

Health professionals, and particularly, health associated professionals also appear to be in shortage in Brazil. Again, this could be explained by population ageing in Brazil as discussed in sub-section 1.1.2. Health professionals include medical doctors, nurses and midwives, paramedical workers, veterinarians, dentists, pharmacists, physiotherapists, nutritionists, opticians, among others. But the occupations that appear to be in even more significant shortage are medical imaging technicians, pathology laboratory technicians, pharmaceutical assistants, dental prosthetic technicians, dental assistants, ambulance workers, veterinary assistants, among others.

ICT professionals is the second occupational category most in shortage in Brazil. This includes software and applications developers and analysts, as well as database and network professionals. ICT technicians also exhibit a moderate shortage. This refers to ICT user support technicians, web technicians, broadcasting and audio-visual technicians, among others.

Customer services clerks and clerical support workers also seem to be in shortage in the Brazilian labour market. This includes bank tellers, money-lenders, debt collectors, travel consultants, hotel receptionists, survey and market research interviewers, library receptionists or mail carriers. General keyboard clerks and numerical and material recording clerks, however, seem to be in surplus. This includes secretaries, typists, data entry clerks, accounting and bookkeeping clerks or yet, payroll clerks. The former occupations require workers to carry tasks with a human interaction or inter-personal component. The later, on the opposite, are occupations whose tasks are mostly manual, repetitive, and that do not require much human interaction. To some extent, this could already reflect the assimilation of new technologies in Brazil.

Business and administration professionals also appear to be in high shortage, while managers, on the other hand, are in surplus. This means that financial analysts, investment advisers, training and staff development professionals, public relations, advertising and marketing professionals are increasingly difficult to find, while senior managers and chief executives abound.

None withstanding, there are still some low-skilled occupations that seem to be in shortage in Brazil. This includes house builders, bricklayers, stonemasons, carpenters, floor layers, plumbers, precision-instrument makers and repairers, handicraft workers in wood, textile or leather, miners and quarries, shoemaking machine operators, chemical

products plant and machine operators, mechanical machinery assemblers, railway operators, taxi, bus, tram and truck drivers, as well as garbage collectors, among many others.

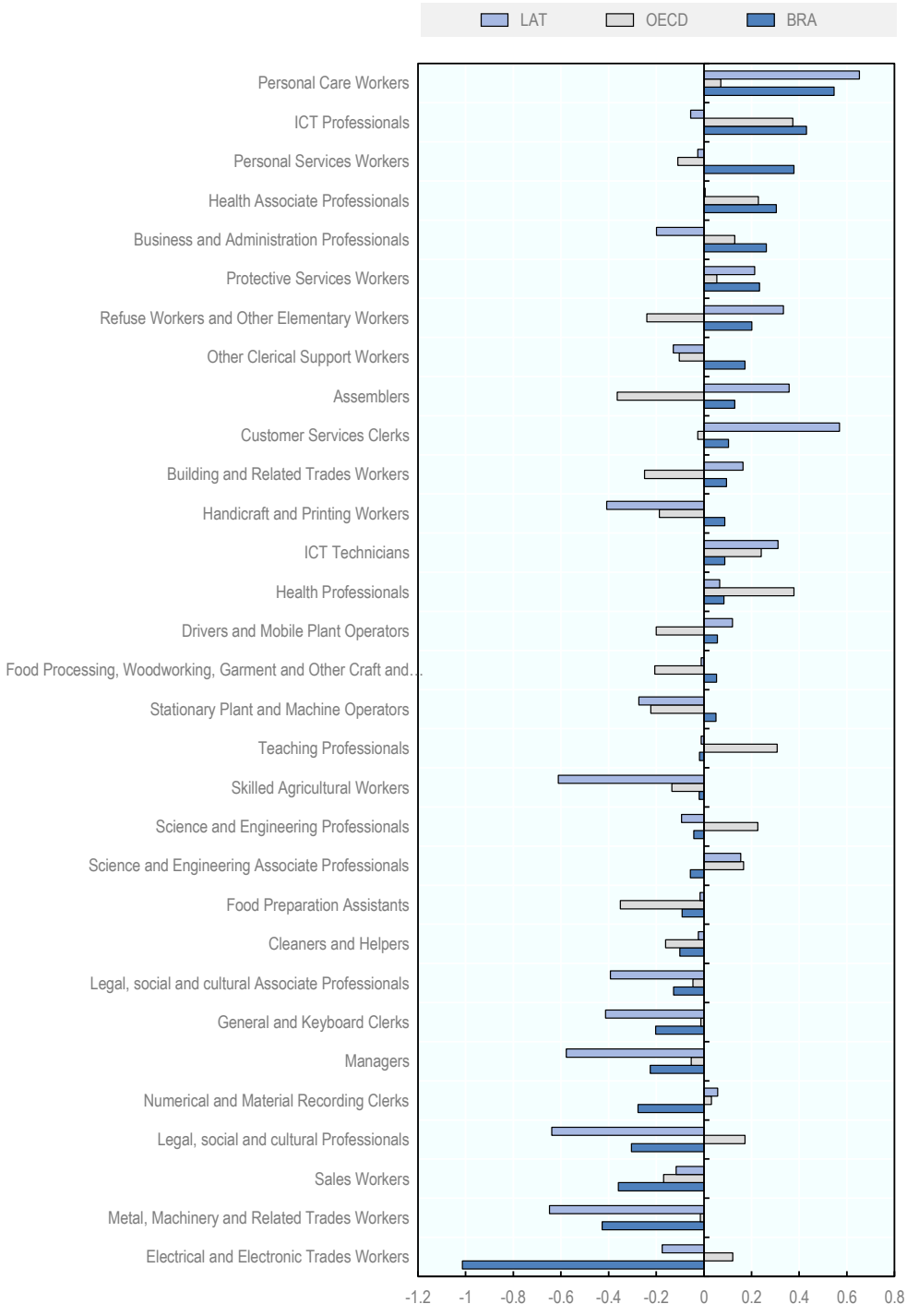
The three occupational categories that exhibit higher surplus are electrical and electronics trades workers, metal, machinery and related trades workers, and sales workers. The first two occupational groups include electrical equipment installers and repairers, electronics and telecommunications installers and repairers, metal workers, metal moulders, and machinery mechanics and repairers. Sales workers include shop sales assistants, shopkeepers, and shop supervisors.

Finally, individual working in legal, social and cultural activities, seem to be in considerable surplus. Individuals working in sciences and engineering, on the other hand, appear to be in right number for the existing demand.

The pattern of occupational shortage in Brazil is quite consistent with the Latin American average (Argentina, Brazil, Chile, Mexico and Peru), with a few punctual exceptions. Compared to the OECD average, however, there are some substantial differences. For instance, all the low-skilled occupations in shortage in Brazil, are in surplus in OECD countries: refuse workers and other elementary workers, assemblers, building and related trades workers, handicraft and printing workers, or drivers and mobile plant operators. On the other hand, workers in sciences and engineering, who are neither in surplus or shortage in Brazil, are mostly in shortage across OECD countries.

These findings are consistent with the previous literature on skill shortages in Brazil. Based on a review of that literature, there is no evidence of a generalised shortage of skilled workers in Brazil, but rather some punctual shortages in very specific areas (Nascimento, 2015). For instance, shortages of builders and health professionals were identified in the recent years.

Figure 1.18. Occupational shortages in Brazil, selected Latin American and OECD countries



Note: Negative (Positive) values indicate that a specific occupation is in surplus (shortage). Values for Latin America are obtained by taking the average of the occupational indicators for Argentina, Brazil, Chile, Mexico and Peru. Values for the OECD are obtained by taking the average for all OECD countries included in the 2018 OECD Skills for Jobs database. Latest year available for each country.
Source: OECD 2018 Skills for Jobs database. Results for all countries can be visualised at http://www.oecdskillsforjobsdatabase.org.

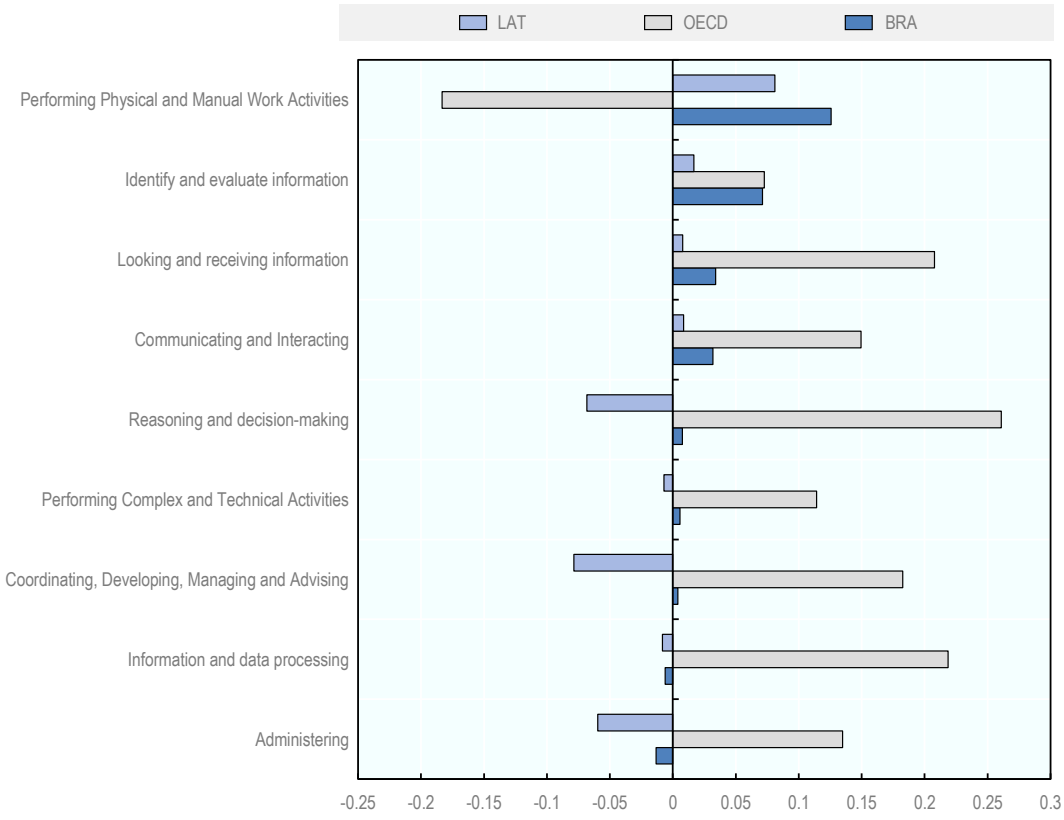
1.2.2. Skills shortages

Going beyond the shortages indicators at the level of occupations, it is possible to look at the pattern of shortages per work activities, work styles, abilities, knowledge and skills, as defined in the O*NET database.

Work activities are typical behaviours and tasks required to a smaller or larger extent in a very large number of occupations and observed in almost all industries. In O*NET, for example, work activities include looking for and receiving job-related information. This comprises getting information, monitoring processes and surroundings, etc. Another work activity considered is identifying and evaluating job-related information. This includes activities such as identifying objects, actions and events, inspecting equipment, structures and materials, estimate quantities of products, etc.

According to the 2018 OECD Skills for Jobs database, in Brazil and other Latin American countries, there are still shortages of individuals able to perform physical and manual work activities (Figure 1.19). This is in clear contrast with OECD countries, where physical and manual work activities are in surplus. The two other work activities that are most in shortage are to identify and evaluate information, as well as looking for and receiving information, which are cognitive activities also in shortage across OECD countries. On the other hand, administering and data processing are work activities in surplus in Brazil.

Figure 1.19. Work activities shortage indicators in Brazil, selected Latin American and OECD countries



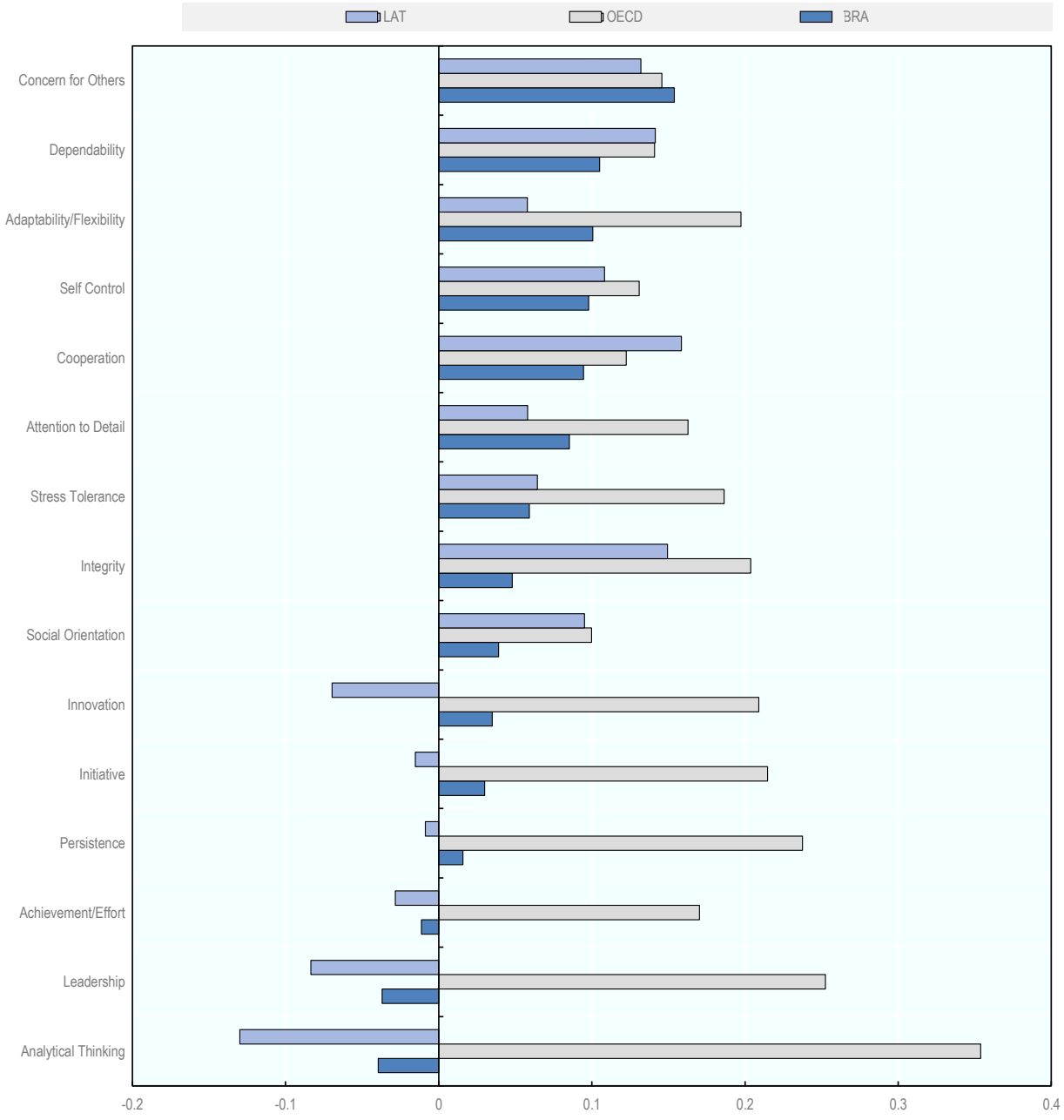
Note: Negative (positive) values indicate that a specific work activity is in surplus (shortage). Values for Latin America are obtained by taking the average of the occupational indicators for Argentina, Brazil, Chile, Mexico and Peru. Values for the OECD are obtained by taking the average for all OECD countries included in the 2018 OECD Skills for Jobs database. Latest year available for each country.
Source: OECD 2018 Skills for Jobs database. Results for all countries can be visualised at: http://www.oecdskillsforjobsdatabase.org.

Figure 1.20 looks at the pattern of shortages for work styles. Work styles refer to personal characteristics that can affect how well someone performs a job. Work styles in O*NET are grouped in achievement orientation (achievement/effort, persistence and initiative), social influence (leadership), interpersonal orientation (cooperation, concern for others, social orientation), adjustment (self-control, stress tolerance, adaptability/flexibility), conscientiousness (dependability, attention to detail, integrity), and practical intelligence (Innovation and analytical thinking).

Interpersonal orientation seems to be the work style most in shortage in Brazil. In fact, all its components – concern for others, cooperation and social orientation – exhibit a positive value for the shortage indicator. The second work style most in shortage seems to be conscientiousness, with again, all of its components – dependability, attention to detail and integrity - being in shortage too. Finally, the capacity to adapt, measured through adaptability/flexibility, self-control and stress tolerance, is the third work style most in shortage. On the opposite of the spectrum, analytical thinking and leadership are work

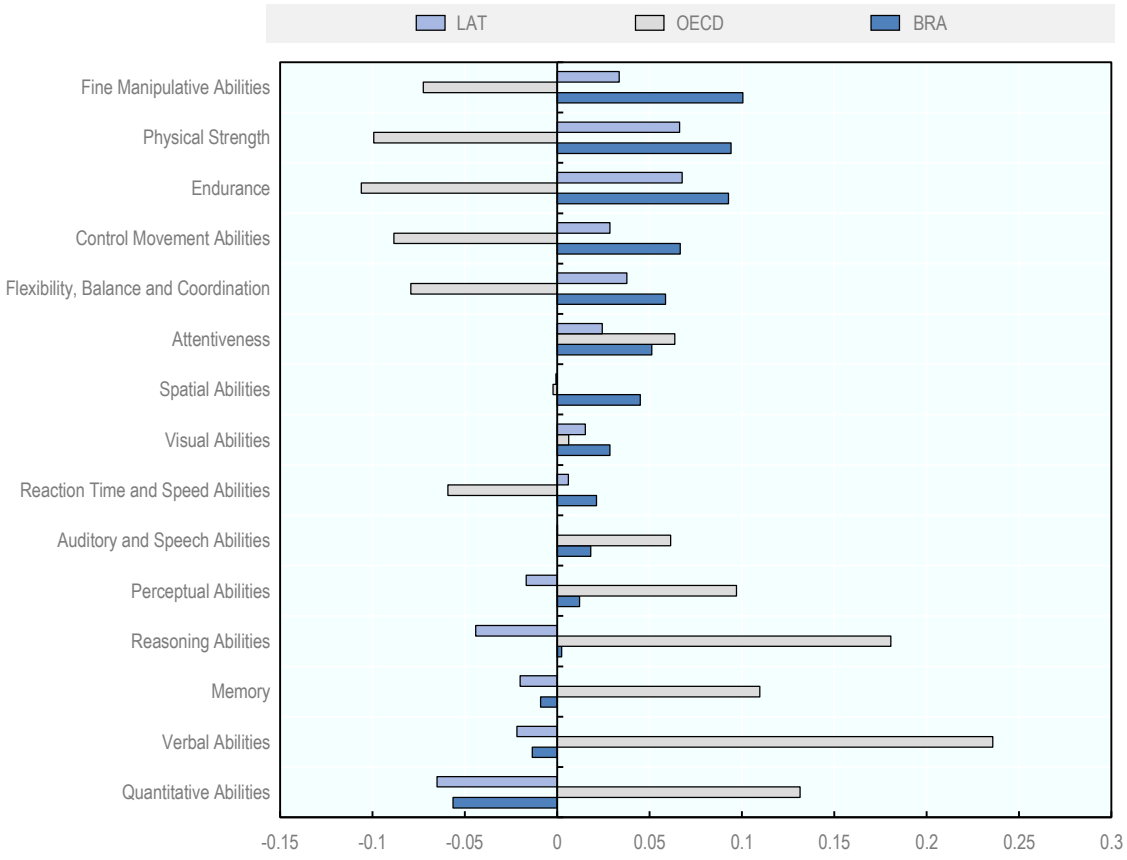
styles in surplus. Surpluses could be explained because individuals possess those characteristics in excess or because there is no demand for such character traits.

Figure 1.20. Work styles shortage indicators for Brazil, selected Latin American and OECD countries



Note: Negative (positive) values indicate that a specific work style is in surplus (shortage). Values for Latin America are obtained by taking the average of the occupational indicators for Argentina, Brazil, Chile, Mexico and Peru. Values for the OECD are obtained by taking the average for all OECD countries included in the 2018 OECD Skills for Jobs database. Latest year available for each country.
Source: OECD 2018 Skills for Jobs database. Results for all countries can be visualised at: http://www.oecdskillsforjobsdatabase.org.

Figure 1.21. Abilities shortage indicators in Brazil, selected Latin American and OECD countries



Note: Negative (positive) values indicate that a specific ability is in surplus (shortage). Values for Latin America are obtained by taking the average of the occupational indicators for Argentina, Brazil, Chile, Mexico and Peru. Values for the OECD are obtained by taking the average for all OECD countries included in the 2018 OECD Skills for Jobs database. Latest year available for each country.
Source: OECD 2018 Skills for Jobs database. Results for all countries can be visualised at: http://www.oecdskillsforjobsdatabase.org.

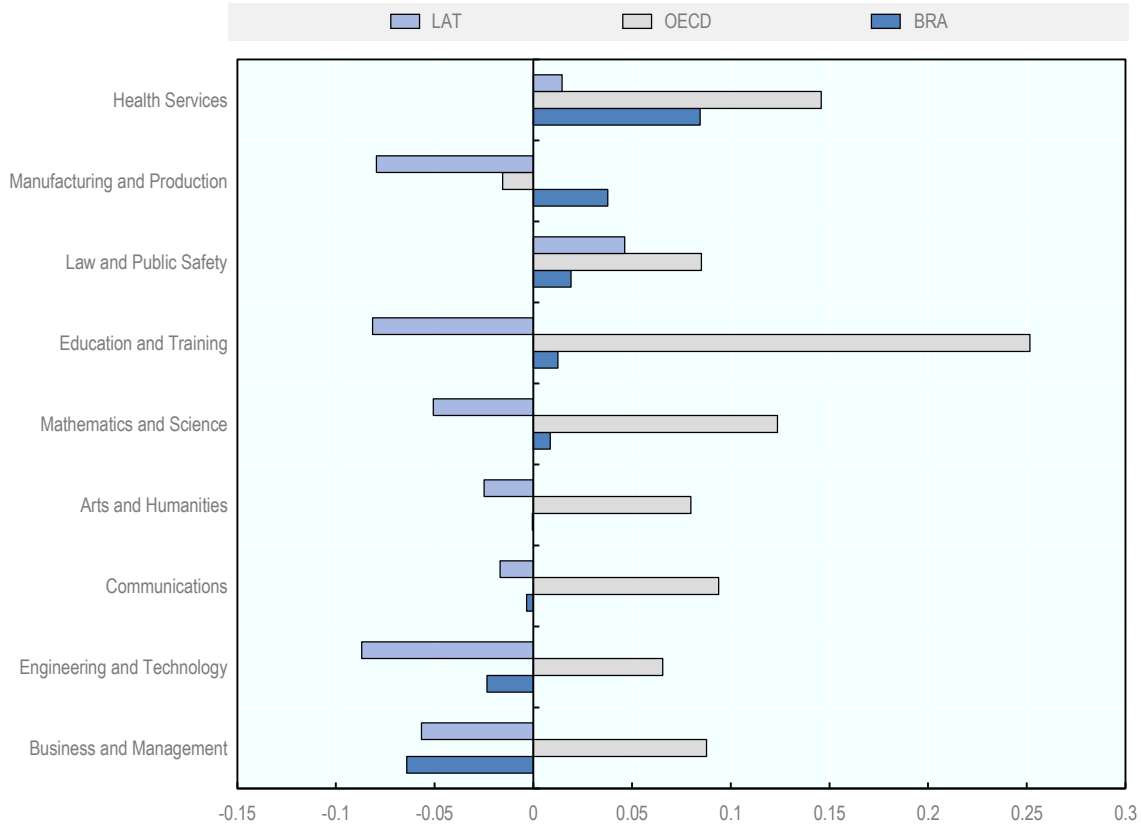
Figure 1.21 looks at shortages in abilities. Abilities are enduring individual attributes that can influence performance at work, how individuals approach tasks, and how they acquire relevant knowledge and skills. Abilities can be classified in cognitive abilities (verbal abilities, reasoning abilities, quantitative abilities, memory, perceptual abilities, spatial abilities, attentiveness), psychomotor abilities (fine manipulative abilities, control movement abilities, reaction time and speed abilities, physical abilities, physical strength abilities), endurance (stamina), flexibility, balance and coordination (extent flexibility, dynamic flexibility, gross body coordination, gross body equilibrium), sensory abilities (visual abilities, auditory and speech abilities).

In Brazil, consistent with the work activities most in shortage, the abilities that are most needed are related to psychomotor abilities and endurance. On the contrary, cognitive abilities are either in surplus, or exhibit a small shortage. Cognitive abilities, especially quantitative abilities, verbal abilities, memory and reasoning abilities, are amongst the

least needed ones. This is in sharp contrast with OECD countries, where cognitive abilities are significantly in shortage and psychomotor abilities are in surplus.

Knowledge are organised sets of principles and facts applying in general domains. Knowledge can be acquired or developed through experience and education. Some jobs require specific knowledge, in which case, having acquired such facts and principles may affect work performance. O*NET considers several categories of knowledge. For example, the knowledge category "business and management" includes knowledge in the areas of administration and management, clerical, economics and accounting, sales and marketing, customer and personal services, personnel and human resources. The shortage indicators for knowledge are depicted in Figure 1.22.

Figure 1.22. Knowledge shortage indicators in Brazil, selected Latin American and OECD countries



Note: Negative (positive) values indicate that a specific knowledge is in surplus (shortage). Values for Latin America are obtained by taking the average of the occupational indicators for Argentina, Brazil, Chile, Mexico and Peru. Values for the OECD are obtained by taking the average for all OECD countries included in the 2018 OECD Skills for Jobs database. Latest year available for each country.
Source: OECD 2018 Skills for Jobs database. Results for all countries can be visualised at: http://www.oecdskillsforjobsdatabase.org.

Business and management, including personal and human resources management, is the knowledge type most in surplus in Brazil. It is followed by knowledge in engineering and technology. On the other hand, knowledge in health services is in significant shortage. Knowledge in education and teaching also appears to be in shortage in Brazil, which is

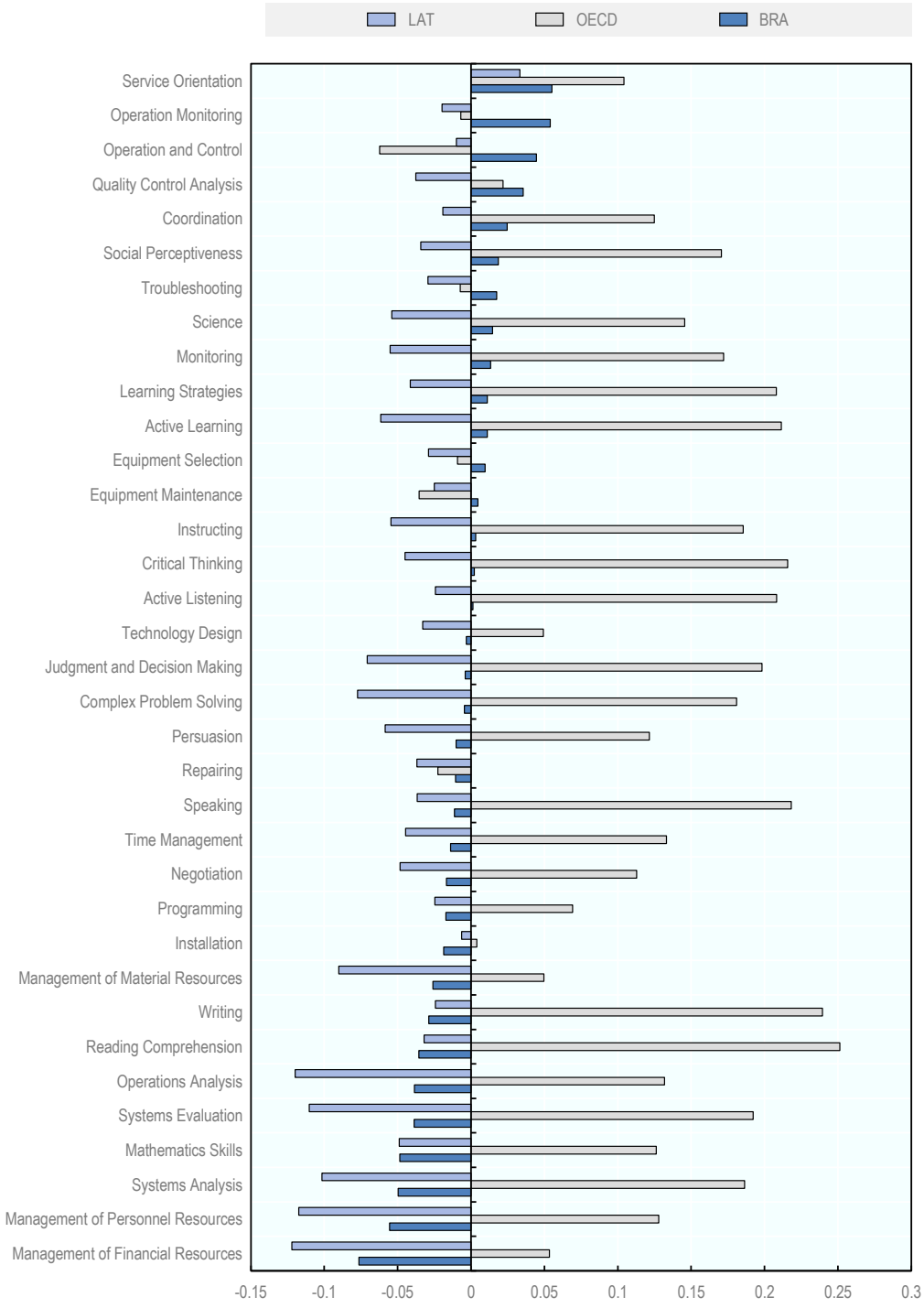
consistent with the revision of the previous literature (Nascimento, 2015). Again, the pattern in Brazil is very much in line with the pattern of shortages in knowledge types experienced by other Latin American countries, with the exception of knowledge in manufacturing and production, education and training, and finally, mathematics and science. Brazil and other Latin American countries exhibit a pattern that is quite distinct from OECD economies, where all knowledge are in shortage except for knowledge in manufacturing and production.

Finally, skills allow individuals to establish procedures to work with given knowledge. Skills are also acquired or developed through experience. In O*NET, skills are divided into different categories. Basic content skills, for example, includes reading comprehension, active listening, writing, speaking, mathematics and science. Basic process skills, on the other hand, includes critical thinking, active learning, learning strategies, and monitoring. Skills shortages are represented in Figure 1.23.

Resource management skills are amongst the skills most in surplus in Brazil – either because the current workforce already possesses too much of this type of skills or because current jobs and vacancies do not require them. System skills also appear not to be needed at the current moment, particularly, systems analysis and systems evaluation. Some basic skills, such as mathematics, reading comprehension, writing and speaking, are also in surplus. On the contrary, in Brazil, social and technical skills appear to be in shortage. This includes service orientation, coordination and social perceptiveness in one hand, and operation monitoring, operation and control, and quality control analysis, on the other hand.

Analysing the results of the OECD *Skills for Jobs database* can be very informative about the current skill shortages in Brazil. Nevertheless, there are other methods to assess skill shortages that are less data intensive and that should be used to complement the type of analysis conducted in this chapter. Additionally, for education, training, employment and migration policies, assessing the current state of the labour market may already be too late, as some policies take a significant amount of time to be implemented and to produce the desired effects. The next chapter will describe methods to anticipate skill needs and how these methods could be implemented in Brazil.

Figure 1.23. Skills shortage indicator



Note: Negative (positive) values indicate that a specific skill is in surplus (shortage). Values for Latin America are obtained by taking the average of the occupational indicators for Argentina, Brazil, Chile, Mexico and Peru. Values for the OECD are obtained by taking the average for all OECD countries included in the 2018 OECD Skills for Jobs database. Latest year available for each country.
Source: OECD 2018 Skills for Jobs database. Results for all countries can be visualised at: http://www.oecdskillsforjobsdatabase.org.

Note

[1] The International Standard Classification of Occupations (ISCO) has been developed by the International Labour Organisation (ILO). More information at: http://www.ilo.org/public/english/bureau/stat/isco/isco08/.

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Chapter 2. Skills assessment and anticipation exercises

This chapter describes the fundamental aspects of the Brazilian Skills assessment and anticipation exercises. First, it discusses initiatives that have been led by the Government. Second, it describes initiatives launched by other relevant stakeholders, such as employers' associations. The chapter analyses the specific challenges faced by these exercises along with solutions that have been found effective in other countries.

In order to design skills policies and training programmes that effectively anticipate and tackle skills imbalances, as well as respond to labour market needs, countries must thoroughly analyse their demand for and supply of skills in a systematic and regular manner. Methods to assess current and prospective skill needs are known as Skills Assessment and Anticipation (SAA) exercises.

Skills assessment and anticipation exercises have existed for more than 50 years and are carried out in virtually all OECD countries. There is no single approach to SAA exercises and the frameworks put in place by different countries vary in terms of the definitions used for skills, the time span, the frequency, the methods and data sources used and whether the exercises have a national, regional or sectoral scope (OECD, 2016).

In Brazil, as of now, there are no rigorous and systematic initiatives to carry out this kind of exercises. In this chapter, the few and scattered SAA initiatives in Brazil are described and compared to the best practices of SAA exercises internationally. Some recommendations are drawn based on these examples from abroad.

2.1. Government-led SSA initiatives

SAA exercises are tools to generate information about the current and future skills needs of the labour market and the available skill supply. The information produced by SAA exercises can serve several purposes. It can inform policy makers in charge of defining employment, education and training, and migration policy. In addition to governments, social partners can also use the information produced by SAA exercises to advise their members on skills to promote within their firms or among their workers, to inform collective bargaining processes and to disseminate the information to a wider audience. Individuals can use the information coming from SAA exercises when making educational or career choices.

2.1.1. Definition of skills for SAA exercises

Skill needs are commonly approximated by measuring which occupations are, or will be, in greater or lesser demand. Occupational forecasts are, in fact, at the origin of the skill needs exercises pioneered by the Bureau of Labour Statistics in the United States (OECD, 2016). However, it is not always clear what skills, educational qualifications or fields-of-study are the most appropriate to satisfy those occupational needs. In some countries, qualification frameworks, occupational standards or detailed descriptions about occupations have been developed to link specific occupations with specific qualifications, fields-of-study or competencies, and ultimately, determine current or future skill needs in terms of attributes that are more useful to those responsible for designing education, training and skills policies.

In Brazil, the Ministry of Labour developed the "*Classificação Brasileira de Occupações*" (CBO) or the Brazilian Classification of Occupations (http://www.ocupacoes.com.br/). The CBO is a document that lists existing occupations in the Brazilian formal labour market, briefly describes the job content, as well as the education and experience requirements in terms of qualification level and field-of-study. A framework has been developed that links each occupation with related professions. Occupations in the CBO are listed with a high level of detail (up to six digits classification). The CBO has existed since 1982 and has already been updated several times so as to reflect structural changes in the labour market. The most recent update was carried in 2002.

The development of the CBO allows the Brazilian government to link trends in occupational demand with demand for specific educational degrees and levels of experience. One of the uses of the CBO, for example, has been to guide individual educational and training choices. The Ministry of Education (MEC) regularly publishes updated catalogues of vocational training courses and short free-form training courses (FIC courses): the "*Catálogo Nacional de Cursos Técnicos*" and the "*Guia PRONATEC de cursos FIC*", respectively (further details about the later in chapters 4 to 8). These catalogues list all MEC-approved training courses, the minimum number of hours of training required, the entry requirements for each course, and a short description of the course content, among other things. For the last edition of these catalogues, in 2016 , the associated occupational CBO codes were included for some of the listed training courses. Based on that information and the regular statistics published by the Ministry of Labour about median earnings and hiring rates per occupation, individuals can make a more informed decision on which vocational training programme or FIC course to enrol into.

The disadvantage of relying on measuring skills as qualification levels, types or fields of study is that educational credentials do not necessarily map to skills required on the job and that there is a substantial variability amongst individuals with the same credentials in terms of their skills and readiness to perform a job (Quintini, 2011).

In response to such limitation, several countries link occupation-based assessment and anticipation information to specific skills through comprehensive occupational standards or descriptions of what skills are required in each occupation (OECD, 2016). In Canada, for example, the National Occupational Classification (NOC) describes the skills required by each of 500 occupational unit groups. In the United States, as another example, a database has been constructed - called *O*NET* - that contains detailed information about the knowledge, abilities and competencies' requirements of more than 900 occupations (Box 2.1). Developing a more detailed description of skills associated to each occupation listed in the CBO would be one possible way forward to develop a more effective skills assessment and anticipation system in Brazil. In Italy, a survey has been implemented to regularly identify skill, knowledge, values and attitudes required by an occupation (OECD, 2016).

Box 2.1. *O*NET*: The Occupational Information Network

The Occupational Information Network (O*NET) is a project developed under the responsibility and sponsorship of the U.S. Department of Labor/Employment and Training Administration (USDOL/ETA). The project consists in collecting information about occupations in the U.S. labour market so as to understand how the nature of work is changing and how it impacts the workforce and U.S. economy.

Every occupation requires a different mix of knowledge, skills and abilities, and is performed using a variety of tasks. The O*NET project constructed a database containing a standardised description of almost 1 000 occupations regarding day-to-day aspects of the job and the qualifications and interests of the typical worker. Occupations are taken from the Standard Occupational Classification[1] (SOC), which was last revised in 2010 to keep up with the changing occupational landscape.

The O*NET database includes variables that are comparable across occupations and describe:

- Worker characteristics: personal and enduring characteristics required in each occupation for effective work performance. For example, abilities, preferences for work environments, work values and work styles.
- Worker Requirements: work-related characteristics that can be acquired and developed through experience and education required in each occupation. For example, basic skills that facilitate learning, cross-functional skills, knowledge and prior education required to perform the job.
- Experience Requirements: requirements related to previous work activities. For example, experience and training required to perform the job, entry requirements to be hired for the job, licenses, certificates or registrations required to hold the job.

The database also includes occupation-specific descriptors, such as the title and SOC identifying code, the description of required and important duties performed by workers in that occupation, alternate titles for the same job, occupation-specific tasks, tools and technologies used in each occupation.

The database is available to the public at no cost and can be downloaded at https://www.onetcenter.org/overview.html. The data is continually updated with ongoing surveys of each occupation's worker population and occupation experts. Respondents indicate the importance of a given skill, knowledge or ability for their job (on a scale from one, not important, to five, extremely important) and the level of the skill, knowledge or ability needed for their job (on a scale from zero to seven). Work styles and contexts are classified solely based on importance.

O*NET is widely considered to be the most detailed and comprehensive assessment of skills used in employment that exists (Beblavy et al., 2016; Dickerson et al., 2012). O*NET has even been regularly used for the analysis of countries other than the United States, assuming that skills needed for particular occupations in the U.S. are the same as those needed by the same occupations elsewhere. This assumption has been tested and largely holds (Cedefop, 2013; Koucky et al., 2012; Lepic and Koucky, 2013). However, in low-income countries, the skill content of certain occupations might differ substantially as the technology and regulatory context is quite distinct (Aedo and Walker, 2012; Aedo et al., 2013; Arias et al., 2014; Handel, 2016).

2.1.2. Data sources for SAA exercises

Ideally, to achieve robust and reliable results, SAA exercises should rely on a combination of both quantitative and qualitative sources of information (CEDEFOP, 2008). This reduces potential biases and helps to expand the scope of the exercises. Common quantitative sources of information include analyses of labour market information (e.g. flows in and out of employment by occupation and sector, trends in wages by occupation, trends in hours worked by occupation, etc.), vacancy surveys, employer surveys, surveys of recent graduates and administrative data on enrolments in and graduation from various levels of education (OECD, 2016). Qualitative inputs may come from interviews, focus groups, round tables, etc.

There are only a few countries that rely on a mix of quantitative and qualitative data sources in the same exercise: Australia, Flanders (Belgium), Italy and Korea. Most countries rely solely on quantitative sources of information. Some countries, such as the Netherlands, draw on qualitative sources for validation purposes rather than a direct input in itself.

But even if using only quantitative sources, it is advisable to combine different data sources. Administrative data is usually of good statistical quality and comes with a large sample or covers the entire population of interest. The information reported is reliable as it is usually coming from social security and tax records or mandatory forms. Administrative data, therefore, is ideal to track labour market trends, as well as trends in educational attainment and enrolments. However, the level of detail and information on skills contents of jobs is often limited in administrative sources.

Surveys may need to be carried out to collect more precise information on skills. This would include graduate surveys, employers' surveys, vacancy surveys and working condition surveys. Graduate surveys, for instance, are useful to understand the employability of recent graduates and to shed light on how well the education system is aligned to labour market needs. Employers' surveys, on the other hand, are used to ask employers about their skill shortages. Vacancy surveys are useful to understand why certain vacancies remain unfilled, and working conditions surveys can provide further information on the work content of jobs and changes experienced at the workplace. Surveys, nonetheless, may suffer from selection bias, low response rates, lack of representativeness and misreporting. Hence the need to use them together with administrative data sources.

Finally, to be able to combine administrative and survey data, and link databases at the individual level using tax identifiers for example, rules and regulations regarding the use of confidential data should be defined accordingly.

In Brazil, there are good quality administrative data sources. For instance, to track trends in wages, or flows in and out of the formal labour market, RAIS ("*Relação Annual de Informações Sociais*" - http://www.rais.gov.br/sitio/index.jsf) and CAGED ("*Cadastro Geral de Empregados e Desempregados*") provide all the information needed. RAIS is an administrative form that must be submitted to the Ministry of Labour each year by all establishments with at least eleven employees. Establishments submit information about their current employees, such as wages, hours worked, occupations, etc. CAGED is an administrative form submitted to the Ministry of Labour for every individual hired or dismissed. Such trends can be complemented using survey data from PNAD ("*Pesquisa Nacional por Amostra de Domicílios*"), for example, to obtain an overview of what is happening in the informal labour market too. Information on employment vacancies

disseminated by the Public Employment Services (PES) could also be exploited to understand trends in employment creation by region, occupation and sector of activity, although it may not be fully representative if many firms disseminate their employment opportunities using other channels than the PES.

To track enrolments and graduations in different vocational education and training programmes, data coming from the SISTEC portal (a portal developed by the Ministry of Education where technical school register courses offered, students' enrolment, attendance, completion, etc. - http://sistec.mec.gov.br/login/login) can be used and provides important demographic information about the participants.

On the downside, there are no graduates surveys, employers' surveys, vacancy surveys or working conditions surveys in Brazil. Recently, the Ministry of Industry, Foreign Trade and Services (MDIC) developed a web portal called "*SuperTec*" (http://www.supertec.gov.br/) where firms can register and fill in a form to report their training needs and the reason why such training needs emerged (the firm is growing, the firm is planning new investments, the firm needs to replace some or all of its workforce, etc.). The information collected from this platform resembles the information that would be collected in an employers' survey on skills needed. However, registration in the "*SuperTec*" platform is voluntary and the number of firms that have registered to submit information is relatively small. Consequently, the information collected via "*SuperTec*" is not representative of all firms in Brazil and its regions. Small and Medium Enterprises (SMEs) and family businesses, for example, are particularly under-represented. In fact, they have very little incentives to register (further details provided in Box 5.3). Even large firms are reluctant to register and provide information on their planned investments by fear that such information would reach their competitors.

Registrion in the platform "*SuperTec*" could be made mandatory for all firms, even small firms and businesses. To mitigate concerns about data confidentiality, rules and regulations concerning the use of confidential data could be strengthened and effectively enforced. Firms should obtain the guarantee that the information will only be used for policy purposes and that only aggregated results will be published, so that no individual firm can be singled out or identified. Alternatively, a random and representative sample of firms could be selected in each region and required to register and submit the training needs form via "*SuperTec*". This would be equivalent to setting up an employers' survey on skills, such as the one conducted in the United Kingdom (UK), for example.

In a country like Brazil, with a vast territory and regions that differ substantially from each other's in terms of geographical landscape, demography, infra-structures or social capital, it is important to obtain data sources that are representative both at the national and sub-national level. In fact, skill needs are likely to differ significantly from one region to the other and this phenomena can only be captured if representative data at the sub-national level is available.

Data should be representative of the current situation and as up-to-date as possible. Recent data allows the policy response to be relevant. Nonetheless, having long time series available allows for better interpretation and understanding of trends. Long time series are also necessary if quantitative forecasting models are to be developed.

Box 2.2. The U.K. Employer Skills Survey

The Employer Skills Survey (ESS) collects information from over 87 000 establishments across the U.K. and covering all sectors of the economy, on skills needs, skills use and skills development. It is one of the largest business surveys in the world. The survey has been conducted biennially since 2011 and was last collected in 2017, under the responsibility of the Department for Education.

Interviews are conducted at the establishment level, rather than the organisational level, with employers that have at least two employees on the payroll, and with the most senior person at the site with responsibility for human resources and workplace skills. The interview is carried out in two parts: a core questionnaire and a follow-up survey looking specifically at the investment employers made in providing training to employees in the previous twelve months. Both surveys are conducted by telephone.

The questionnaires cover information on the demographics of firms, recruitment activity and difficulties filling vacancies due to skill-shortages, the skills lacking in the available labour market, the extent and nature of skills gaps within the current workforce and how these affect different occupations, how employers respond to these skills gaps, employers' training and development activities for their employees (type of training provided and expenditure on training), as well as how employers manage, develop, engage and incentivise their staff.

When enquiring firms about specific occupations, the questionnaire uses broad occupational groups, such as "high-skill occupations", "middle-skill occupations", "service-intensive occupations" and "labour-intensive occupations". The exact questionnaire used and further information can be found at: https://www.gov.uk/government/publications/employer-skills-survey-2017-uk-report.

2.1.3. Developing SAA methods

There is no single method of SAA. Several approaches and methods have been developed, some of which are descriptive of the recent past and current situation, while others are forward-looking. Most SAA systems combine several methods.

Approaches that refer to the recent past or current situation can be analysis of labour market trends (like the construction of shortages indicators for the OECD Skills for Jobs Database 2018 used in the previous chapter, analysis of flows in and out of the labour market by occupation and sector, analysis of trends in wages, etc.), or micro-level studies (for example, studies of the placement of recent graduates, or studies of the vacancies posted and hard-to-fill, employers' surveys, etc.).

Forward-looking approaches, on the other hand, include macroeconomic modelling of future developments (potentially by economic sector, by region, by occupation or skill type), extrapolation of the occupational structure within sectors and regions using econometric methods, and foresights of skill needs within regions, sectors and occupations (using interviews, focus groups, round tables of experts, case studies and scenario development analysis, etc.).

Each approach has its own strengths and weaknesses. Analysis of trends using administrative and survey data and micro-studies using graduates' surveys, employers' surveys or vacancy surveys, are good methods to ensure representativeness and obtain

detailed information about people's behaviour and their perceptions. They are also good methods to obtain a more direct measure of skills. Nonetheless, such methods require technical expertise in survey design and conduction (weighting, questionnaire design, interview training, etc.), as well as in the analysis of survey outcomes. It may also be problematic to get responses and large samples are needed to get robust data and results. Therefore, these methods may end up expensive.

Forecasting quantitative models are reliable, comprehensive, consistent and transparent. However, these methods require consistent time series on labour markets (sector, occupation, qualification, etc.) and population (age, gender and labour market participation), expertise in building and running quantitative forecasting models, as well as statistical and programming experience. Such methods can also be costly and give a false impression of precision. Furthermore, not every concept is easily quantifiable.

Qualitative methods (such as interviews, panels of experts, etc.) have the advantage of not requiring specific data. These methods may be able to address problems and concerns more subtly and in greater depth. Additionally, these methods are useful to exchange views and can also provide a holistic picture of skill needs. However, synthesizing qualitative outcomes often proves challenging and results may not be easily extrapolated to other contexts. These methods can also be unrepresentative, provide only a partial view or suffer from potential bias and subjectivity. It is also difficult to conduct such methods in a systematic and consistent way.

In Brazil, there are some elements in place to conduct skills assessment analyses that refer to the current situation and recent past, although no system has been put in place so that such analyses are conducted regularly and consistently, and so that results feed into policy design. Furthermore, forward-looking approaches are missing and there is no department in the government that has been specifically attributed the responsibility of conducting SAA exercises to inform employment, education, training and migration policies altogether. This is one of the biggest challenges to the Brazilian skill development system.

One country that has been particularly successful in developing an effective SAA system, and that has some similarities with Brazil in terms of vastness of geographic area, disparities across regions and population diversity, is Australia. In Australia, the SAA system is well-developed and a wide variety of exercises, combining both quantitative and qualitative data, are carried out at the national, sub-national and sectoral level (Box 2.3).

The Australian SAA system is, nevertheless, resource intensive. It is not always easy to find the right people to acquire and analyse data, just as to communicate the results appropriately. The SAA system in Australia also suffers from the drawback of being occupation-based. A more skilled-based approach would be recommended. Developing a detailed skill-based occupational classification, such as O*NET, to link the results from an occupation-based SAA system, such as the Australian one, to skills, would be a promising avenue.

Box 2.3. The Australian SAA system

The production of skill needs information in Australia is under the responsibility of the Department of Jobs and Small Business which has its own team and budget for the purpose. Other stakeholders also lead exercises, including the Australian Bureau of Statistics (ABS), the National Centre for Vocational Education Research (NCVER), the Department of Education and Training (DET), as well as state-level authorities and industry committees, which provide complementary information (OECD, 2018).

The backbone of the SAA exercise conducted by the Department of Jobs and Small Business is an employers' skills survey called "Survey of Employers who have Recently Advertised" (SERA). The SERA is a telephone-based interview of employers who have recently advertised vacancies in selected skilled occupations, as they are in a good position to comment on current recruitment. It is conducted by the Department of Employment through its State and Territory Labour Economics Offices (LEOs) and its National Office.

Selected occupations are taken from the Australian and New Zealand Standard Classification of Occupations (ANZSCO) at the six-digit level. Only relatively large occupations are selected (those with national employment of at least 1 500 individuals) and which are considered skilled occupations (that require at least three years of post-compulsory-school education and training). While occupational coverage varies from year to year, there is a core of around 80 occupations which have been assessed annually. These are mostly professionals, technicians and trades workers.

Researchers contact employers who have recently advertised a vacancy for the occupation being assessed. Vacancies are selected from a wide range of sources including metropolitan and regional newspapers and internet sites. When there are many advertisements in the occupation being assessed, a sample is randomly selected. When there are not enough advertisements for a particular occupation, employers are cold canvassed to discuss their recruitment experiences and expectations. Contact with employers is discussion based, rather than a formatted survey, as this allows for the identification of issues which are relevant for each particular occupation (although interviewers are provided with a list of recommended questions as guidance). Key issues discussed includes the proportion of vacancies filled, the number of applicants, the number of suitable applicants, skill and qualification requirements of the position, etc. Key statistical and qualitative information from these discussions is recorded and analysed.

To reduce the influence of seasonal factors, contacts are made at approximately the same time each year for each group of occupations. The exact number of employers contacted depends on the number of people employed in the occupation, the number of employers and the number of vacancies advertised. Attempts are made to survey an appropriate number of employers from both metropolitan (state and territorial capital cities) and regional areas.

Cold canvassing for occupations with low vacancy numbers consists of employers being asked whether they have advertised vacancies in the target occupation in the last six months. If they have, the standard discussion over key issues takes place. Otherwise, discussions focus on the likelihood of them recruiting in the next six months, their expectations of difficulty filling vacancies, whether they have potential employees

in the target occupation approaching them for work, their experience with staff turnover in the target occupation, etc.

This procedure provides a consistent methodology for research across states and territories which can be analysed over time to determine trends in skilled labour markets. Nevertheless, to reduce potential bias, the Department of Jobs and Small Business complements the information collected through SERA with data from the Australian Bureau of Statistics, namely the Labour Force Survey, to look at changes in employment levels, trends in wages, hours worked, among other things, at the national level and separately by targeted occupation. Researchers from the Department of Jobs and Small Business also take account of other data sources, such as industry activity statistics and projections and graduate employment outcomes. Finally, results from the analysis are discussed with key associations to ensure that they are consistent with their perceptions and expectations.

All the information collected and analysed is also used to feed into a quantitative forecasting model developed by the Department of Jobs and Small Business. This model forecasts employment trends at the state and regional level, by skill level and by detailed industry and occupation. It consists in the average of an ARIMA (Autoregressive Integrated Moving Average) model and a ESWDT (Exponential Smoothing with Damped Trend) model that places further weight on recent trends rather than historical time series. Forecasts are conducted every year and for a time span of five years. At the end, results are manually adjusted for known future industry and regional developments.

Based on all the information gathered and processed, researchers from the Department of Jobs and Small Business rate each targeted occupation in terms of shortage. This rating exercise is used to define, for example, the Skilled Occupations List (SOL) which is then considered for a range of employment, education and training, and migration policies. Further details can be found at: https://www.jobs.gov.au/skillshortages.

2.1.4. Time, geographical and sectoral coverage

To develop an effective SAA system, Brazilian authorities will have to consider the frequency which the SAA exercises should be repeated, the time span of the forecast and foresight exercises[2], as well as the extent of the coverage: whether it is conducted at the national level, state level, and municipality level, and finally, separately by sector of activity.

Skill needs anticipatory exercises can be considered short-term (six months to two years), medium-term (two to five years) or long-term (five or more years). Short-term SAA exercises are less common, perhaps because they differ little with the assessment of current skill needs. Medium-term SAA exercises are the most common in OECD countries (OECD, 2016).

SAA are generally carried out on an annual basis. Long-term forecasts covering a time span of ten years or more are run less frequently, but they should still be updated regularly to take into account new developments.

National-level coverage may be useful for broad education and training policy, as well as overall labour market monitoring. However, national-level assessments overlook specific skills needs that may be present in a particular region or sector. Furthermore, labour market mobility usually occurs within sector and within region. Therefore, skill imbalances observed in one region or sector may not be present in another (OECD,

2016). This could be particularly relevant in Brazil. In this context, regional specific and sector-specific exercises are strongly recommended as they can facilitate more targeted policy making.

To achieve national, regional and sectoral coverage, most countries usually carry national assessments whose results can be disaggregated at the regional and/or sectoral levels. In other countries, national exercises are complemented by independent regional and/or sectoral analyses (OECD, 2016). In Norway and Switzerland, for example, those are carried out by professional associations in an *ad-hoc* basis. When carrying out independent regional- and sectoral-specific exercises, it is important to avoid potential incompatibilities with national results. Such incompatibilities could prevent reaching a consensus on what skills are most needed. For that purpose, some adjustments may need to be made case-by-case.

In Brazil, lack of human and financial resources may constitute a barrier to carry out independent and complementary regional and sectoral SAA analyses. To minimise the costs, complementary independent sector-specific SAA analysis can be carried out for two or three sectors each year, following a rotating structure. This rotating structure has been adopted in Finland, for instance.

In terms of regional coverage, one possibility would be for several municipalities to team-up and aggregate resources so as to develop a local-based SAA framework (statistical infra-structure, network of local stakeholders, local platforms to exchange ideas, information, perceptions and reach a consensus on local skill needs, publication of a common report, etc.). These regional-specific SAA frameworks would not necessarily need to stick to administrative state circumscriptions. For example, border municipalities from different states, but who are well-connected in terms of infra-structures, important flows of workers commuting across them, local firms trading with each other, etc. would be good candidates to team-up and develop a local SAA framework. State governments should support the creation of such local SAA networks, for example, through actions of awareness for their importance and potential impact on regional and national policy, or by organising training workshops where SAA methods are explained. Staff involved in the development of local SAA frameworks could meet regularly across the country to share and learn from everyone's experience. There are several example of collaboration agreements to develop regional-specific SAA exercises in Sweden (Box 2.4).

Box 2.4. Aggregating interests at the local level: examples from Sweden

In Sweden, the education system is decentralised. While the decentralised system grants ample freedom to municipalities to allocate funds at the local level, it led to the emergence of competition between schools to attract students, both within municipalities and across municipalities within states, so as to secure funding.

The emergence of competition across municipalities has led them to pursue objectives that are not aligned with the national ones, namely attracting students at all costs rather than planning educational offer to tackle skills imbalances in the medium to long-run using SAA information (OECD, 2016).

As a result, platforms to coordinate local interests, produce synergies and reduce competition were developed. *Teknikcollege* and the regional framework in the Gothenburg region are two successful examples.

Teknikcollege

The idea behind the concept of Teknikcollege is that education providers from a minimum of three municipalities are required to co-operate through explicit agreements and offer joint technology-oriented courses at different levels. For example, one school can provide the physical infra-structure, while another school provides teaching staff and the third one uses its local network to place students on internships. The different education providers then share the costs and benefits obtained.

The education providers from different municipalities are encouraged to collaborate and form a local network with firms so that they can align their course offer to the needs of employers in their geographical area. For that purpose, regional steering groups were formed by members coming from the industry, education providers, municipalities and regional government. During the meetings of these steering groups, members discuss what are the skills needed locally, what education providers can offer, what investments would be needed to meet local skills needs, and whether synergies between schools across municipalities would help to offer courses that are aligned with these skills needs.

The regions and municipalities are also encouraged to form part of a larger national network with the goal of promoting the exchange of experiences and provide quality assurance of the different local education providers in a coordinated manner. Further information can be found at http://www.teknikcollege.se/teknikcollege-i-english/.

The Gothenburg regional network

The Gothenburg regional network consists in an explicit platform to establish a joint planning of the educational offer in the region, so as to meet local labour market needs one to five years ahead, while taking into account the specificities of the regional school system. The network is composed by various local stakeholders, including firms and municipalities. The network is built so as to preserve a good balance between smaller and larger municipalities.

When the network meets, members are tasked to propose ideas on what issues should be prioritised at the regional level. Together, they must draft an agreement on the content of the regional objectives to be passed on to the political steering group of the region. Once the regional objectives are approved, they are sent back to each municipality which is,

finally, in charge of enforcing it through the use of its own local resources.

One of the strengths of this approach is that while many Swedish municipalities lack the resources to use SAA information, through the Gothenburg Regional network they are able to benefit from shared statistical information, analytical capabilities, experience interpreting results, etc.

2.1.5. Disseminating SAA results

In most countries, results from SAA exercises are shared and disseminated through the publication of reports and the development of websites. In some countries, public media (TV, radio, newspapers or magazines) are also used to disseminate the results to a wider audience. In the Netherlands, the government also uses social medial channels to share the information collected through SAA exercises (OECD, 2016).

Effective web dissemination usually centralises all the information coming from SAA exercises in one single platform. This is the case, for example, in Canada, with the web platform "Job Bank" (Box 2.5). Web platforms that are particularly successful tend to have more than one interface depending on the targeted audience or to allow for an interactive experience, tailoring the information to users' interests (OECD, 2017). Other countries have adopted this approach, namely in Austria, with the "Qualification Barometer" web platform, and in Bulgaria, resulting from the collaboration between the Bulgarian Industrial Association, the Confederation of Independent Trade Unions (CITUB) and the Confederation of Labour "*Podkrepa*" (ILO, 2017).

Other dissemination methods sometimes used are the organisation of seminars, conferences, workshops and panel discussions (for example in Canada and Slovenia), or making experts available to explain SAA results to the press (as is the case in Norway).

In Brazil, the Ministry of Labour (MTb) has recently launched an on-line platform called *National Observatory of the Labour Market* ("*Portal do Observatório Nacional do Trabalho*") that provides information on earning per occupation and earning per level of education. The platform also disseminates information on movements in the Brazilian formal labour market, namely hirings and job separations. Such information is computed from administrative data sets such as RAIS, CAGED and data from "*Cadastro Único*", the social security records where all individuals that receive some sort of welfare benefit are listed. The information is published through tables of statistics that can be downloaded and press articles that summarise and interpret the information. The purpose of this platform is to make labour market information available to state governments and municipalities' managers. However, information cannot be easily interpreted for a non-informed audience and the platform has not been designed for the general public. For instance, it does not allow one to easily compare himself or herself with workers in other regions or other occupations.

Box 2.5. The web platform "Job Bank" in Canada

The platform "Job Bank" (https://www.jobbank.gc.ca/home) has three interfaces: "Job Bank for employers", "Job Bank for job seekers" and "Labour Market Information".

For employers, the platform allows them to post vacancies on-line so as to disseminate the information to potential candidates. It also provides a job matching service to help recruiters find potential candidates with specific characteristics. The platform also provides information on business financing programmes, employment standards (labour law, health and safety regulations, among other things), training opportunities for the firms' workers, etc.

For job seekers, the platforms lists all available job opportunities with the possibility of searching according to certain criteria. It is also possible for job seekers to create a resume using a professional template that they can download and print or directly use to apply for jobs on the platform. The platform publishes tips on how to effectively look for a job or how to prepare for an interview. This information is adapted for individuals belonging to particular groups, such as veterans, students and youth, newcomers to Canada, senior workers, persons with disabilities and indigenous people.

Finally, the platform has a whole interface designed to disseminate labour market information:

- It is possible to explore jobs or career options that match individuals' skills and knowledge. Individuals can tick out of a list of different skills and knowledge that they possess and visualise the results of available vacancies that demand such skills and knowledge.
- Individuals can enter an occupation's name and learn about available jobs in that occupation, associated average wages and career prospects, as well as skills and job requirements for that occupation. The platform allows the possibility of searching only in a restricted geographical area.
- It is also possible to enter one's current wage and compare it to individuals in similar occupations in other parts of the country or between occupations in the same geographical area.
- Individuals can look for high-paying education programmes (based on median earnings and by educational attainment level) or plan their career with the "Career navigator quizzes".
- Individuals can compare fields of study according to median earnings, earnings range, and percentage employed, percentage unemployed and percentage not looking for a job after course completion.

All the information used to develop this web platform comes from Government-led SAA exercises at the national and regional governments exercises conducted locally. The information can be easily used by any individual, but also by social partners, regional government staff and national government staff.

Independently, the Ministry of Labour also manages a web portal of employment vacancies called "*Emprega Brasil*" (https://empregabrasil.mte.gov.br/). This web portal is led by the Public Employment Services (SINE). Through this portal, workers can search for employment vacancies, information about unemployment benefits and the minimum salary programme. The portal also redirects individuals to the webpage of "*Escola do Trabalhador*" (worker's school), a platform of e-learning courses made available for free and for anyone who wants to enrol (http://escola.trabalho.gov.br/). E-courses offered through this platform correspond to free-form professional qualification courses and they are certified by Brasília's University ("*Universidade de Brasília*"). To enrol in these e-learning courses, there are no entry requirements and individuals can progress at their own pace. In the same portal, "*Emprega Brasil*", employers can post employment vacancies, verify the resume of a particular worker and whether it matches administrative records, as well as submit compulsory information regarding job hirings and separations.

The two web portals, "*Portal do Observatório Nacional do Trabalho*" and "*Emprega Brasil*" are not connected. Consequently, it is not possible to link the occupations associated with highest median earnings and hiring rate according to "*Portal do Observatório Nacional do Trabalho*" with on-line vacancies or related e-learning courses listed in "*Emprega Brasil*", for example.

In parallel, the Ministry of Education (MEC) also runs a web platform called SISTEC (http://sitesistec.mec.gov.br/) which displays information about vocational educational and training programmes across the country. Through this platform, it is possible to view all vocational courses leading to a secondary education degree that are available in each state, the schools that offer these courses and the number of students enrolled in each. In fact, it is compulsory for technical schools to register and enter all the details of their vocational course offer. In some cases, when the schools also offer free-form professional qualification courses (the short courses called "*Cursos FIC*"), these courses will also be listed. However, there is no exhaustive listing for FIC courses as technical schools that do not offer secondary-level vocational education programmes are not obliged to register in the portal. Vocational training courses listed in the SISTEC portal are not linked to particular occupations, so it is not possible to infer the associated expected earnings or career prospects, nor identify high-paying vocational education programmes.

There exists yet another web portal called "*Educa Mais Brasil*" (https://www.educamaisbrasil.com.br/) that provides extensive information regarding scholarships to enrol in basic, secondary, tertiary and vocational education, as well as in professional qualification courses. Through this webpage, individuals can register, obtain information about which scholarships they would be eligible to and be redirected to the relevant webpages to apply for these scholarships.

Finally, MDIC is planning to further develop its work-in-progress web platform "*SuperTec*" so as to use it as a dissemination tool. Based on the information collected through firms on training needs, the platform would spread information on the occupations which are most in demand by firms in all regions of the country. The idea is that the platform would then establish a link with the related training courses available, listing the technical schools in which such courses are available and the entry requirements. The platform has also been prepared so that individuals can look out for information about each occupation, such as median earnings and number of recent hirings. Lack of financial and human resources is preventing the platform from developing further and being implemented on a large scale.

The different web portals developed by MTb, MEC and MDIC could be improved following the Canadian example. Coordination between the three ministries so as to interact the different portals they manage could lead to the development of a unified web platform with all the relevant information for employers, job-seekers, students, families and workers. Centralising the information in one web portal would make it much easier to obtain the relevant information for all audiences. Interacting the information from different portals in one website would also improve the quality of the information provided and increase its potential uses and applications. As it stands at the moment, initiatives from different ministries overlap in some aspects (for e.g. with the dissemination of information regarding earnings and hiring rate per occupation), while none of them really manages to connect skills needed, training courses available, career counselling and employment opportunities.

2.2. Stakeholders involvement in SAA initiatives

In most countries, several actors are involved in the development of skills assessment and anticipation exercises. They commonly include different ministries, public employment services, regional or sector-specific institutions, and social partners. These stakeholders are also generally involved in the discussion of the results and the development of policy responses.

There are several mechanisms to spur the discussions and to facilitate consensus over which skills are needed across different stakeholders. Formal mechanisms include legal norms that oblige the government to consult with other stakeholders around skill issues, or yet the inclusion of stakeholders in advisory boards to different ministries. Informal mechanisms include the setting up of work groups, round tables or skills councils.

Skill councils, for example, are employer-led or tri-partite organisations involving representatives from employers, workers and government or educational institutions. They are generally publicly-funded, but can receive some additional funding from its private sector members. Skill councils provide a platform for the discussion of skills-related challenges of specific sectors or regional areas, as well as the development of a joint policy response (OECD, 2016). Such skill councils have been established at the sector-level in the United Kingdom and in Finland, for example.

In some countries, employer organisations or individual employers lead their own independent SAA exercises. This approach is less common, however, as in most OECD countries SAA exercises already exist and employers do not see the value added of building their own models.

In Brazil, given the lack of regular and consistent SAA exercises, some regional offices of SENAI (see Box 1.1) have developed their own SAA methods. Such methods have proved very effective in identifying skills needs in the manufacturing sector and aligning SENAI's training offer to the needs of local labour markets. In fact, the SAA method developed by SENAI São Paulo, for example, has been mentioned in several publications as best practice example to develop a SAA framework (see ILO, 2017).

Box 2.6. SENAI's SAA exercises

SENAI developed a framework called "*Mapa do Trabalho Industrial"* (Map of manufacturing work), that tries to anticipate what skills will be most important in the manufacturing sector between 2017 and 2020. This framework employs mixed methods and combines information from interviews with senior managers and local policymakers, as well as data on employment creation per sector. The information gathered is then analysed and translated into a list of training needs across different geographic areas. Table 2.1 presents the main areas of training expected to be in high demand between 2017 and 2020, as identified by SENAI in 2016.

Table 2.1. Areas of training expected to be in high demand between 2017 and 2020

Area of training
Construction
Environment and production
Metalworking and mechanics
Food
Clothing and footwear
Information Technology and Communication
Energy
Vehicles
Petrochemicals and Chemistry
Wood and Furniture
Paper and Printing
Mining
Research, Development and Design

Source: "*Portal da Indústria*" http://arquivos.portaldaindustria.com.br/app/conteudo_18/2016/10/19/12033/ApresentaoMapadoTrabalhoIndustrial20172020.pdf.

SENAI also has a national platform to track their former students, called "*Sistema de Acompanhamento de Egressos do SENAI*" (SAPES) or SENAI's Graduates Tracking System (http://sapes.senai.br/). Through this platform, SENAI units in each state collect data on employment rates, occupational patterns and earnings for graduates from all of SENAI's training courses. The platform also allows SENAI to identify former students' current employers, so that they can be contacted and asked to participate in regular satisfaction surveys. The information collected is used by SENAI to evaluate the quality of their training courses, as well as to understand which graduates are more easily absorbed in the labour market and enjoy better employment conditions. The results from such analyses can feed back into training courses' planning and content development.

Besides the nation-wide "*Mapa do Trabalho Industrial"* and the management of the SAPES platform, some state-level SENAI offices have also developed their own SSA exercises. In fact, SENAI branches in each state have some autonomy to decide which training courses to open, allowing them to adapt to local demand for skills, although they usually try to keep their activities aligned to national guidelines.

SENAI from Santa Catarina

In Santa Catarina, a wealthy state in the south of Brazil, SENAI representatives make decisions on which courses to offer based on direct contacts with local employers. Often, senior management staff from local firms contact SENAI directly to ask for the opening of specific courses. Otherwise, SENAI Santa Catarina sends out surveys to employers in order to identify the key skills needed.

Additionally, in 2013, SENAI *Santa Catarina* conducted an *ad-hoc* study called "*Programa de Desenvolvimento Industrial Catarinense*" or Programme for the Industrial Development in Santa Catarina (PDIC 2022). The purpose of this large study was to identify trends in the state industrial production and strategic industrial sectors (http://www4.fiescnet.com.br/en/homepdic). The study combined the perceptions from employers and experts gathered through workshops and round tables, with the collection of quantitative data. After analysing the information collected, several road maps were published providing general guidelines on how to boost each key sector's productivity and competitiveness. These guidelines sometimes included references to skills needs.

SENAI from São Paulo

In São Paulo, SENAI developed a rigorous and systematic framework to identify skill needs. This framework combines different methods and data from different sources.

The first step of their framework uses administrative data from the Ministry of Labour (RAIS) to look at trends in the flows in and out of employment by occupation and within the manufacturing sector, separately by region within the state of São Paulo.

The second step consists in connecting the information from the occupational analysis with national and international databases on skills use. At this point, they use different data sources such as O*NET and CBO to understand how trends in occupations translate into trends in skills.

Additionally and independently, SENAI *São Paulo* also sends online questionnaires to firms in the sector and state to enquire them about industrial developments, future skills needs and hiring difficulties related to lack of skills.

The final stage of the SAA framework consists in combining the quantitative and qualitative data collected, which will be used as background material for the appreciation of a technical committee. Experts with different occupational backgrounds make up these technical committees. They are expected to discuss the results and agree on what the ideal profiles of workers in the manufacturing sector will be in the coming years. Those ideal professional profiles are then used to define which technical courses to offer and how to develop their content.

SAA exercises conducted by SENAI's regional offices are quite focused on the particular objective of identifying skills needs in the manufacturing sector to define their own courses' content. This means that such exercises may lack the flexibility or broadness in scope to be directly applicable for other policy purposes or useful to other actors. Nevertheless, SENAI's SAA model could be adapted by the Brazilian government to be used at the national scale and for other sectors of activity. Alternatively, the Brazilian government could develop a SAA governance structure so that a national SAA framework is complemented by sector-specific exercises led by institutions from the S-

System, for example. This would require closer collaboration between the government and S-System institutions, as well as the development of coordination mechanisms to avoid overlapping initiatives and the inefficient use of resources.

Notes

[1] The Standard Occupational Classification (SOC) system is a federal statistical standard used by federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data (see https://www.bls.gov/soc/). All workers are classified into one of 867 detailed occupations according to their occupational definition. To facilitate classification, detailed occupations are combined to form 459 broad occupations, 98 minor groups, and 23 major groups. Detailed occupations in the SOC with similar job duties, and in some cases skills, education, and/or training, are grouped together.

[2] Forecast and foresight exercises both look into the future. Forecast exercises aim at providing general indications about future trends. Foresight exercises provide a framework for discussion between stakeholders or experts to jointly think about future scenarios, and eventually, to develop priorities that can be translated into policy actions.

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Chapter 3. Lessons from adult training programmes before PRONATEC

This chapter briefly reviews past government initiatives to promote adult training. It describes adult training programmes that predeceased PRONATEC ("Programa Nacional de Acesso ao Ensino Técnico e Emprego"), the Federal Government's latest adult learning intervention. The chapter provides an historical context for the development of PRONATEC and highlights some of the issues related to the implementation of previous programmes.

Skills imbalances are costly for individuals and for the society as a whole. Therefore, tackling skill mismatch and skill shortages is a major challenge for countries affected by rapid and substantial changes in skill needs, such as Brazil.

Different types of policies can steer demand for and supply of particular skills. Investment in the general and vocational education system, for instance, is needed to meet the increasing and specific demand for skilled workers that comes with technological change, globalisation and demographic changes. Targeted financial incentives can promote access to training for individuals from disadvantaged backgrounds or in situations of vulnerability. Providing high-quality information, advice and career guidance also promotes the development of skills needed in the labour market. Second chance education, recognition of prior learning, access and availability of lifelong learning opportunities, re-training the unemployed, are other examples of education and training policies that promote resiliency in the face of structural changes in the world of work.

Given the low educational attainment and the lack of a well-developed public vocational education system in Brazil, as well as the sub-optimal investment of Brazilian firms in on-the-job training (see Section 1.1.), government-led programmes that facilitate the participation of adults in training have the potential to play an important role in boosting the supply of the right skills and reducing skill imbalances. In fact, adult training courses equipping workers with skills needed for occupations in high-demand, can be particularly adequate in the Brazilian context, where unskilled workers and the unemployed are unlikely to get back to the formal education system to up-skill or re-skill.

Setting up an adult learning system that is responsive to changing skill needs is key to protect individuals from the negative consequences of the changes ahead and to ensure that they make the most of the opportunities they provide. High quality adult training is seen as a major policy tool to ensure the labour force's adaptability in light of the changes expected to affect the quantity and quality of jobs that are available, as well as the skill-sets they require. As adult training courses tend to be of short duration and target the current generation of workers, adult learning is also a policy tool that allows for faster intervention and materialisation of results.

During the last decades, several large-scale national programmes have been developed and implemented in Brazil to increase the offer of vocational and technical education, as well as to boost participation in free-form short training courses that do not necessarily articulate with the education system. Significant efforts have been made by successive governments to make access to adult training more inclusive, raise the earnings and the employability of lower-income segments of the population.

3.1. "*Programa de Reciclagem Profissional*" (1994-96)

In 1994, the Ministry of Labour (MTb) introduced a programme called "*Programa de Reciclagem Profissional*" with the purpose of re-training unemployed workers. The programme was one of the lines of actions of the Public Employment Services (SINE, "*Sistema Nacional de Emprego*") and its objective was twofold. First, it aimed at providing training to unemployed workers so as to increase their chance of re-integrating the labour market and reduce their unemployment duration. Second, the programme also specifically aimed at equipping individuals with the skills and qualifications required by employers in local labour markets. Funding for the programme came from the "*Fundo de Amparo ao Trabalhador*" (FAT[1]), the financial public fund managed by the Ministry of

Labour and used to finance unemployment subsidies, among other initiatives. "*Programa de Reciclagem Profissional*" was the first Government-led initiative to provide free adult training courses of a short duration.

Given that the programme targeted individuals who benefited from unemployment insurance, training courses offered under "*Programa de Reciclagem Profissional*" were limited to a maximum duration of three months. Three types of modalities were offered within the programme, each with a distinct target population and a training content adapted accordingly (Gutierrez Alves and dos Santos Vieira, 1995). The first modality targeted unemployed workers with no education or who had not completed primary education. These unemployed workers were offered training for 240 hours in total. The 240 hours were split into 180 hours focused on basic oral and written communication skills, as well as basic numeracy skills, and the remaining 60 hours focused on general knowledge. The second modality targeted unemployed workers who had at least completed primary education, but without a clearly defined occupational profile. The third modality, finally, targeted unemployed workers who had already received vocational training but who could benefit from further specialisation in their occupation. Training for the second and third modalities lasted between 60 and 240 hours and the content was balanced between general and occupational-specific skills.

The design and implementation of this programme was still under discussion when a more ambitious programme, contemplating unemployed as well as employed workers, was proposed and pushed forward. At the time, the introduction of new hardware and software in the Brazilian industry had started to threaten jobs, putting low-skilled workers at risk of job loss and exclusion from the labour market. In this context, extending adult training provision to those already at work became a priority (Pinto Bulhões, 2004).

3.2. Planfor – "*Plano Nacional de Qualificação do Trabalhador*" (1996-2002)

PLANFOR ("*Plano Nacional de Qualificação do Trabalhador"* or National Plan for Professional Qualification), a programme under the direction of the Ministry of Labour (MTb), was implemented in all regions of the country from 1996 to 2002. This ambitious programme aimed at ensuring that all Brazilian citizens had access to training, with a particular focus on those excluded or on the verge of exclusion from the labour market. PLANFOR came to respond to the need for up- and re-skilling of workers at risk of losing their jobs with the introduction of new technologies in the industrial sector, in particular, the development and adoption of new software and hardware.

The programme's main line of action was to tackle financial barriers in access to adult training by providing, at no cost for the participants, free-form adult training courses of a short duration and vocational nature. The Federal government at the time established a specific quantitative target for PLANFOR: starting from 1999, at least 20% of the economically active population should receive training each year (Pinto Bulhões, 2004). This corresponded to approximately 15 millions of people aged more than 16 years old (according to official documentation from the Ministry of Labour in 2003).

Funding for the programme also came from the FAT public fund and almost all of the financial resources allocated to the programme were transferred to lower administrative levels, namely state governments and municipalities (more specially, to the "*secretarias estaduais e municipais de trabalho*", i.e. the state and municipal departments of work). State governments and municipalities were free to use such funds to develop and implement decentralised initiatives and partnerships with local stockholders and members

of the civil society, i.e. non-governmental groups and associations (churches, community groups, youth associations, interest groups, academic organisations, etc.). States and municipalities could manage their training programmes and partnerships independently and autonomously, as well as hire training providers of their choice directly.

To identify training needs at the local level and match training offer to skills in demand by local employers, a specific governance structure involving states and municipalities was implemented. Each state would nominate a person responsible for the implementation of PLANFOR and for liaising with municipalities. Each municipality was responsible for analysing their local labour market and collecting information on specific training needs. Based on that information, municipalities would then request training courses to the state manager of PLANFOR. The State programme's manager would liaise with technical schools and other stakeholders to organise training provision. While the principle was good, in practice, this governance structure to identify training needs at the local level did not function very well (see Box 3.1).

Box 3.1. The implementation of PLANFOR in the state of Rio Grande do Sul

In the state of Rio Grande do Sul and until 1999, the state government had not provided any formal guidance to municipalities on how to identify their training needs and elaborate their training requests (Pinto Bulhões, 2004),. Despite the provision of such guidance in 2000 and 2001, there was no indication that municipalities were actually using or implementing such guidance. As a result, from 1996 to 2001, more than 50% of the documents with training requests from the municipalities of Rio Grande do Sul did not include any diagnostic of local skill needs.

Among municipalities that implemented the state directives and included some diagnostic, there was significant heterogeneity across municipalities in their effectiveness to identify skill needs. For instance, municipalities from metropolitan areas provided more information about local trends in the labour market than municipalities in the rural areas of the state.

Most municipalities would organise open meetings to consult with different local stakeholders about local skill needs. While involvement of all relevant entities was commendable, the large number of participating stakeholders often made it difficult to reach a consensus. Furthermore, not all parties involved in the meetings were equally informed about local labour market trends. Consequently, not all the information shared in these meetings was equally reliable.

Another major criticism in the implementation of PLANFOR in the state of Rio Grande do Sul, relates to the content of the training courses provided. Most of the course load was spent on the acquisition of general and basic skills, rather than the accumulation of specific skills. Many of the students surveyed after completing PLANFOR training courses pointed out that there was very little time invested in practical activities. Additionally, the majority of the students surveyed considered that courses were too short. Professors involved in PLANFOR training courses, on the other hand, highlighted the heterogeneous profile of students in terms of previous education and professional experience, which made it particularly difficult to teach beyond general and basic notions.

Another challenge was the varying quality of courses, particularly those provided by private institutions. In Rio Grande do Sul, a significant share of PLANFOR training

courses were provided by NGOs, religious communities and other civic associations, workers' unions, along with universities, schools from the state and municipal network, and "*Sistema S*" technical schools (see Box 1.1). One of the consequences was that it was difficult for the state manager of PLANFOR to monitor and evaluate the quality of all the training courses provided.

Despite all the above-mentioned challenges, some outcomes of PLANFOR in Rio Grande do Sul were promising. For instance, it was successful in involving the most vulnerable and making access to adult training more inclusive. In Rio Grande do Sul, vulnerable workers – the unemployed, workers with very low income, women, young workers between 16 and 24 years old, and non-white Brazilian workers – were over-represented among training participants in relation to their share in the economically active population.

The coverage of PLANFOR fell well below the established target. In 2000, for example, only 5.2% of the economically active population (EAP) participated in a free training course funded via PLANFOR (Severnini and Fernandez Orellano, 2010).

Table 3.1. Coverage of PLANFOR from 1995 to 2000

Year	No. individuals trained (in millions of Reais R$)	% EAP	Investment (in millions of Reais R$)
1995	0.1	0.18	28
1996	1.2	2.08	220
1997	2	3.38	348
1998	2.3	3.79	409
1999	2.7	4.35	354
2000	3.3	5.2	437
Total	11.6	3.23	1796

Source: Data provided by the Ministry of Labour in 2003 to Severnini and Fernandez Orellano (2010)

According to official documentation from the Ministry of Labour (MTb), the overall budget allocated to PLANFOR fell significantly between 2002 and 2003, from BRL 302 million to BRL 186 million (budget for 2003 as approved by the government leaving office in 2002). One of the reasons for the fall in public investment on PLANFOR after 2002 was political and related to the change in government after the elections.

PLANFOR was the first large-scale federal programme offering short adult training courses for free in Brazil. For the first time, low-income and vulnerable workers were also given the opportunity to enrol in continuous and lifelong learning. Investments made in a programme such as PLANFOR contributed to spread the idea that lifelong learning and adult training should also be considered a line of action to promote employment, well-being and inclusiveness.

Box 3.2. Impact evaluations of PLANFOR

Some studies in the literature have attempted to quantitatively assess the impact of PLANFOR. One study uses propensity score matching to evaluate the impact of adult training on labour earnings, the probability of employment and the probability of formal employment (Reis, 2012). The author uses data from the Monthly Employment Survey ("*Pesquisa Mensal de Emprego*" - PME), a longitudinal survey representative of the six main metropolitan areas in Brazil – Belo Horizonte, Porto Alegre, Recife, Rio de Janeiro, São Paulo and Salvador - conducted by the Brazilian Census Bureau ("*Instituto Brasileiro de Geografia e Estatística*" - IBGE). Every month, the IBGE collects information about 100 000 individuals aged 10 years old or more. In each interview, the survey collects information regarding attendance and completion of training. The author uses data starting from March 2002.

Results from this study suggest that training increases the employment probability of the unemployed workers by six percentage points, increases labour earnings by up to 45% and increases the probability of formal employment by at least three percentage points. Results are very heterogeneous across demographic and skill groups. The effects appear to be more pronounced for less educated individuals and prime-age workers. However, the information collected in the survey is not sufficient to understand whether the reported training corresponds to a programme associated with PLANFOR or any other training programme. Therefore, the results from this study cannot be directly attributed to PLANFOR.

Another study exploited a randomized experiment conducted in the metropolitan area of Belo Horizonte, between June 1996 and December 2000, to assess the impact of PLANFOR in the state of Minas Gerais, called "*Plano Estadual de Qualificação Profissional*" (Hermeto Camilo de Oliveira and Gonçalves Rios-Neto, 2007). For the purpose of the study, candidates for training were randomly selected to register for courses subsidised by PLANFOR (a lottery determined who were the candidates selected for free training provision). Treatment and control groups were surveyed four times: once at the beginning of the training programme in December 1996 and three times afterwards – June 1997, March 1998 and December 2000. Logistic regressions were used to test for the quality of the randomisation and none of the covariates seemed to explain selection into treatment. The authors conclude that in the metropolitan area of Belo Horizonte, participation in PLANFOR training courses reduced the number and duration of unemployment episodes for individuals who were not unemployed at the time of training. For individuals who were unemployed when starting the training programme, the effect of attending a training course subsidised by PLANFOR is not statistically significant.

Since PLANFOR was highly decentralised and its implementation varied greatly from one state to the other, and even between different municipalities within states, it is difficult to extrapolate the results from this randomised control trial to other regions of Brazil. Nevertheless, this small scale local experiment suggests that the free provision of short technical training can have a positive impact on labour market outcomes.

3.3. PNQ – Plano Nacional de Qualificação (2003-12)

The "*Plano Nacional de Qualificação*" or PNQ was developed in 2003, by the new government elected in 2002, but only became fully implemented during the course of 2004. PNQ came to replace PLANFOR. It was tied to the Brazilian Public Employment Services (SINE), funded by FAT resources, and under the responsibility of the Ministry of Labour.

PNQ maintained the governance structure of PLANFOR, where municipalities and states were key players in defining the training courses to be offered, in close consultation with local governmental and non-governmental organisations. State governments remained responsible for the choice and hiring of training providers, who could be private schools, public institutions, schools from "*Sistema* S", or even NGOs. Courses being subsidised via PNQ were also free-form short technical courses. One study provides an example of how the collaboration between different administrative levels was organised in the municipality of Piracicaba, in the state of São Paulo (Ferraz and Ribeiro de Oliveira, 2018; Box 3.3).

Box 3.3. The implementation of PNQ in Piracicaba, state of São Paulo

In 2011, a Federal agreement was signed between the Ministry of Labour (MTb), the "*Secretaria Municipal do Trabalho e Renda*" (SEMTRE, the municipal department for work of Piracicaba) and the City Hall of Piracicaba. Under this agreement, SEMTRE was responsible for organising free-form training courses in Piracicaba. The course offer was defined together with the Municipal Employment Commission of Piracicaba, based on studies and analyses of the local labour market. The Ministry of Labour transferred public funds to SEMTRE so as to support the initiative.

SEMTRE was also responsible for selecting participants for these training courses. Candidates would need to be unemployed and priority was given to low income individuals or individuals with low level of schooling. Additionally, 30% of the total number of places available for training was reserved for individuals above 30 years old and 10% for individuals with disabilities. For candidates who would meet all the criteria, places were allocated on a first-come first-served basis.

SEMTRE signed three contracts for training provision with technical schools from "S*istema S*": BRL 52 320 were invested for the creation of 120 places in training courses related to manufacturing and sales (60 places in each area) and BRL 26 160 were invested to create 30 places in training courses related to services more generally. Overall, the total investment per student was BRL 872 and BRL 4.36 per student/hour of training.

However, according to the study that describes the programme in detail, these numbers were higher in Piracicaba than in the rest of the country (Ferraz and Ribeiro de Oliveira, 2018). In fact, just as for PLANFOR, the decentralised implementation of PNQ meant that investments made, training offer, candidates selection and training quality, may have differed substantially across municipalities within states, and across states.

Most of the strategic guidelines from PLANFOR were also maintained for PNQ. The target population was more clearly defined and specifically included: workers with low

income, low-educated workers, long-term unemployed, African-Brazilians, Indigenous-Brazilians, women, youth, disabled workers, workers above 40 years old, rural workers, family farmers and other domestic workers, autonomous workers, self-employed workers without employees, workers from cooperatives or associations, and individuals considered to be in precarious work.

Nevertheless, before 2008, information regarding the free provision of training courses in the context of PNQ was mostly disseminated through the agencies of the Public Employment Services throughout the country, reaching primarily the unemployed. Job seekers were referred to the training courses being offered in the state or municipality by the Public Employment Services. One of the major criticism to this approach was that workers in the informal labour market, and long-term unemployed who no longer received unemployment insurance (and therefore, had little connexion to the Public Employment Services), would not have access to the information.

From 2008 onwards, new channels of dissemination were developed in collaboration with the Ministry of Social Development ("*Ministério do Desenvolvimento Social*", MDS) via "*Bolsa Família*", a social welfare programme under the responsibility of MDS. "*Bolsa Familía*" is an on-going conditional cash transfer programme, dating back to 2003, through which poor families receive financial aid, as long as their children remain enrolled at school and vaccinated. Adults from households who received the "*Bolsa Família*" financial aid also started to be referred to PNQ training courses. This collaboration between MTb and MDS, to widen the coverage of adult training courses and reach new segments of the target population, was one of the main novelties of PNQ, as compared to PLANFOR.

The "*Departamento Intersindical de Estatística e Estudos Socioeconômicos*" (DIEESE), a research centre affiliated to workers' unions, and "*Unitrabalho*", a network of universities and research institutions, conducted some analyses of the programme's effectiveness in reaching the most vulnerable segments of the population. First of all, according to these studies, 100 000 workers, on average, attended a PNQ training course each year (Lessa, 2011). This number falls well below the target of the programme, which was to provide training to 20% of the economically active population each year, just as PLANFOR. Women made up the majority of participants. In 2011, for example, 67% of the workers who attended a PNQ training course were women (DIEESE, 2011), who may be more vulnerable in the labour market. In terms of ethnic origin, however, 25.6% were of mixed-race (individuals usually referred to as "*pardo*") and only 10% were Black, revealing that the programme was not particularly successful in reaching these segments of the population. Finally, regarding educational attainment, the average schooling level of individuals who attended PNQ training courses (completed upper secondary school) was much higher than the average schooling level of the Brazilian population (incomplete lower secondary school). Consequently, the programme did not fully reach the lowest educated workers, who are those most likely to be excluded from the labour market and further formal education. This under-representation of low-skilled workers could be explained by the existence of pre-requisites to enrol in training courses subsidised by PNQ (Lessa, 2011). In fact, these pre-requisites often included basic knowledge normally acquired in upper-secondary school.

The average number of hours of training for PNQ courses was 200 hours, although some courses offered a lower workload (DIEESE, 2011). Differences in workload varied substantially across course provider. For instance, while courses provided by universities and "*Sistema S*" lasted approximately 200 hours (204.7 and 198.7 hours, respectively)

NGOs, community centres and other associations, offered significantly shorter PNQ training courses of, on average, 185.8, 169.4 and 140.6 hours, respectively. This variation in the length of training courses suggests that courses may also vary on other aspects including content and quality.

In terms of public investment, PNQ represented less than 1% of the budget of the Public Employment Services, ranking second to last in terms of investment across all PES initiatives[2] (Lessa, 2011). Investment in the programme decreased over time between 2003 and 2012, despite the increasing costs of training provision and reflecting the low priority still attributed to adult training at the time.

With the new government in 2011, PNQ would be replaced by a new adult training programme called "*Programa Nacional de Acesso ao Ensino Técnico e Emprego*" or PRONATEC. Investments in PRONATEC were much more significant than the investments in PLANFOR and PNQ, and the governance of the programme also changed quite significantly. The next chapters will describe and assess the PRONATEC adult training programme.

3.4. From PLANFOR and PNQ to PRONATEC

Several lessons can be taken away from the adult training programmes that predeceased PRONATEC. First of all, it became quickly evident to the Brazilian government that adult training programmes should extend beyond unemployed workers who maintain a link with the Public Employment Services. Adult training programme have the potential of up- and re-skilling employed workers at risk of losing their job due to structural changes in the economy and changing skill needs in the labour market. However, both PLANFOR and PNQ were mostly perceived as policies to improve inclusiveness, reduce poverty and prevent social exclusion. PLANFOR and PNQ were not sufficiently well articulated with the national strategy for productivity and competitiveness. The governance structure of PRONATEC, discussed in detail in the following chapter, has address this issue by involving several ministries (health, defence, tourism, industry, etc.) in the implementation of the programme.

Second, training provision should be limited to certified technical schools or institutions. As both programmes, PLANFOR and PNQ, allowed training courses to be offered by NGOs, religious communities, civic associations, or workers' unions, for example, controlling the quality of training was too difficult. Courses offered by different type of institutions could be quite different in content, infra-structures, and even hours of training provided. Similarly, even if training provision is limited to a restricted number of accredited institutions, training courses should follow a minimum standard regarding number of hours of training, content, etc. Otherwise, there will be a lot of heterogeneity in training quality across institutions in the same region and across regions. The effects of changes in the industry structure, such as those triggered by falling employment in the manufacturing sector and a stronger integration into the global economy, can affect regions asymmetrically if the response of training policies is not equally effective in all areas of the country. With PRONATEC, as will become clear in the next chapter, significant steps were taken to limit differences in training practices across the country, although there is still scope for improvement.

Third, for the training course offer to be aligned with local labour market needs, it is insufficient to delegate the responsibility to states and municipalities of identifying skill needs and aligning their initiatives accordingly, if there is not a formal Skill Assessment

and Anticipation (SAA) system in place that they can rely on to obtain good-quality information, learn how to implement rigorous methods, benefit from pre-established platforms to disseminate information, etc. At the very least, if the responsibility of identifying skill needs is fully delegated to states and municipalities, there should be clear guidelines on how to proceed, uniformly applied in all regions of the country, accompanied with campaigns to raise awareness for the importance of such exercises, or even training workshops to teach state government and municipalities staff about SAA methods they could implement. Systematic local SAA initiatives should then be encouraged, enforced and monitored by the government. Without such formal SAA structure in place and rigorous controls, decentralised initiatives from higher administrative levels (Federal government) to lower administrative levels (state governments and municipalities) may lead to the inefficient use of public funds. This is an area where little improvements were made with PRONATEC and where further attention is needed.

Fourth, both PLANFOR and PNQ were short-lived adult training programmes. Consequently, there is insufficient time to assess the programmes' merit, revise and reform them, as well as for significant results to materialise. This makes it particularly difficult for the several stakeholders involved to learn from their experience and to be held accountable for their decisions. Successful programmes take time. It takes time to carefully design and implement adult training programmes and it may take several years before results are visible and quantifiable.

Fifth, the development and implementation of both PLANFOR and PNQ saw very little involvement from the Ministry of Education (MEC). Adult training programmes in Brazil, before PRONATEC, were structured completely at the margin of the official education system. PRONATEC, on the other hand, has been mostly managed and developed by MEC. However, involvement from both Ministry of Education and Ministry of Labour is key for the development of a successful adult training programme.

The Ministry of Labour has access to information from the Public Employment Services agencies across the country and statistical data on labour market trends. Together with its connection to social partners, this makes MTb a fundamental stakeholder for the development of a sound SAA system that should influence the course offer of any adult training programme. Additionally, MTb has the possibility to follow training programme participants so as to monitor their integration into the labour market and evaluate the effectiveness of the training programme. Finally, MTb can articulate adult training with active labour market policies and other employment policies. The Ministry of Education, on the other hand, is well placed to control the quality and certify training providers. MEC has the necessary know-how to develop a framework for the recognition of prior learning and reduce barriers in the access to adult training when entry requirements are imposed. Finally, MEC can award certifications to training participants, recognise training modules and articulate free-form short training courses with the vocational education system, so as to create incentives for training participants to proceed with further education.

On the positive side, PNQ opened the door to inter-ministerial collaboration in adult training programmes, with the successful partnership between MTb and MDS in disseminating information about training courses to a wider public. Inter-ministerial collaboration is now at the heart of the governance structure of PRONATEC.

Finally, one last consideration is worth mentioning. Despite the existence of a public network of technical schools, financed by Federal, state and municipal funds, both

PLANFOR and PNQ were mostly implemented by private institutions. In this regard, the strategy followed by the Brazilian government to develop its adult learning system has been to transfer resources from the public to the private sector for the execution of a public policy. As will be discussed in the next chapter, PRONATEC mostly follows the same strategy by relying significantly on training provision from S-system technical schools. This strategy can offer several advantages, namely that adult training programmes benefit from already established high-quality infra-structures at little cost.

Notes

[1] FAT funding comes from different sources: contributions from firms with 0.65% of their gross sales, contributions from non-profit organisations with 1% of their total wage bill and contributions from firms and retailers with 1.65% of the value of all imported goods and services. FAT funds are meant for the unemployment insurance programme, the minimum salary allowance programme, and programmes for economic development, such as programmes for adult training.

[2] SINE carries several activities and initiatives to match job seekers to employers, to promote employment creation by local firms, to help individuals setting-up their own business and to monitor the unemployment insurance programme.

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Chapter 4. PRONATEC: governance and coverage

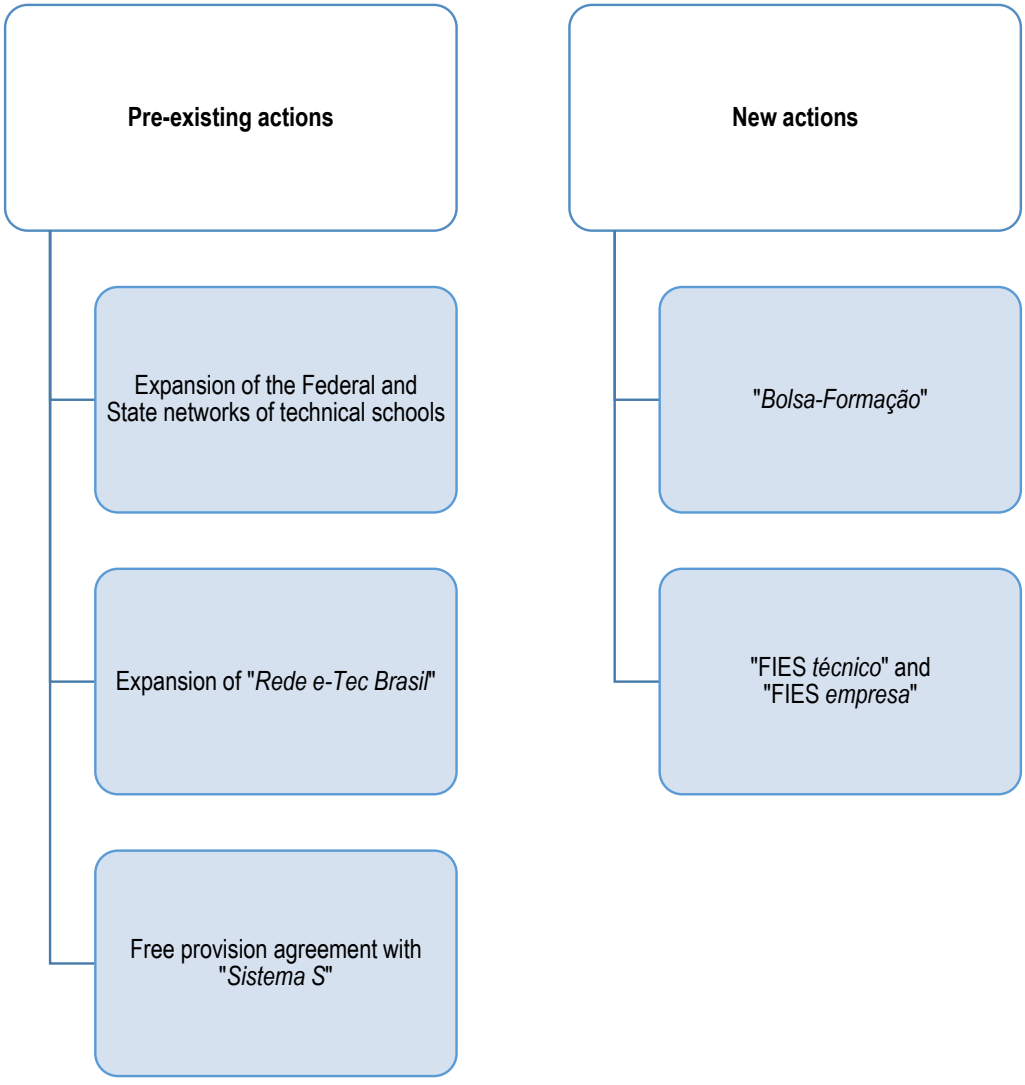
This chapter describes the PRONATEC adult training programme: its several initiatives, its governance structure, the profile of its participants and its geographical coverage. The chapter analyses some of the pros and cons of PRONATEC's design and implementation. Throughout this analysis, whenever a particular challenge is identified in the design and implementation of the PRONATEC programme, some policy recommendations are suggested, based on best practices internationally.

The "*Programa Nacional de Acesso ao Ensino Técnico e Emprego*" (PRONATEC) is the most recent adult training programme implemented by the Brazilian Federal government.

4.1. PRONATEC initiatives

In 2011, the Federal government of Brazil created the "Programa Nacional de Acesso ao Ensino Técnico e Emprego" (National Programme for Access to Technical Education and Employment) or PRONATEC (Lei nr. 12.513, 26/10/2011). PRONATEC was a government-led initiative to expand the offer of vocational education, increase its quality and create incentives for every Brazilian citizen to enrol in free-form short adult training courses. The legal document that institutionalised PRONATEC refers to already existing initiatives, formalising them as Federal law, and launches two new lines of action Figure 4.1.

Figure 4.1. PRONATEC initiatives



Source: PRONATEC law (Lei nr. 12.513 do 26/10/2011).

Amongst the already existing initiatives, the PRONATEC law formalised the national objectives of expanding the Federal and State networks of vocational schools and the number of vocational training courses available in distance learning. In fact, until the end of the 1990s, the Federal network of vocational schools consisted of only 140 establishments across the entire country. From 2003 onwards, successive Federal governments invested in the expansion of this network, delivering an additional 562 establishments by 2014, spread across 512 municipalities and every state (Gomide and Pires, 2013). Similarly, to expand the offer at the state level, in 2007, the Ministry of Education (MEC) created the programme "*Brasil Profissionalizado*". This programme expanded the network of state vocational schools. States would sign agreements with the Ministry of Education (called "*Termos de compromissos*") for the transfer of Federal funds to state governments that could only be used for the construction and the modernisation of vocational schools, the opening of training laboratories, and for the coaching of instructors and professors. Several investments were also made to expand the offer of vocational courses through distance learning. Also in 2007, MEC launched the programme "*Rede e-Tec Brasil*" through which it would finance state governments and municipalities, so that those would develop the necessary infra-structures for distance education. All these programmes were brought under the PRONATEC umbrella when the programme was institutionalised in 2011.

The law that institutionalised PRONATEC also revised the agreement of free training provision by technical schools from "*Sistema S*" (see Box 1.1). It stated that technical schools from "*Sistema* S" should increase their free training provision and use about two-thirds of their net profits to provide free places to individuals with low earnings and jobseekers. Additionally, the PRONATEC law stated that training courses provided freely by technical schools from "*Sistema S*" should have a minimum of 160 hours. There was no minimum amount of hours of training before that.

Two new lines of action were foreseen in the PRONATEC law, although only one of them was effectively developed. Since 2001, MEC have been managing a programme called "*Fundo de Financiamento Estudantil*" or FIES. This consisted in giving scholarships to students wanting to enrol in general tertiary education degrees approved and certified by MEC, but for which enrolment is not free. PRONATEC was meant to expand this initiative so as to provide funding for students wanting to enrol in vocational courses at the level of tertiary education – "FIES *técnico*" – and firms wanting to provide training to their collaborators – "FIES *empresa*". Despite mentioning the initiatives, there were no other documents published after the PRONATEC law to regulate "FIES *técnico*" and "FIES *empresa*", nor to provide further details about their implementation. Nevertheless, the fact that the PRONATEC law contemplated an initiative that would provide funding for employers to organise training activities on-the-job or sponsor their workers to enrol in further training, reveals that the Federal government was conscious of the importance and potential of continuous education and adult training. Furthermore, it also shows that, originally, PRONATEC was not only meant as a programme to increase the equality of opportunities and promote inclusiveness in the Brazilian society. In fact, the emphasis on employer or job-specific training means that the Federal government was also concerned with fulfilling employers' skill needs with the ultimate aim of improving national productivity and competitiveness.

In practice, however, the main contribution of PRONATEC was to introduce "*Bolsa Formação*". This initiative consists in providing free training courses, free access to the necessary teaching material, as well as a subsidy meant to cover the cost of commuting to school and a daily meal. The subsidy is available to individuals at risk of social exclusion

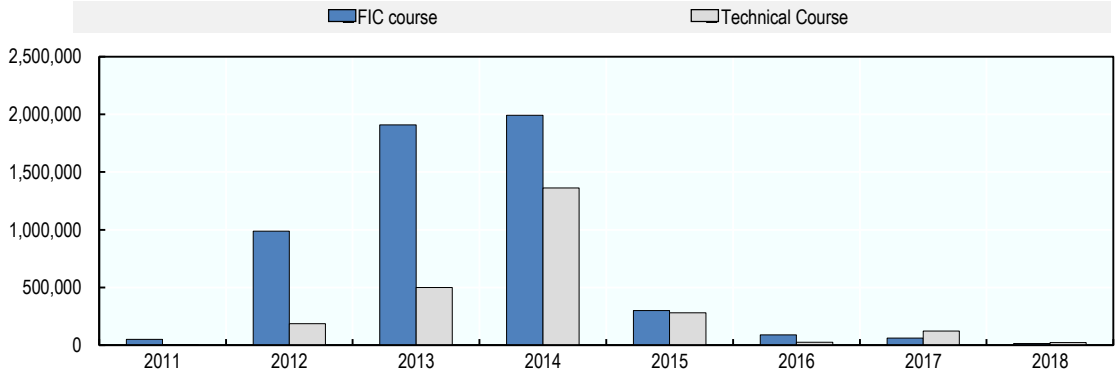
and workers who would otherwise hardly engage into further training. Two types of training courses are offered and qualify for the subsidy within PRONATEC: vocational training courses ("*Cursos técnicos profissionalizantes*") or short professional qualification courses meant to re-direct workers to a new occupation or to deepen their occupation-specific expertise ("*Cursos de formação inicial e continuada*" or "*Cursos* FIC"). The first type of course, hereafter Technical Courses, can last from one to three years or from 800 to 1 200 hours in total. The second type of course, hereafter FIC Courses, can last from three to six months or from 160 to 400 hours in total. While the former targets young individuals, potentially still in education, and leads to a qualification equivalent to lower or upper secondary education, the latter is particularly aimed at individuals who have already left education and integrated the labour market or who are actively looking for a job. FIC courses certificates do not provide any equivalence in terms of educational attainment. In this context, FIC courses are usually considered free-form training courses. Individuals qualifying for a subsidy for the first type of courses receive what is called a "*Bolsa formação estudante*" ("student training subsidy") and those qualifying for a subsidy for the second type of courses receive a "*Bolsa formação trabalhador*" ("worker training subsidy").

The Federal government, at the time, set up the ambitious objective of training 8 millions of workers in five years through the PRONATEC programme. Ultimately, the goal was to raise the earnings and employability of lower-income segments of the workforce, as well as increase employment in the formal sector. With PRONATEC, it became clear that adult training became again one of the main priorities of the Federal government. One important change with respect to the previous programmes – PLANFOR and PNQ – is that MEC became the main actor responsible for the development, implementation and management of the programme, instead of MTb. There were several reasons behind this change, some of them political. Nonetheless, by giving MEC a central role, PRONATEC became the first Federal adult training programme structured in articulation with the official education system in Brazil.

It is possible to retrieve the evolution of the number of PRONATEC participants until 2018, using the micro dataset of student's records from "*Sistema Nacional de Informações da Educação Profissional e Tecnológica*" or SISTEC. SISTEC is the official portal from the Ministry of Education, where all training providers register their training offer – course openings, number of classes, location of classes, number of places available per class, etc. – and students enrol for courses with their personal details.

The number of PRONATEC participants each year is displayed in Figure 4.2. Every year, the number of students registered for FIC courses prevailed over the number of students registered for a Technical course (except in 2017). The programme reached high levels of participation in 2013 and 2014, but the number of participants significantly decreased in the following years. Some courses are cancelled for exogenous reasons or lack of participants before starting. Students who enrolled in courses that got cancelled are not taken into account in Figure 3.3. But all other students are accounted for, even those who may have dropped-out.

Figure 4.2. Number of PRONATEC participants from 2011 to 2018



Source: SISTEC micro data set of PRONATEC students' records.

Given the importance of FIC courses as compared with Technical courses for most years of the programme, PRONATEC is effectively a large-scale *adult learning* programme. With PRONATEC, the Federal government kept one of the best elements of PNQ: the inter-ministerial collaboration. In fact, as discussed in the previous chapter, the dissemination campaign of PNQ had significantly improved thanks to the collaboration between MTb and MDS. In the governance of PRONATEC, inter-ministerial collaboration became a key element as explained in the following section. On the other hand, PRONATEC is a more centralised programme than PLANFOR and PNQ. Although still involved, lower administrative levels (States, Regional councils, Municipalities) have a less central role in the programme. With PRONATEC, Federal funds are no longer transferred to the State governments, for example, but directly used by MEC to pay training providers. Removing intermediaries in the process contributed to lowering the level of bureaucracy, and mostly, the risk for deviation of public funds.

4.2. PRONATEC governance

Unlike PNQ and PLANFOR, the management of PRONATEC is mostly under the responsibility of the Ministry of Education (MEC), with the collaboration of several ministries and other governing bodies. The collaboration of MEC with other ministries, formalised through a technical cooperation agreement ("*Acordo de cooperação técnica*"), and with State governments' departments of education - formalised through terms of commitment ("*Termo de compromisso*") - gave rise to several modalities of PRONATEC. Collaborating ministries and State governments' departments of education (SEEDUCs) are referred to as "requesting partners" ("*parceiros demandante*"). Each requesting partner can establish, in collaboration with MEC, more than one modality of PRONATEC. Each modality has a different target group and, potentially, offers different types of training courses. Some modalities offer Technical courses, while others offer FIC courses.

All the requesting partners and modalities of PRONATEC that offer FIC courses – the adult training courses – are listed in

Table 4.1. For instance, the Ministry of Labour (MTb) has five different modalities of PRONATEC offering FIC courses. Some modalities are active since 2011, while others were only created later on (such as PRONATEC "*Aprendiz"* and PRONATEC "*ProJovem Trabalhador*"). Each modality can have a particular target population. For example, "PRONATEC *Mulheres Mil*", created by the Ministry of Social Development (MDS), offers training courses for women in situations of social vulnerability (women suffering from domestic violence, among other cases). Other partners do not target any segment of the population in particular. To illustrate this, the Ministry of Health (MS), with the modality "PRONATEC *Saúde*", is open to any worker interested in pursuing training in the health area.

Every year, MEC publishes and updates the catalogues of training courses: "*Guia de cursos FIC*" for FIC courses and "*Catálogo Nacional de Cursos Técnicos*" for Technical courses. The catalogues specify the minimum and maximum number of hours of training for each course and provide a short description of the course content, the broad area of study in which that training course fits, and the minimum entry requirements to register for each course. Entry requirements may consist of a minimum age or level of education. Requesting partners consult the catalogues and inform MEC about the specific training needs of their target public. For that purpose, MEC prepared a template file called "*Mapa da demanda*" (demand map), to be filled and returned by each requesting partner. The information that needs to be provided in these demand maps includes the exact course code being requested, the code of the municipality where the training course should take place, the number of places that are needed for each combination of course and municipality, the course's area of study, the course's type (FIC or technical course), and finally, within which PRONATEC modality the course is being requested.

After receiving the demand maps from all the requesting partners of PRONATEC, MEC aggregates the demand for courses to verify whether different partners have requested similar training courses in the same location and if a sufficient number of places has been requested to justify a course opening. Training requests within PRONATEC modalities considered exclusive (marked by "E" in Figure 4.1) cannot be aggregated with requests from other partners. This means that training classes are opened exclusively for the candidates pre-selected by the requesting partner within that modality. Training requests within PRONATEC modalities considered priority (marked with "P" in Figure 4.1) can be aggregated with other demands, but the targeted population by the respective demanding partner should be prioritised when filling the training places available. Other candidates can enrol in these training classes, but only if places remain unfilled by the targeted public Training requests within the remaining PRONATEC modalities (marked by "S" in Figure 4.1, standing for "Shared") can be freely aggregated with other requests (further details are provided in the next chapter).

After this process, MEC consults with different training providers in each location to understand whether such course openings are feasible. The training providers' infrastructures and the availability of professors and instructors will determine the feasibility for the subsequent calendar term. This process of consultation with training providers to determine which course openings are feasible is called "*pactuação*" (further details in the next chapter). Training providers can then register their course openings in the SISTEC portal and start accepting students' registrations.

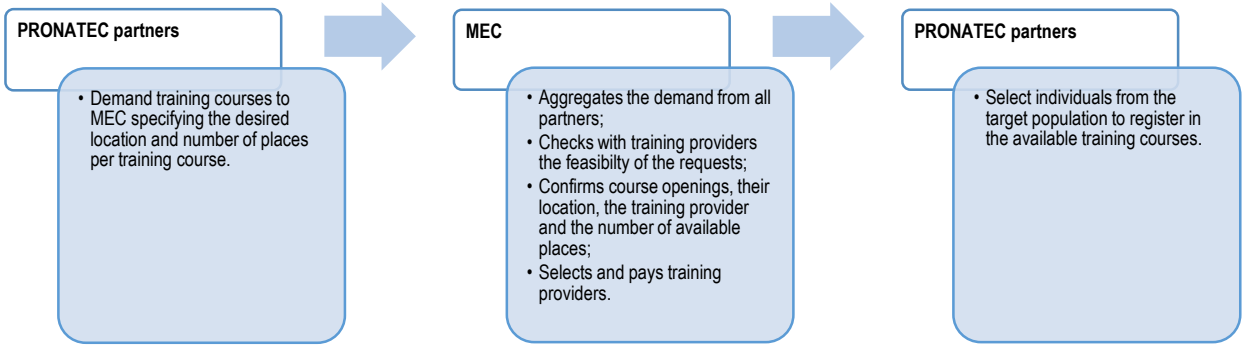
Table 4.1. PRONATEC partners and modalities

Partner	Modality of PRONATEC	Years active	Type	Target (if any)
MEC - SECADI	PRONATEC EJA FIC (Fundamental & Médio)	2013-2018	S	Individuals who did not complete compulsory schooling at the regular age
	PRONATEC ProJovem Urbano	2014-2015	E	Youth (18-29) living in urban areas who dropped out before completing compulsory schooling
	PRONATEC Jovem FIC	2011-2018	S	Youth (18-29) who dropped out before completing compulsory schooling
MTb	PRONATEC Aprendiz	2014-2018	S	Youth (14-24) or disabled who will complete an internship in micro or small firm
	PRONATEC Aprendiz 2	2016-2017	E	Youth (14-24) or disabled who will complete an internship in micro or small firm
	PRONATEC ProJovem Trabalhador	2017	E	Youth (18-29) in unemployment
	PRONATEC Trabalhador	2013-2018	S	Precarious workers
	PRONATEC Seguro-Desemprego	2011-2018	P	Unemployed workers
MEC - SETEC	PRONATEC E-Tec	2016-2017	E	n. a.
	PRONATEC Profuncionario	2016-2017	E	Basic education professionals
	PRONATEC 2016	2016-2018		n. a.
	PRONATEC Serviços Públicos	2014-2018	S	n. a.
MS	PRONATEC Saúde	2016-2018	P	n. a.
MDS	PRONATEC Mulheres Mil	2013-2018	E	Women in situation of social vulnerability
	PRONATEC Brasil sem Miséria	2011-2018	S	Individuals who benefit from social welfare programmes
	PRONATEC Vira Vida	2014-2015	E	Youth victims of sexual violence
	PRONATEC Sistema Socioeducativo Semi-Aberto		S	Youth under social and educational measure partly in Juvenile detention centre
	PRONATEC Sistema Socioeducativo Aberto	2013-2018	S	Youth under social and educational measure
MDH	PRONATEC Sistema Socioeducativo Fechado	2013-2017	E	Youth under social and educational measure in Juvenile detention centre
	PRONATEC Pop Rua	2014-2015	E	Homeless individuals
	PRONATEC Viver sem limite	2013-2018	P	Disabled individuals
MAPA	PRONATEC Agro	2014-2018	S	n. a.
MCTIC	PRONATEC Comunicações	2013-2015	S	n. a.
MC	PRONATEC Cultura	2013-2018	S	n. a.
MD	PRONATEC Aeronáutica	2013-2016	E	Officials from the air force
	PRONATEC Aeronáutica Reserva	2014-2015	S	Officials from the air force in reserve
	PRONATEC Exército	2013-2015	E	Officials from the army
	PRONATEC Exército Reserva	2014-2015	S	Officials from the army in reserve
	PRONATEC Marinha	2013-2016	E	Officials from the navy
	PRONATEC Marinha Reserva	2014-2016	S	Officials from the navy in reserve
	PRONATEC Marinha Mercante	2013-2014	S	n. a.
MDIC	PRONATEC Setor Produtivo		S	n. a.
	PRONATEC Brasil Maior	2013-2016	S	n. a.
MPA	PRONATEC Pesca e Aquicultura	2013-2015	S	n. a.
MJ	PRONATEC Sistema Prisional	2013-2018	S	Individuals serving time in semi-open or open regimes
	PRONATEC Sistema Prisional em regime fechado	2013-2017	E	Individuals in detention

Partner	Modality of PRONATEC	Years active	Type	Target (if any)
MPS	PRONATEC Reabilitação Profissional	2013-2018	P	Workers in occupational rehabilitation
MMA	PRONATEC Ambiental	2015-2017	S	n. a.
	PRONATEC Bolsa Verde	2015-2016	E	Individuals living in traditional communities
	PRONATEC Catadores	2014-2016	E	Individuals already working as waste collectors
MTur	PRONATEC Copa	2012-2014	S	n. a.
	PRONATEC Copa na empresa	2013-2014	E	Employees of firms in the sector
	PRONATEC Copa Social	2014	S	Vulnerable youth
	PRONATEC Turismo na empresa	2015-2016	E	Employees of firms in the sector
	PRONATEC Turismo Cidadão	2015-2016	S	n. a.
	PRONATEC Turismo Desenvolvimento Local	2015-2017	S	n. a.
	PRONATEC Turismo Social	2015	E	Vulnerable youth
Planalto	PRONATEC Campo	2013-2018	S	Family farmers and rural workers

Note: Partners are listed with their abbreviation. The full name of each partner can be found in the glossary of abbreviations at the beginning of the report. Each partner can have more than one PRONATEC modality. Some modalities are managed by more than one partner in collaboration. The column "Years active" shows the years in which students' records were identified in the SISTEC micro dataset for each modality. The type of the modality can be either "S" if shared, "E" if exclusive or "P" if priority. See main body of the text for further explanations. When the "Target (if any)" column is filled with "n.a.", the respective PRONATEC modality is open to any individual interested in getting training for the corresponding partner's area of intervention.
Source: Official PRONATEC documentation and http://portal.mec.gov.br/pronatec

Figure 4.3. The central role of MEC in the governance of PRONATEC

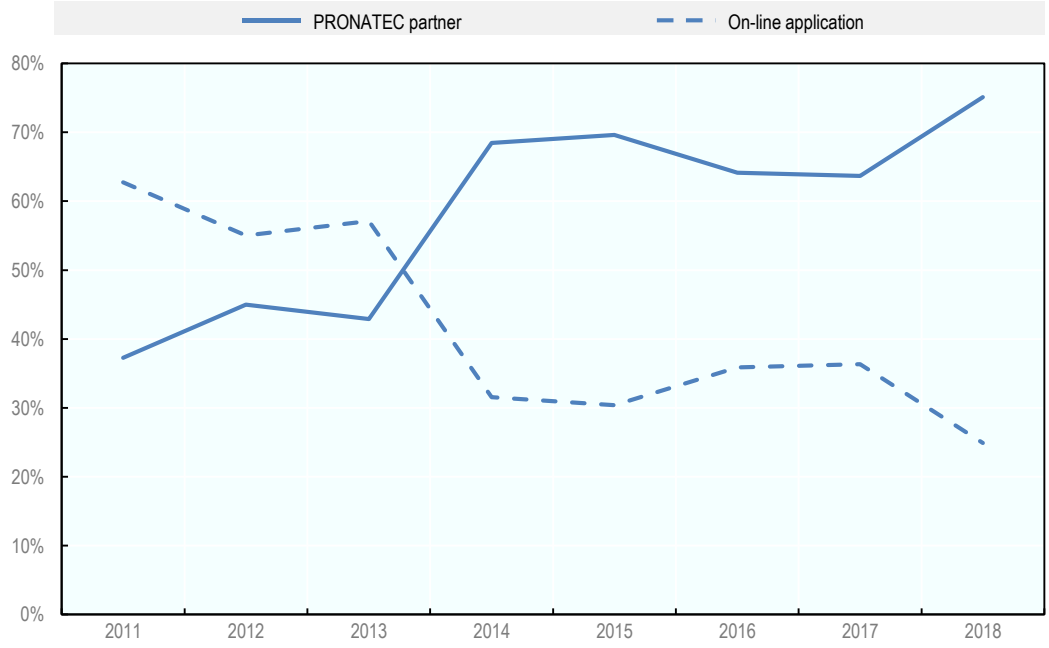


Source: PRONATEC law (Lei nr. 12.513 do 26/10/2011).

Individuals can enrol in training courses (FIC and Technical) by one of three different ways. First, individuals can be selected by a requesting partner who then takes charge of the individuals' pre-enrolment. Second, from all the remaining vacancies, not already filled by individuals selected by the requesting partners, and for all the vacancies that are not exclusive to a particular target group, individuals can pre-enrol directly through the PRONATEC website (http://pronatec.mec.gov.br). Finally, for Technical courses only, individuals can also apply via the SISUTEC website (http://sisutec.mec.gov.br). When selected by a requesting partner or pre-enrolling via the PRONATEC website, individuals qualify for a training subsidy ("*Bolsa formação*").

Figure 4.4 displays the number of students that were selected and pre-enrolled by a requesting partner and the number of students that pre-enrolled directly on-line via the PRONATEC website or the SISUTEC portal. Since 2014, most students are selected and pre-enrolled by requesting partners, meaning that most vacancies available for PRONATEC training courses are targeted to particular segments of the population or aimed at fulfilling a determined policy objective.

Figure 4.4. Students' pre-enrolment mode from 2011 to 2018



Note: Technical and FIC courses are taken into account, but only courses that were not cancelled. On-line applications include students who pre-enrolled with the PRONATEC website (http://pronatec.mec.gov.br) and the SISUTEC portal (http://sisutec.mec.gov.br).
Source: SISTEC micro data set of PRONATEC students' records.

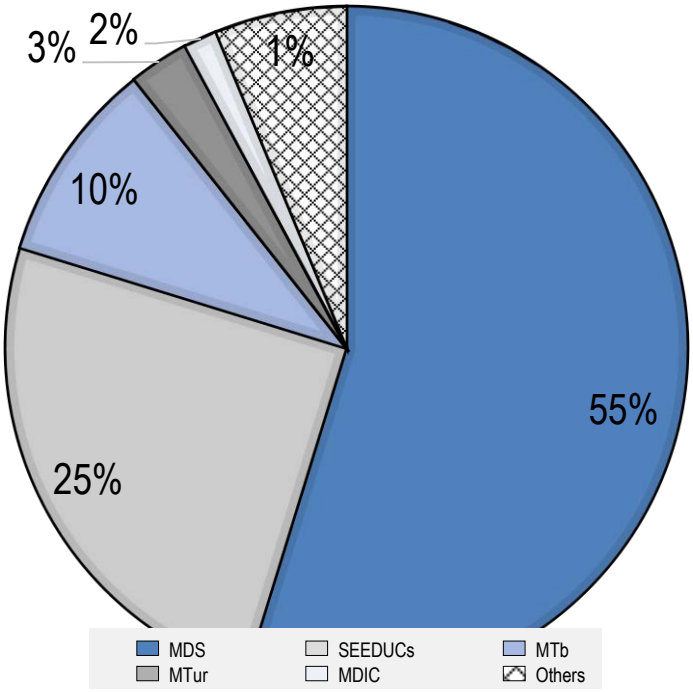
Inter-ministerial collaboration is one of the most successful aspects of the PRONATEC programme. Thanks to this governance structure and the involvement of several ministries and state departments of education, PRONATEC was able to reach a wide public and to address training needs for all sectors of activity: health, defence, business and administration, industry, tourism, etc. The fact that all ministries coordinated in a unique programme also avoids the duplication of efforts and overlap of different initiatives, with sometimes similar objectives and target public. Furthermore, with a unique programme, several policy objectives, concerning the action of several ministries, can be pursued: democratisation of professional education, promotion of inclusiveness, reduction of poverty, improving labour productivity and firms' competitiveness, promotion of exports, etc. In this context, PRONATEC's governance structure should be preserved and should serve as an example to other countries aiming to implement a large-scale adult training programme.

Pre-registration does not guarantee a place into any training course. Requesting partners can eventually select and pre-enrol more individuals than places available for the training courses they requested. Individuals need to confirm their enrolment in person at the

training institution. Places for training are then confirmed on a first-come first-served basis by the training provider. Training providers are ultimately responsible for checking individuals' documentation and making sure that minimum entry requirements are effectively met. Pre-enrolled individuals can be refused into a course by the training provider for lack of entry requirements. Finally, some courses can be cancelled by the training provider if an insufficient number of individuals comes to confirm their pre-enrolment. Further details about the enrolment procedure will be provided in the next chapter.

Figure 4.5 and Figure 4.6 show the number of PRONATEC participants per requesting partner and per modality offering FIC courses. The modality developed by MDS called "PRONATEC *Brasil sem miséria*" (PRONATEC Brazil without poverty) was the PRONATEC modality that most contributed for the total number of programme participants so far. The second most important modality, in terms of number of participants, although far behind "PRONATEC *Brasil sem miséria*", was "PRONATEC *Seguro-Desemprego*" (PRONATEC unemployment insurance), carried by MTb.

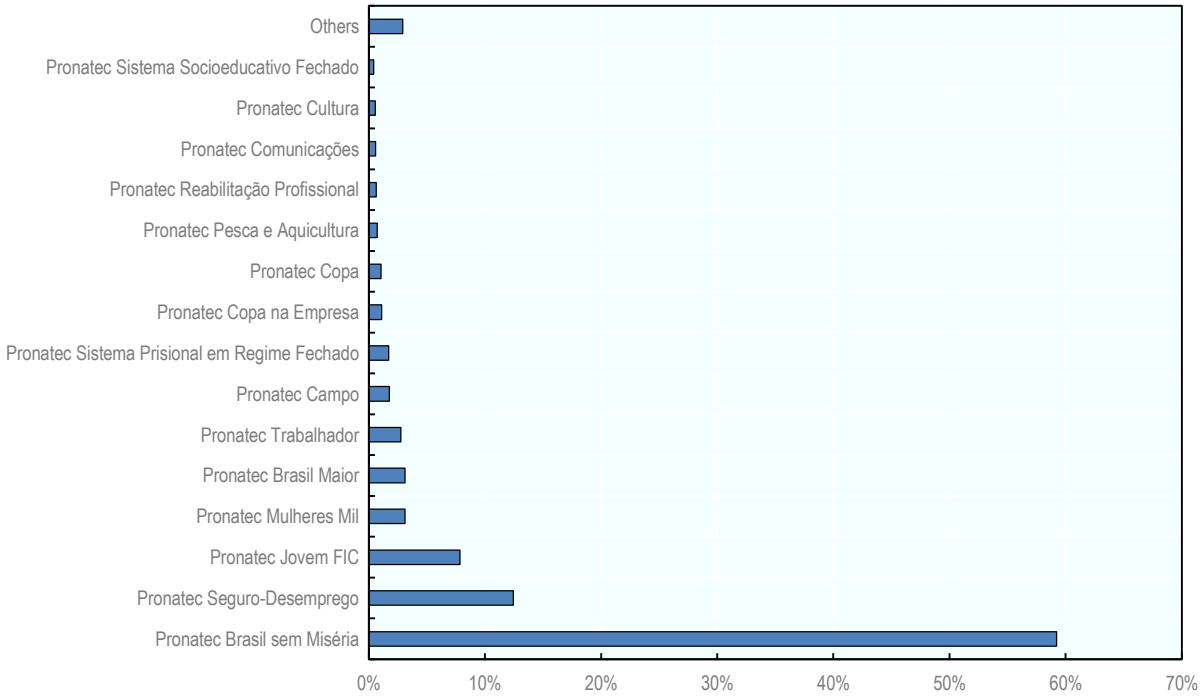
Figure 4.5. Number of participants per requesting partner from 2011 to 2018



Note: Both FIC and Technical courses are taken into account. Total aggregated over the years.
Source: SISTEC micro data set of PRONATEC students' records.

State departments of education have also been largely contributing for the programme by requesting training courses in their municipalities and identifying suitable candidates locally. A quarter of all enrolments in PRONATEC training courses were made through SEEDUCs. Therefore, although PRONATEC gives a less central role to state governments by not transferring them public funds directly, with the established governance structure of PRONATEC, local authorities still have the opportunity to address local training needs.

Figure 4.6. Number of FIC courses participants per modality between 2011 and 2018



Note: Only modalities offering FIC courses are taken into account and only students registered for FIC courses. Total aggregated over the years.
Source: SISTEC micro data set of PRONATEC students' records.

Although each requesting partner contributes to disseminate information about the programme and their PRONATEC modalities, in particular towards their target public, MEC takes charge of the overall advertising expenses with PRONATEC each year. Figure 4.7 shows that PRONATEC made up the majority of the advertising expenses of that Ministry in 2013 – the year before the programme reached its pick of participation. In fact, PRONATEC was well advertised throughout the country between 2013 and 2014, using mostly street billboards and flyers (Figure 4.8 and Figure 4.9).

However, although MEC's advertising expenses have been increasing in the last four years, expenses related to PRONATEC almost ceased. Effective and inclusive adult learning systems should start by promoting the benefits of adult learning. In fact, evidence suggests that adults, and in particular low-skilled individuals, are not always able to recognise the need to develop their skills further (OECD, 2018; Windisch, 2015). Public awareness campaigns can come in many forms: media channels (TV, radio, print press, online and social media, etc.), public events (fairs, conferences, workshops, exhibits, etc.), networks of contacts, or even direct mail.

One example that could be followed by the Brazilian government comes from Slovenia, where the Institute for Adult Education has been organising an annual lifelong learning week since 1996, which includes more than 1 500 events, implemented in cooperation with other partners across the country. This has proved very successful in mobilising participation in adult learning programmes, while remaining cost-effective (Box 4.1).

Box 4.1. The Slovenian Lifelong Learning Week (LLW)

Since 1996, the Slovenian Institute for Adult Education (SIAE), through the Slovenian Lifelong Learning Week (LLW), has been working on implementing a culture of continuous learning by attracting public attention to thousands of inspiring educational, promotional, information and guidance, as well as social and cultural events. The exhaustive list of events can be found in the LLW's website: https://llw.acs.si/about/.

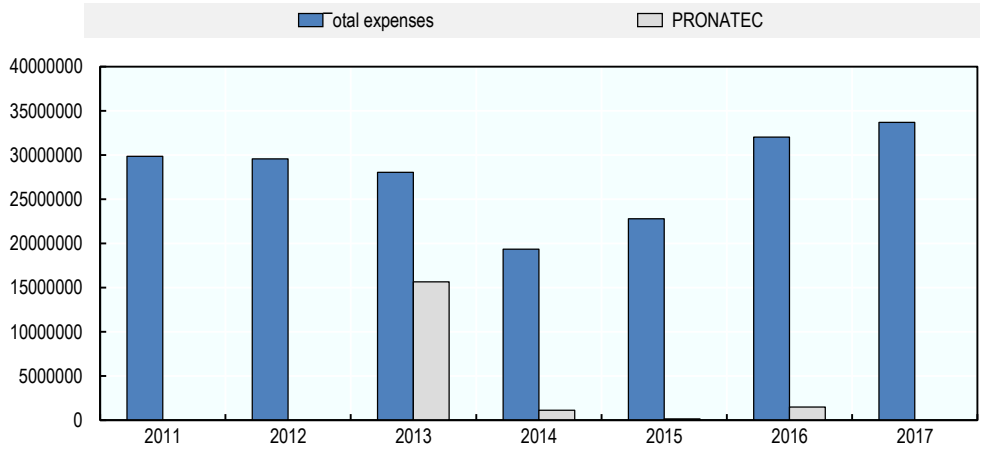
The LLW has become a festival which annually involves several hundreds of institutions, NGOs, interest groups and other stakeholders. The project has received the financial support of the Ministry of Labour, Family, Social Affairs and Equal Opportunities, as well as the Ministry of Education, Science and Sport. Event coordinators complement this public funding with their own resources and financial help from sponsors and donors.

Every year, the LLW committee attributes three types of awards which are disclosed during the national LLW opening ceremony: the individual learning award, the learning group award, and the learning institution award. These awards are meant at rewarding outstanding individuals, groups and institutions who have invested their resources in learning and yielded admirable results, such as personal growth, improving their working and social status, influenced their environment (family, community, neighbourhood, etc.) to learn or who have promoted the knowledge of others. Until 2008, 15 awards were given annually. Since then, for budgetary reasons, the number of awards has lowered, but still five awards have been attributed each year.

Another initiative linked to the LLW is the "Role Models Attract campaign". LLW award winners record themselves telling their story and how lifelong learning has improved their lives. These video-portraits are then spread to target groups, contributing for the promotion of lifelong learning opportunities.

There is little public information about the overall budget dedicated to PRONATEC. Given that PRONATEC was institutionalised by Law, funding for the programme came directly from the Federal government's annual budget. According to several press articles, successive Federal government allocated a total amount of BRL 10 billion (EUR 2.32 billion) for the PRONATEC programme between 2011 and 2015. This value does not include Federal funds transferred to technical schools from "*Sistema* S" within the context of the agreement of free training provision for vulnerable workers. More recently, the Federal government invested about BRL 110 million in 2016 and BRL 41 million in 2017, therefore significantly reducing the amount of public funds dedicated to the PRONATEC programme. This drastic reduction in public investment is the reason behind the fall in PRONATEC advertising expenses, as well as the fall in the number of PRONATEC participants in the recent years.

Figure 4.7. MEC advertising expenses from 2011 to 2017



Note: Expenses expressed in current values and Brazilian Reais.
Source: Data provided by MEC to the OECD Secretariat.

Figure 4.8. Example of a PRONATEC flyer in the state of Rio Grande do Sul



Source: Portfolio of Leticia Corrêa Ribeiro: http://www.kawek.net/ribeiroleticia-106492

Figure 4.9. Example of PRONATEC Billboard



Source: Portfolio of Leticia Corrêa Ribeiro: http://www.kawek.net/ribeiroleticia-106492

4.3. The profile of PRONATEC participants

When pre-enrolling candidates in PRONATEC courses, requesting partners are encouraged to submit to MEC a document that describes the methodology adopted in mobilising the targeted public and selecting candidates. The criteria used to sort candidates should be transparent and clearly communicated to the public. Requesting partners can use questionnaires, interviews, cognitive tests or other methods to collect information about potential candidates for their selection process. There is not a standard procedure that applied to all requesting partners and each has the freedom and autonomy to adopt the preferred selection method.

Requesting partners are also required to make sure that candidates meet the minimum entry requirements – in terms of age and educational attainment. When there are no such minimum requirements, requesting partners are asked to consider whether candidates possess the knowledge and experience required to successfully complete the training course or, at least, if it is feasible for them to follow the course content. This assessment of previous knowledge and competencies remains largely at the discretion of the requesting partner's staff in charge of the selection. For example, for PRONATEC "*Seguro Desemprego*", staff at the SINE offices in each region can make that decision. Consequently, the criteria used for that judgement can change from one requesting partner to the other, or even, from one staff at the same SINE's office to the other, as there are no strict guidelines or procedures to recognise candidates' previous knowledge and experience.

While there is a decentralised programme in Brazil for the formal recognition of prior learning, this programme – called "*Rede* CERTIFIC" - was never fully developed and implemented (see Box 4.2). As a consequence, individuals have no means of proving that the experience and knowledge they have accumulated over time is sufficient to attend and successfully complete a specific PRONATEC course. The lack of a well-functioning programme for the formal recognition of prior learning partly explains why assessments of candidates remains largely on requesting partners' staff's discretion.

Box 4.2. Recognition of prior learning and the programme "*Rede* CERTIFIC" in Brazil

In 2014, the Ministry of Education (MEC) and the Ministry of Labour (MTb) collaborated to create a programme of formal recognition of prior learning called "*Rede* CERTIFIC" (*Portaria SETEC n. 8 de 02/05/2014* and *Portaria Interministerial n. 5 de 2/04/2014*). The objective of this programme was to formally recognise the knowledge, skills and professional competencies acquired by individuals through their family life, civic engagements, involvement with social partners and professional experience. This formal recognition could lead to a certification with equivalence to a particular educational level.

The formal recognition of prior learning would occur in a decentralised manner, directly through the authorised schools from the "CERTIFIC" network. Federal, state and municipal technical schools would need to apply to become part of the "CERTIFIC" network and be authorised to issue formal certifications based on prior learning. The formal certifications issued by the "*Rede* CERTIFIC" programme could only be equivalent to vocational education diplomas. The methods to assess the candidates was to be developed directly by staff at the authorised schools.

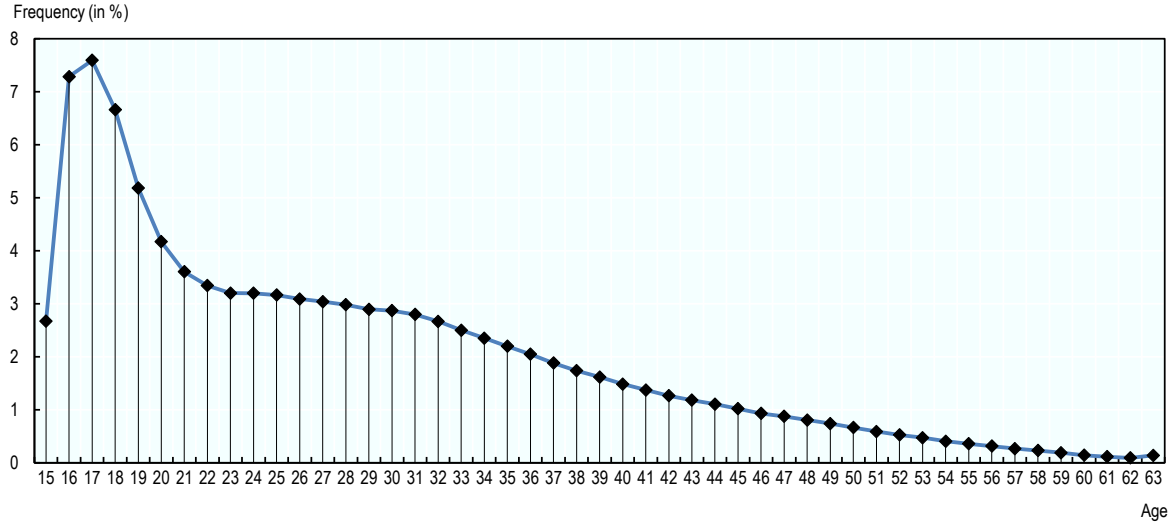
In the 2014 legal document that creates the programme "*Rede* CERTIFIC", MEC and MTb planned to create a national council that would develop the procedure of authorising schools to become part of the CERTIFIC network and general guidance for these schools on how to assess candidates. Ultimately, the responsibility of supervising and monitoring the programme fell on the department of Professional and Technological Education at MEC.

However, there were no further actions from either ministry to develop this programme. In practice, there are very few schools belonging to the "CERTIFIC" network and the number of certificates issued remains very small. The small scale of "*Rede* CERTIFIC" has prevented it from having a meaningful impact so far.

Older workers are those most likely to benefit from programmes that recognise prior learning and accumulation of experience. In fact, older workers have left formal education long ago and may not possess the formal requirements, qualifications or pre-entry conditions to enrol in a PRONATEC course. Validating and certifying older workers' skills can help to re-engage them with learning activities.

Figure 4.10 depicts the age distribution of FIC courses participants. Even excluding technical courses and focusing on adult training, younger workers - between 16 and 20 years old - constitute the majority of participants. Participation in FIC courses decreases monotonically with age. Hence, older workers seem to have benefited less from the programme, although they might be the workers at higher risk of exclusion from the labour market due to technological changes.

Figure 4.10. Age distribution of PRONATEC participants from 2011 to 2018



Note: Only FIC courses are considered. Data aggregated over the years.
Source: SISTEC micro data set of PRONATEC students' records.

Developing a full-scale system to recognise prior learning could improve the Brazilian adult learning system and, in particular, the PRONATEC programme in two aspects: (i) it would contribute to engage older workers into adult learning, who are vulnerable of being excluded from the programme based on the lack of entry requirements; and (ii) it would establish a framework to assess candidates' background when selecting them for PRONATEC courses, avoiding that staff from different ministries, SINE's offices or state departments of education, apply different criteria or benefit their personal network of family and friends in the access to subsidised training courses. One potential example to follow is the Portuguese programme "*Passaporte Qualifica*" (Box 4.3).

Box 4.3. The Portuguese "*Passaporte Qualifica*" programme

The programme "*Passaporte Qualifica*" was launched in March 2017 with the objective of raising the educational level and the formal qualifications of the Portuguese workforce, as well as to engage adult workers in further education. It consists in a programme for the formal recognition of competencies acquired through experience and informal learning.

"*Passaporte Qualifica*" starts with a web portal where individual workers can create a profile and register all the formal qualifications obtained, as well as all the skills they consider they accumulated throughout their adult life so far. After completing their profile, users of the portal can run a simulator on-line to consult potential and alternative pathways. The simulator will take into account the qualifications and skills acquired so far and suggest potential training courses or modules that, if taken, could lead to a formal certification and the recognition of a particular educational level. Whenever possible, the simulator will suggest more than one possible pathways to a formal certification.

After consulting the different possible pathways generated by the simulator, individuals can choose one of the alternatives and obtain further information about the training modules or credits that have been validated based on their prior experience, and those that

are still missing to obtain a formal certification or the recognition of a particular educational level. Individuals can also consult the list of recognised training centres where they could enrol for the missing modules or credits.

The on-line profile can be constantly updated with the new qualifications obtained, modules or credits completed. After all credits are validated, individuals can print out their "*Qualifica*" passport and present themselves at a "*Qualifica*" centre to request the formal recognition of their qualification or educational level. There are more than 250 "*Qualifica*" centres across the country.

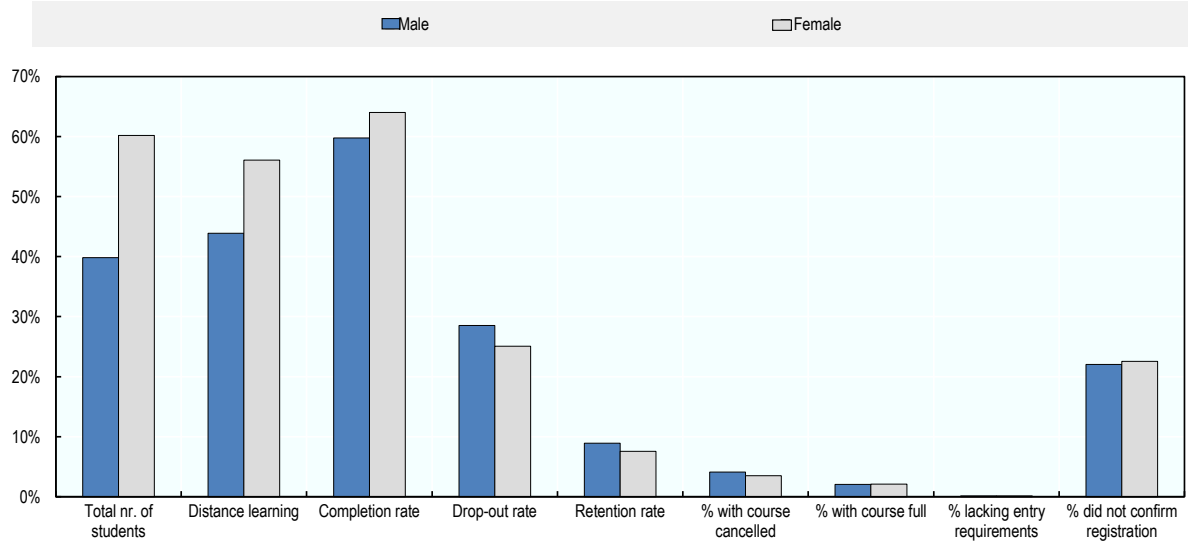
The web portal has an extensive list of Frequently Asked Questions (FAQs) and a phone number that can be dialled to obtain further information about the programme. There are also several video tutorials to understand how a profile should be created and how to take the most of the on-line simulator.

Further information can be found following the link https://www.passaportequalifica.gov.pt/.

With the micro data from SISTEC, it is also possible to compare the completion rates and drop-out rates per demographic group and across individual characteristics. Figure 4.11 compares the number of participants in FIC courses by gender, between 2011 and 2018, across all PRONATEC modalities. Women were clearly more highly represented than men. In fact, there are 20 percentage points difference between the participation of men and women. Out of all participants, women were also more likely to enrol through distance learning and women achieved higher completion rates than men. Otherwise, the percentage of students that could not enrol due to course cancellation, because the course was already full or for lack of entry requirements, is not significantly different for men and women. Therefore, there were no apparent differences between men and women in terms of participation in PRONATEC training.

The data also suggests that there were no significant differences between individuals of different ethnical groups. Additionally, individuals with some disability and individuals living in rural communities, did not exhibit a different pattern than the remaining PRONATEC participants. Distance learning was equally attractive and accessible to all demographic segments of the population, since no group in particular seem to have adopted this modality more than others.

Figure 4.11. PRONATEC outcomes by gender between 2011 and 2018



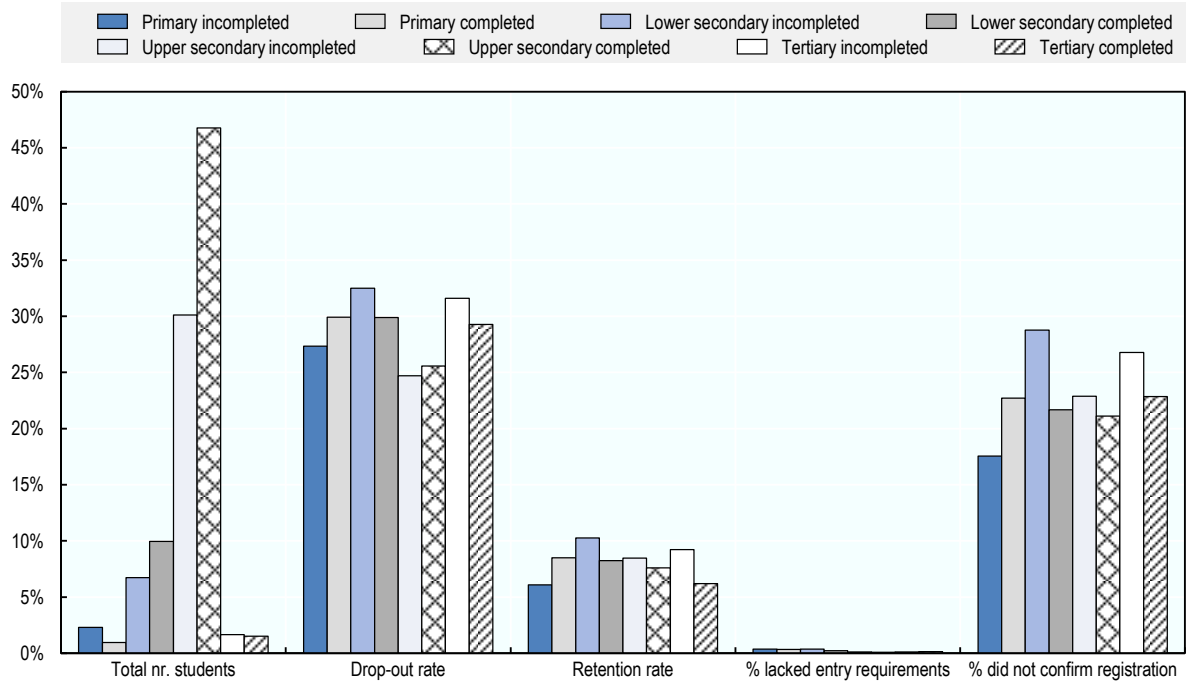
Note: Only FIC courses are considered. Data aggregated between 2011 and 2018.
Source: SISTEC micro data set of PRONATEC students' records.

Figure 4.12 shows the distribution of FIC courses participants by educational attainment, also between 2011 and 2018, across all modalities and training courses. The most represented group was that of individuals with completed upper secondary education, followed by those who did not complete upper secondary school. Workers with completed primary education are the least represented amongst FIC courses participants. It is possible that minimum educational attainment as entry condition for a large fraction of training courses, worked against individuals with solely primary education. In fact, pre-enrolled individuals with completed and uncompleted primary education are those more likely to have been prevented from confirming enrolment due to lack of entry requirements. This consideration further supports the idea that developing and implementing a system to recognise prior learning, knowledge and experience is highly recommended (see again Box 4.3). Individuals who initiated but did not complete lower secondary education are those more likely to drop-out, more likely to fail the completion of the course and be retained, and also, more likely not to show up to confirm their enrolment, a potential symptom of lack of motivation.

Figure 4.13 compares the same outcomes for two distinct groups: individuals who were in receipt of unemployment benefits when starting the training course and those who were not. Although one could expect that individuals who received unemployment benefits are those who could benefit the most from training and should be more motivated – for being out of work and not sufficiently long to be discouraged – they exhibit higher drop-out rates, lower completion rates and were more likely not to show up to confirm their pre-enrolment. These could be explained by the fact that individuals who receive unemployment benefits might be low skilled workers who are generally harder to engage into learning activities. Another potential explanation is that enrolment in a PRONATEC training course was made mandatory for individuals who were receiving unemployment benefits for the second time in their working career. These workers may not have been particularly motivated to complete the course they were pre-enrolled into, but may have

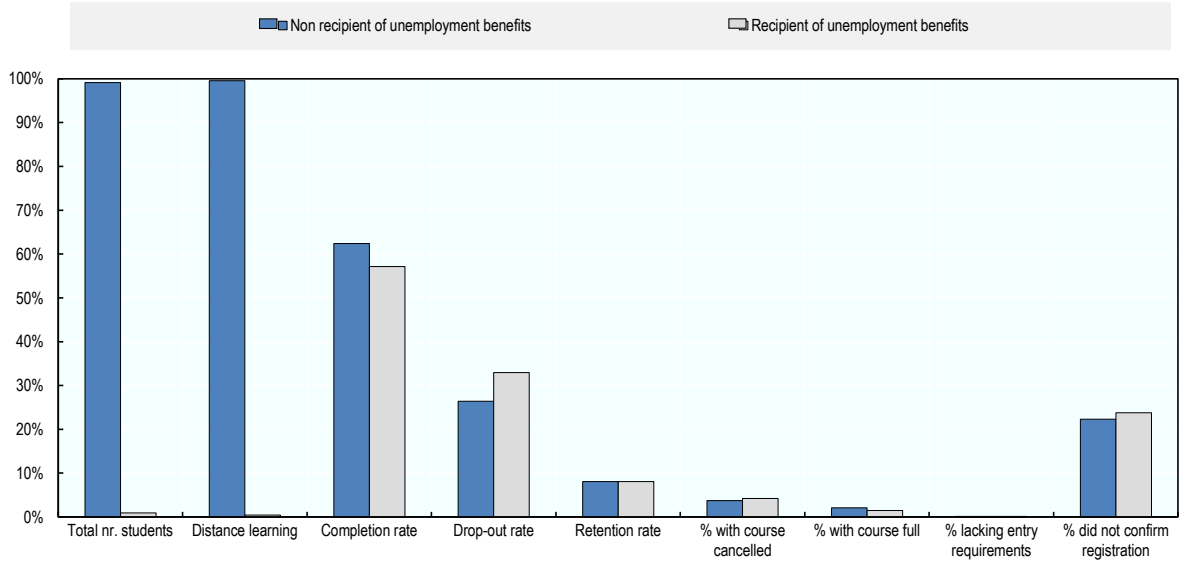
confirmed their enrolment solely with the purpose of meeting all requirements to receive the unemployment benefit.

Figure 4.12. PRONATEC outcomes by education groups between 2011 and 2018



Note: Only FIC courses are considered. Data aggregated between 2011 and 2018.
Source: SISTEC micro data set of PRONATEC students' records.

Figure 4.13. PRONATEC outcomes for individuals who received unemployment benefits from 2011 to 2018



Note: Only FIC courses are considered. Data aggregated between 2011 and 2018.
Source: SISTEC micro data set of PRONATEC students' records.

Although there were no major differences in outcomes across demographic groups, except for individuals under unemployment benefits and those who aren't, some segments of the population that were meant to be targeted by PRONATEC may still be underrepresented amongst training participants. This seems to be the case for older workers. This is a segment of the working population that might be particularly vulnerable and at risk of social exclusion, and that would deserve more attention from policy makers to ensure that there is equal opportunity in access to training and labour market opportunities.

4.4. Geographical coverage

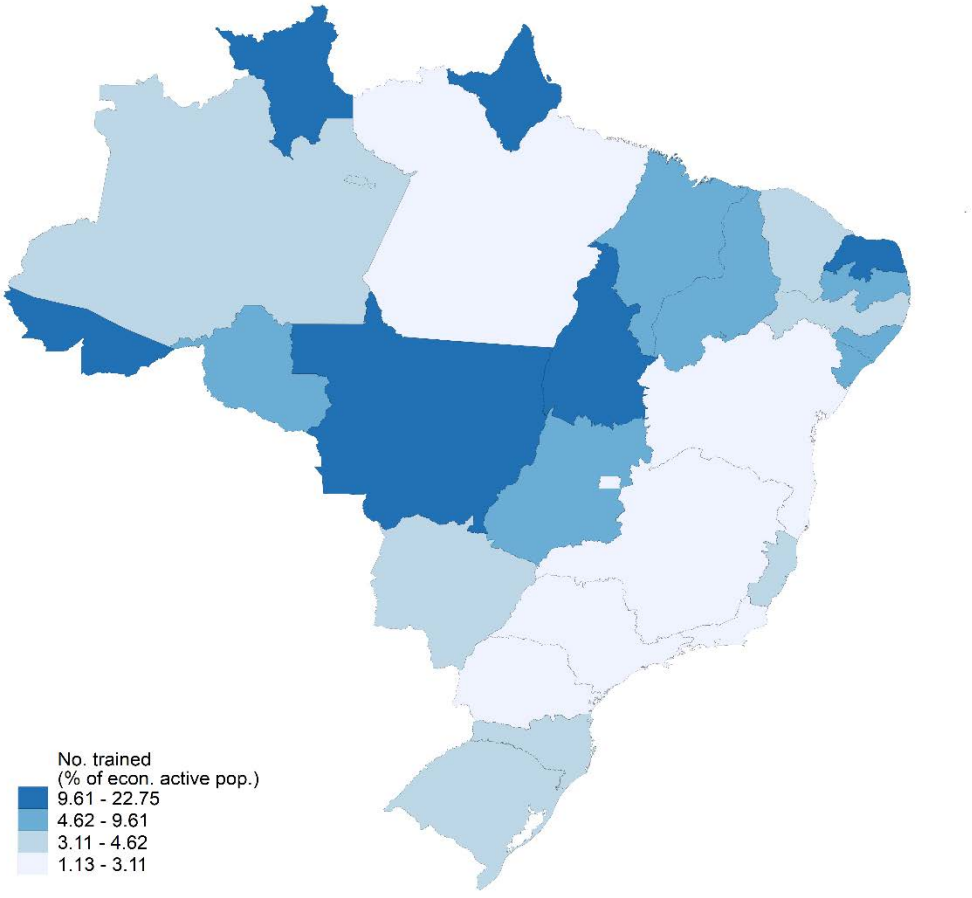
One of the merits of the PRONATEC adult learning programme is its vast geographical coverage, despite the country's large area, the heterogeneity and diversity of its regions and the existence of remote areas that are hardly connected with urban centres or by any infra-structure. Figure 4.14 shows the number of students who were registered for a PRONATEC FIC course between 2011 and 2018 by state. The number of students enrolled is expressed as a percentage of the economically active population[1] in each state and the Federal District. PRONATEC has been particularly active in the states of Acre, Amapá, Mato Grosso, Rio Grande do Norte, Roraima and Tocantins, covering almost 30% of the economically active population. These are all states with a GDP per person lower than USD 10 000 as of 2011, according to official data from the Brazilian Institute of Geography and Statistics or IBGE ("*Instituto Brasileiro de Geografia e Estatística*"). Only the states of Maranhão and Piauí have lower GDP per person. In the richest regions of Brazil, namely Distrito Federal and the states of Rio de Janeiro and São Paulo, PRONATEC covered less than 5% of the economically active population. Therefore,

PRONATEC seems to have been particularly effective in reaching out to the population living in the poorest areas of Brazil.

Overall, PRONATEC has covered as much as 4 125 different municipalities in 2014, out of 5 570 in total (Figure 4.15). These figures refer mostly to FIC courses. In 2014, there were PRONATEC FIC course in 4 063 municipalities out of 5 570 across the entire country. However, not all types of training providers contribute equally to spread the offer of PRONATEC courses across the country, and especially, in remote geographical regions.

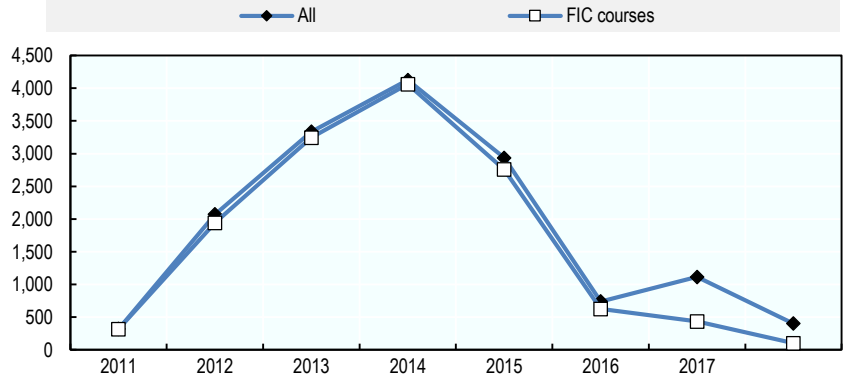
Figure 4.16 shows the number of municipalities across the country covered by each type of training provider. As will be thoroughly discussed in the next chapter, PRONATEC courses can only be provided by Federal Institutes, state and municipal technical schools, Federal Universities, technical schools from the S-system (SENAI, SENAC, SENAR and SENAT) or private technical schools duly accredited by MEC. Among all of these types of training providers, SENAI and SENAC are particularly well represented geographically, reaching more than 2 500 municipalities each. SENAI and SENAC are closely followed by Federal Institutes, while the lowest coverage goes to private institutions. Technical schools from "*Sistema* S" have, therefore, a fundamental role in the geographical coverage of the programme. SENAI, for example, holds a network of 555 fixed units and 442 mobile units, through which it can hold FIC courses. The mobile units, in particular, can be transported across the country by truck, train, or even by boat, in order to reach remote municipalities where there are no technical schools and where the infra-structures do not allow individuals to commute easily. These mobile units are particularly well-adapted to the morphology of states like Pará and Amazonas, for example.

Figure 4.14. Number of PRONATEC students in FIC courses per State and Federal District between 2011 and 2018



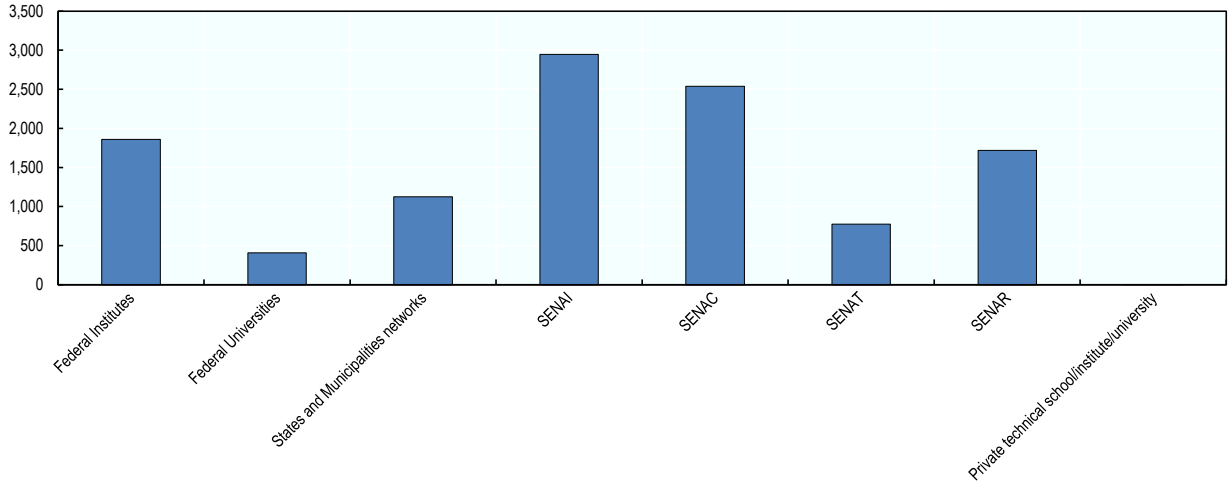
Note: Only FIC courses are considered. Total number of students aggregated between 2011 and 2018.
Source: SISTEC micro data set of PRONATEC students' records.

Figure 4.15. Number of municipalities covered by PRONATEC each year



Source: SISTEC micro data set of PRONATEC students' records.

Figure 4.16. Number of municipalities covered by each type of training provider between 2011 and 2018



Note: Only FIC courses are considered. Data aggregated across the years.
Source: SISTEC micro data set of PRONATEC students' records.

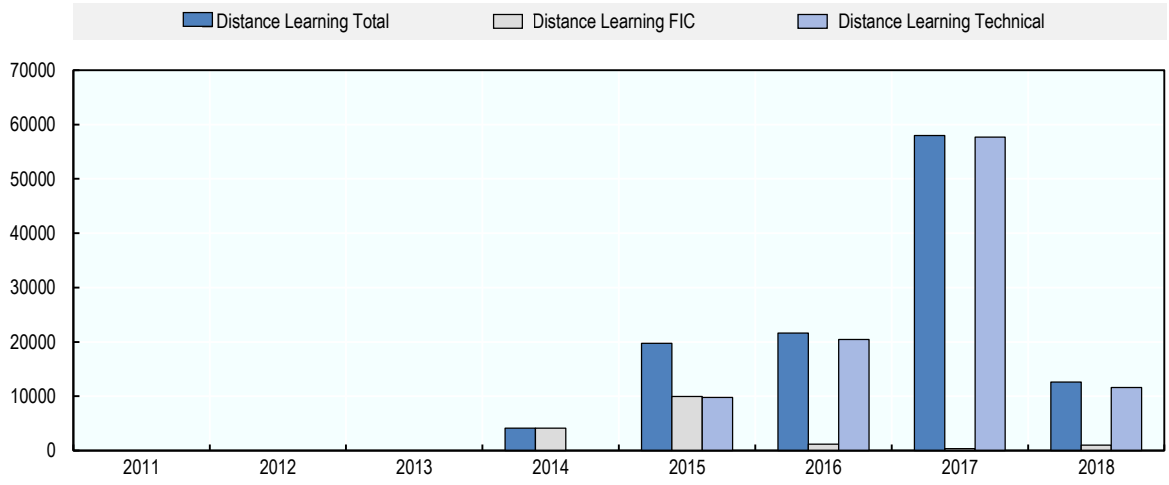
A cost-effective alternative would be to promote the offer of flexible learning opportunities. Training courses available on-line, by correspondence, taking learning materials home and learning remotely without being in regular face-to-face contact with a teacher in the classroom, are some examples of flexible learning opportunities. Training providers who possess the appropriate infra-structure can offer distance learning courses within PRONATEC. However, distance learning has not been really widespread for FIC courses, as suggested by Figure 4.17. Based on SISTEC's records, students enrolled in training courses through distance learning did not have lower completion rates than students who attended regular training courses in person. Therefore, further efforts should be made by the government to boost the offer of distance learning courses.

Another possibility, which has been exploited in some OECD countries, is to offer training courses in a modular or credit-based format. Modular approaches consist in individuals completing self-contained learning modules that can be combined to eventually gain a full qualification. Individuals could complete one self-contained module at a time, possibly in different times of the year, combining modules from different training providers, potentially at different locations. The Danish adult learning system, for example, strongly relies on such modular approach (OECD, 2018). Individuals working towards a qualification in Labour and Market Training Centres ("*Arbejdsmarkedsuddannelse*") can choose from a wide range of training modules, some of which may be organised within the general education system. In Mexico, individuals enrolled in the "*Modelo Educación para la Vida y el Trabajo*" (Model for Life and Work) programme can combine different modules with different topics, some of which are delivered in an on-line platform.

Beyond offering training courses in every region of the country and exhibiting high levels of enrolment everywhere, the successful completion of a training course can also be substantially influenced by local infra-structures. Individuals living in areas of poor transportation infra-structures, for example, may have more difficulties to attend training regularly, waste more of their time commuting from one place to the other, and experience greater physical tiredness at the end of the day. All these factors may

substantially affect their ability to successfully complete the training course. This is particularly relevant, given that the value of the training subsidy per hour has been set at a constant rate for all regions of the country (further details on the training subsidy will be provided in the next chapter). This means that individuals living in remote areas, with very little options to commute to school, receive the same subsidy than individuals living in urban areas with a well-developed public transportation system.

Figure 4.17. Number of students enrolled through distance learning between 2011 and 2018



Source: SISTEC micro data set of PRONATEC students' records.

The constant value for the PRONATEC training subsidy or "*Bolsa Formação*" across individuals, regions, training centres and training courses, is one of the biggest limitations in the implementation of the PRONATEC programme. In fact, different individuals have different capacities to save and invest in their own professional development. Individuals with different family situations will also have more or less opportunities to enrol in lifelong learning opportunities. Individuals with kids, for example, may not be able to attend evening courses, unless they are able to hire a babysitter or other services to take care of their children while occupied. Workers living in different regions experience different costs from commuting. The PRONATEC training subsidy should be adjusted accordingly. In fact, if regions are not equally attended by the programme, this could even contribute to widen the gap in economic growth and well-being across different areas of the country.

One argument for keeping the value of the "*Bolsa Formação*" constant across regions and individuals is that it simplifies the administrative procedure of transferring public funds to training participants. Additionally, differentiating the value of the subsidy across individuals could lead to undesirable situations of discrimination or personal favours. However, there are other ways of avoiding abuses of power and misuse of public funds that would not jeopardise the implementation of the programme.

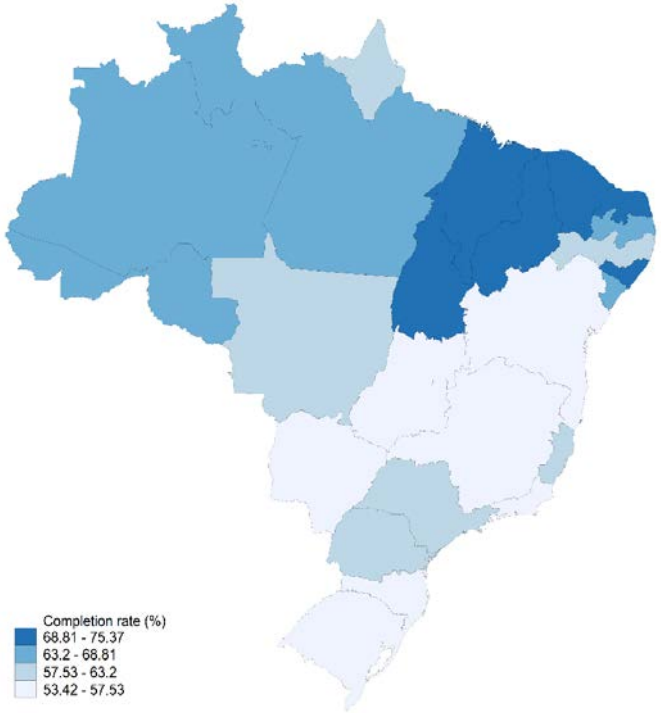
The government could consider a fixed set of possible values for the "*Bolsa Formação*" and there could be clearly defined criteria to qualify for each of the different subsidies. As long as the overall procedure is kept transparent, it becomes easier to detect possible

frauds and abuses of power. This system of multiple values for the training subsidy - depending on clearly defined observable individual characteristics - could be accompanied with regular audits to PRONATEC partners selecting candidates, schools and participating individuals. The government could set up a computerized management system of the training subsidies attributed, where information about individual participants could be cross-checked with administrative databases on earnings, wealth and the receipt of other social benefits.

Figure 4.18 and Figure 4.19 represent the completion rate for FIC courses between 2011 and 2018 by state and by municipality. States from the north-east region exhibit the highest completion rates. Alagoas, Ceará, Maranhão, Piauí, Rio Grande do Norte and Tocantins all obtained completion rates between 70% and 75% of the total number of students who confirmed their enrolment and effectively started a training course. However, these averages hide significant intra-state variation. Completion rates within one state can easily vary between close to 0% and more than 75%.

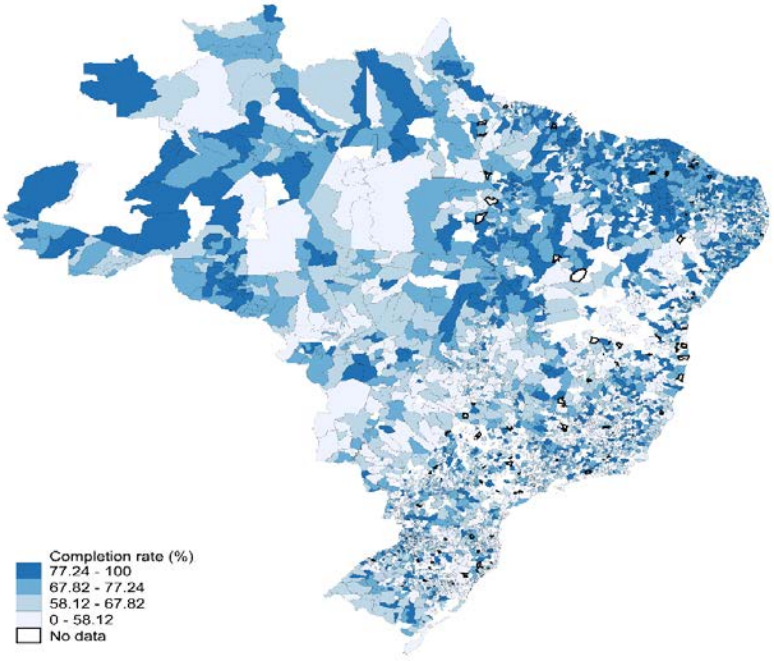
Regions that are less densely populated and where some communities are difficult to reach, such as in the states of Acre, Amazonas, Pará and Rondônia, for example, also reached relatively high completion rates, between 60% and 70% of the total number of students who confirmed their enrolment in a training course that effectively started. The lowest completion rates – and the highest dropout rates – can be found in States from the southern and south-eastern regions, such as Minas Gerais, Rio de Janeiro, Rio Grande do Sul and Santa Catarina.

Figure 4.18. Completion rates by State and Federal District between 2011 and 2018



Note: Only FIC courses are considered. Data aggregated over the years.
Source: SISTEC micro data set of PRONATEC students' records.

Figure 4.19. Completion rates by Municipalities between 2011 and 2018



Note: Only FIC courses are considered. Data aggregated over the years.
Source: SISTEC micro data set of PRONATEC students' records.

Despite its wide geographical reach, the effectiveness of the PRONATEC programme to fulfil specific local demand for training may have been limited. In fact, as previously mentioned, training courses subsidised by PRONATEC need to be selected from the national catalogue published by MEC, "*Guia de cursos* FIC". It is possible that in some states, or even municipalities, training needs are not contemplated by courses proposed in the FIC national catalogue. By centrally defining a list of training courses that can be subsidised within the PRONATEC programme, MEC tends to select training courses which will be demanded in all areas of the country, ignoring training courses that might be urgently needed in only a few remote areas of the country. This was the case, for example, in the states of Amazonas and Pará. To overcome this limitation and satisfy the demand for very specific training needs, some states have developed their own adult learning programmes (see the example in Box 4.4).

Box 4.4. State programmes to complement PRONATEC: the case of "*Pará profissional*"

In 2016, the state government of Pará approved a law that creates the state adult learning programme "*Pará Profissional*". The institutionalisation of this programme through a formal law ensures that the programme will continue beyond the specific government that developed it and the successive electoral cycles. This formalisation was put in place so as to maximise the long-term returns of the initiative. The objective of the programme "*Pará profissional*" is identical to the objectives of PRONATEC, but applied to the municipalities within the state of Pará.

The main contribution of "*Pará Profissional*" relies on the identification of specific local training needs that are not contemplated by PRONATEC and the nationally defined catalogue of FIC courses. By limiting its scope to one state, communication, coordination

and collaboration between members of the state government, municipalities, local schools, social partners and private firms is much facilitated. Together, and under the responsibility of the programme's coordinators in the state government, partners identify what are the skill needs of each community and whether such needs can be met by the existing local training offer.

For example, one of the skill needs identified by local partners that could not be met by PRONATEC or the existing training offer, consisted of tourist guides for religious routes in the state of Pará. In fact, pilgrims on religious routes are one of the biggest tourist attractions in the state. However, there was no national programme offering training for such specific local skill need. Another example is training courses to learn how to handle latex and incorporate it into other products and with other materials. This is also a very specific need of the region, which exports raw latex to the rest of the country, but could benefit from exporting latex-based products of higher value added.

Once specific local skill needs are identified, the different partners establish a formal collaboration agreement so as to develop a new training course that can fill this skill shortage. Schools or social partners can provide the classroom, other infra-structures and instructors when possible. Private firms can contribute with equipment's, experienced instructors, or the organisation of practical tutorials and internships. The state government can provide the funds to hire new instructors, purchase missing equipment or rent classroom space if needed. This generates some flexibility in the training location, schedule and content, allowing courses to take place closer to the targeted public and to meet the needs of local communities.

When a free course is opened, a public announcement is made so that anyone in the state can apply for the training course. Staff at the government of Pará collect applications, sort them, select candidates and pre-enrol them into the training courses. Students do not receive any training subsidy, unlike for PRONATEC. Therefore, it is possible that students enrolling for a course provided through "*Pará professional*" are more motivated and engaged.

But to reduce drop-out rates from the programme, state government staff, together with their partners, always organise an induction session for each course explaining its content, the expected work load, the criteria for successful completion, the occupations for which the course may lead to, the expected employment rate and average earnings in those occupations, among other things. Students are allowed to cancel their enrolment after the induction session if they believe that the course does not meet their expectations. Because this session happens very early in the process, students who cancelled their enrolment after the induction session can still be replaced by other candidates kept on a waiting list. According to staff at the state government of Pará, induction sessions have been very effective in improving the completion rates of training courses offered in the context of "*Pará professional*".

The programme has set a target of training 10 000 individuals per year, with a budget of BRL 8 million, and until 2019. This budget was made of only state funds. Nonetheless, further funds can be obtained through private-public partnerships in the organisation of specific training courses.

While this is a promising initiative, the programme is still developing and there is insufficient data yet to assess its merits. For the moment, it remains a low-scale programme and its results may not be easily extrapolated to larger initiatives.

Two considerations can be made out of the example from "*Pará professional*" (Box 4.4). First, that the organisation of induction sessions prior to the start of a PRONATEC training course, or at the early stages of the training course, might be a useful and costless mechanism of reducing drop-out rates. In fact, further information and career guidance is needed to avoid unrealistic expectations, feelings of frustration and to maximise the potential of the public investment made in the PRONATEC programme. Career guidance, more generally, helps individuals to understand their skill set and development needs, as well as navigating through the available learning opportunities and training courses that would best suit them (OECD, 2018). Examples of career guidance services from other countries are provided in Box 4.5.

Second, it is possible that, by creating incentives for training providers to supply courses that are listed in the national catalogue of FIC courses, but that do not necessarily match urgent local demand for skills, PRONATEC even contributes to misalign training needs and training offered in some regions, in the medium-long term. In fact, training providers may be tempted to invest in infra-structures, equipment and materials that allow them to increase their offer of training courses which are subsidised. To capitalise on such investments, training providers may want to continue offering the same courses for a relatively long time horizon. The next chapter will carefully analyse the alignment of training needs and PRONATEC's training offer.

Box 4.5. Examples of career guidance services from other countries

To be effective career guidance takes into account timely labour market information and the outputs of skill assessment and anticipation exercises. Career guidance can be delivered by the public employment services (PES), specialised public guidance services, or yet, career guidance websites (OECD, 2018).

In Iceland, social partners and the government are working together in the *Education and Training Service Centre* to develop career guidance services in cooperation with education providers around the country.

Other countries have developed one-stop-shops where individuals can get all the information they need in one place. For example, the House of Guidance (*Maison de l'Orientation*) in Luxembourg opened in 2012 following the collective effort of five departments across the Ministries of Education, Labour and Higher Education. The house provides a one-stop-shop for education and labour market orientation. Previously targeted at a younger age group, there has been a greater focus on adult learners since 2017.

Similarly, the project Education Shop (*Leerwinkel*) in West Flanders (Belgium) is an independent one-stop-shop for advice on educational options and financial support. The project focuses specifically on adults with low education levels, immigrants and detainees.

Note

[1] The economically active population includes all individuals in legal age of work that are employed or unemployed and actively looking for a job. It excludes individuals still in education, discouraged unemployed workers who are no longer looking for a job, as well as individuals unable to work.

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Chapter 5. PRONATEC: Training provision and alignment with labour market needs

This chapter proceeds with the description of the PRONATEC adult training programme, getting into further details regarding the selection of training providers and how public funds are transferred to training institutions and individuals. The chapter proceeds with the analysis of training outcomes across different types of training institutions. Particular emphasis is placed on the alignment of the training offer with labour market needs. When challenges are identified, alternative solutions are suggested, based on practices from other countries.

For adult education and training to be useful for individuals, firms and societies, it is imperative that the provided training is of high quality, as well as aligned with the skill needs in the labour market. This chapter reviews how the adult training programme PRONATEC selected and funded training providers. Using micro data from the SISTEC portal, several aspects of training provision are analysed across different types of institutions. This analysis suggests that there is still a significant amount of heterogeneity in the delivery of PRONATEC training courses. Finally, the offer of PRONATEC courses is compared with skill shortages in Brazil, as identified by the OECD Skills for Jobs database. This comparison reveals that PRONATEC training courses do not always respond to the most prominent skills needs in Brazil. Several recommendations are drawn, based on examples of best practices from other countries whenever possible.

5.1. Selecting and financing training providers

5.1.1. Selection of training providers

PRONATEC partners can request a particular training provider for their course demand, if duly justified. Otherwise, and in the majority of cases, training providers need to apply and obtain the approval of MEC to offer PRONATEC training courses. Different factors may be taken into account, such as the provider's infra-structure and the availability of instructors. For the infra-structure, particular attention is paid to classroom illumination and ventilation, as well as building accessibility. Regarding the instructors of PRONATEC courses, three criteria need to be met:

1. The coordinator of PRONATEC courses needs to hold a tertiary education degree.
2. Instructors need to hold at least a secondary-level vocational or general education degree.
3. At least 80% of the professionals involved with the pedagogical and administrative management of PRONATEC courses need to have a formal institutional link with the training provider.

Four types of institutions can be designated or apply to become PRONATEC training providers: public institutions from the Federal network of professional, scientific and technological education ("*Rede Federal de Educação Profissional, Científica e Tecnológica*"); state and municipal technical schools; technical schools from "*Sistema* S"; and finally, private institutions. This is a major difference compared with the previous programmes – PLANFOR and PNQ - where Non-Governmental Organisations (NGOs), civic associations, workers' unions, cooperatives and other institutions could also become training providers. The existence of a list of specific requirements for these types of institutions, in order to become a PRONATEC training provider, is also a novelty relative to previous programmes. By restricting the type of institutions that could offer PRONATEC training courses and setting some objective criteria, the new approach limits the heterogeneity in the quality of FIC courses subsidised by the Federal government. It is also easier for MEC to control and supervise training providers across the country. However, as will be discussed in the following sub-sections, there is still some heterogeneity in quality across PRONATEC training providers.

After aggregating the demand for FIC courses from all PRONATEC requesting partners ("*mapas da demanda*"), MEC publishes, through the SISTEC portal, a consolidated map of training demand with details about the types of courses and the locations requested (called "*Mapa das Demandas Identificadas*"). In a first stage, training providers submit

offer proposals to meet such demand. MEC then has the responsibility of approving such proposals, within the limits of number of places requested for each training course in each location. In a second stage, training providers can submit proposals not necessarily contemplated in the consolidated map of training demand. MEC then coordinates with requesting partners to evaluate such proposals. This second phase constitutes an opportunity for training providers to apply for PRONATEC funds for courses that they have already set up and are ready to deliver without additional investment on infra-structures or hiring of new faculty.

After obtaining the approval from MEC to their proposals, training institutions can publish their class openings in the SISTEC portal, informing the portal's users about the location of the training, the number of places available, the minimum entry requirements, the predicted start and end date of the FIC training course, the schedule, the number of hours of training scheduled per day, among other things.

One potential limitation of this system, is that training providers can exploit this process of consultations, negotiation and conciliation, to maximise the amount of public funds they receive, but without necessarily offering training courses that meet employers' skill needs. The process of "*pactuação*" is meant at identifying what courses can be quickly offered and these may not always correspond to courses that will equip students with the skills and knowledge most needed in the labour market or likely to become needed in the future. Further discussion about the alignment of training provision with labour market needs will follow in the next sub-sections.

5.1.2. Monitoring student enrolment and financing training provision

After the publication of class openings, as discussed previously, PRONATEC requesting partners select and pre-enrol candidates for FIC training courses through the SISTEC portal. For shared modalities, i.e. modalities that do not require exclusive classes or their public to be prioritised (marked with "S" in Table 3.1), requesting partners can pre-enrol their selected candidates to any class opening. For PRONATEC modalities considered priority (marked with "P" in Table 3.1), MEC selects specific class openings. The requesting partner for that modality is then the only partner able to pre-enrol its selected candidates for such courses, at least, in an initial stage. Only later, and if places remain available, all the other partners are also able to pre-enrol their selected candidates. For modalities considered exclusive (marked with "E" in Table 3.1), MEC also selects specific class openings. Requesting partners for such modalities are then able to exclusively pre-enrol their selected candidates to these openings. Requesting partners can pre-enrol candidates up to twice the total number of places approved for each FIC training course. Once this limit is reached, no more pre-enrolments are possible in the SISTEC portal. Finally, individuals can pre-enrol on-line (via the PRONATEC website: pronatec.mec.gov.br) for FIC training courses that have not yet reached their limit of pre-enrolments, even without having been selected by a PRONATEC demanding partner.

If a training course does not receive at least 50% of its approved number of places in pre-enrolments, it can be cancelled. Otherwise, pre-enrolled candidates via PRONATEC partners receive a formal letter inviting them to confirm their enrolment at the training institution in person. There is only a limited period of time during which the enrolment can be confirmed. If an opening has received more pre-enrolments than approved number of places by MEC, pre-enrolments are confirmed on a first-come first-served basis.

Training institutions can refuse to confirm a student's enrolment in any of the following cases:

- If the student's documentation is insufficient or missing;
- If the student does not meet some minimum entry requirement (based on age or educational attainment);
- If the class has been cancelled in the meantime;
- If the number of places has already been filled;
- If the student wants to attend the FIC training course as part of a more complete training programme, but the FIC course content does not match the requirements of that programme.

In all the above cases, the training provider has to declare the reason why the enrolment was not confirmed in the SISTEC portal. Students who never showed up to confirm their pre-enrolment are also signalled as such in SISTEC. In principle, individuals enrolled for FIC courses cannot request to be transferred to other FIC courses once their enrolment has been confirmed by the training provider, unless the FIC courses for which they were originally registered is cancelled.

On the positive side, the overall procedure is well organised and everything adequately recorded on the SISTEC portal, generating a lot of information that could be used for the programme assessment and the evaluation of training providers. On the other hand, the procedure can be quite lengthy and complicated. Pre-enrolments and enrolments represent two layers of administrative procedures at different locations and with different staff. At each stage, documentation has to be presented, forms filled, among other things. This bureaucracy constitutes a potential barrier to access adult training for individuals who lack time or financial resources - in which case the time spent on these procedures can have a high opportunity cost. Simplifying the enrolment procedure is strongly advised to make sure that access to PRONATEC training courses is not barred for individuals who lack time for work or family reasons.

Federal funds allocated to the PRONATEC programme are transferred to training providers as a function of the number of students registered in each institution and the total number of hours of training provided to each student. The exact amount to be transferred to each training institution is calculated as the product of the total number of students registered, the total number of hours of training provided, and the fixed value per student/hour set by MEC, added over all the training courses offered by the institution.[1]

MEC sets the value per student/hour to BRL 10, regardless of the training course, the location of the school and the type of training provider. In actual fact, the cost of training provision varies widely across courses, across providers and across regions: some training courses are more costly than others to provide (for e.g. a course to become assistant in the maintenance of aircrafts will most likely require more equipment than a course to become administrative assistant), schools offering a larger number of courses may be able to benefit from economies of scales that smaller schools are unable to enjoy, equipment may be more difficult to obtain and instructors more difficult to hire in some regions than others (for e.g. comparing the region of São Paulo and states across the Amazon rainforest). As a result, the fixed value per training hour and student translates into varying financial returns across providers and regions.

Part of the training subsidy that training providers receive must be transferred to eligible PRONATEC participants. This amount is meant to cover commuting expenses and a meal per day for the duration of the training course. By establishing this training subsidy, the Federal Government - and MEC in particular - aims at overcoming potential financial

barriers to access adult training. Rules for the attribution of this subsidy were clarified in an official document published by MEC in 2015 (*Portaria MEC nr. 817/2015*). Alternatively, training institutions can directly provide transportation and meals to their students.

The constitutional law establishes that the assistance provided to individuals should take into account the specificities of the region, the characteristics of the individuals, and all factors that may influence access to the training institution, class attendance and the successful completion of the training course. However, the "*Bolsa Formação*" was set at BRL 2 per hour of training for every student attending a PRONATEC FIC course in any institution across the country. As discussed previously, fixing the amount of the subsidy was meant to simplify significantly the procedure, preventing any disputes, claims of personal favours or conflicts of interest. It was also aimed at reducing bureaucracy when transferring funds to individuals, through training providers. This a typical example of a situation where the fear of misappropriation of public funds wins over what would have been the optimal policy design.

In fact, there are several issues as a result of this fixed value policy. First of all, different training providers across the country have different incentives to adapt their methods and curricula, as well as a different capacities to invest, expand and innovate in their course offering with PRONATEC. Large training providers have an advantage over small training providers. In fact, providers with a wider variety of courses can more easily balance out losses on one course with benefits from another. Small training providers, or providers with a limited number of courses in offer, are more constrained. Second, this creates incentives for training institutions to offer courses that have very little provision costs. These may not necessarily be the courses that are most needed in the labour market and may lead to further distortions in the alignment of training offer and training needs. Third, the policy may not attend the needs of the most vulnerable workers adequately and may perpetuate an unequal access to training opportunities.

These are good reasons to justify that the training subsidy per student/hour should not be fixed, but adjusted depending on the individual, the training course offered, the location and the type of training provider – as already discussed in subsection 4.4. There could be a small set of possible values for the training subsidy, so as to keep the system simple, and an objective list of conditions to qualify for each subsidy amount. As long as these criteria are clearly defined and kept transparent, the system should remain resilient to corruption, political and personal favours.

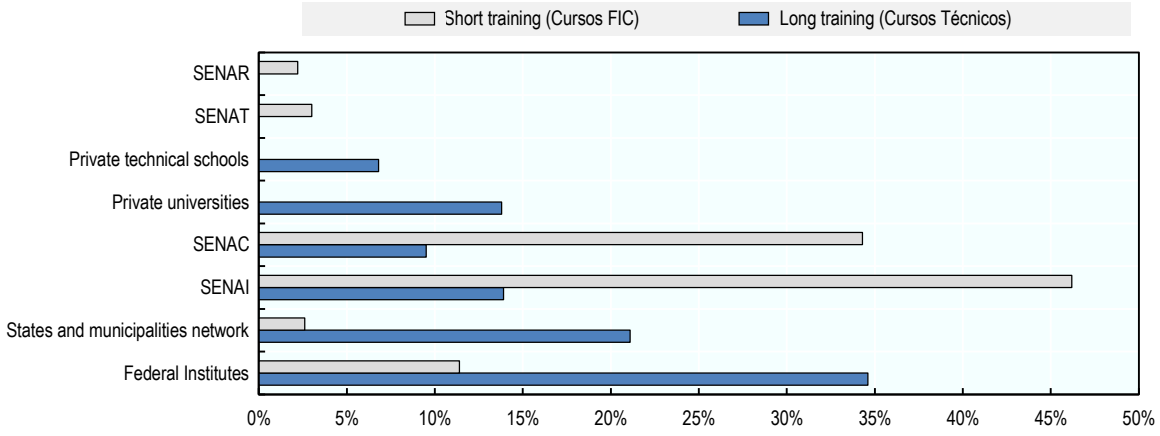
Attendance monitoring for funding purposes is under the responsibility of each training provider. Every month, the training institution has to enter into the SISTEC system each student's attendance. This has to be done before the tenth of the subsequent month and is a necessary condition for Federal funds allocated to PRONATEC to be transferred to schools. Schools are responsible for putting in place a system so that students can consult and confirm their attendance record. Students have up to one month after the completion of the training course to confirm their attendance record on the system. This was meant to minimise attendance misreporting from training institutions. However, neither training institutions nor students have an incentive to report lack of attendance. Training institutions would not want students to exceed the thresholds set up by MEC below which they will not receive their payment. Students interested in keeping the training subsidy of BRL 2 per hour of training would also not want to admit that they attended less than a certain amount of classes. Given that both parties' incentives are aligned, it is unclear whether this attendance reporting system works effectively. One way of preventing that

training providers and students abuse from the system and implicitly pact on misreporting attendance would be to conduct inspections to training providers.

5.2. Heterogeneity across training providers

Figure 5.1 displays the relative importance of each type of institution in the provision of PRONATEC training courses, according to official government sources. The majority of FIC courses were provided by SENAI, the technical schools from "*Sistema* S" dedicated to the manufacturing sector, closely followed by SENAC, the equivalent school dedicated to the sales and services. Private institutions, on the other hand, were barely involved in the provision of FIC courses.

Figure 5.1. PRONATEC training providers between 2011 and 2018

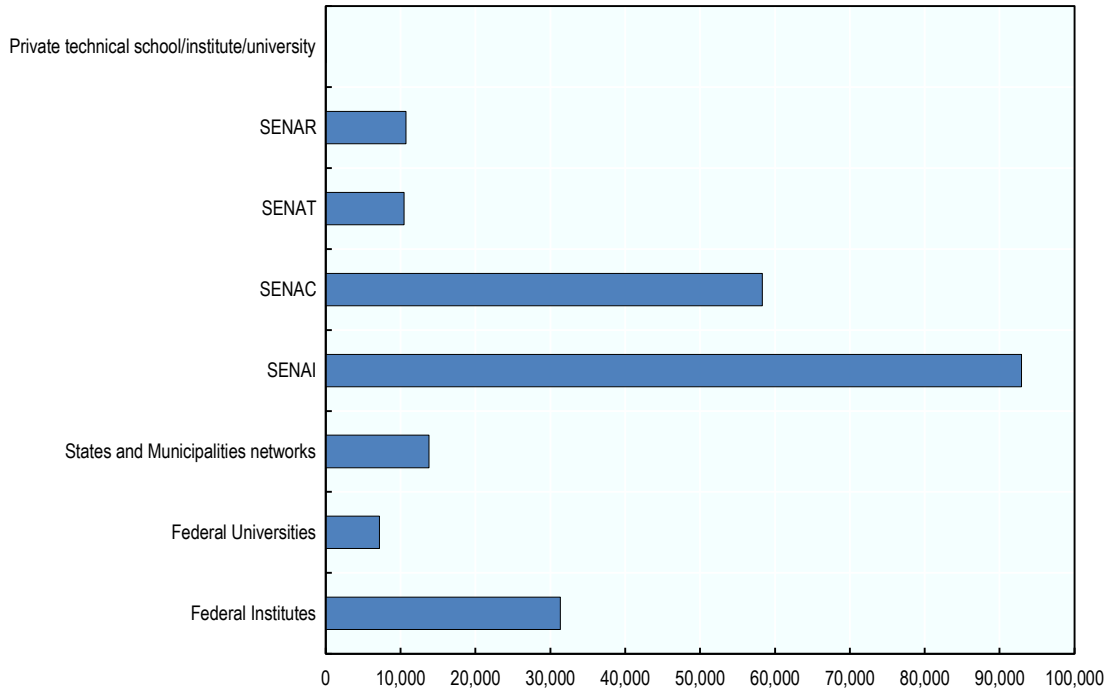


Source: SISTEC micro data set of PRONATEC students' records.

Using the micro-data records from SISTEC, and focusing only on FIC courses that have not been cancelled, it is possible to identify the number of different training classes and the number of different training courses available per type of institution.

Figure 5.2 looks at the total number of different classes opened (each year, in different locations, for different training courses) and Figure 5.3 looks at the total number of training courses (aggregating different classes in separated locations and years). Curiously, Federal institutes and universities offered a much higher number of different training courses than technical schools from "*Sistema* S" (SENAI, SENAC, SENAR and SENAT), relative to the number of students enrolled and number of classes opened. A similar pattern is observed for state and municipal technical schools. This suggests that technical schools from "*Sistema* S" are more specialised than public institutions in terms of training provision. Public institutions offer a larger variety of training courses. In a way, this means that public providers are open to a wider profile of students, promote diversity and possibly encourage inter-disciplinary interactions. But further specialisation can also mean that schools from "*Sistema* S" have accumulated more experience teaching in these particular fields, potentially increasing their courses' quality.

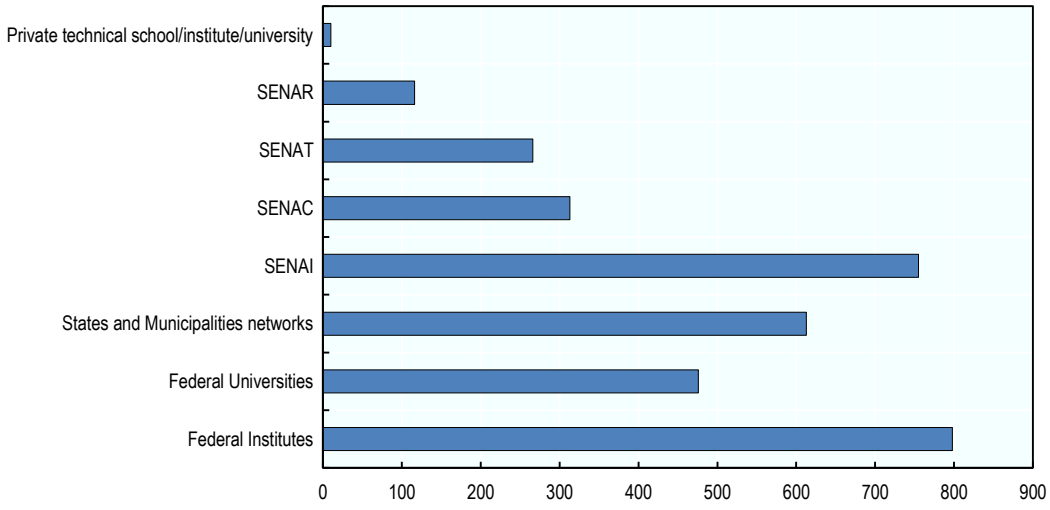
Figure 5.2. Number of classes per type of training provider between 2011 and 2018



Note: Only FIC courses are considered. Data aggregated over the years.
Source: SISTEC micro data set of PRONATEC students' records.

Exploiting the same data source, it is also possible to investigate the number of classes opened in the morning, afternoon and evening shifts (Figure 5.4). Public institutions (from the Federal network or state and municipal schools) privileged classes during the evening shift, allowing individuals to engage in training while employed or actively looking for a job. Private institutions, on the contrary, offered the majority of their classes during the afternoon, making it more difficult to reconcile adult training with other commitments. Technical schools from "*Sistema* S" offered a balanced number of classes across different shifts. This may suggest that public providers have greater concerns with equality of opportunity, inclusiveness and removing barriers to training, than private training institutions. Private providers may have been selecting a certain profile of students by adding barriers to access training, such as lack of time, for example. Another potential explanation is that public providers have limited resources available during the morning and afternoon shifts, while providing education to regular students, while technical schools from "*Sistema S*" and private schools face less resource constraints.

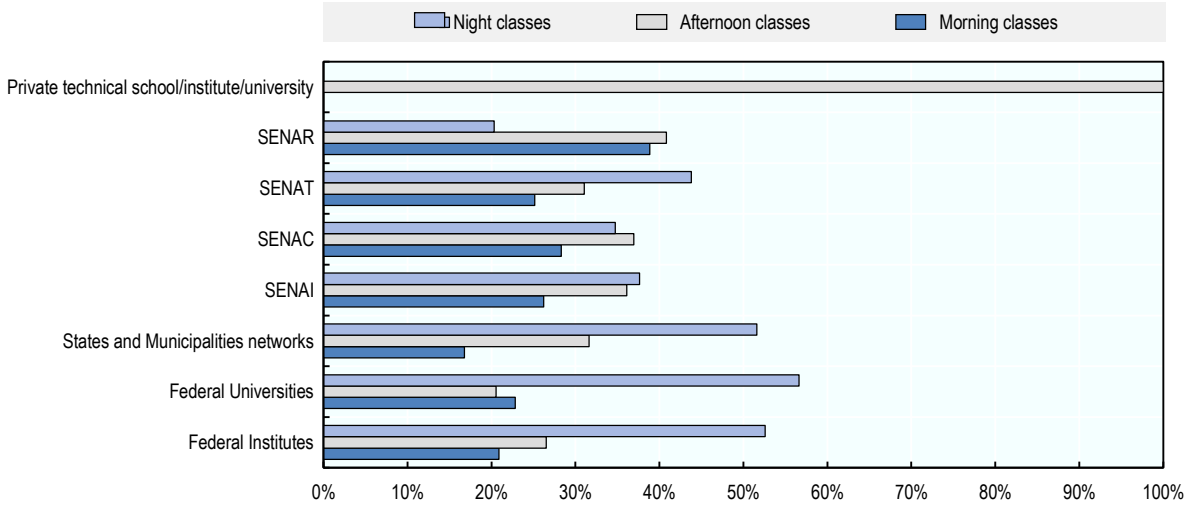
Figure 5.3. Number of courses per type of training provider between 2011 and 2018



Source: SISTEC micro data set of PRONATEC students' records.

Figure 5.5 represents the share of students enrolled in distance learning mode out of the total number of students enrolled for training by each type of institution. Public institutions record a higher share of students enrolled in distance learning mode than private institutions and technical schools from "*Sistema* S". Once more, this suggests that public schools have higher concerns with reaching out to a wider profile of students, and in particular, students who may have faced barriers to participation in adult training for work-related, family-related or geographical reasons. Moving forward, further incentives should be created so that the offer of distance learning courses is expanded, even in private schools and technical schools from the S-system.

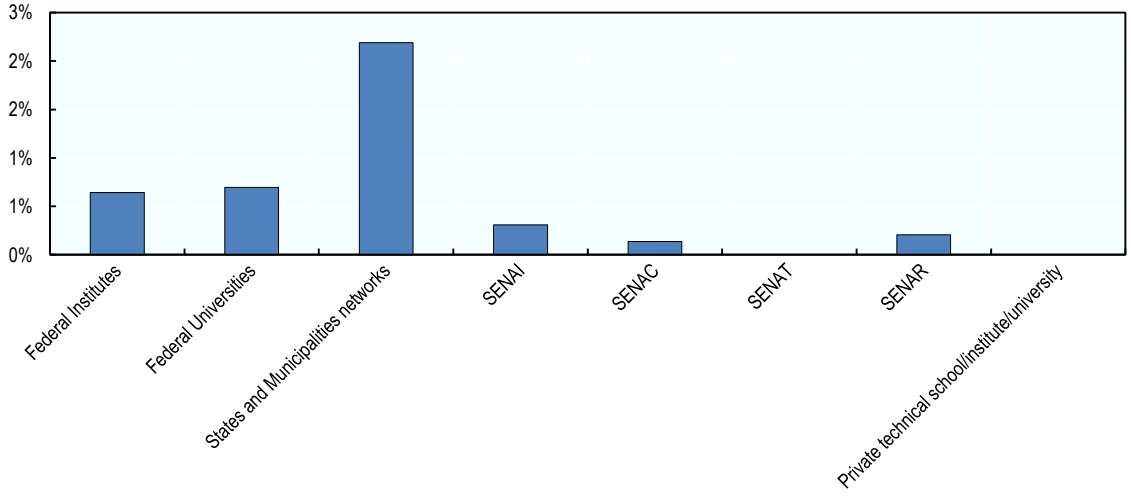
Figure 5.4. Distribution of classes per schedule shift by type of training institution between 2011 and 2018



Source: SISTEC micro data set of PRONATEC students' records.

Given that there are no strict rules on the number of places per class, training providers are relatively free to decide how many students each training class can accommodate, within the limits of the total number of places MEC has allowed them to offer. The variance of the number of places per class is not very high across technical schools from "*Sistema* S" and public institutions, as can be inferred from Figure 5.6. Private training providers, however, exhibit a higher number of places per class than the remaining type of institutions, potentially in an attempt to maximise the amount of public funding received for a fixed amount of costs.

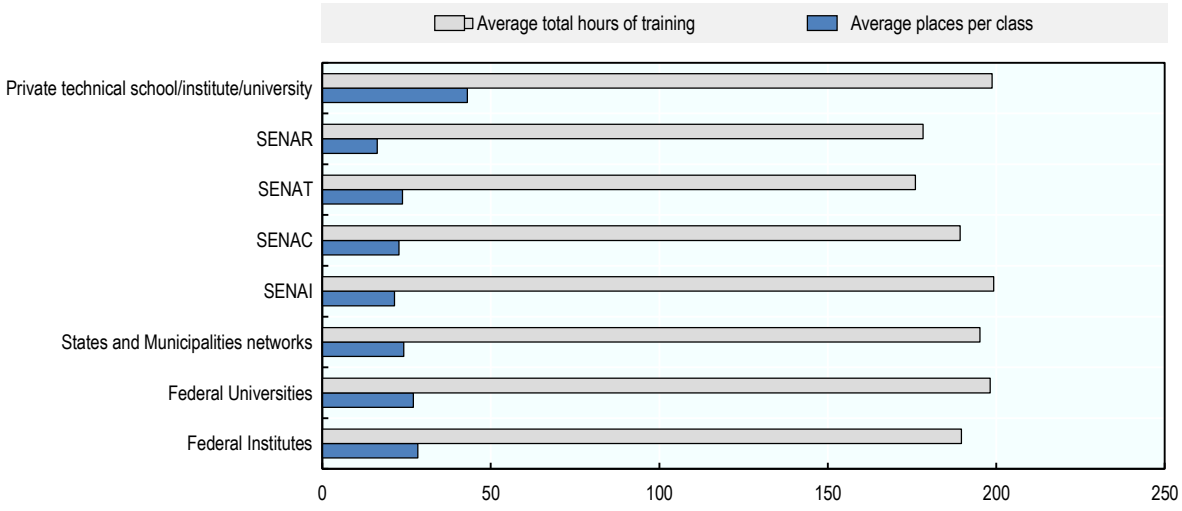
Figure 5.5. Percentage of students registered in distance learning mode by type of training provider between 2011 and 2018



Source: SISTEC micro data set of PRONATEC students' records.

The total number of hours of training for FIC courses, on the other hand, has to be comprised between 160 and 400 hours. Within that range, nevertheless, training providers can set the number of hours of training at their own discretion. Figure 5.6 shows the average number of hours of training for all the FIC courses offered by a similar type of training provider. The number of hours of training does not vary by much across type of institutions. Technical schools from SENAR and SENAT are the ones exhibiting the lowest average, while private institutions, SENAI schools and Federal universities, display the highest average.

Figure 5.6. Average students per class and average hours of training by type of training provider between 2011 and 2018



Source: SISTEC micro data set of PRONATEC students' records.

Hiring professors and instructors is also entirely under the responsibility of training providers. Public institutions offering PRONATEC training courses can hire new instructors for specific PRONATEC courses. However, public providers always have to ensure transparency in the selection procedures, respecting all the legal formalities associated with a public hiring procedure, and observe all the requirements of a public employment contract. Private institutions and technical schools from "*Sistema* S", who are not subject to rules concerning public hiring procedures and public employment contracts, benefit from greater flexibility, lower administrative costs and bureaucracy. Consequently, it is easier for the later types of institutions to adapt their training offer quickly to what is being demanded by MEC and its partners, to open new courses and respond timely to changes in the labour market. Public hiring of professors for PRONATEC courses should be made simpler so that public providers are not lagging behind other training providers and can respond quickly to new training demands. Otherwise, there might be substantial differences in the re-employment rates of students enrolled in different institutions, as well as differences in teaching quality, if public providers are unable to quickly hire adequate professors.

Training providers are strongly encouraged by MEC to follow-up with their students after completion of the training course so as to help them on the transition to work. Different methods are suggested, such as appointments with a career counsellor, the organisation of soft skills training workshops, mock job interviews, etc. However, there are no legal obligations or clear guidance binding training institutions to comply with these practices. Effectively, different types of institutions, or even similar institutions across different locations, adopt different methods and follow students with different levels of intensity. Similarly, there are no obligation to survey students after completion of the training course so as to enquire about their employability, post-training earnings, overall satisfaction with the training course, etc. In most schools, students are only surveyed informally and not in a systematic manner. Only SENAI technical schools have developed a systematic survey to collect post-training information about their students, as part of their overall method to evaluate the quality of their training courses (Box 5.1).

These differences across institutions are likely to result in different levels of training quality across providers. Ultimately, returns to PRONATEC training may also be different for students graduating from different types of institutions.

Box 5.1. SENAI's training assessment method

Since 2009, SENAI has developed a systematic method to assess the training courses offered by all its technical schools across the country (http://www.portaldaindustria.com.br/senai/canais/educacao-profissional/sobre-educacao-profissional/sistemas-de-avaliacao/). The assessment, called "*Sistema de Avaliação da Educação Profissional e Tecnológica*" or SAEP, takes place in four distinct phases:

1. **Assessment of projects**. Before a training course is created, SENAI's regional departments are required to assess local demand for skills. After identifying local skill needs, regional departments must assess whether technical schools in their area already possess the necessary infra-structure and faculty to train workers for these particular skills. If not, they must report what would be the investment needed. Such projects are submitted to the regional council of each state's SENAI who can approve the proposals and allocate the funds to make the necessary investments. It is only after the council's approval that a course plan is developed with its proposed content, duration, etc.
2. **Assessment of courses' development**. At the start of the training course, the pedagogical team of each SENAI technical school assesses whether the course plan has been strictly followed. For that purpose, faculty, students and the school management team are asked about teaching quality, pedagogical methods and the infra-structures, namely the classroom, the laboratory, the library, etc.
3. **Assessment of students' performance**. As soon as 80% of the training course has been completed, students can be asked to sit an on-line test to evaluate whether they have acquired the necessary skills for the occupation they are training for. Such tests are prepared by the faculty of SENAI and consist of multiple-choice questions. They assess specific skills that students should have developed during the training, but also, general and management competencies. On-line tests are common across all SENAI schools in the country and standardized. Students are also required to fill a short background questionnaire so as to provide information on their socio-economic context.
4. Since 2017, a subset of the students who take the on-line test are also selected for a practical test. The practical test consists of presenting students with a concrete problem that could come up in their work routine and assessing the proposed solution.
5. **Post-training earnings survey**. After completing the training course, students are asked to fill a questionnaire that collects information about their current professional status, whether they are employed in the area they were training for, what their current occupation is, who their employer is and what their expectations are for the future. One year after the course completion, students are surveyed again in order to understand if their employment situation has changed. Students are asked whether they continue to work in the same area, with the same employer and if their earnings have changed. Whenever the student is employed one year after the course completion, SENAI may also interview the student's

employer. Employers are asked how satisfied they are with SENAI training graduates. Employers are randomly selected to cover all training modalities offered by SENAI.

These systematic assessments have helped SENAI to improve the quality of their training courses over time, just as the employability of their students has increased. This process has contributed towards their positive reputation amongst employers, helping the institution to place its students even more easily and generating a virtuous cycle.

In order to minimise the heterogeneity in training quality across institutions and to improve the overall quality of PRONATEC training courses, MEC should impose further requirements to training schools in order to become PRONATEC providers and receive public funding. Some of the criteria that could be demanded, picking-up on several considerations made so far, would be:

- To organise induction sessions before the start or at the very beginning of training classes so as to set expectations right and reduce drop-out rates;
- To offer career guidance services, assistance in looking for a job or a practical internship to gain experience in the field of study;
- To offer some training in soft skills, together with technical skills, such as team work, corporate responsibility, professional behaviour, entrepreneurship, etc.;
- To develop a formal framework to evaluate training courses, such as the one developed by SENAI;
- To increase the offer of flexible learning opportunities – perhaps with a minimum threshold of enrolments via distance learning – such as e-learning, part-time courses or evening courses - to ensure equal opportunity in adult training across all types of institutions.

In Japan, clear guidelines are provided to training providers (OECD, 2018). Only training providers who can demonstrate that they comply with such guidelines are accredited and allowed to offer training courses subsidised by the government. The Japanese government conducts regular inspections to training providers and requires the submission of several documents to ensure that guidelines are effectively implemented. The Japanese government also offers workshops to staff at training institutions to clarify the content of such guidelines and provide concrete examples on how to implement them.

Another mechanism that could be put in place is to transfer resources to training providers based on quality indicators. In fact, transferring funds based on the number of students enrolled, without a reliable system to monitor student attendance, may lead to low internal efficiency of training institutions and a strengthening of supply-driven training provision (Ziderman, 2016). Nevertheless, to move towards a financing system based on quality indicators, a clearly formulated, transparent and objective disbursement policy would need to be developed. Otherwise, funding could be affected by political influence, interest group pressure or the negotiating skills of the institutional actors.

There is yet another system that has been used in some countries to subsidise training courses while fostering competition amongst training providers so as to ensure a minimum level of training quality: individual training vouchers or individual training accounts. In these systems, instead of budgetary allocations being made directly to training providers, individuals pay tuition fees charged by training institutions, wholly or

in part, through vouchers of entitlement to training courses. Voucher schemes have been used for adult training in some countries, although most programmes are still on a trial basis. Box 5.2 provides further details on their functioning.

Box 5.2. Individual Learning Accounts

1. There are two types of individual learning accounts (ILA):
   - **ILA saving schemes.** Individuals save on a regular basis towards payment for periodic training over the working life. The government can create incentives for individuals to save for this type of accounts by making tax concessions or matching individual contributions by the same amount or a fixed percentage of the saved amount. This type of scheme has been implemented in the U.S. After having accumulated sufficient savings, individual can choose from several training options directly.
   - **ILA voucher-type**. Individuals are entitled to access training courses at zero or reduced cost. Usually, vouchers are attributed to low-skilled and low-income individuals. Such schemes have been implemented in Austria, Belgium and Scotland.
2. In France, yet a third type of scheme has been developed since 2004. Employees are entitled to request 20 hours of annual training from their employers, up to a maximum of 120 hours over a six-year period. Once accumulated, individuals can choose which training they wish to attend, but their employers must approve their choice. Training can be taken during or outside working hours. If taken outside working hours, individuals are entitled to receive 50% of their net wage for each hour of training taken. However, so far, only 30% of firms have used this scheme and less than 7% of employees in total (Ziderman, 2016).

5.3. Alignment of the training offer with labour market needs

Since 2011, MEC published four editions of the FIC courses catalogue ("*Guia de cursos* FIC"). The first edition, from November 2011, contemplated 442 different training courses. The second edition, published in October 2012, had 515 different FIC courses. The third edition, from September 2013, already had 657 courses, and the last edition, circulated in 2016, proposed 646 different courses.

The publication of a catalogue of training courses that could be offered within the PRONATEC programme is one of the novelties, compared with previous Federal adult learning programmes (PLANFOR and PNQ). It ensures that similar training courses have the same standards across the country, in terms of entry requirements and hours of training, for example. Another advantage is that only training courses previously approved and certified by MEC can be offered within PRONATEC, limiting the risk that low-quality training courses are publicly funded. In fact, PRONATEC requesting partners can only request training courses contemplated by the catalogues published by MEC. One of the drawbacks, as discussed previously, is that skill needs specific to a particular region or municipality, are unlikely to be fulfilled by PRONATEC FIC courses since they most likely are not considered in a national catalogue. Additionally, given that the catalogues contemplate a large number of courses, it is unlikely that all of them respond to current or anticipated skill needs. Many of the courses proposed in the catalogues are

training courses commonly found in all technical schools, for which there already is a large number of students enrolled. To that extent, the definition of the FIC course catalogue is mostly supply-driven.

Based on that catalogue, it is under each PRONATEC demanding partner's responsibility to make sure that the training courses requested under their modalities will increase training participants' opportunities and prospects in the labour market. Each partner is encouraged to discuss with social partners and local employers in order to identify training needs in their area of intervention. Nevertheless, there are no specific guidelines for that process, nor any systematic methodology that ought to be used by all partners equally. As a consequence, each PRONATEC requesting partner can adopt a completely different procedure. In most cases, consultations with the private sector and social partners only occurs occasionally and informally. For some PRONATEC modalities, such consultations do not even occur.

MDIC is the only PRONATEC demanding partner that developed a systematic method to collect information about training needs from the private sector directly (Box 5.3). This method consists in a web platform called "*SuperTec*", where firms can register and fill-in a questionnaire regarding their staffing and skill needs. MDIC uses such information when defining its demand map and requesting courses to MEC. As a result, training requests submitted by MDIC are driven by employers' skill needs. According to O'Connell, Mation, Basto and Dutz (2017), the average re-employment probability for a job-seeker attending a PRONATEC course was found to be 9% one year after completion. Job-seekers who completed a PRONATEC training course requested by MDIC within the modality "PRONATEC *Brasil Maior*", on the other hand, had a higher probability of being employed by almost 15%. These re-employment probabilities only refer to re-employment in the formal sector. Although MDIC's method has proved quite successful, it still has some limitations.

First of all, registration by firms in the "*SuperTec*" platform is completely voluntary. Many small and medium enterprises are either not aware of the existence of this platform, or do not see any incentive in registering as they expect MDIC to prioritise requests from large firms. Large firms may also not want to register and submit confidential information regarding their expansion and investment plans, by fear of leakage to their competitors. Therefore, the information collected through the "*SuperTec*" platform is not representative. While some large firms may see their training needs attended, many others will not take advantage of that tool. In this context, there is scope for improvement and further optimising course requests. Second, the screening work involved with all the requests submitted is resource-intensive. At the moment, MDIC does not possess the financial resources to develop an automated screening procedure. Finally, the criteria used by MDIC staff to sort and prioritise requests is unclear and not fully transparent. It is possible that some firms benefit from this system over others through their personal network and influence.

Box 5.3. MDIC's "*SuperTec*" platform

MDIC recently developed a web platform for firms to register and list their current and prospective training needs. This platform, still under development, is called "*SuperTec*" (http://www.supertec.gov.br/mdic/Portal).

Although anyone can register, create a profile and submit the questionnaire, MDIC only considers requests that are submitted by employers, disregarding requests that are submitted by associations, unions or other institutions. This involves substantial screening work by staff at MDIC, but ensures that requests from that ministry are not influenced by other parties that may not be aware of local skill needs.

Through this portal, firms can submit their responses to a questionnaire and request specific training courses for a particular region or geographical area. Apart from specifying training needs, firms are asked to respond to other questions, such as demographics of the firm and questions that will allows MDIC staff to prioritise amongst all the requests received. For example, if requesting a particular training course, firms are justify their request by choosing one of the following options:

1. The firm's current activity is increasing and the firm is looking to hire new workers with skills in a particular domain or area;
2. The firm is requesting courses to provide training to its partners and community. For example, the firm needs its suppliers to develop particular skills;
3. The firm is making a new investment (a new plant, a new factory, developing a new product, etc.) and the investment requires hiring new workers with a given set of skills;
4. The firm is replacing or plans to replace its existing workforce by individuals with a different set of skills;
5. The firm would like to up-skill its current workers.

In the case of an activity increase, a plant expansion or new investment, firms are required to provide additional information, such as the size of the investment, the number of new collaborators the firm is expecting to hire, etc. For the replacement and up-skilling of the current workforce, firms are also asked to specify how many workers would be concerned.

Based on that information, MDIC prioritises requests that will generate new employment and that are expected to contribute for the country's competitiveness.

As discussed in chapter 2, section 2.1.2, registry in the platform "*SuperTec*" could be made mandatory for all firms, even small firms and businesses. To mitigate concerns about data confidentiality, rules and regulations concerning the use of confidential data could be strengthened and effectively enforced. Firms should obtain the guarantee that the information will only be used for policy purposes and that only aggregated results will be published, so that no individual firm can be singled out or identified. Alternatively, a random and representative sample of firms could be selected in each region and sector of activity. These firms would then be required to register and submit the training needs

form via "*SuperTec*". This would resemble an employer survey on skill needs that is representative by sector and sub-nationally.

The information collected via the platform "*SuperTec*" could then be centrally processed and analysed, using the pooled resources from all the PRONATEC demanding partners and MEC, or the resources from a dedicated Skill Assessment and Anticipation (SAA) technical team or department. Alternatively, demanding ministries could process and analyse the information collected regarding their sector of activity, and different SEEDUCs could process and analyse the information concerning each state or region. MEC would then have the responsibility of making sure that different partners are analysing the information adequately, following similar appropriate methods, as well as conciliating the analyses from each partner. For that purpose, organising regular training in SAA methods across different partners would be highly recommended.

Complemented with other data sources and SAA methods, a shortened list of FIC courses could be defined per sector of activity and/or per region that corresponds to the specific skill needs identified. Such shortened lists of FIC courses could be used as PRONATEC FIC courses catalogues. These catalogues would contemplate a smaller number of courses, but that would respond closer to actual skill needs in each sector and/or region of the country. This process would replace the current procedure of completion of demand maps by each PRONATEC partner and aggregation of requests by MEC. MEC could directly proceed with the "*pactuação*" process with training providers, based on such shortened catalogues.

In fact, the current procedure has led to an offer of PRONATEC training courses that is not well aligned with labour market needs. Table 5.1 and Table 5.2 list the ten most and least popular training courses, respectively, in terms of number of students pre-enrolled.[2]

According to the OECD 2018 *Skills for Jobs* shortages indicators by occupation, general and keyboard clerks, as well as electrical and electronic trades' workers are occupations in surplus. Nevertheless, some of the most popular training courses fit into these ISCO occupational categories, such as "administrative assistant" and "building electrician for low voltage installations". Additionally, according the work activities shortage indicators from the *Skills for Jobs database*, administering, and information and data processing (one of the activities required to perform the job of a "computer operator"), are two of the activities most in surplus. Management of personal resources, on the other hand, is one of the skills most in surplus, while "human resources assistant" is one of the most popular PRONATEC training courses.

Table 5.1. Training courses with highest number of students pre-enrolled

Ten most popular training courses
Administrative assistant
Computer operator
Human resources assistant
Building electrician for low voltage installations
Basic English
Receptionist
Computer assembly and repair
Warehouse keeper
Manicure and pedicure
Operator of overlock and straight line sewing machines

Source: SISTEC micro data set of PRONATEC students' records.

Table 5.2. Training courses with lowest number of students pre-enrolled

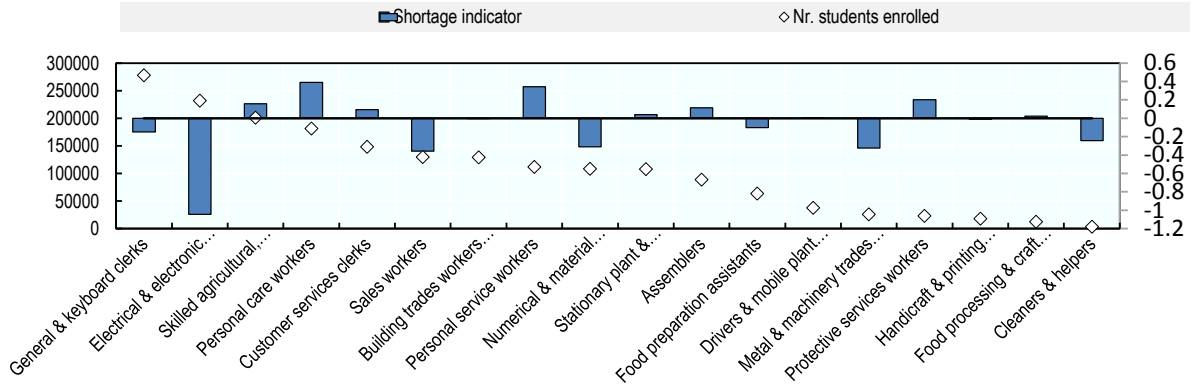
Ten least popular training courses
Animation post-producer
Civil protection agent
Mechanical and hydraulic tractor
Professional for coupling and alignment of tubes
Equipment operator in residual treatment units
Portuguese language and Brazilian culture for deaf - Intermediate level
Photography printer
Lift installation and repair
Machine operator for cinema/theatre set
Clown

Source: SISTEC micro data set of PRONATEC students' records.

According to the OECD 2018 *Skills for Jobs* shortages indicators by occupation, general and keyboard clerks, as well as electrical and electronic trades' workers are occupations in surplus. Nevertheless, some of the most popular training courses fit into these ISCO occupational categories, such as "administrative assistant" and "building electrician for low voltage installations". Additionally, according the work activities shortage indicators from the *Skills for Jobs database*, administering, and information and data processing (one of the activities required to perform the job of a "computer operator"), are two of the activities most in surplus. Management of personal resources, on the other hand, is one of the skills most in surplus, while "human resources assistant" is one of the most popular PRONATEC training courses.

"Civil protection agent", on the other hand, which is the second most unpopular training course, belongs to the ISCO occupational category "Protective service workers", which appears to be in shortage according to the *Skills for Jobs* indicators. This simple analysis suggests that the training offer requested by several PRONATEC partners does not effectively match the skills demanded in the labour market.

Figure 5.7. Occupational shortage indicator and PRONATEC student enrolment



Note: The total number of students enrolled is depicted in the left-hand side vertical axis and the occupational shortage indicator is represented in the right-hand side axis. A negative value for the occupational shortage indicator means that the occupation is in surplus. A positive value for the indicator means that the occupation is in shortage. Data for the shortage indicator refers to 2014. Data for the number of students enrolled refers to 2012-2018.
Source: SISTEC micro data set of PRONATEC students' records and OECD Skills for Jobs database.

Figure 5.7 plots together the occupational shortage indicator from the OECD *Skills for Jobs database* and the total number of students who confirmed enrolment and actually started a training course leading to each ISCO occupational category. Not all ISCO occupational categories are included because some of them are not specifically mentioned for any of the training courses offered in the latest FIC courses catalogue (or their CBO equivalent).

Based on this comparison, it seems that the alignment between training offer and labour market needs could still be significantly improved. It is striking that the most popular training courses and the two occupations for which most individuals are training are clearly in surplus, while occupations with shortages – such as personal care workers, personal services workers and customer services clerks – total a lower number of PRONATEC students.

The misalignment between training offer and labour market needs can emerge at different stages. First, part of the misalignment might be explained by the training courses requested by PRONATEC demanding partners. If the programme partners do not conduct adequate analysis of labour market needs that feed into their training requests, there is little chance that the final training offer will match the skills needed by employers. In this case, replacing the procedure of "*Mapas da demanda*" by systematic and regular SAA exercises, with the definition of sector- or region-specific FIC courses catalogues that contemplate a shorter list of training courses, but that respond appropriately to labour market needs, is strongly advised.

Second, the misalignment could also come from the "*pactuação*" process. In particular, when training providers submit proposals to MEC that may not have been included in the consolidated demand map, but for which they already have the infra-structure in place. This could increase the offer for training courses that are already being supplied in sufficient number as opposed to creating new courses to meet emerging needs. In this case, the "*pactuação*" procedure should be revised so that training providers can only be funded for courses that would be included in a short FIC courses catalogue that adequately responds to skill needs. It is possible that new investments are required and time is needed to develop new training courses that respond to such needs. However, an adult training programme can only be entirely successful if sufficient time is allowed so that the existing training offer can be aligned and adapted to labour market needs.

Alternatively, implementing a voucher scheme could also help fixing the misalignment occurring at the stage of "*pactuação*". Individuals entitled to training vouchers would be free to choose one of the training courses contemplated in a short FIC courses catalogue appropriately defined based on SAA methods. To benefit from the increasing demand for training courses that the attribution of these vouchers would generate, training providers would have strong incentives to offer only the training courses that respond to the identified skills needs. Voucher could be used only in accredited and certified training providers that respond to a list of requirements specified by MEC, such as the ones proposed in this chapter.

The implementation of this voucher scheme would also reduce the bureaucracy associated with the processes of pre-enrolment and confirmation of enrolment discussed in sub-section 5.1.2. It would take into account students' preferences and potentially increase levels of motivation and lower drop-out rates from the programme. By restricting the use of the training vouchers to courses specified in a local-specific FIC courses catalogue, this scheme would also respond better to local specific skills needs.

Attributing training vouchers would not invalidate the actual governing structure of PRONATEC. Different ministries and SEEDUCs could continue to collaborate, coordinate, and be involved in the (i) selection of individuals from their target population to attribute training vouchers; (ii) development of SAA methods.

If a voucher system is implemented, individuals could choose their training provider and training course freely and hand-in the attributed voucher to the training institution of their choice. The training institution could then claim the funding to the Government by returning all training voucher collected and specifying the training courses chosen by the participants. The government would transfer to the training providers an amount based on that information. Such amount should cover the costs of training provision, as well as transportation costs and a meal per day for the participants. The former would remain with the institution, while the later would be paid by the institution to the training participant, following the current financing procedures of PRONATEC.

Whenever participants pick training courses that are highly demanded in the labour market, but more costly to provide for requiring specific equipment or specialised instructors, the student/hour taught of that course could be funded at a higher value. Similarly, training institutions in areas of the country where it is more difficult to attract instructors or develop high-quality training infra-structures, could also receive a higher value per student/hour. Finally, training voucher could have a unique identifier linked to the individual who benefits from it and has handed it over to the institution. Based on family, social and economic conditions, as well as living area, the amount transferred to the training provider to cover for transportation costs and a meal per day for the participants should also be higher.

Training providers eligible for a higher student/hour value should be clearly identified based on objective and transparent criteria. Training courses that are considered particularly in high-demand in the labour market, but more costly to provide, should also be clearly identified within the restricted list of courses available in a region-specific FIC catalogue developed based on systematic SAA methods.

Finally, it is possible that partner's requests and pre-enrolments refer individuals to training courses in shortage, but due to lack of information, students largely confirm their enrolment and attend training courses that lead to occupations mostly in surplus. If so, further public information about labour market trends and career counselling services could contribute to reduce the misalignment between the training effectively supplied and the skills demanded by employers. Career orientation and counselling would be the more important if the implementation of a voucher scheme is considered, leaving the choice of training programme to individuals.

Notes

[1] Several rules apply when computing the amount to be transferred. First of all, training institutions may choose to provide a total number of hours of training for FIC courses between 160h and 400h. The catalogue of FIC courses published by MEC may determine a different interval and will also set a maximum number of hours that can be refunded. Training providers offering more hours beyond that limit will not be reimbursed for these additional hours. Second, course openings that have been cancelled before the start of classes will not be added up to the above formula. Students who did not confirm their pre-registration, by lack of requirements, documentation, for not showing up or because the course was full, are not taken into account in the calculations either. Third, students who do not show up in classes during the first five consecutive days of training, attend less than 50% of classes during the first ten days of training, or attend less than 50% of classes after 20% of the total training has elapsed, are automatically deregistered from the training. These students are not taken into account for the above calculation either. Fourth, and last, students who drop out of the training course up to 20% of the total training has elapsed do not count towards the formula either. Student who drop out after at least 21% of the training course has elapsed would count with the entire training hours load for the above calculation. Students that drop-out before 20% of the training course is complete, can still be replaced with other students kept on a waiting list.

[2] The ranking is robust to classifying courses based on the total number of places allocated after the demand aggregation by MEC and the total number of classes opened across the country and different training providers.

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Getting Skills Right

Brazil

The world of work is changing. Digitalisation, deepening globalisation and population ageing are having a profound impact on the type and quality of jobs that are available and the skills required to perform them. To what extent individuals, firms and economies can harness the benefits of these changes critically depends on the readiness of adult learning systems to help people develop relevant skills for this changing world of work. In Brazil, the speed of population ageing is projected to be significantly faster than what has been experienced by most developed economies. At the same time, increasing integration into the global economy will create new opportunities and propel growth. But it will also affect the content of exports and the stage at which Brazil contributes for Global Value Chains (GVCs). Profound changes in the economy are to be expected in the coming decades. As these changes have not yet fully materialised, Brazilian policy makers have a window of opportunity to prepare for the transformations ahead. This report aims at providing policy recommendations, based on best practices internationally, to prepare the Brazilian adult learning system so that it is ready to support people in acquiring the relevant skills for the future.

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