Getting Skills Right

Italy



OECD

Getting Skills Right: Italy



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Foreword

Across countries, tackling skill mismatch and skill shortages is a major challenge for labour market and training policies in the context of rapid and substantial changes in skill needs. In most countries, a substantial share of employers complain that they cannot find workers with the skills that their businesses require. At the same time, many college graduates face difficulties in finding job opportunities matching their qualifications.

In light of this challenge, OECD has undertaken an ambitious programme of work on how to achieve a better alignment or skill supply and skill demand, with a focus on: i) understanding how countries collect and use information on skill needs; ii) investigating cost-effective training and labour market policies to tackle skill mismatch and shortages; iii) studying the incentives of training providers and participants to respond to changing skill needs; and iv) setting up a database of skill needs indicators.

This works builds on the extensive programme of work of the OECD in the area of skills, including the OECD Skill Strategy and its follow up national implementation strategies, the Survey of Adult Skills (PIAAC) and its rich analyses in the areas of skills mismatch, vocational education and training and work-based learning.

This policy review is one of a series on skill imbalances aiming to identify international best practice in addressing skill imbalances in order to minimise the associated costs to individuals, enterprises and economies. The review involves an in-depth assessment of the country's skills system, leading to a set of policy recommendations backed by analysis and input from country stakeholders.

The work on this report was carried out by Fabio Manca 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 Stefano Scarpetta (Director for Employment, Labour and Social Affairs) and staff at the JP Morgan Chase Foundation.

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Executive summary

Developing better skills and using them effectively in the labour market can play a major role in revamping stagnant productivity growth in Italy and promote a more inclusive labour market. To achieve this objective, however, Italy faces a number of important challenges.

Skill mismatches and shortages are pervasive in the Italian labour market. Skill shortages exist in specific areas of the labour market; some 6% or workers in Italy are under-skilled while 18% are under-qualified. More surprisingly, despite the disappointing performance of Italy in the OECD Survey of Adults Skills (PIAAC), some skills surpluses are also present. Over-skilled (11.7%) and over-qualified (21%) workers represent a substantial part of the Italian workforce and 35% of workers are mismatched by field of study (e.g. working in a field that is unrelated to their studies). These uncomforting results are linked to the weak demand for high-level skills by many small and medium-size firms whose productivity, degree of internationalisation and use of new technologies is low.

Against this backdrop, the Italian Government recently launched a set of comprehensive reforms to strengthen the functioning of the labour market (the *Jobs Act*), the education system (*la Buona Scuola*) and the industrial productive system (*Industria* 4.0). These reforms are interconnected and show many potential synergies. The recent reforms can contribute to substantially reduce skill imbalances by: spurring the creation of more and better skills; strengthening the linkages between education providers and the world of work; and boosting the demand for high and technical skills. These policy interventions should, in turn, lead to growth in productivity, well-being and socioeconomic inclusiveness. However, implementation challenges remain.

The *Buona Scuola* reform, through the *Alternanza Scuola Lavoro* (ASL) (a new set of measures establishing compulsory internship periods for all secondary-school students), strengthens incentives for education providers and the world of work to co-operate. A lack of trust and dialogue between these actors, however, undermines the development of education programmes that could lead to develop more relevant skills and to reduce imbalances. Much also needs to be done to reduce the fragmentation in the provision technical vocational education and training (TVET) and to strengthen its status. Career guidance and counselling should be reinforced to reduce the role played by families' socioeconomic background in students' choice between TVET and general education. This can contribute to improving the allocation of talent to schools and to reducing skill imbalances. Much can be achieved, also, by spurring the involvement of firms in the development of technical training aimed at filling the needs of the labour market. The *Istituti Tecnici Superiori* (ITS) are a welcome innovation in the provision of TVET. Challenges remain, however, in establishing coherent internship periods in some technological areas so that ITS can truly supply work-relevant skills in all fields.

Better skill matching can be spurred by industrial policy too. The set of initiatives behind *Industria* 4.0 can play an important role in boosting skill demand in Italy by

helping smaller firms to become more innovative, connected to the world technology frontier and open to international markets. Achieving this result, however, will require strengthening the entrepreneurial and managerial skills of Italian employers to make them pro-active actors of the digital revolution.

In addition, both hard/technical (e.g. engineering, maths) and soft/transversal (e.g. communication, attention to details) skills will be needed by workers to successfully address the labour market challenges that stem from rapid technological change. Transversal skills such adaptability or flexibility, allowing workers to switch easily from one occupation to another or between different tasks within the same occupation, will be increasingly important in the future. Evidence from the *OECD Skills for Jobs Database* shows that workers and occupations in high-demand in the labour market make an extensive use of high-skills across different domains.

Retraining and lifelong learning are likely to grow in importance especially in the context of a rapidly changing labour market. The Italian education system needs to give more effective support to students and workers to develop the necessary skills to adapt to new jobs and tasks throughout their careers. Addressing this challenge will require a substantial change in teaching methods and in the content of curricula taught at school. Along with that, it is fundamental that Italy addresses the weak wage incentives, poor career progression provided to teachers while, at the same time, boosting the adoption of creative teaching methods. Similarly, it is fundamental to provide stronger incentives to young and talented Italians to pursue the teaching profession.

In 2015, the Italian Government ratified the Jobs Act, a comprehensive labour market reform which addresses the drivers of labour market duality through a new regulatory framework that is reshaping the relationships between employers and employees in Italy. Several challenges lie ahead in the implementation of the reform and many of these relate to the delivery of active labour market policies (ALMPs) to boost the skills of the unemployed so as to match the needs of firms. The creation of the ANPAL, the national agency for ALMPs represents a major shift in the way Italy approaches labour market challenges. This shift can have large repercussions on the way Italy develops and matches skills. The rejection of the constitutional reform proposed through a national Referendum in December 2016 has, however, modified the initial plan for the ANPAL to centralise the responsibility for the delivery of ALMPs in Italy. As it stands now, ALMP remain a shared competence between the ANPAL and the regional governments and co-ordination challenges are likely to arise if roles, responsibilities and accountability mechanisms are not clarified effectively.

Limited resources and infrastructure for ALMPs represent another challenge. In this context, the delivery of the ALMPs can be enhanced through the development of sophisticated skills profiling tools that can help PES case workers to streamline their activities and provide more tailored and effective support. The ANPAL is already putting efforts into identifying new tools for the delivery of ALMPs but these measures will need time to be fully operational and should be carefully monitored to ensure they achieve the desired objectives.

Key recommendations

- Schools and school principals should be given the necessary resources to manage and promote the *Alternanza Scuola Lavoro* (ASL) more effectively. Training and upskilling of school managers about their knowledge of current skill needs in the labour market are imperative to support and initiate the co-operation between education institutions and firms.
- Italy's labour market suffers from shortages of cognitive and quantitative skills that need to be addressed through more innovative teaching methods able to help students develop those skills since a young age. A better designed set of incentives and stronger career progression linked to performance are required to boost the attractiveness of teaching professions as well as to provide workers in this profession with adequate incentives for mobility.
- More incentives should be provided to firms to engage proactively in the internship initiative under the ASL reform. More should be done, also, to integrate the views of employers both in the design of the content of work-based learning activities and in the assessment of the skills acquired by students during their internships.
- The fragmented provision and poor status of TVET need to be addressed. The quality of laboratories and infrastructures should be improved to make them effective in developing work-relevant skills and increase the status of this education path. Similarly strengthening career guidance and counselling is key to reduce the role played by families' socioeconomic background in students' choices between TVET and general education. This can spur a better allocation of talent across education pathways and strengthen the development of students' skills that correspond to labour market needs.
- The involvement of firms in the development of technical training aimed at filling the needs of the labour market should be encouraged as technical skills, especially in computers and electronics are shown to be in strong shortage. The scaling up of places in the *Istituti Tecnici Superiori* (ITS) is an important priority. Similarly, fostering the coherence of internships activated in ITS is important to reinforce the already encouraging labour market outcomes of their graduates. Stronger links between universities and employers should be also promoted to support the development of *Lauree Professionalizzanti* to fill skill shortages in technical areas.
- The entrepreneurial and managerial skills of Italian employers need to be strengthened further, especially those in family-owned enterprises and in SMEs. The use of high performance workplace practices (HPWP) such as job-rotation, training, mentoring and task discretion should be strengthened across firms of all sizes so as to boost the Italian sluggish skill demand. Employers need to become pro-active actors of the digital revolution as envisaged by the plan *Industria 4.0*. For that, Italy will need to go through a substantial transformation and reorganisation of activities and tasks in the workplace. The dissemination of information about Industry 4.0 technologies to all firms, and especially smaller ones, should be strengthened further to enhance the take-up of the whole I4.0 package.
- The soft/transversal skills of workers should be developed further to help them adopt and adapt to new technologies. Retraining and lifelong learning (LLL) will play an increasingly important role in all countries and it is imperative for Italy to strengthen the delivery and coverage of LLL across workers of all skill levels. The provision of courses to develop language or ICT skills should also be boosted by diverting resources from training programmes that are, instead, currently financing less relevant skills.
- Supportive policies such as accommodating housing policies and relocation subsidies, greater flexibility of work arrangements and family support should be strengthened to promote greater regional mobility and skill matching.

Key recommendations *(cont.)*

- The relationship between qualifications and skills in Italy needs to be reinforced to improve the skill-matching process and the selection of skilled workers by employers. This should be done by strengthening the links between education providers and the world of work to improve employers' recognition of the value of qualifications. Strengthening the work-based learning component of formal education is also essential for qualifications to become true signals of skills and to enhance skill matching. Similarly, the diffusion of labour market information and of job-vacancies through formal channels should be enhanced as vacancies are too often "invisible" to those who do not have strong social or professional networks. The use of social media, open to a large audience, should also be strengthened with the aim of reaching all potential jobseekers.
- Wages should be linked more closely to productivity as this can provide workers with the adequate pecuniary incentives to develop and use their skills in jobs that truly make full use of their human capital. Similarly, by anchoring wages to productivity, employers will have more incentives to attract the right type of skills for their vacancies. The use of *contratti di produttivitá* (contracts with bonus incentives) should be encouraged further.
- The collaboration between ANPAL and local actors in the delivery of labour market programmes for the unemployed should be strengthened, following the positive experience of the Italian Youth Guarantee programme.
- Resources for active labour market programmes should be scaled up, as the number of PES staff per jobseeker is still very low. Skill profiling tools should be reinforced and the collected information should carefully integrated within regional informative systems as well as ISTAT and INAPP's national network of statistical information *Sistema Informativo delle Professioni*. Occupational mobility should also be strengthened through tailored retraining of workers geared to specific skills that have been identified to be in shortage in the Italian labour market.

Assessment and recommendations

Policies to address skills imbalances in Italy

The *"Buona Scuola"* reform has the potential to reshape the Italian education system by providing, through the *Alternanza Scuola Lavoro (ASL)*, renewed incentives for education providers and the world of work to co-operate. Lack of trust and dialogue need to be addressed, however, to develop strategies leading to more relevant skills to reduce imbalances.

Italy suffers a profound lack of dialogue and trust between schools and firms and the very much needed links between these stakeholders have not emerged spontaneously in the past. The status of TVET is affected by a severe negative social stigma and education tracks that build links with the world of work have been traditionally perceived as leading to low-quality education. Against this backdrop, in July 2015, the Italian Government approved a comprehensive set of new education measures which go under the name of "*La Buona Scuola*" (the Good School) reform with the intended objective of radically transforming the Italian education system by addressing several of the long-standing issues at the core of the low level and quality of Italy's skills.

The "*Alternanza Scuola-Lavoro*" (ASL) is one of the most remarkable traits of the *Buona Scuola* reform as this introduces, for the first time, compulsory internship periods and work-based learning not only in technical and professional secondary schools (e.g. *istituti tecnici* and *istituti professionali*) - but also in the "humanistic and scientific gymnasiums" – the *licei* – where the linkages with the labour market and firms' needs have been traditionally thin and sporadic.

… implementation challenges have emerged that can potentially hinder the positive effects of the reform…

Schools and employers are slowly adapting to the introduction of the ASL and much still needs to be done for the ASL to be fully operational as well as for the relevant stakeholders to be ready to absorb the policy change. At the moment, schools (especially the *licei*) find it difficult to integrate the ASL in their curricula and to create the necessary synergies between academic programmes and the vocational content of the internship periods.

Implementation challenges arise as the ASL reform' guidelines give little indication on the specific role of employers in identifying learning goals. Much of the burden related to the implementation of the ASL is, instead, left to schools.

The tasks of school principals are extremely challenging and complex. This is all the more so given the lack of specific knowledge on labour market issues of many of

them. This situation, in turn, lead to the promotion of work-based learning activities of heterogeneous quality both across different education institutes and geographically across regions in Italy.

Employers are also in a difficult position when accepting minors participating to the ASL within their premises as these need to be monitored constantly and their safety ensured. The lack of dialogue between education providers and employers has also contributed to the ASL' internships periods being often detached from students' learning paths and to be carried out at the end of the academic year. More incentives and support should be provided to firms to proactively engage in the implementation of the ASL reform.

The difficulties to adopt the ASL reform are, however, also linked to the size and geographical distribution of firms across the national territory. Whenever links with employers are especially difficult to be established, "simulated enterprises" (laboratories that mimic the work done in a real firm and the tasks of workers) are used instead. These latter remain, however, a second-best option as students are not always directly confronted with the, sometimes unexpected, challenges of real production. To streamline and encourage collaboration between schools and firms the Italian Government created a specific web portal (*Registro Nazionale Imprese-Scuola Lavoro*) whose effective functioning needs to be monitored. More initiatives are ongoing with the chambers of commerce (*Unioncamere*) and ANPAL playing a key role in assisting schools to implement the ASL and students to find suitable work-based learning opportunities.

In Italy, however, firms still play a minor role in in the assessment and validation of the skills acquired by students during the ASL. Much of the assessment is still done by school teachers who, in many instances, lack the adequate or specific work-experience to comprehensively assess the work-related skills acquired by students. More should be done to integrate Italian firms both in the design of the content of work-based learning activities and in the assessment of the skills acquired by students during the ASL. This latter element is especially important to build the necessary trust around ASL skills so that these can be effectively absorbed by the labour market.

Much needs to be done to reduce fragmentation in TVET provision and to strengthen its status. Career guidance and counselling should be reinforced to reduce the importance played by students' socioeconomic background in their enrolment decisions between TVET and general education. This can contribute to improving the allocation of talent to schools and reduce skill imbalances.

In Italy, TVET education is provided through three distinct models that have grown in a somehow disorganised manner over time. This undermines significantly the visibility and status of TVET programmes in Italy. The quality of laboratories and infrastructures should be improved to make them effective in developing work-relevant skills. Too many young Italians are trained on old technologies and their work-related experience, when exiting schools, is far from being adequate to make them interesting candidates for the scarce jobs available.

The provision of TVET at the regional level (IeFP) has the potential to provide tailored solutions to skills imbalances that are specific to the territory. This is particularly important in a country like Italy where economic, social and education challenges can change dramatically from one region to the other. IeFP pathways, however, face several challenges and, at the moment, are not able to fulfil their

potentially important role in aligning the local supply of skills to the demands of employers.

With some exceptions, the IeFP programmes are perceived as low-quality courses. Career guidance and counselling support could help mitigate the low visibility of TVET as they are fundamental for students to navigate through education options and to understand employment prospects. In Italy, the perceived quality of career guidance in schools is high. However, while the counselling support is good, this does not immediately lead to smaller shares of *undecided* students. In this context, the help and support that Italian students receive from families is, also, positive and important. However, an undesirable social *lock-in* effect can sometimes emerge.

Too few young Italians from disadvantaged backgrounds tend to choose the *licei* when, in fact, they would have the adequate skills to do so. On the contrary, students coming from advantaged backgrounds usually dismiss *tout court* the possibility of enrolling in TVET tracks as these are perceived to be of lower quality.

The recent revision of the normative regulating apprenticeship contracts (*apprendistato di primo e terzo livello*) has also the potential to strengthen the linkages between firms and students. The impact of these new efforts needs to be carefully monitored as incentives for firms to adopt apprentices in Italy have been traditionally weak.

Families and schools in Italy should work more closely together to strengthen the orientation and counselling given to students. Similarly, the Italian Government should boost the advertising campaigns used to increase the status and visibility of TVET programmes and highlight – both among students and families – the good employment outlook of these programmes.

Qualifications in Italy do not provide robust signals of workers "true" skills. This makes skill matching more difficult as employers have only partial and poor information to sort candidates into jobs and skill requirements. However, evidence shows that graduates from universities that provide better professional and technical skills transit more quickly to high-quality and well-paid jobs. All the others struggle in a very much polarised labour market that places them in jobs for which they are usually mismatched by skills.

In Italy, qualifications are too often a weak signal of students' skills. This hinders the job-matching process and increases the risks for employers of hiring the "wrong" candidate. Much more needs to be done to strengthen the skill-signalling power of Italian qualifications to make them robust labour market indicators for employers. Much can be achieved by creating bridges between education providers and the world of work to create trust towards qualifications while, at the same time, strengthening the work-based learning component of formal education.

Graduates from university programmes that provide high-quality professional training are well-rewarded in the labour market and are likely to quickly transit to high-quality jobs. Students in the Health and Welfare, Safety and Defence and Teaching and Education fields of studies are those reporting the best alignment between the professional and technical training received during their studies and the skills required by their current jobs. This situation is, in turn, rewarded by higher salaries in the labour market.

The picture of a strongly polarised labour market emerges in Italy. High-quality and relatively well-paid vacancies in Italy are scarce and these are quickly filled by candidates who have developed the adequate skills (e.g. a robust alignment between their skills and those required by employers). The search and matching process for graduates who have lower skills, instead, takes longer and it leads to jobs whose match is poor in terms of workers' satisfaction, wages and skills.

Much can be achieved by spurring the involvement of firms in the development of technical training aimed at filling the needs of the labour market. The *Istituti Tecnici Superiori (ITS)* are a welcome innovation in the Italian TVET offer. Challenges remain, however, in fostering coherent internship periods in some technological areas of ITS. Evidence shows that providing more relevant work-based learning, also in ITS, can lead to gains in terms of employability and skill use at work. ITS are also too small to fill all the Italian skill gaps and the new *Lauree Professionalizzanti* can help reduce skill shortages. Challenges still arise as much needs to be done, yet, to upskill Italian teaching staff to ensure that work-relevant skills are provided to university students.

Generally speaking, the alignment between education programmes and employers' needs can be spurred by a *top-down* approach, where the government and universities design the training programmes so as to respond to the demands of the labour market or through a *bottom-up* approach, where firms are strongly involved in the identification of training priorities for students.

Italy is now addressing this *puzzle* by implementing both approaches simultaneously through, on the one hand, the establishment of the so-called *Lauree Professionalizzanti* (Professional Tertiary Degrees – where the government and universities take the lead in the design of programmes to satisfy labour market needs) and, on the other hand, the creation of the *Istituti Tecnici Superiori* (Higher Technical Institutes – ITS, where the firms play a key role in the provision of training for their needs).

ITS have so far shown extremely good results in developing work-relevant skills that are then rapidly absorbed by the labour market. Preliminary evidence seems to signal, however, that ITS Foundations where the presence of firms is stronger show a better alignment between the skills provided to students and those required by the labour market. This, in turn, leads to brighter labour market outcomes in terms of employment rates for graduates in those areas.

Commentators highlighted that it will be difficult for ITS to grow in number (while keeping their effectiveness) as the Italian productive fabric, grounded on many small enterprises, is not fertile to such experiences everywhere across the national territory. The new *Lauree Professionalizzanti* can help filling the gaps.

Striking a good balance between the need to support the development of ITS and that of strengthening the education system with a more varied TVET offer (the *Lauree Professionalizzanti*) is a complex task. While the *Lauree Professionalizzanti* may distort the incentives to enrol in ITS, they can potentially represent a useful tool to spur the supply of technical skills at the tertiary level. To be successful, this experiment needs to create strong links between universities and employers from the very beginning. Such linkages, while much needed, have emerged only in sporadic cases in the past. Among the reasons of past failures, the lack of dialogue between tertiary education institutions and the world of work and the difficulties of integrating technical

and professional programmes into academic programmes, these latter favouring theory over practical and hands-on learning.

Other challenges relate to the disconnection between university teaching staff and the world of work as only few university teachers have up to date technical and professional experience. This is all the more so as only 16% of teachers in tertiary education are less than 40 years old. The age of teachers represents a challenge as older ones may lag behind the fast developments of new technology and of labour market needs. The large share of relatively old teachers in Italy also discourages youth to enter this career path as progression is not ensured and wages are not attractive.

Low wages and issues related to the geographical mobility of teachers remain among the well-known and long-standing problems of the Italian education system. Worryingly, data from Almadiploma (2016) show that up to 62% of upper-secondary students enrolling to tertiary education in the teaching field of study are not happy with their choice. In addition, the imbalances at the regional level in the allocation of teaching professionals, even after the recent reform, contribute to perpetuate the skill divide between the north and the south of the country. A better designed set of incentives, stronger career progression and wages can boost the attractiveness of the profession and provide teachers with the correct incentives for mobility.

Better skill matching can be spurred by sound industrial policy. The recent increase in data availability (e.g. big data) triggered by the dramatic expansion in the use of new digital interfaces poses challenges to countries and workers as to how to adopt and adapt to these technological changes and make the best use of them to increase productivity. Italy, more than other countries across the OECD, is likely to struggle to adjust to recent technological changes as the skills of its workforce will need to go through a substantial transformation. The new set of interventions of *Industria 4.0* is a step in the right direction, but implementation challenges need to be addressed for the reform to reap all benefits.

The Italian Government has recently introduced a set of ambitious industrial reforms with the objective of igniting a radical shift of the Italian productive system towards the use of new and high value-added technologies. The set of reforms goes under the name of *Industria 4.0* (I4.0)

Big Data Analytics, Cloud Computing, Industrial Internet, Additive and Advanced Manufacturing (i.e. 3D printing and interconnected robots) are among some of new technologies that the I4.0 measures aim to stimulate through a mix of public and private investments in new infrastructures, R&D initiatives and programmes to upskill the Italian workforce. The skill component of the I4.0 reform is, therefore, pivotal for its implementation and success.

Firm size, innovation and skill needs are the fundamental aspects behind the coexistence of a generally low-skilled workforce, large shares of over-skilled workers and skill shortages in certain areas. All these, represent a major challenge facing the implementation of *Industria 4.0*.

The relationship between firms' size and productivity assumes particular relevance to explain the skills challenges that Italy will have to face when implementing the I4.0 measures. A polarised picture emerges when analysing Italian productivity: some (few and relatively large) firms are highly productive while others (many and relatively small firms) show extremely low productivity levels.

Firm size helps explain both the quantity and quality of skill demand in Italy. Large and innovative Italian firms seek workers with high technical and transversal skills to reinforce their position in global and international markets. Smaller firms, instead, react to upward (or downward) swings in the demand for their goods.

Evidence shows that the small size, low productivity and limited product diversification of the vast majority of Italian firms represent a major challenge to the Italian skill system as this situation is leading to a weak demand for high-skilled workers in most sectors while creating shortages in few others as a consequence of the demand from the few larger firms.

Industria 4.0 can play a pivotal role in boosting the sluggish Italian aggregate skill demand by helping smaller firms to become more innovative, connected to the world technology frontier and open to international markets. Achieving this result, however, requires strengthening the entrepreneurial and managerial skills of Italian employers to make them pro-active actors of the digital revolution.

In Italian firms, work organisation features and management practices that encourage the deployment of skills in the workplace are rare by international standards. In Italy, too many workers end up in jobs where their skills are not used or developed effectively. Larger firms show better results in terms of high performance workplace practices (HPWP) than smaller ones but work organisation practices such as task discretion, mentoring, job rotation or employee participation, incentive pay, training practices and flexibility in working hours are still extremely low across firms of all sizes.

In addition, Italian "family" managers lack, in some cases, the key skills needed to face the challenges brought about by globalisation and internationalisation. This weakness, peculiar to the Italian tradition, contributes to the vicious circle for which Italian firms remain small and concentrated in traditional sectors, requiring primarily low-skilled workers and producing (with only some notable exceptions) low value-added goods.

Raising awareness among employers and employees of the potential economic returns that stem from the use of new technologies is equally important. Much more than in other OECD countries, firms, employers and employees in Italy are, in fact, not familiar with the use of ICT technologies. This represents a major impediment to the take-up of the I4.0 package of measures in the first place.

The labour market challenges stemming from rapid technological change can be effectively addressed only through a combination of hard/technical as well as soft/transversal skills. Skills that allow to easily switching from one occupation to others (or between tasks within the same occupation) will be increasingly important in the future. Learning to learn will be one the crucial feature of future workers' skill set as this will help them adopt and adapt to new technologies and face rapid changes in labour market demands. Retraining and lifelong learning will be crucial to adapt to forthcoming challenges.

Flexibility, the ability to make a professional presentation or being punctual is among the skills that employers struggle to find in young graduates. The lack of one of these skills results in employers discarding an otherwise suitable candidate for the advertised vacancies.

Unfortunately, most Italian graduates lack adequate soft and transversal skills. Schools and teachers can play an important role as educators and provide support to students in developing soft skills through innovative teaching methods. The Italian education system, however, seems to be unprepared for this challenge. Historically, Italian schools and universities have favoured traditional teaching over innovation. Building bridges between education and the world of work is a key to "'teach" students some work-relevant soft skills such as team-work, punctuality and flexibility.

Young workers – more familiar to ICT and technological innovations – are generally in a relatively better position to fill the new skill gaps that are likely to emerge as a consequence of the adoption of new technologies envisaged by the I4.0 reform. Older workers, however, can (should) also play an important role in the implementation and adoption of the I4.0 measure but there exists a substantial risk these latter could be displaced and mismatched when new technologies are adopted in production workflows as envisaged by the I4.0 measures. To reduce the likelihood of this event, all workers will need to upskill and retrain throughout their whole working life.

Retraining and upskilling programmes can help workers of all ages to familiarise, for instance, with new technologies and to reduce the depreciation of their skills induced by rapid technological change. Italy, however, lags behind other countries when it comes to the participation of adult workers in education and training at all levels.

The recent economic crisis has also had a considerable impact on training and LLL activities in Italy as evidence shows a reduction in training activities across firms. This reduction was especially sharp in firms operating in the North-East and Centre regions. Against this backdrop training providers have tried to diversify their offer and retrained their own workforce to provide programmes that are more aligned to labour market needs, responding more effectively to the requests of employers.

While many Italian workers are lacking basic ICT skills, have only basic knowledge of foreign languages and lack a wide range of soft and hard skills, too much of the available funds for training has been used to provide courses in areas that are only marginally related to the development of those skills that are required to face rapid technological change and globalisation. The provision of courses to develop language or ICT skills should be boosted by diverting resources from training programmes that are financing less relevant skills.

In 2015, the Italian Government ratified the Jobs Act, a comprehensive labour market reform which addresses the drivers of labour market duality through a new regulatory framework that is reshaping the relationships between employers and employees in Italy. Several challenges lie ahead the implementation of the Jobs Act. Many of these challenges relate to the delivery of active labour market policies to increase the skills of unemployed so as to match the needs of firms. Other challenges emerge due to the fragmentation of the Italian labour market, where the North leads through cases of best practice and the South follows at a great distance

The Jobs Act introduced a new single open-ended contract with increasing levels of protection according to workers' job tenure (*contratto a tutele crescenti*). At the same time, firing costs were made less uncertain for firms by restricting the grounds for reinstatement in cases of dismissal without just cause. Finally, the Jobs Act introduced

generous – albeit temporary – social security cuts for newly hired workers under the new permanent contracts.

While the reform seems to have boosted the creation of permanent contracts in the first year, the potential gains coming from it should be assessed in the medium and long run as these are expected to work through a renewed set of implicit incentives given to i) employers to recruit and to ii) workers to develop adequate skills to meet employers' demands. Crucially, the Jobs Act also promoted the creation of a new National Agency for Active Labour Market Policies (*Agenzia Nazionale per le Politiche Attive* – ANPAL). The ANPAL has been designed to provide renewed incentives and support for the unemployed to retrain and upskill in order to meet the needs of the labour market.

Italy is a country of contrasts that need to be brought together by a coherent policy response. A deep economic and productive divide has for too long contributed to the divergence of labour market performances between southern and northern regions of the country as well as within regions in these areas.

Better matching of the available skills to local labour market needs is, in Italy's fragmented context, fundamental to increase productivity and well-being of all Italians. Much, therefore, needs to be done to enhance skill matching, especially in lagging areas of the country.

A strong geographical divide contributes to the long-standing weak performance of the Italian labour market and of its economy. While cases of best practice exist in the south of the country, these are not widespread. Participation to the labour market also varies dramatically from one region to the other and also within regions. As an example, while the average share of Italian NEET is extremely high by international standards, the aggregate national figure masks an even more worrisome picture where certain regions from the south of Italy show shares of NEET as high as 40%. This is only the tip of the iceberg as the functioning of the labour market across Italian regions varies considerably and so does the quality of skill matching.

Despite major regional skill imbalances, residential mobility in Italy is very low and many Italians do not have sufficient incentives to relocate. Supportive policies need to be strengthened, such as housing policies and relocation subsidies, greater flexibility of work arrangements and family support.

A fragmented legislative framework has also contributed to limit labour market mobility and so, skill matching. Until recently, separate Regional Qualification Frameworks (*Quadri Regionali di Standard Professionali*) have been used by each Italian region to certify formal qualifications. The implementation of different standards and procedures at the local level has eventually led regions to recognise only their own qualifications, eventually reducing intra-national labour mobility. The situation has recently improved with an agreement between state and regions on the use of a national qualification framework. Its effective implementation across all regions should be carefully monitored.

Strengthening the validation of informal learning can also lead to higher labour market mobility. Despite the efforts of the Ministry of Education and of the Ministry of Labour and Welfare, a solid system for the Recognition of Prior Learning (RPL) at the *national level* has not been developed yet. Standards for RPL, instead, do exist at the regional level but their fragmentation represents a potential limitation to the

functioning of the whole system that eventually contributes to the emergence of skill mismatch and shortages.

While labour market performance varies greatly across regions, wage differentials between the north and south of the country are instead small (around 7%). In addition, the higher costs of living in the North contribute to reduce these differences even further so that workers with a stable job have usually weak incentives to move in response to skill shortages arising somewhere else in the country. Weak wage incentives for the employed hinder labour market mobility and, contextually, the quality of skill matching.

The situation is, however, different for those who are unemployed. The main drivers of intra-national migration (usually from the South to the North) are not wage incentives but the likelihood of being employed, the latter being higher in the northern part of the country.

The fact that intra-national mobility is driven mostly by employability prospects – rather than wage differentials – is the reflection of both a weak aggregate demand for skills and of a tight labour market. Both aspects, in turn, lead many workers to accept jobs for which they are usually over-qualified and, in many cases, also mismatched by field of study. The individual costs associated to accepting jobs for which a worker is mismatched are, however, substantial and they materialise in substantial wage penalties paid by mismatched workers relative to other well-matched workers.

Linking wages to productivity is, therefore, imperative to spur a better skill match as this can provide workers with the adequate pecuniary incentives to develop and use their skills in jobs that truly make full use of their human capital. Similarly, by anchoring wages to productivity, employers will have more incentives to attract the right type of skills for their vacancies.

Vacancies in Italy are hidden and few are advertised publicly. Family and professional networks are the channel through which jobs are matched to skills, with sub-optimal effect on the quality of the matching.

The weak aggregate demand for skills in conjunction with the limited number of jobs available in Italy has also contributed to the emergence of substantial brain-drain, with many young (but also older) Italians looking for high-quality and well-paid jobs abroad.

In the Italian labour market, many vacancies are hidden and not visible to those who would, in principle, be able to supply adequate skills to fill them. Professional and family networks represent, by far, the most important channels of diffusion of labour market information and play a major role in matching vacancies to workers and so, to skills.

Italian employers – especially those in SMEs and in the south of the country – struggle to identify their skill needs and in many instances prefer to rely on their restricted professional or social/family network instead of "taking the risk" of hiring someone from "outside" and whose characteristics are unknown.

Until the recent introduction of the Jobs Act, the combination of high firing costs, low managerial skills and of poor skill-signalling power of qualifications/education titles has dramatically hindered skills matching in the Italian labour market. This, in

turn, led to a suboptimal allocation of talent and to the widespread use of informal networks to recruit workers through temporary and insecure contracts.

The recent crisis has exacerbated the situation, with an increase in the vacancies that have been "hidden" from the public access. Those who did not have access to high-quality networks have been exposed to increasingly fewer public job-vacancies and many decided to move abroad. International migration, driven by the desire of finding a better skill match, is usually positive as it allows a better allocation of talent. The drain of a nation's human capital, however, does represent a major problem when this country is not able to attract from abroad the talent required by its own labour market in specific areas.

Italy scientists' net migration position in between 2001 and 2010 has been negative, with many Italian scientists moving abroad and going to the United States. Initiatives are needed to endogenously spur a stronger demand for those skills that have been developed nationally as well as to attract international talent to fill shortages when needed.

Active and passive labour market policies (LMP) fundamentally differ in the way they see skills as a tool to address labour market challenges and crises. Passive LMP such as unemployment benefits can help to provide relief to the unemployed from the strains of their labour market condition. This is done by supporting the incomes of unemployed but not directly their skills. Active LMP, instead, aim to provide workers with tools and support to retrain and upskill so as to return to employment in the best possible job match through an enhanced skill set.

The creation of the ANPAL, the national agency for the provision of active labour market policies represents a major shift in the way Italy approaches labour market policies. Such shift has potentially notable repercussions on the way Italy develops and matches skills.

Italy has a long tradition of passive labour market policies and of relatively generous wage-topping mechanisms – the *Cassa Integrazione Guadagni* (CIG) – that have been largely used a "*the"* solution to temporary crises and labour market challenges.

Against this backdrop, the Jobs Act promoted the creation of the ANPAL to provide renewed incentive for the unemployed to retrain and upskill in order to meet the needs of the labour market. Putting emphasis on "*active*" interventions is going to face several ideological barriers. Italy needs to do more to create the adequate social context for this change.

The rejection, however, of the constitutional reform proposed through a national Referendum in December 2016 has modified the initial plan for which the ANPAL would have centralised the mandate over the delivery of ALMPs in Italy and, as it stands now, this is a shared competence between the ANPAL and the regional governments.

Co-ordination challenges with and among regions, especially with regards to the interpretation of *minimum standards* for the delivery of services to jobseekers, are likely to emerge. These can potentially end up undermining the role of the ANPAL itself. Doubts remain, therefore, on how the constellation of different experiences at the local and regional level in delivering labour market policies will be able to homogenously adapt to the radical switch to ALMPs. This is all the more so in a context where regions will not be fully accountable to the national agency.

It is, therefore, imperative for Italy to design adequate mechanisms to strengthen co-operation between regional and national stakeholders. It is crucial to identify clear criteria on which regions and providers of services have to be hold accountable homogeneously across the whole national territory.

Another major challenge facing the ANPAL in the delivery of ALMPs will be that of making the best use of scarce resources. Skill profiling tools can help streamline case-workers activities and have already been implemented in Italy within the Youth Guarantee (YG) scheme in 2014. This positive experience should be capitalised upon for the delivery of ALMPs.

Along with the development of new profiling tools, the ANPAL is going to manage a web portal whose aim is to provide information to both jobseekers and employers on vacancies and skills available in the labour market. It will be important to monitor the effective functioning of this web tool and, especially, the integration with regional informative systems and with the national network of statistical information provided by ISTAT and INAPP's *Sistema Informativo delle Professioni.*

Chapter 1

Introduction to key trends and facts

Increased globalisation and rapid technological change, but also demographic, migration and labour market developments, have altered considerably the structure of skill requirements in most countries in recent decades.

This chapter draws on recent national and international evidence to provide an overview of the key trends and facts that represent the context within which skills imbalances emerge in Italy. Key trends analysed relate to the evolution of productivity, GDP growth as well as employment and unemployment. Others facts analysed relate to the supply of skills in Italy as well as to female and youth's labour market participation.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

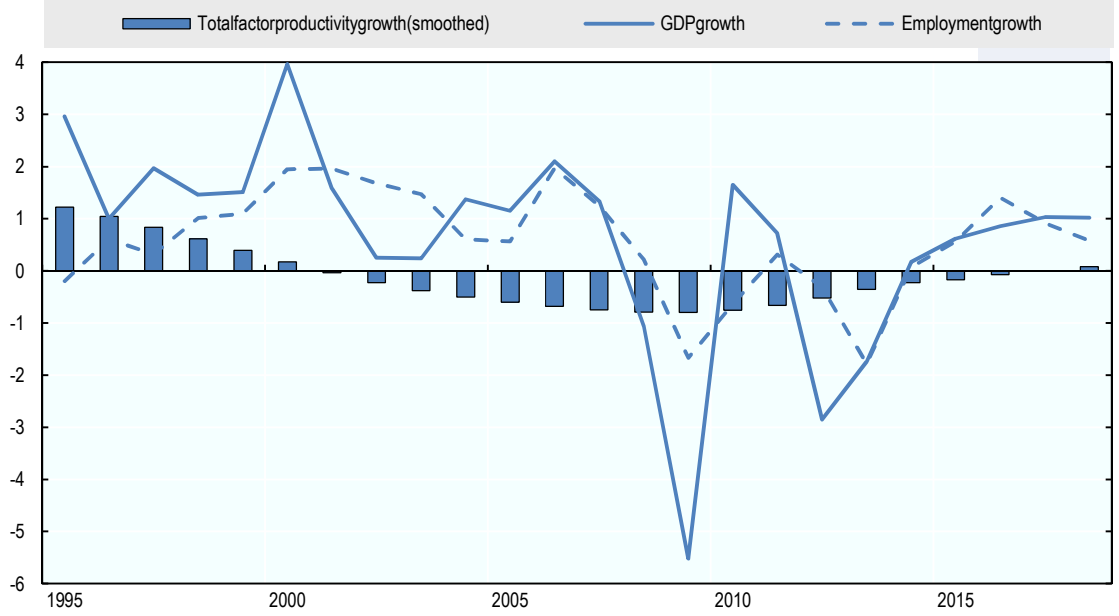
Key economic trends and facts

The global economic and financial crisis hit Italy hard and aggravated structural weaknesses in its economy and labour market

The Italian real GDP per capita dropped by about 10% since the onset of the crisis in 2008, but the country is finally recovering and both economic growth and labour market performance are giving signs of a moderate improvement.

While the crisis put an extraordinary stress on Italy's productive system and labour market, some of the causes behind the current economic weakness are deeply rooted in the Italian economic and social fabric and started well before the global financial crisis. Since the end of the 1990s, for instance, output growth has been substantially below the EU average and total factor productivity growth has been stagnant and even negative since the early 2000s (Figure 1.1). Productivity has started a slow recovery, but it is still relatively low to lead to sustained GDP growth. Low productivity levels and weak growth represent a fundamental skill challenge in Italy as these lead to a weak aggregate demand for skills and to mismatch in many areas of the economy.

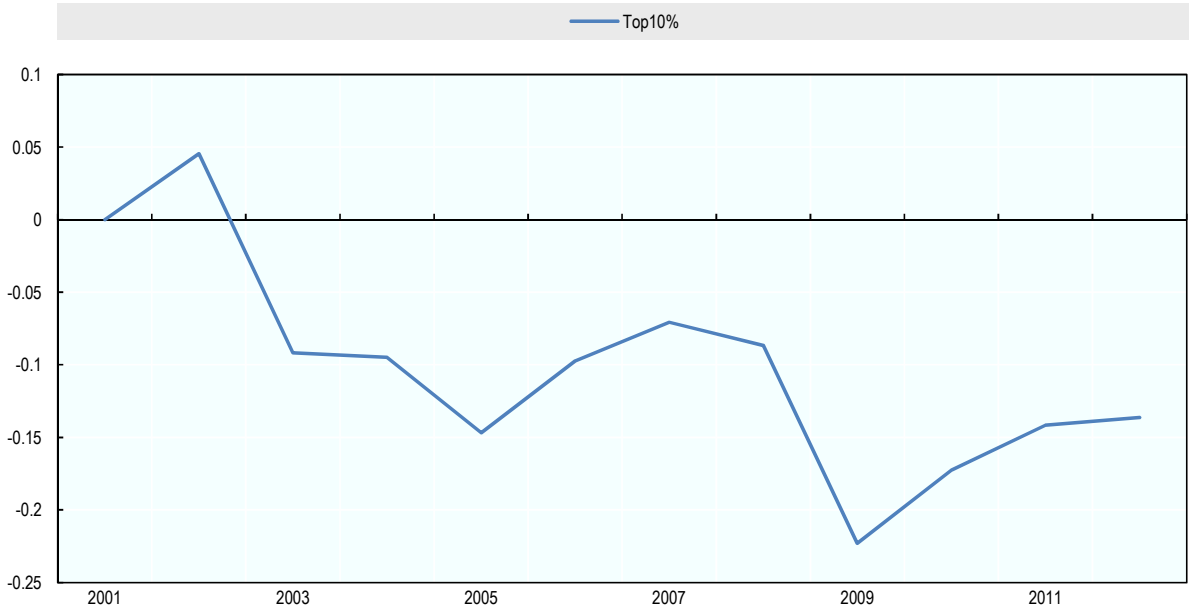
Figure 1.1. The long-lasting Italy's challenges



Source: *OECD Economic Outlook Database.*

Differently from the experience of other OECD countries, the productivity of Italian most efficient firms in the manufacturing sector has declined in recent years (see Figure 1.2). Recent evidence (Andrews et al., forthcoming) seems to suggest that labour productivity in Italy's manufacturing sector could be around 20% higher if Italy's most technologically advanced firms were as productive (and large) as the global frontier benchmark.

Figure 1.2. Italy: Manufacturing productivity of most technologically advanced firms



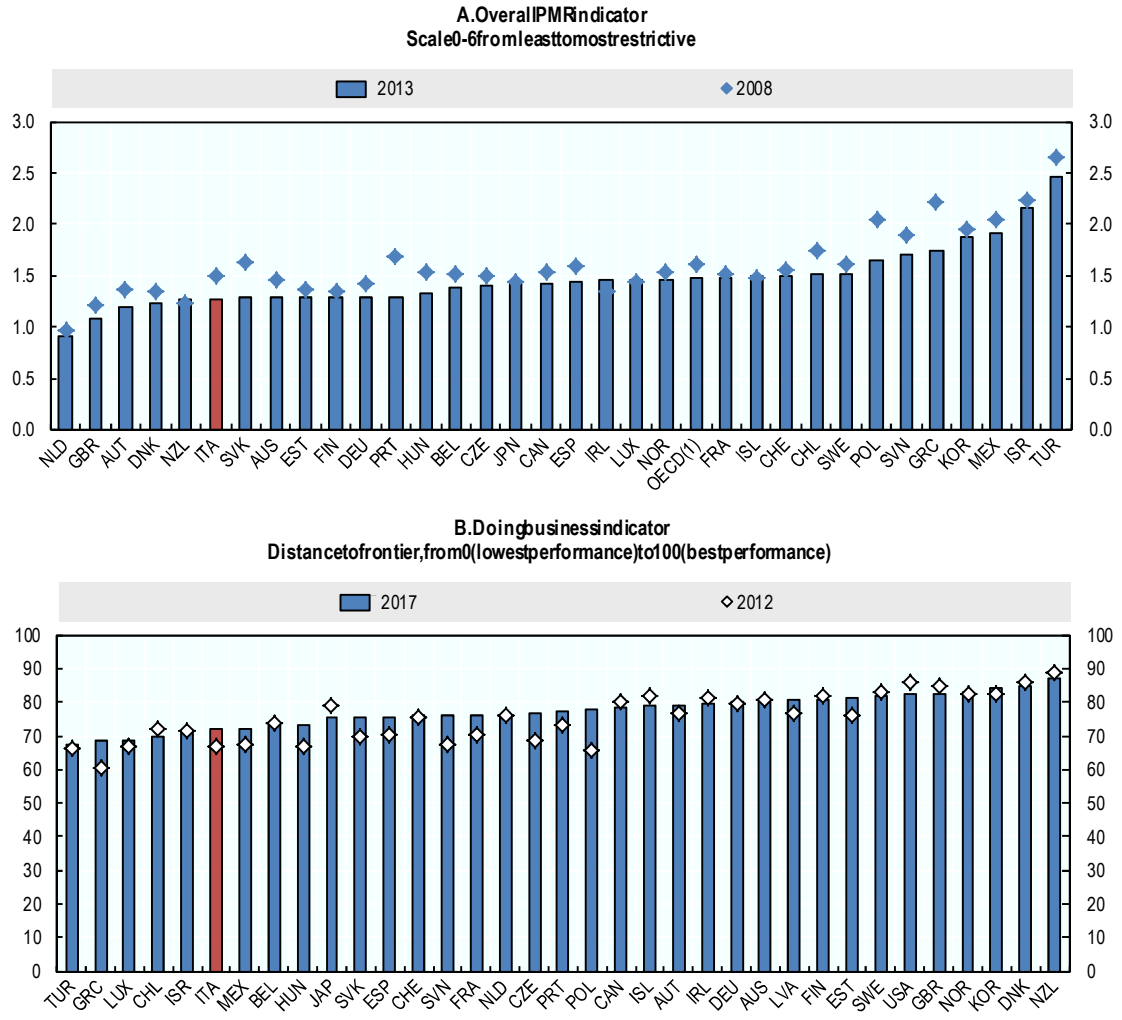
Note: Figure shows the unweighted average of real labour productivity (defined as real value added per employee) for the most technologically advanced firms in Italy (10% most productive firms). The values are normalised at their initial values in 2001 for Italy.

Source: *OECD Economic Survey of Italy* (2017).

Recent evidence (Andrews and Cingano, 2014) also suggests that approximately three-quarters of the productivity gap between the global and national frontier firms is attributable to the small size of Italian firms which, in turn, contributes to the weak aggregate demand for skills.

Other factors concur to explain the weaknesses of the Italian economy. While the government is committed to fiscal sustainability and continues to reduce the deficit gradually, Italy's high public debt (above 130% of GDP) is still a considerable barrier to economic growth and it represents a burden for Italy's competitiveness.[1] Despite difficulties, Italy has made several progresses in opening up markets to competition. That being said, there is still room for lowering barriers relating to state controls and public ownership, which are only close to the OECD average (Figure 1.3).

Figure 1.3. Restrictions to product market regulation have eased



1. Average of all OECD countries excluding the United States and Latvia.

Source: OECD Product Market Regulation Database; and Doing Business 2017.

The 2017 budget bill provides several incentives to boost investments and innovation – especially through the *Industria* 4.0 set of interventions. The new Budget bill also lowers the corporate income tax rate from 27.5 to 24% and has recently extended social security contribution exemptions for new permanent contracts for an additional two years, limiting such exemption, however, only to regions in the south of the country as well as to newly-hired students who have completed internships at the firm (OECD, 2017).

Growth is projected to remain weak

Against this backdrop, GDP is projected to grow by 0.9% in 2016 and edge up to 1% in 2017 and 2018. Fears concerning the stability of the Italian banking sector and others related to the uncertainties stemming from the Brexit could lead to a decrease in private consumption growth in 2017 affecting the weak recovery experienced so far.

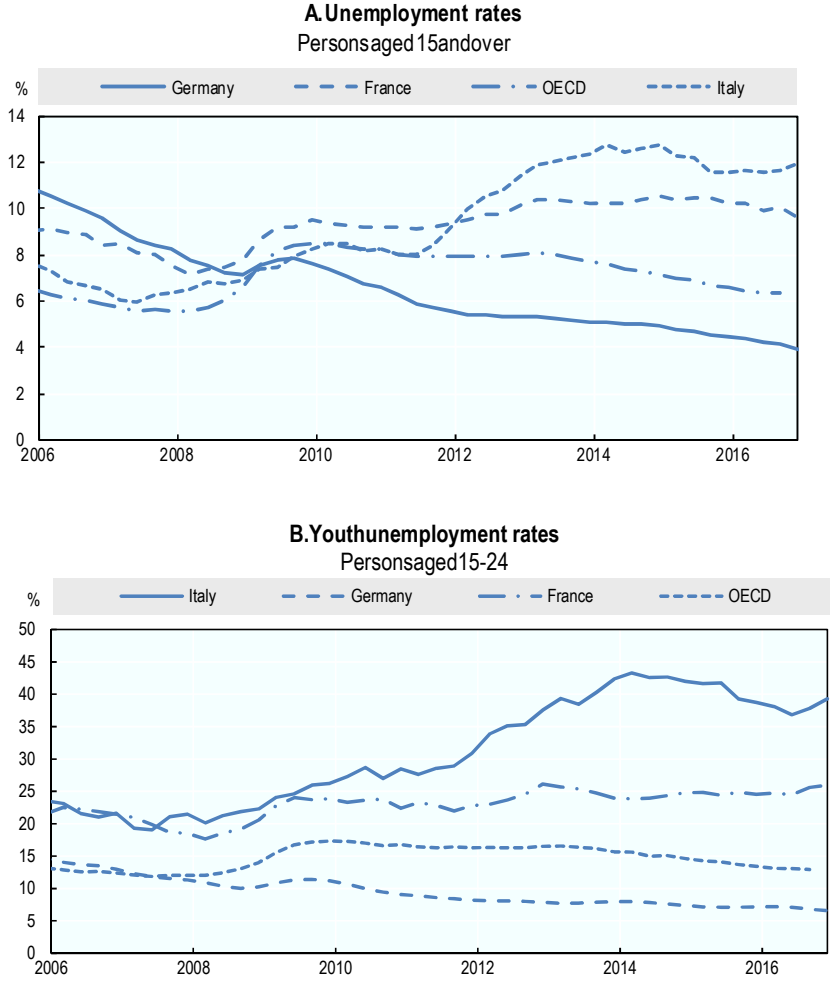
A more effective public administration, more investments in innovation and an improved business environment are needed to counterbalance these short-term challenges as well as to raise the chronically low Italian productivity performance in the long-run. These will also contribute to spur both the demand and supply of skills and their alignment in the labour market.

Key labour market and social trends and facts

Unemployment remains high, especially for youth

The negative effects of the Great Recession have been particularly severe for the Italian labour market. Since the onset of the crisis, Italy's unemployment rate has sharply increased up until 2014 and then started decreasing in more recent years (Figure 1.4). The impact of the crisis has been strong everywhere, but also uneven, hitting young Italians more than other groups in the labour market. Youth unemployment rate more than doubled in between 2007 and 2014 reaching dramatically high rates that still persist in 2016 (39.3%).

Figure 1.4. Unemployment rate in Italy has decreased

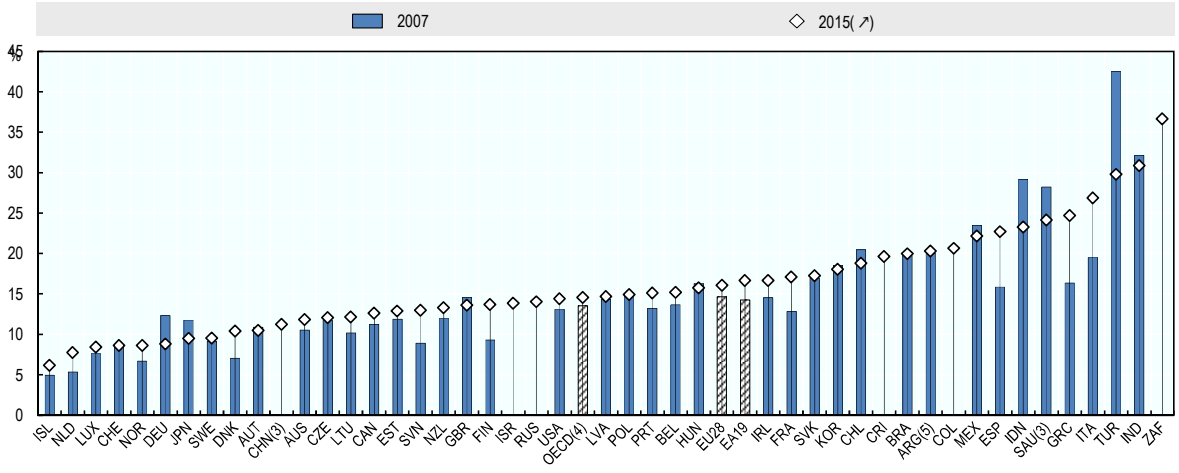


Source: OECD Labour Force Statistics.

Even more wore worrisome, this trend has been accompanied by an increase in the number of NEETs (youth not in employment or in education and training). Despite the recent labour market improvements, the share of NEET remains too high and this implies a substantial risk of long-term scarring effects for Italy's youth (Figure 1.5). These can lead to a permanent reduction in their employability and earnings capacity. Income inequality has also increased substantially in recent years. A recent study (Adda and Trigari, 2016) shows that age explains a disproportionate fraction of the rising income inequality. In 2015 the age of workers explained 56% of the observed income inequality, followed by regional drivers (e.g. living in the south of the country), the level of education of workers and gender, this latter explaining only 4% of observed inequality (down from 13% in 2007).

Figure 1.5. NEET rates are still very high in Italy

Percentage of youth aged 15-29 who are neither employed nor in education or training, 2007[1] and 2015[2]



1. Date not available for China, Israel, the Russian Federation and South Africa, 2006 for Chile, 2005-06 for India, and 2008 for Korea.

2. 2010 for China; 2011-12 for India; 2013 for Chile and Korea; and 2014 for Argentina, Brazil, Indonesia, Israel and South Africa.

3. The NEET rate has been estimated and may include unemployed persons who are studying.

4. OECD is the unweighted average of the OECD countries shown (excluding Israel).

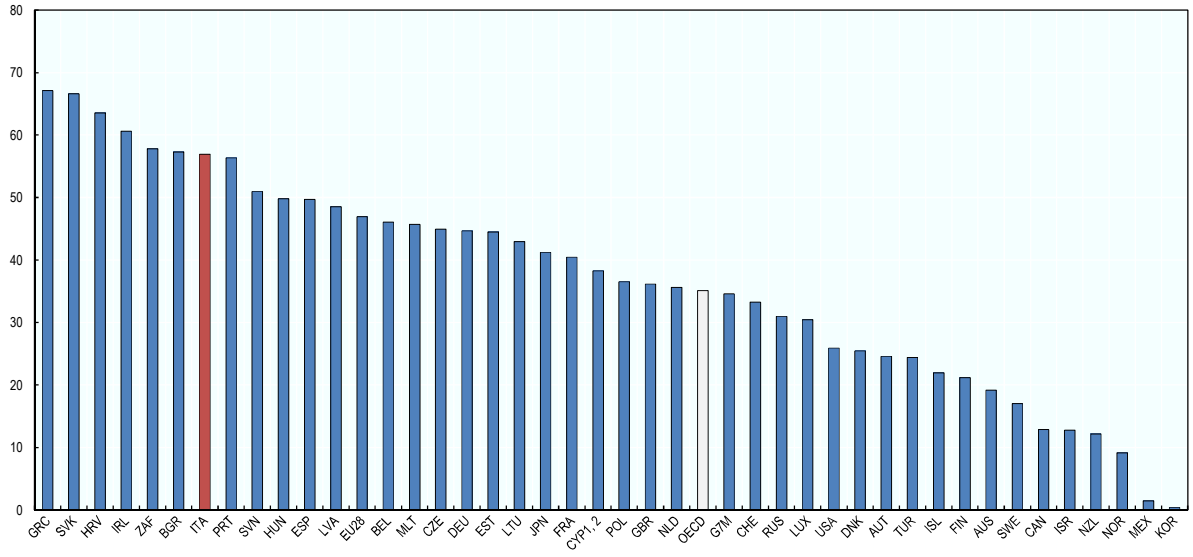
5. Selected urban areas only.

Source: OECD calculations based on national labour force surveys excepted census data for China and *OECD Education Database* for Australia, Israel, Korea, New Zealand and the Russian Federation.

High long-term unemployment puts skills at risk of depreciation

Italy also shows one of the highest shares of long-term unemployed (56%)[2] across the OECD (Figure 1.6). The risk is that of a substantial depreciation of the skills of long-term unemployed which may lead to their permanent detachment from the labour market.

Figure 1.6. Long-term unemployed rate is among the highest in the OECD



Note: Total refers to age 15-64. Long-term unemployment is defined as unemployment lasting 12 months or more.

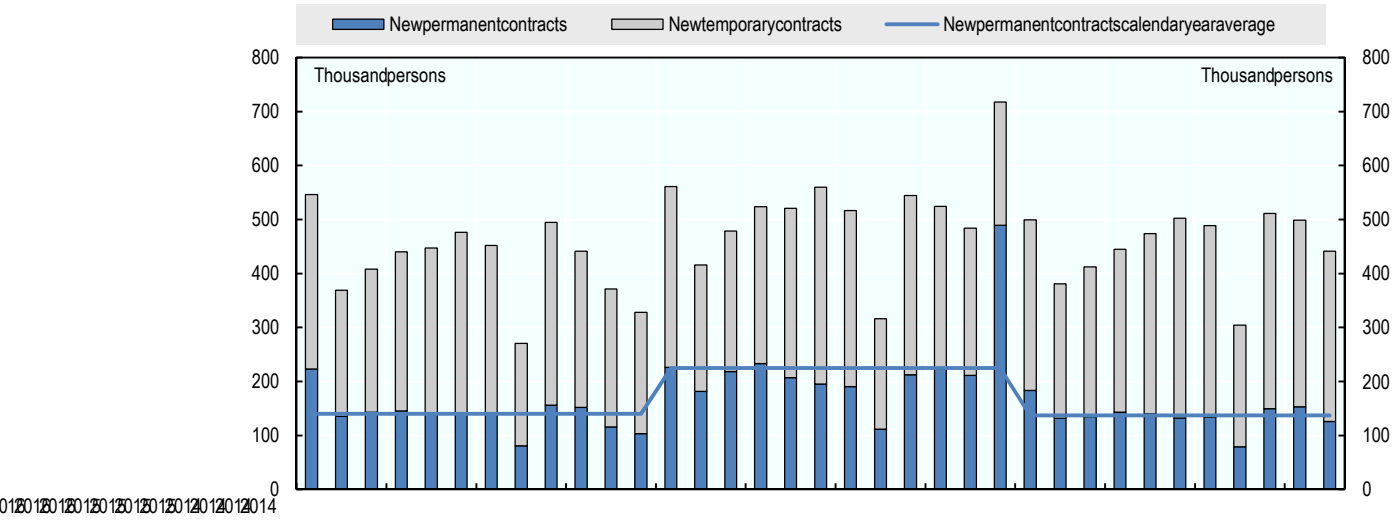
1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: OECD Labour Force Statistics.

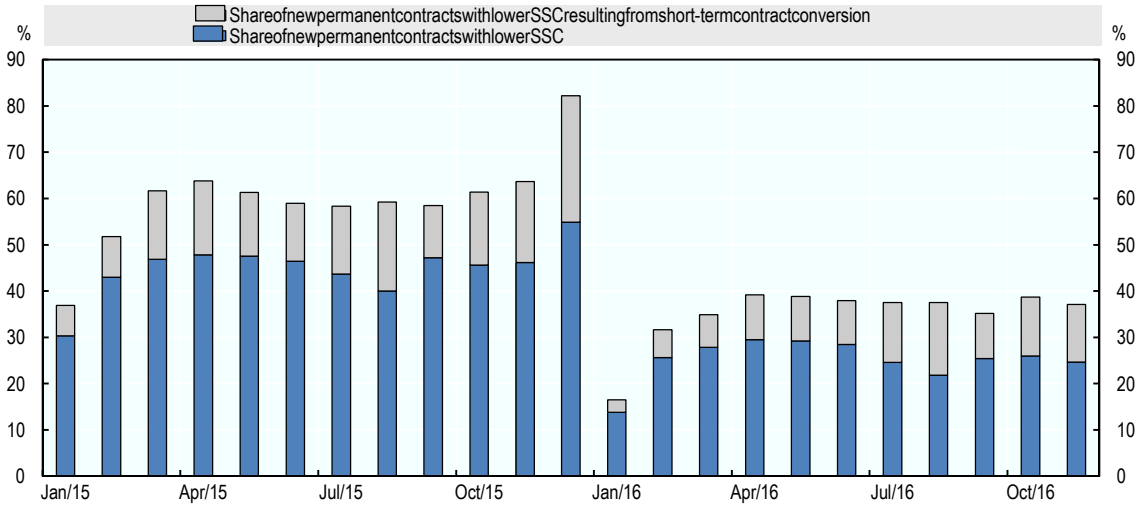
The recent labour market reform (Jobs Act) and especially the temporary exemptions from social security contributions for new permanent contracts have contributed to increase employment and participation rates (Figures 1.7 and 1.8) in the short-run but the recovery is still weak.

Figure 1.7. The evolution of permanent contracts in recent years



Source: Istituto Nazionale della previdenza sociale (INPS), Osservatorio sul Precariato.

Figure 1.8. Contracts benefitting from SSC exemptions accounted for a large share of new permanent contracts

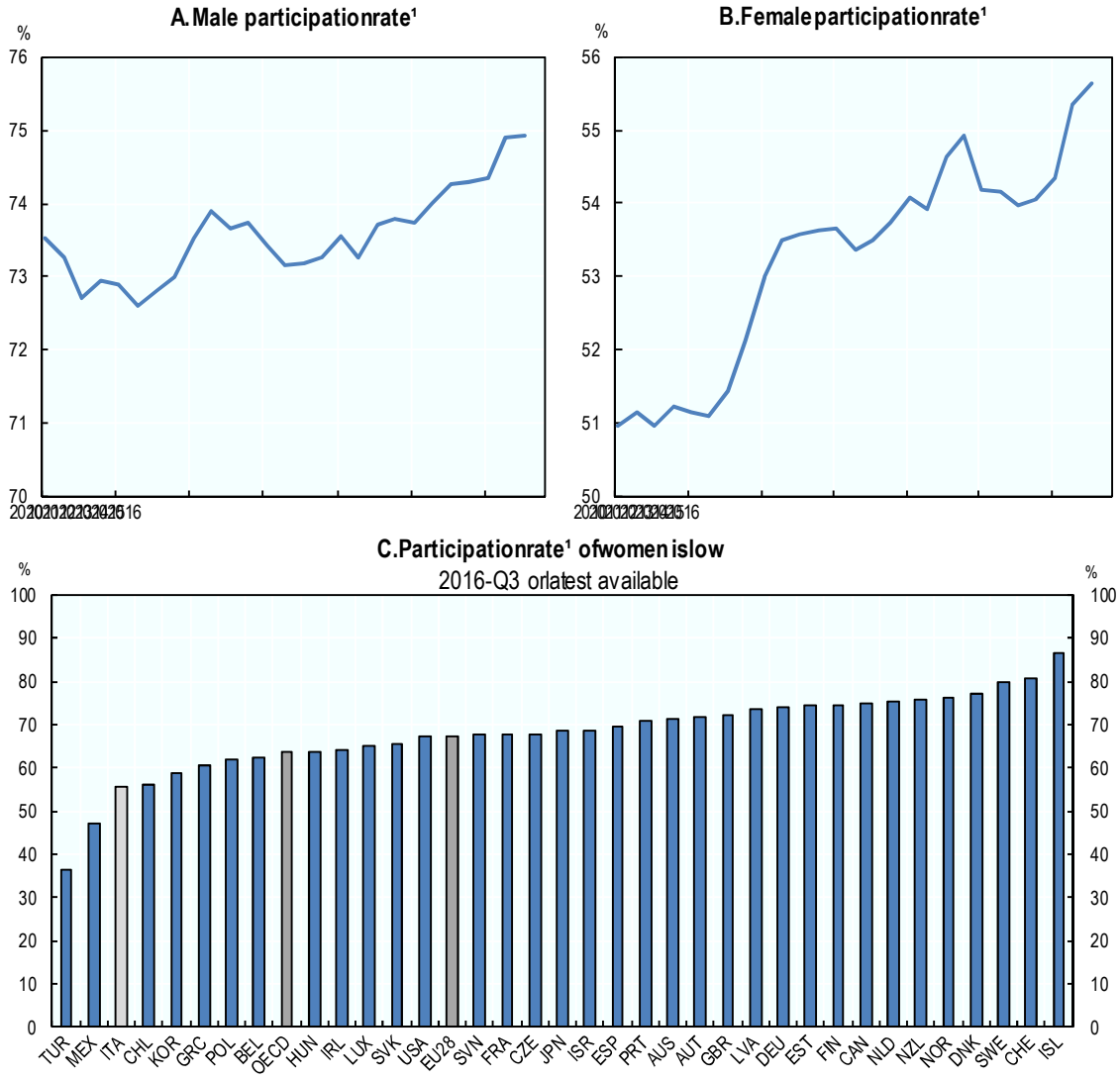


Source: Istituto Nazionale della previdenza sociale (INPS), Osservatorio sul Precariato.

Women participation to the labour market has increased but much remains to be done

While unemployment has recently declined, labour market participation increased especially among women as the crisis seemed to have affected male-dominated economic sectors. The participation of women is, nonetheless, still too low and should be boosted by additional reforms to create the necessary conditions for women to access the labour market (Figure 1.9).

Figure 1.9. Male and female participation rates



1. The labour force participation rate is defined as the ratio of the labour force to the working age population (15-64 year old), expressed in percentages.

Source: OECD Labour Force Statistics.

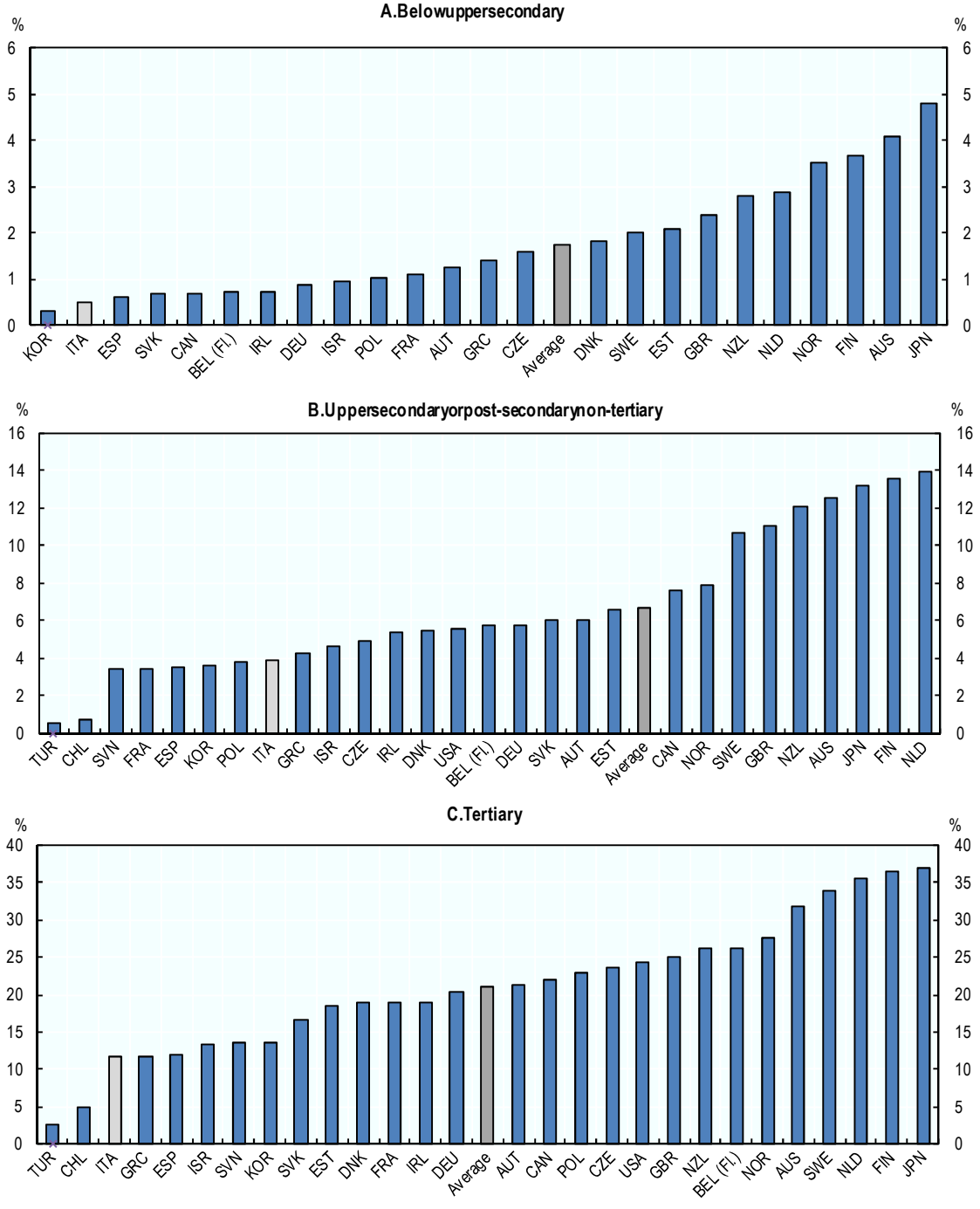
Key education and skills trends and facts

Italy performance in international skills assessment is disappointing

When compared to other countries participating to the OECD survey of Adults Skills (PIAAC), Italy underperforms both in terms of its workforce's educational attainment and skills levels (Figure 1.10).

Figure 1.10. Skills of Italians are low at all education levels

Percentage of adults scoring at literacy proficiency Level 4 or 5,
by educational attainment (2012 or 2015)



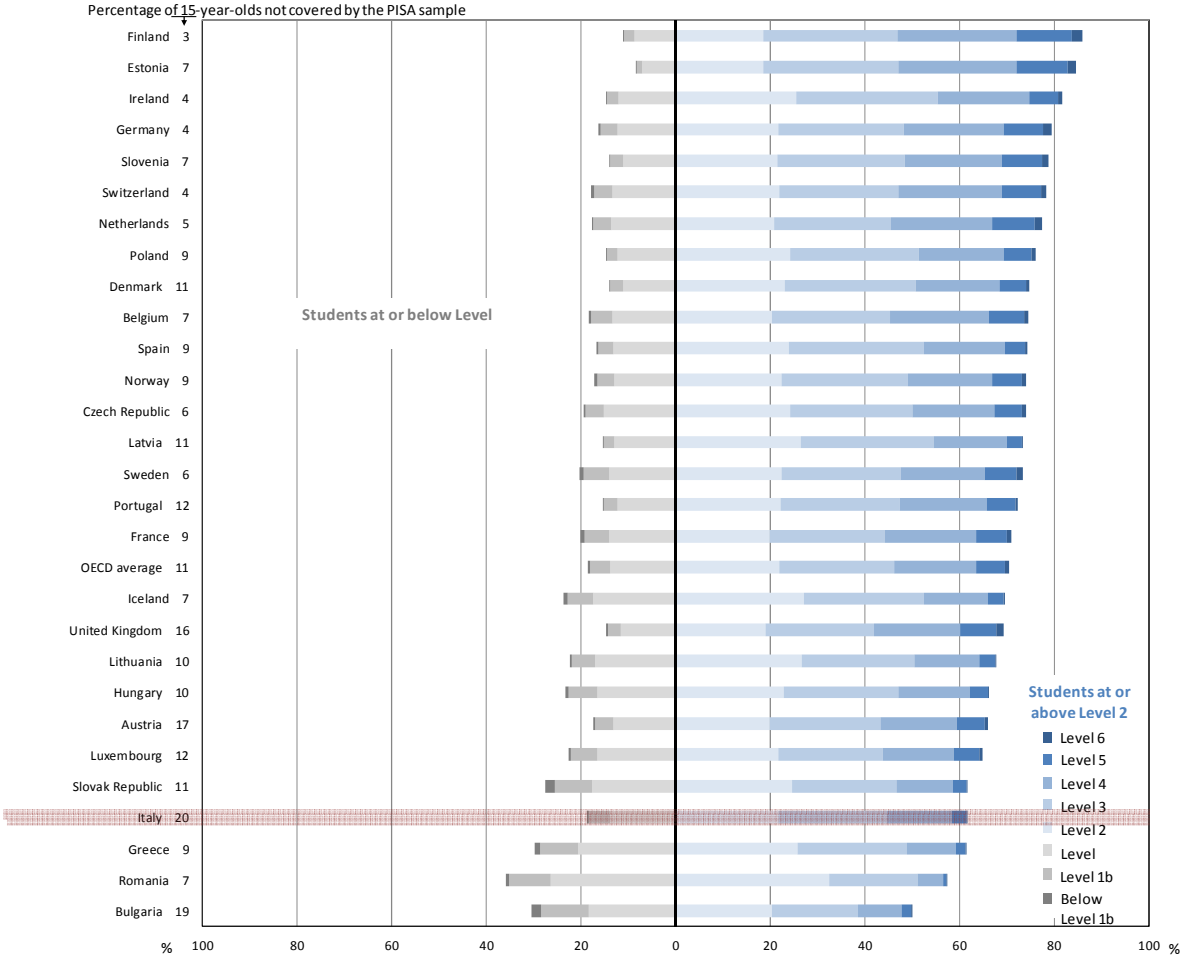
Note: The share of adults at proficiency levels 4 and 5 reflect the share of adults with high scoring at literacy proficiency.

Source: OECD (2016), *Education at a Glance: OECD Indicators*.

Challenges in developing a sufficient supply of skills start at an early age. The scores in reading, mathematics and sciences as recorded by the most recent OECD PISA assessment have increased substantially in Italy. However, average levels of proficiency in reading, math and sciences still remain low compared to other countries (Figure 1.11).

Figure 1.11. 15-year-olds' proficiency in science

Students at the different levels of proficiency in science, as a percentage of all 15-year-olds



Note: The length of each bar is proportional to the percentage of 15-year-olds covered by the PISA sample.

Countries and economies are ranked in descending order of the number of students who perform at or above Level 2, expressed as a percentage of the total population of 15-year-olds in the country.

Source: *OECD PISA 2015 Database*, Table I.2.1.b.

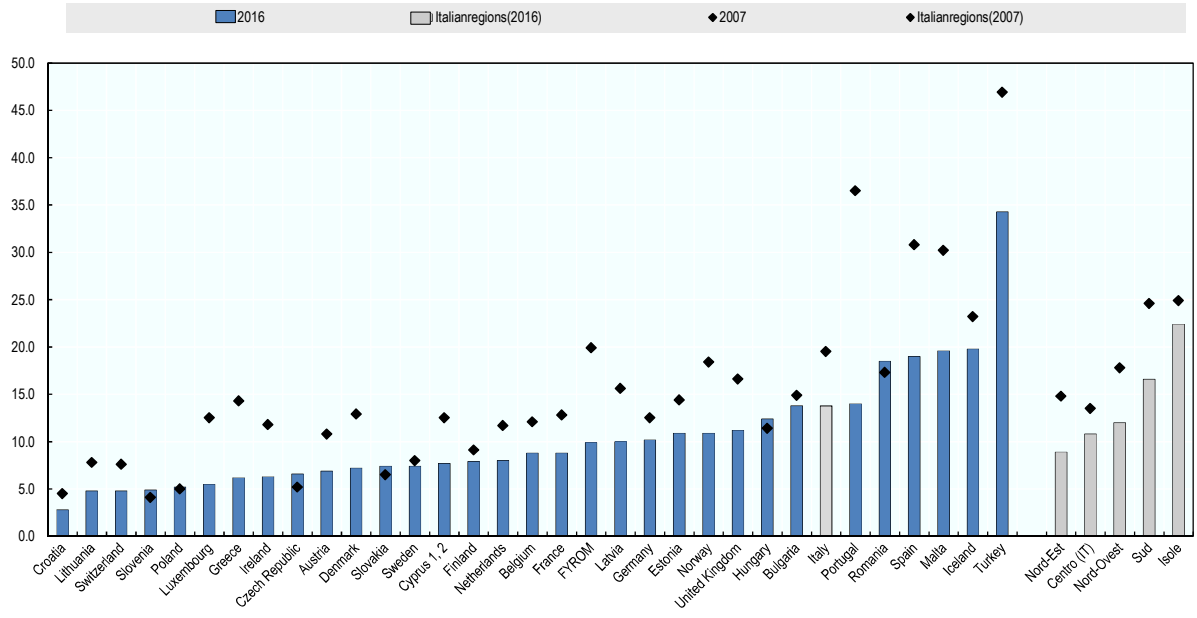
One in seven young Italians leave school without a qualification

Among the several reasons contributing to the low skill performance of Italians, early school drop-out is particularly worrisome as this is a barrier for young Italians to fully develop their skills in the formal education system. Despite a sharp decrease in the share of early school leavers in between 2007 (20%) and 2016 (14%) the number of Italy's students that left education and training with at most a lower secondary

education diploma is still one of the highest figures across OECD countries. This result, moreover, masks great regional heterogeneity (Figure 1.12) where some regions in the South and Islands show dropout rates as high as 23%.

Figure 1.12. Drop-out rates in Italy and their geographical disaggregation

Percentage of population aged 18-24 who has left education and training with at most a lower secondary education diploma (2016 and 2007)



1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

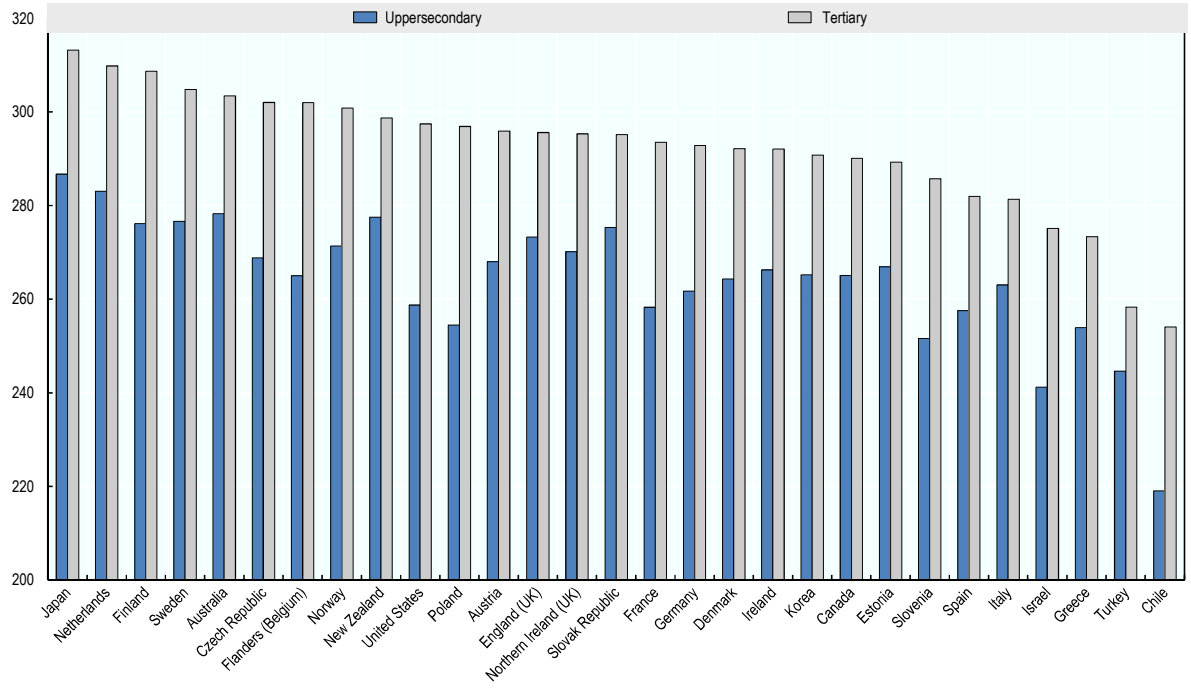
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: ISTAT, NOI-ITALIA Database, 2016 and OECD (2017), *OECD Economic Survey of Italy*.

Tertiary graduates also perform poorly in foundation skills

Tertiary education plays also a fundamental role in the creating the supply of skills that are needed to match the requests of employers in the labour market. Results from the OECD survey of Adults Skills (PIAAC), show that the mean literacy proficiency score of Italians with either an upper-secondary or tertiary degree is well below the average of the OECD (Figure 1.13). Worryingly, the weak performance of Italian graduates is similar in both young (20-24 years) and older cohorts (25-64 years), pointing to the fact that a considerable share of young Italian graduates lacks the skills needed to compete in international labour markets. In addition, in Italy, the difference in literacy proficiency between adults with a tertiary degree and adults with lower than upper secondary degrees is among the smallest in the OECD pointing to marginal skills development in universities.

Figure 1.13. Literacy proficiency score of Italians in upper-secondary and tertiary education levels



Note: Lower than upper secondary includes ISCED 1, 2 and 3C short. Upper secondary includes ISCED 3A, 3B, 3C long and 4. Tertiary includes ISCED 5A, 5B and 6. Where possible, foreign qualifications are included, as the closest corresponding level, in the respective national education systems.

The sample for the Russian Federation does not include the population of the Moscow municipal area.

Source: Survey of Adult Skills (PIAAC) 2012, 2015.

In addition to having relatively low skills, Italians are also less likely to participate in adult education and training than their peers in other OECD countries. According to PIAAC, only 24% of adult Italians participate in education or training, compared with 52% on average in OECD countries.

Notes

1. In addition, Italians are ageing faster than the OECD average with resulting problems for the sustainability of the social security system (OECD, 2017).
2. Defined as the share of unemployed for 12 months or more

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Chapter 2

Skills assessment and anticipation system

Skills assessment and anticipation (SAA) exercises are carried out in virtually all OECD countries but the approaches used can vary substantially. This chapter sketches the fundamental aspects of the Italian SAA system by discussing the involvement of its main actors and stakeholders in the creation and use of SAA information. The chapter reviews the co-operation ties across these stakeholders and the channels used to disseminate SAA information to policy makers and end-users.

Skills assessment and anticipations exercises in Italy are well developed

Italy has developed several tools and instruments to assess and anticipate the skill needs in the labour market. These tools have the potential to effectively feed into the policy making process and to spur a better alignment between skill demand and supply. In Italy, exercises and analyses run at very different levels of aggregation, spanning from the national to the regional and sectoral levels. Similarly, a wide array of methods are used to assess and anticipate skill needs, going from those using survey data - collected both from employers and graduates - to econometric estimates of future skill demands. New developments are also making use of leading-edge technologies and of big data to assess, in "real time", the pulse of the Italian labour market.

INAPP[1] (National Institute for the Analysis of Public Policies), **Unioncamere** (the Association of Chambers of Commerce) and the consortium of Italian Universities **Almalaurea** co-operate with the National Statistical Office (**ISTAT**) in the development of a network of interrelated and complementary analyses of the Italian labour market and of its skill needs. The **ANVUR** and **Invalsi** are other institutions that provide input and analyses on the functioning and quality of the Italian education system both at the secondary and tertiary level by tracking the performances of Italian students, graduates and research activities. Finally, other independent organisations and institutions such as the **CRISP** (*Centro di ricerca interuniversitario per i servizi di pubblica utilità*) complement the regular analysis of the institutional organisations with *ad-hoc* studies on the needs of the Italian labour market.

INAPP is a leader in the activities to monitor skill needs in Italy

The Skills Audit

The Audit Survey of Professional Needs (*Audit dei Fabbisogni Professionali*) is an in-depth analysis carried out by INAPP (formerly ISFOL) on Italy's skill needs. The Audit has become a cornerstone of Italy's system to assess and anticipate skill needs and it has been running, in different waves for several years. The information produced for this analysis feeds into INAPP's web portal on Professions, Employment and Skills requirements[2] designed and maintained by INAPP on behalf of the Ministry of Labour and Social Policy.

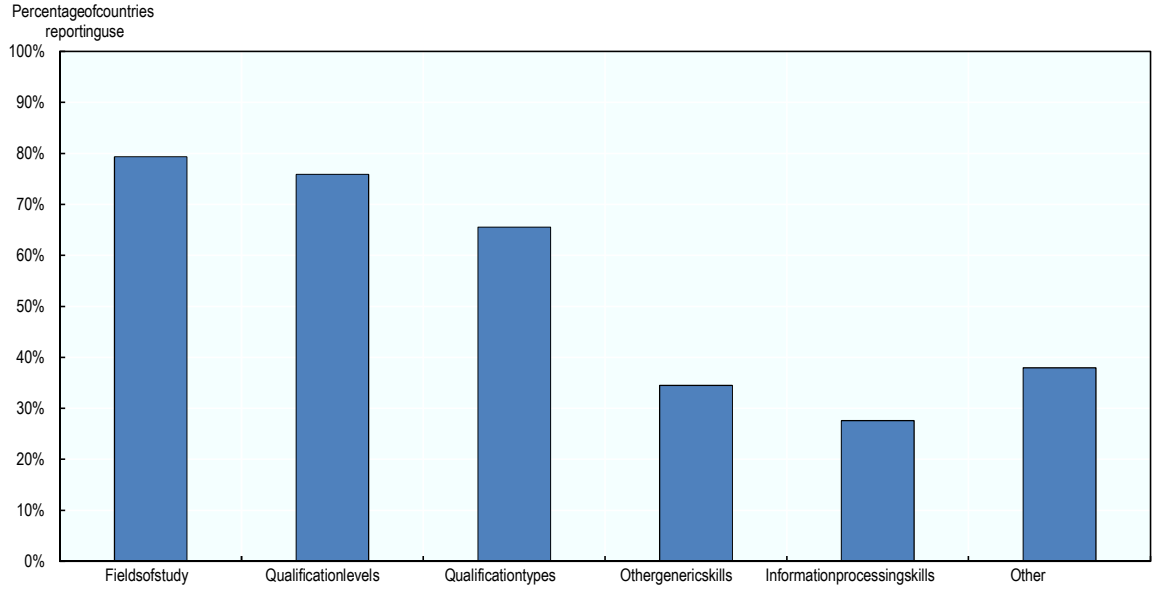
The last wave of the audit has been conducted in 2013-14 on a sample of roughly 35 000 private firms through face to face interviews with employers. In order to ensure the representativeness of the sample, employers interviewed are selected randomly using the Statistical Archive of Active Enterprises (ASIA) managed by ISTAT. The sample is structured in a way to provide information and data on skill shortages across different economic sectors. Special attention is paid to the disaggregation (and representativeness of) results of firms of different size and their geographical distribution.[3] As for the information collected, entrepreneurs and human resource managers of large, medium and small enterprises interviewed in the audit are asked to assess whether their workforce has the adequate skills to perform the tasks required by their jobs or whether they are not able to fill the skill needs of the firm adequately.

Both the type and the quality of the information collected are major strengths of INAPP's analysis which represents a case of best practice across the OECD. Figure 2.1 shows that across countries (OECD, 2016) skill assessment and anticipation (SAA)

exercises commonly make use of "fields of study" or "qualification levels" and "types" to approximate for skills. This is so as these variables are usually readily available from national and international data sources. The granularity of these proxies is, however, low as the mapping from qualifications to skills can be imperfect.

Figure 2.1. Measures used to assess or anticipate skill needs

As a percentage of all countries



Note: Percentages based on responses from 28 countries (Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Korea, the Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey and the United States). If more than one questionnaire was received per country, a definition is considered if reported in any questionnaire received.

Source: OECD (2016), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*.

INAPP's Audit is, instead, based on a much more granular approach to skills analysis that departs from the mere analysis of qualifications to, instead, distinguish between knowledge and skill needs. As pointed out by Colombo (2016),[4] in INAPP's Audit, "*knowledge needs are specifically linked to the education and training system and allow to link major gaps with the supply of graduates by type and field (specific questions are asked about knowledge of concepts and topics in mathematics, physics, science, health, law etc.)*". The Audit also analyses skill needs defined by categories of general/transversal skills that are related to each worker's ability to interact with others, to organise the work, to plan the use of resources, to solve problems[5] (see Box 2.1).

Box 2.1. From qualifications to knowledge and skill types

INAPP's Audit is s divided into three main sections (A, B, C) whose key objective is that of detecting if, in the current economic climate, companies express the necessity to update the knowledge and / or skills of some of the professionals in their workplace. While Section A collects background information, Section B is especially interesting as it examines the needs relating to 33 knowledge, organised into eight thematic areas: business management (six questions); production process (two questions); engineering and technological sciences (seven questions); mathematical sciences, natural and social skills (seven questions); health sciences (two questions); education science (one question); humanities (six questions); legal and safety sciences (two questions). Section C is, instead, devoted to investigate 35 different types of skills organised into eight thematic areas: written and oral communication and comprehension (four questions); applied mathematical and scientific skills (two questions); control of activities and resources (two questions); management of relationships (four questions); problem solving (five questions); planning of activities and use of resources (four questions); management of own professional development and of other people (three questions); management of technical aspects related to the activity of the firm (11 questions).

Skills as opposed to qualifications are analysed in other countries too. Canada's Office of Literacy and Essential Skills (OLES), for instance, funds projects that carry out skill needs assessments of generic skills, while matching resulting training interventions to employer demand. It has identified a set of essential skills, skills that are needed in nearly every job, with differing levels of complexity. OLES has developed descriptions of how these skills are relevant in each occupation. The set of Essential Skills includes: reading, writing, document use, numeracy, computer use, thinking, oral communication and working with others. In this context, OLES has funded a series of competency assessment tools, including the Test of Workplace Essential Skills (TOWES). Such competency assessment tools are most effective when individuals can assess and upgrade their skills in line with employer demand, as well as their own employment goals. The framework of Essential Skills and the TOWES has been used to inform the development of generic academic accreditation (e.g. ISCED 3 equivalent degrees for workers who did not finish upper secondary school). TOWES has been used in the province of Manitoba to identify generic skill shortages and inform curriculum development in adult training programmes.

Source: INAPP website and OECD (2016), *Getting Skills Right: Assessing and Anticipating Changing Skill Needs*.

Among its exercises, INAPP has also developed a skills forecasting multi-sector macro-econometric model. This model bases the forecasts on the scenarios of the evolution of GDP and of the labour market coming from the official estimates of the government and other international organisations. A sector-to-occupation matrix is then used to obtain scenarios at the occupational level that are then used to forecast the demand for labour. A forecast of the supply of labour and of its skills is also done over the medium-run so that its combination with the demand side produces forecasts of mismatch and of skill requirements.

The Survey on Occupations and ISFOL PLUS

While the Audit is meant to target firms and employers, INAPP - in collaboration with ISTAT – runs also a specific survey on workers' perception of skills imbalances: the Survey on Occupations (*Indagine campionaria sulle professioni*). Along with that, INAPP (ex-ISFOL) has also developed the "Participation, Labour, Unemployment Survey" (ISFOL PLUS) to analyse specific sub-samples of the Italian labour market that are usually overlooked in main labour statistics but whose analysis is essential to have a complete snapshot of skill needs in Italy.

With regards to the Survey on Occupations, this is conducted on a sample of approximately 16 000 workers every five years.[6] Similarly to the approach developed

in the United States by O*NET,[7] the Survey on Occupations aims to assess several dimensions of the workers' activity which relate to knowledge, skills, work context, work styles, abilities, generalised work activities, values. In line with the best practice developed by the US O*NET, INAPP survey assesses the importance of all the above mentioned skills and knowledge dimensions as well as the level of complexity of each item to perform the job.

ISFOL PLUS, instead, has reached its fourth edition and it keeps providing interesting information of labour market dimensions that are usually – and culpably – only marginally explored by major surveys such as the labour force survey. The PLUS survey has, so far, substantially contributed to the understanding of key aspects of the Italian labour market such as the distribution of contracts (employees, independent, informal, etc.), the mechanisms behind job search (fundamental for skill matching), the participation of women and youth to the labour market as well as that of older workers. The level of granularity of PLUS' analysis (see Box 2.2) and the focus on complex and overlooked challenges makes it an important tool to understand how the supply and demand of skills find a match in Italy.

Box 2.2. A "PLUS" that provides something more: A fine disaggregation level

The nature and design of ISFOL PLUS makes possible the administration of extremely detailed questions on the nature and characteristics of the work, education and family status of small, and usually less studied, groups of individuals. This allows – through dedicated modules – to provide reliable estimates for aggregates or specific themes that are very small and usually overlooked. The survey system allows, in fact, to produce statistically significant estimates of aggregates also relatively few in population (from 70 000 to 100 000 individuals), representing approximately 0.5% of employment, with a 5% interval confidence level.

Source: INAPP website.

The new INAPP is a renewed chance to deepen the understanding of the public sector's skill needs

ISFOL has recently transited to a new structure and into a new institute, INAPP (National Institute for the Assessment of Public Policies). Five thematic areas are going to be the focus on INAPP: innovation, employment and welfare, skills and occupations, labour market dynamics as well as poverty, disability and social inclusion.

During the restructuring of its activities, it will be important that the new INAPP makes the best use of the expertise and consolidated experience maturated on the analysis of skill needs in Italy by the ISFOL experience. If anything, the INAPP efforts should be strengthened so as to provide continuous support to policy makers in designing effective labour and education policy interventions to tackle skills imbalances.

It is interesting to notice that many of the skill challenges that Italy is facing today are also linked to an inefficient public sector that is struggling to become truly productive. The analysis of the skill needs of the public administration (one of the areas covered by INAPP), therefore, assumes prominent importance and relevance as a tool to tackle skills imbalances more generally in Italy.

With this objective, INAPP along with the Ministry of Economy and Finance (MEF) has recently started a pilot project to map the skills and competencies of the Italian public administration sector. Such mapping represents a novel and important step towards a better understanding of the skills supplied and demanded by the public administration and a much needed tool to spur productivity in one of the key areas where Italy has traditionally struggled. This new analysis will also represent an important tool to monitor the developments of the recent reform of the public administration (*Riforma Madia*) as well as to link this new information to the *Sistema Informativo sulle Professioni* promoted by INAPP and ISTAT.[8]

ISTAT is leading efforts to create an homogeneous and interconnected network of skills and occupational information

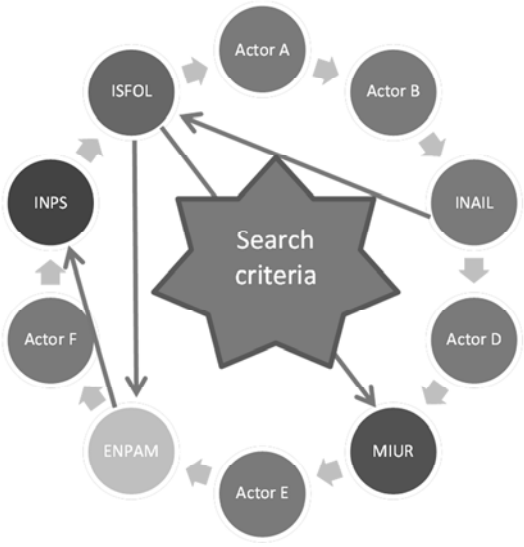
Since 2010, the Italian Institute of Statistics (ISTAT) and INAPP have put major efforts in developing an inter-institutional partnership with the intent of spurring the creation of major interconnections and synergies across different data sources that, directly or indirectly, can provide key information about skill needs in Italy.

The *Sistema Informativo sulle Professioni* (Information System on Occupations) aims to aggregate labour market intelligence proceeding from very different – though in many cases complementary – data sources managed by several Italian institutions and bodies.

The information that feeds into the information system comes, for instance, from the official ISTAT's labour force surveys as well as from Unioncamere Excelsior (Union of Chambers of Commerce) survey of employers, INAPP survey on Occupations and Skills Audit and from their forecast analyses of economic, employment and occupational trends over the medium-term.

The main strength of the Italian Information System on Occupations is that of being able to aggregate a great deal of different administrative records (Figure 2.2). Administrative data proceeds from: i) the Ministry of Education on universities supply of courses and education offer; ii) INPS (the Social Security Service) that provides information on wages; iii) the National Institute for Insurance against Work-related Injuries (INAIL) which inputs information on workplace and work-related accidents; iv) the Medical Association (ENPAM) on health care workers; v) the Association of Agro-technicians providing information on their members as well as the Liguria and Veneto Regions which provide information on their local training systems and labour markets.

Figure 2.2. Actors interacting in the *Sistema Informativo sulle Professioni*



Source: ISTAT (2016).

Creating a platform to aggregate data with these characteristics is an extremely complex task *per se*, but the real challenge lies in making it operational so that the information, proceeding from the different data sources, is presented in a homogeneous manner and the end-users can bridge from one source to the other.

Major efforts have been, therefore, put in developing a platform coherent with the occupational classification system (the CP 2011,[9] *Classificazione delle Professioni*) so that this could be used to aggregate and share the information coming from different stakeholders through the use of common criteria. As of now, in fact, all institutes and stakeholders participating to the project need to input their information following the CP2011 classification. The information is, hence, available on the website of ISTAT and INAPP with a widget that permits to retrieve the occupational data directly from the different sources[10] but with a shared and homogenous nomenclature.

Challenges lie ahead as the Information System is now moving from being a prototype to a fully institutionalised system with the direct involvement of all partners in its governance. Future developments will concern both the extension of the partnership to other data providers as well as the integration of their data into the existing system. Along with that, the establishment of an inter-institutional platform that guarantees the updating and development over time of the information system will become crucial to ensure the quality of the information provided. This aspect is currently being discussed. Finally, the rapid increase in the use of new technologies and social network platforms poses the question of whether the whole data infrastructure should move towards the logic of a "*linked open data system*" (ISTAT, 2016) which should also target mobile applications in order to spur the diffusion of labour market intelligence.

Almalaurea provides up to date information on graduates labour market outcomes

Almalaurea is the largest Inter-University Consortium in Italy. It aggregates around 74 different Universities collecting information, and providing analysis, on around 91% of Italian graduates. Among its activities, the most important is the annual survey of graduates that investigates the profile and employment outcomes of Italian graduates at one, three and five years after graduation.

The survey analyses a number of different issues related to both the perception of students towards the quality of education programmes in universities as well as the characteristics of the jobs of those entering the labour market after graduation. Particular attention is paid to the analysis of graduates' satisfaction towards the alignment of their academic title to the needs of the labour market.[11] Similarly, the analysis focuses on what (and how) skills are used in the workplace, the type of work arrangements and the contracts stipulated by graduates when entering the labour market as well as their job satisfaction.

In light of the recent reforms of the Italian education system and the fast-changing nature of labour market needs, Almalaurea has put major efforts in providing a realistic and updated picture of these socioeconomic trends by adjusting the survey with new questions and analyses. As an example, following the recent introduction of the *Buona Scuola* reform, Almalaurea's survey of graduates is now introducing explicit questions about the graduates' experience with the *Alternanza Scuola-lavoro*[12] reform. Similarly, Almalaurea has already conducted analyses on the experience of the *Istituti Tecnici Superiori* (ITS) with an ad-hoc focus on the satisfaction and characteristics of students graduating in different technological areas.

The effort is, therefore, targeted to provide policy makers, universities as well as students and graduates with valuable insights to enhance skill matching in the labour market. As a reflection of the quality and robustness of the information collected by Almalaurea, its data has been recently incorporated into the National Statistic System (SISTAN) managed by ISTAT. This recent development will likely contribute to spur the use of this information even further and to increase its visibility to policy makers.

The successful experience of Almalaurea led to the establishment, in the year 2000, of Almadiploma as an association of secondary schools across several Italian regions. Almadiploma also runs a survey of students but, this time, in secondary schools. In 2016, the survey collected information from 261 educational institutes and 40 181 graduates, 85% of whom fully completed the survey questionnaire providing information about their socioeconomic status, their activities at school (some questions are on the work-based learning activities) as well as on their perception of the quality of laboratories and education programmes at the secondary level. Though of great value, the survey is not fully representative of the whole secondary schools' system in Italy and the regional coverage is still scattered.[13] Strengthening this and other tools[14] is fundamental to understand the dynamics behind the crucial – and usually difficult – transition from secondary to tertiary education programmes, there where many Italian students drop-out from the education and become inactive or NEET.

Unioncamere and the Excelsior Information System assesses current needs and anticipates future ones

Most countries across the OECD developed skill forecasts to inform both policy makers and end-users about the future needs of the labour market. In Italy, the Excelsior project, run by Unioncamere, provides both long term skill forecasts as well as information on current/short-term needs.

Long term skills forecasting is provided by an econometric model which resembles the one developed by CEDEFOP in its skill needs forecasting exercises.[15] Excelsior forecast model provides information on the skill demands of occupation in 30 different sectors by analysing both expansion and replacement demand components. These sectoral forecasts are then mapped at a rather granular disaggregation level to occupational skill demand at the third ISCO level.

Along with the forecasts, the Excelsior Information system provides a regular analysis of the short-term needs of the Italian labour market through the collection of employers' survey data. The survey is large in size and it covers around 100 000 firms each year. Firms are asked to provide detailed information on their recruitment needs as well as, among other things, information on the reasons for recruiting and whether they currently face labour or skill shortages. Information on hard-to-fill vacancies is collected and analysed along with indications on the education level required for each occupation in demand. The results are presented in an annual report[16] and in a web platform which allows extracting information at an extremely detailed geographical level.[17]

…and the ANVUR evaluates the quality of universities

Information on the functioning of universities is also available through the analysis of the ANVUR (*Agenzia di Valutazione del Sistema Universitario e della Ricerca*) and of the INVALSI (*Istituto nazionale per la valutazione del sistema educativo d'istruzione e di formazione*).

The ANVUR oversees the national evaluation of the quality of universities as well as of all public and private recipients of public funding for research activities. In brief, the ANVUR acts as the national agency for quality assurance in the field of higher education and research. Within its activities, to develop its own institutional strategies, the Agency collaborates with European and international bodies or agencies and administrations of other countries by exchanging information and experience on national and international cases of best practice.

Among the most useful analyses carried out by the ANVUR is the recent Assessment of the Quality of Universities' Research Activities (*Valutazione della Qualità della Ricerca* – VQR) for the years 2011-14. Results from this analysis shows that universities across the national territory have finally started to converge in terms of research quality. The difference in the quality of the research across universities and between the South/Islands and north of the country has decreased substantially in the last four years (2011-14) but significant gaps still remain.[18]

INVALSI is, instead, the National Institute for the Evaluation of the Education and Training System in Italy. It carries out regular and systematic analyses on the knowledge, skills and abilities of students as well as on the overall quality of education institutions and vocational education and training. INVALSI also carries out analyses in the context lifelong learning and studies on school dropout. It also manages the National Evaluation System (*Sistema Nazionale di Valutazione* – SNV).

Other analyses make use of new information technologies to assess the skills needed by the labour market

Recent technology innovations and the surge in the use of big data and internet platforms are spurring the use innovative approaches to skill analysis. By extracting information from vacancies advertised in internet, web crawlers and textual analyses allow to analyse skill needs at a fine disaggregation level and with a frequency that other data sources do not permit.[19]

In Italy, interesting work has been carried out recently by CRISP, a research centre of the University of Milano-Bicocca. Since 2013 CRISP has developed a web tool that extracts web vacancies from the largest Italian job-advertising portals. Once vacancies are collected, these are then reclassified according to standard statistical classifications such as ISCO, NACE or ESCO to allow the merging of this information with other statistical databases. Since the text of the vacancies can be rather generic, the software that has been developed by CRISP automatically looks for keywords signalling the types of skills required by each vacancy allowing a comprehensive mapping skill needs advertised on the web.

Though an increasing number of job vacancies is posted online, many remain hidden and are, instead, advertised through personal or professional channels (see Mandrone et al., 2016). The results coming from the analysis of web vacancies and big data, therefore, need to be taken with caution as the sample used to do inference may not be representative of the entire labour market.

If information is out there, how is this used?

A crucial challenge for many OECD countries is that of making the best use of available SAA information. OECD (2016) provides a comprehensive analysis of the different Skill Assessment and Anticipation (SAA) systems across a wide variety of countries. The study highlights that several barriers usually emerge in the use of SAA for policy making. In many cases, the weak engagement of policy makers in both the development of the exercises and in the discussion of the results becomes a notable obstacle to responding to skill challenges through evidence-based policies.

The recent education, employment and industrial reforms in Italy are, nonetheless, strongly grounded on the use of the rich available SAA information. The involvement of the ministry of employment in the activities of the INAPP provides continuity in the skill analyses that feed in the policy discussion. At the same time, the engagement of the ministry of education and research (MIUR) and of that of ministry of economic development (MISE) and other partners in creating a solid information network (*Sistema Informativo sulle Professioni)* with ISTAT and INAPP represents a case of best practice that should be strengthened even further through the engagement of other relevant ministries.

Despite these examples of best practice in Italy, there is scope for the providers of SAA information to improve and consider the use of additional/alternative strategies to disseminate the information and to engage their audiences, especially end-users such as jobseekers and students, more effectively. This can be done, for example, through the use of *social media* (e.g. Facebook; Twitter, etc.). Social platforms are rarely used in Italy (as in other countries) and expanding their use can prove effective to increase reach-out, especially among certain groups such as young Italians (OECD, 2016).[20]

More systematic efforts should be undertaken to disseminate information through *public media* too. Indeed, while around half of OECD countries disseminate SAA information through TV, radio, newspapers or magazines, this does not seem to be systematically the case in Italy (see Manca, 2015; OECD, 2016 and OECD 2017). Disseminating SAA information through these channels could be an additional, and powerful, tool to reach out a broader public and ensure that the pool of candidates for the available jobs is the largest possible.

Notes

1. INAPP (National Institute for the Assessment of Public Policies) is the new name that has been given to ISFOL (National research institute for vocational education, training and social policies). In the text INAPP will be used to refer also to the activities carried out by ISFOL in the past.
2. See: www.professionioccupazione.isfol.it. Users can browse the employment outlook of each occupation, and link this outlook to the types of skills and knowledge which are (and will be) required by the labour market.
3. The stratification of the sample of companies is representative of the entire economy. This comprises 13 economic sectors (identified from the NACE classification of economic activities), three enterprise size (enterprises from 0 to 49 employees, 50 to 249 and large companies with 250+ employees) and four geographical areas (northwest, northeast, central, south and islands).
4. "La dolce vita: analysing skill gaps and skill needs in Italy", paper prepared for the Mutual Learning Programme, DG Employment, Social Affairs and Inclusion.
5. Overall the analysis is very detailed as there are specific questions for 33 knowledge needs and 35 skill needs.
6. So far the survey has been run in only two waves in 2007 and 2012 but the next wave is expected in 2017.
7. https://www.onetonline.org/.
8. See below for a description of the *Sistema Informativo sulle Professioni.*
9. http://cp2011.istat.it.
10. The various institutes and stakeholders participating retain the rights over the data that feed into the information system.
11. Survey data indicate that the satisfaction has been decreasing substantially (with the exception of the Engineering field of study) among all Italian graduates in the last years probably due, also, to the difficulties of young graduates to find a good match in the labour market in times of economic crisis.
12. The *Alternanza Scuola-Lavoro* (ASL) is probably one of the most remarkable traits of the *Buona Scuola* reform as this introduces, for the first time, compulsory apprenticeship periods and work-based learning not only in technical and professional secondary schools (e.g. *istituti tecnici* and *istituti professionali*) but also in the "humanistic and scientific gymnasium".
13. The region with the largest number of institutions included in the Survey for 2016 is Lazio, with 61 secondary schools, followed by Lombardy, with 45 institutes, Emilia-Romagna (40) Liguria (26), Puglia (22), from Toscana (20) and other 10 regions, present a total of 47 institutes
14. See Eduscopio or the WeGo Tool below.

15. http://www.cedefop.europa.eu/en/events-and-projects/projects/forecasting-skill-demand-and-supply/data-visualisations.

16. http://excelsior.unioncamere.net/.

17. Some results are available up to the municipality level.

18. IRAS1 is the main indicator of the quality of research used in VQR and it is used to allocate about 60% public funding to universities. This indicator, measuring the quality of academic research, takes values in between 0 and 1. It is computed by attributing scores to the research activities in each single university in a specific scientific area and dividing these by the sum of the scores of all the publications assessed in the same scientific area nationwide.

19. The collection of real time job-vacancy data, done through web-scraping tools, can bring various advantages over alternative data sources. The main one relates to the frequency with which information can be collected and updated as web scraping technologies allow collecting information on job-postings on a daily basis.

20. The main difference between disseminating SAA information through a simple report or web portal, on the one hand, or through social networks, on the other, is that in the former case individuals need to actively look for SAA information while in the latter case the providers can actively reach out to individuals who are already part of the social network.

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Chapter 3

Skill mismatch and shortages in Italy: Highlights from the *OECD Skills for Jobs Database*

This chapter provides novel evidence on the existence and degree of skills imbalances in Italy. To this purpose the chapter draws directly from the information contained in the new OECD Skills for Jobs Database. Imbalances in skills, abilities and knowledge types for Italy are analysed and their extent is compared to that observed in other countries for which information is available in the OECD Skills for Jobs Database. The chapter also explores how key technological trends are reshaping the demand for skills in Italy and how the information contained in the OECD Skills for Jobs Database *can be used to provide guidance on the skills that are needed to fill current gaps in the labour market so as to increase skill matching.*

In recent decades, the demand for skills in the labour market has undergone a significant change as a result of global trends such as technological progress and population ageing. At the same time, developments such as the increased female labour market participation and migration flows have altered the supply of skills. In light of these changes, it is increasingly important for countries to understand their skills demand and supply in order to facilitate and improve the match between the two. Poor matching of demand and supply can lead to skills imbalances, such as shortages, surpluses and mismatch, which could have negative consequences for firms, individuals and the aggregate economy.

The new *OECD Skills for Jobs Database* fills this knowledge gap, by providing regularly-updated international evidence on skills shortage, surplus and mismatch. By looking at skills – i.e. the set of competences mobilised to perform the tasks related to a job – rather than occupations or fields of study, the new indicators go beyond the traditional measures of imbalances. Three domains of competence are measured and presented in the database – *skills, knowledge and abilities* – based on the occupational information from the O*NET database. Furthermore, unlike the generally subjective information available from employer surveys, the OECD Skills for Jobs indicators are based on quantitative data from large-scale household surveys. The indicators measuring shortage and surplus (i.e. skill needs indicators) are constructed using a multidimensional set of quantitative signals on skills pressure, including wage growth, employment growth and unemployment (BOX). Similarly, mismatch indicators use formalised criteria for assessing the match between an individual qualification level or field and the requirement on the job.

Box 3.1. The dimensions behind the shortages and surpluses in the *OECD Skills for Jobs Database*

In order to draw a multidimensional picture of the surplus and shortage of workers in specific occupations (as well as of the underlying skills associated to those occupations), the OECD skill needs indicator (contained in the Skills for Jobs Database measuring shortages and surpluses of skills, knowledge and abilities) is composed of five sub-indices, each of which is meant to provide complementary information on different dimensions explaining the emergence of labour market pressures and skill demand. As a result, the composite indicator provides a holistic interpretation of skill imbalances in the labour markets of the economies analysed rather than focusing on the impact of each sub-index independently.

The skill needs indicator is constructed in two consecutive steps. In the first step, sub-indices for hourly wage growth, employment growth, unemployment rate, hours worked and under-qualification are used to provide a quantitative indication by country of the extent of the labour market pressure on each one of the occupations analysed. The result of this analysis returns a ranking of occupations ordered from the one most in shortage to most in surplus in each labour market (i.e. the occupational shortage index, see OECD, 2017).

In a second step, the evidence of the occupational shortage index (i.e. the ranking of occupations in shortage/surplus) is used to map occupations that are in shortage/surplus into the underlying skills requirements associated to those occupations. To do so, the occupation-skills taxonomy developed by the O*NET is used. The skill needs indicators, therefore, provide information on both occupational and skill shortages/surpluses in a comparable manner for European countries as well as for South Africa. Information is provided at the 2-digit ISCO occupation level as well as disaggregated into several skills dimensions.

Source: OECD (2017), *Getting Skills Right: Skills for Jobs Indicators*.

OECD Skills for Jobs Database: A cross-country perspective

Across countries, results from the *OECD Skill for Jobs Database* show that the most common shortages in the k*nowledge* domain are found in computers and electronics, education and training as well as in some mathematics and science fields (e.g. geography, biology) and in the healthcare field (i.e. therapy and counselling, psychology and medicine and dentistry). Shortages of this kind are most common in Finland, the Netherlands but also Ireland and Belgium. Surpluses, on the other hand, are mainly found in the areas of transportation, manufacturing and production as well as in the knowledge of building and construction. Surpluses of this kind are found across most countries and commonly in Estonia, Bulgaria and Romania as well as in the Netherlands, Ireland and Belgium, where these shortages are often critical.

Among *abilities*, verbal and reasoning abilities as well as perceptual and quantitative abilities are those found most commonly in shortage across countries. Surpluses, instead, are more recurrent in manual and routine abilities such as physical strength, flexibility, balance and co-ordination, endurance or control movement and fine manipulative abilities.

Skill shortages are concentrated among content skills (e.g. reading comprehension, writing, speaking and active listening), process skills (e.g. critical thinking and active learning), complex problem solving skills and social skills (e.g. instructing, social perceptiveness). The shortages are biggest in Finland, Luxembourg, the Netherlands, Spain or Germany while. Surpluses are in Switzerland, Hungary but also in South Africa.

Across countries, the strongest shortages are found in occupations that use several different skills simultaneously, with high intensity, and across multiple knowledge areas. This evidence seems to support the hypothesis by which workers with high-skills intersecting different knowledge areas are scarce in the labour market but, generally, in high demand. The biggest surpluses occur, instead, in relatively low-skill intensive occupations as expected.

Box 3.2. Definitions of skills, abilities and knowledge types

Knowledge statements refer to an organised body of information usually of a factual or procedural nature which, if applied, makes adequate performance on the job possible. A body of information applied directly to the performance of a function.

Skill statements refer to the proficient manual, verbal or mental manipulation of data or things. Skills can be readily measured by a performance test where quantity and quality of performance are tested, usually within an established time limit. Examples of proficient manipulation of things are skill in typing or skill in operating a vehicle. Examples of proficient manipulation of data are skill in computation using decimals; skill in editing for transposed numbers, etc.

Ability statements refer to the power to perform an observable activity at the present time. This means that abilities have been evidenced through activities or behaviours that are similar to those required on the job (e.g., ability to plan and organise work). Abilities are different from aptitudes as these latter are only the potential for performing the activity.

Source: OECD (2017), *Getting Skills Right: Skills for Jobs Indicators*.

Many of the shortages that are emerging across countries are likely to be related to automation processes that are making routine skills redundant and cognitive ones increasingly more important. Deductive reasoning (i.e. the ability to apply general rules to specific problems), fluency of ideas (i.e. the ability to come up with a number of ideas about a topic) or information ordering (i.e. the ability to arrange things or actions in a certain order or pattern according to a specific rule) are only some examples of the abilities that are found to be in shortage in all countries and that are difficult for machines, robots and artificial intelligence to replicate adequately.

At the other end of the skill spectrum, results from the *OECD Skills for Jobs Database* confirm the existence of surpluses in routine manual and physical skills and abilities. Control precision abilities (e.g. the ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions) used for example in mining occupations such as roof bolters or mine shuttle car operators are shown to be in critical surplus across many of the countries examined. Similarly, evidence shows a negative correlation between the increase in robots per hours worked in between 1993 and 2007 and the shortages of control precision abilities and of physical strength needs across countries.

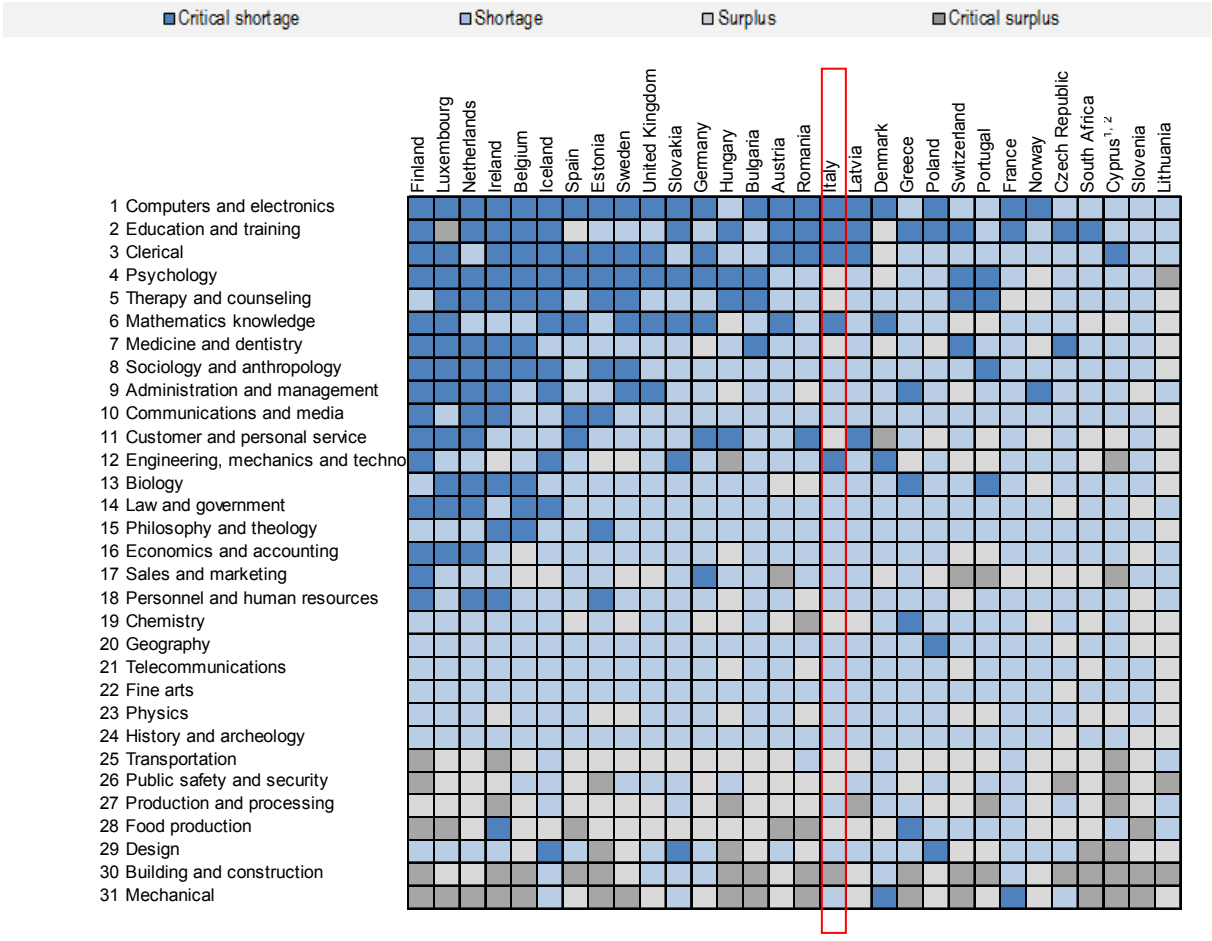
The shortages in cognitive skills have become more acute over time and the same is true for the surpluses in manual/physical skills leading to increasing polarisation in skill demands.

Skills imbalances in Italy

When compared to other countries such as Finland, Luxembourg, the Netherlands or Ireland and Belgium, the shortages of skills, abilities and knowledge observed in Italy are only mild and, in those cases when they are instead substantial, they tend to be concentrated in specific technical areas and domains (Table 3.1) or in quantitative and complex problem-solving areas.

Table 3.1. Knowledge, skills and abilities needs across countries

A. Knowledge needs across European countries and South Africa (latest available year)



B. Abilities needs across European countries and South Africa (latest available year)

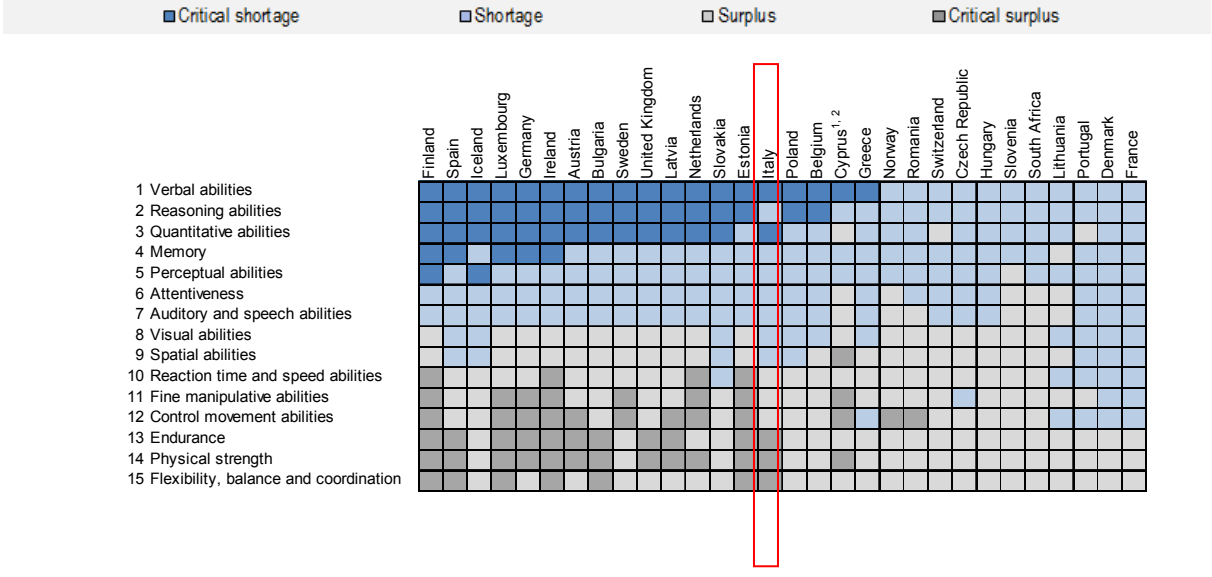
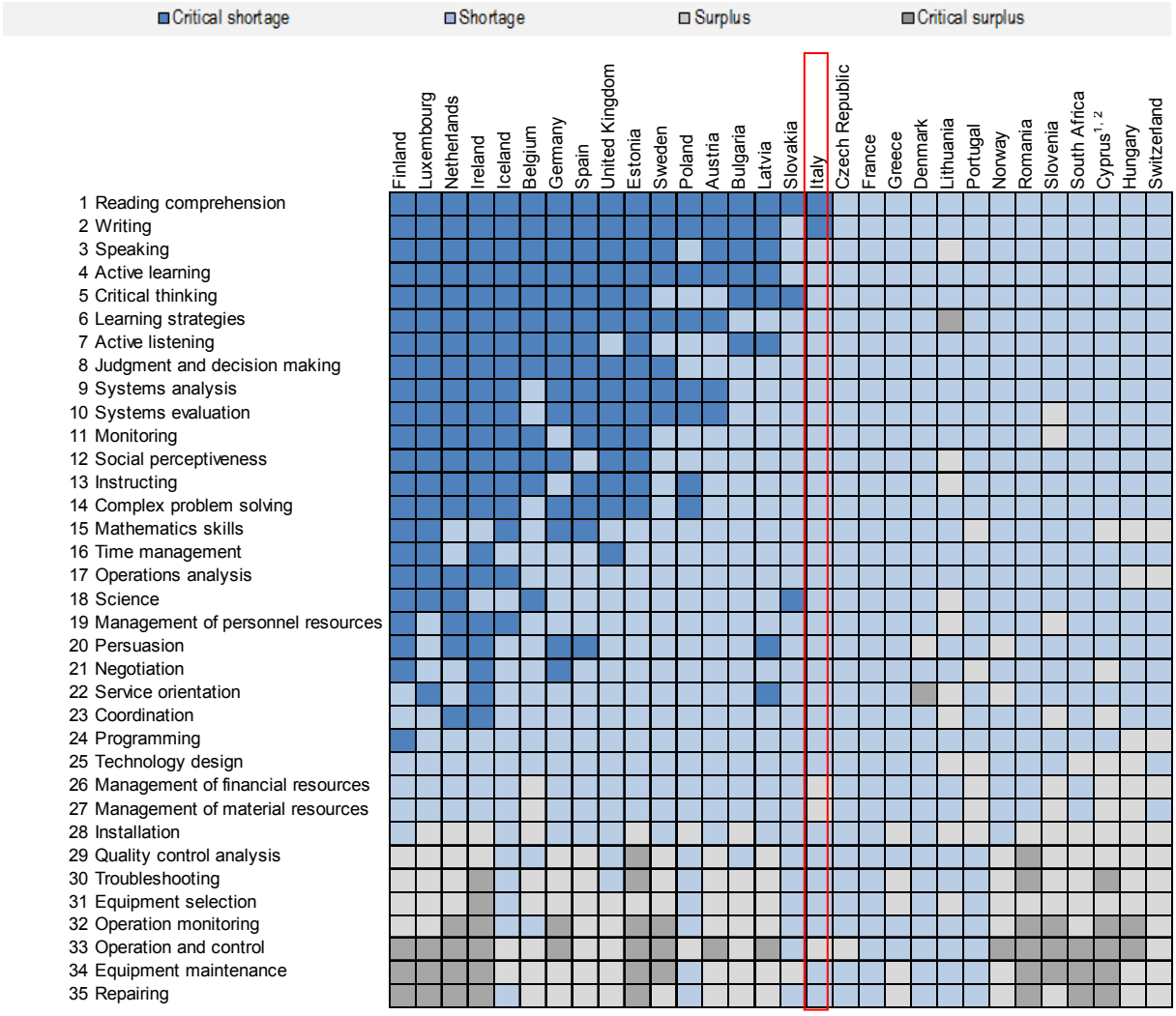


Table 3.1. Knowledge, skills and abilities needs across countries *(cont.)*

C. Skill needs across European countries and South Africa (latest available year)



Note: Critical shortage (darker blue) is defined as the observations in the top quartile of the positive skill imbalance values across countries and skills. Critical surplus (darker grey) is defined as the observations in the bottom quartile of the negative values.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: *OECD Skills for Jobs Database.*

Focusing on Italy, results in Figure 3.1 (panel A) show that, across all knowledge types, computer and electronics, clerical knowledge but also mathematics, engineering, mechanics and technology as well as design are among the *knowledge* types that are

most demanded (in shortage) in Italy. Knowledge in the area of building and construction, public safety and security or customer and personal services are, instead, in surplus in the Italian labour market.

When looking at the *skills* dimension (Figure 3.1, panel B) results show gaps in basic skills such as reading comprehension, writing, active listening and critical thinking. These shortages are widespread across the whole Italian labour market and affect workers employed in several different occupations. A various range of *abilities* are also in shortage in Italy (panel C). Verbal abilities (i.e. abilities that influence the acquisition and application of verbal information in problem solving) as well as quantitative abilities (i.e. abilities that influence the solution of problems involving mathematical relationships) are highly demanded in Italy and workers with these characteristics are generally difficult to find and, as such, have relatively brighter labour market outcomes.

Other abilities such as endurance and physical strength are, instead, in surplus, suggesting that technological change and automation may be already leading to the transformation of the tasks that workers are required to carry out on their daily job routine and, especially, leading to production processes that rely increasingly less on physical attributes of the workers.

Figure 3.1. Knowledge, skills and abilities needs in Italy

A. Knowledge needs in Italy

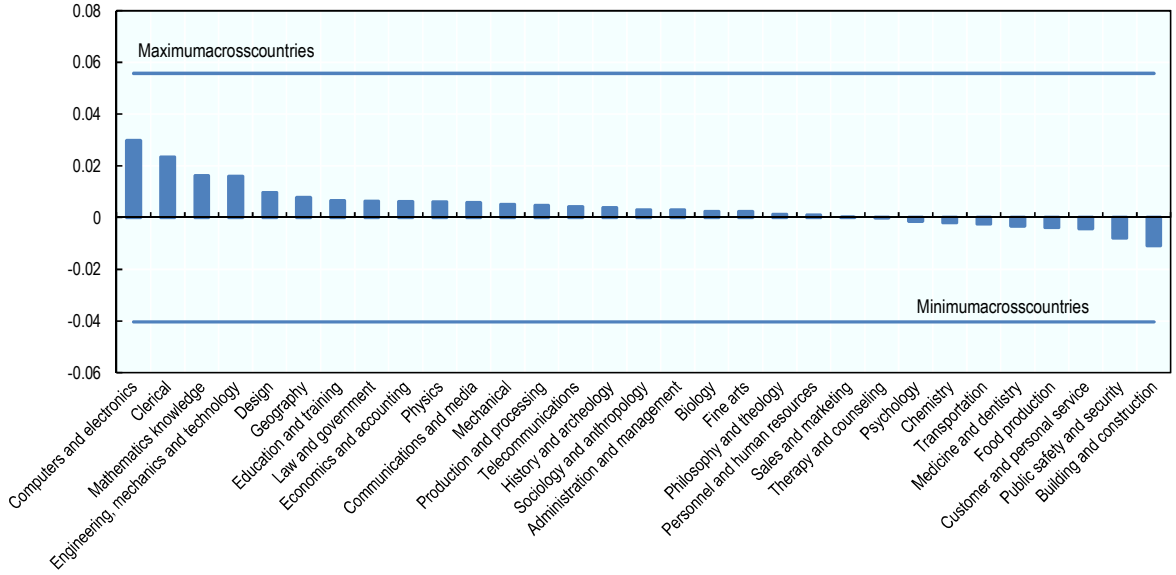
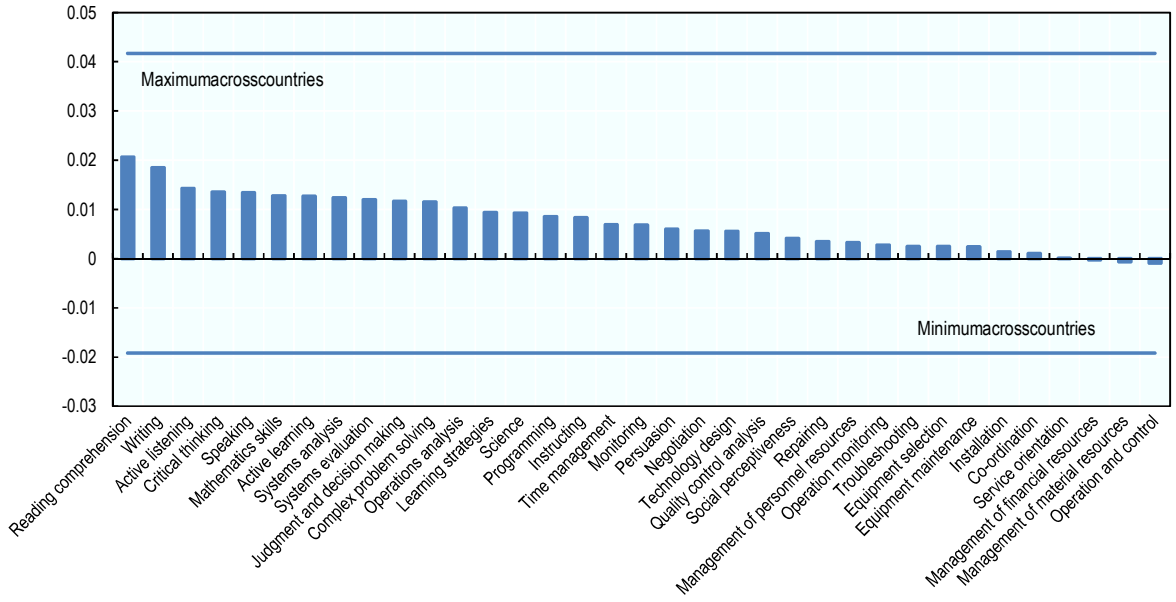
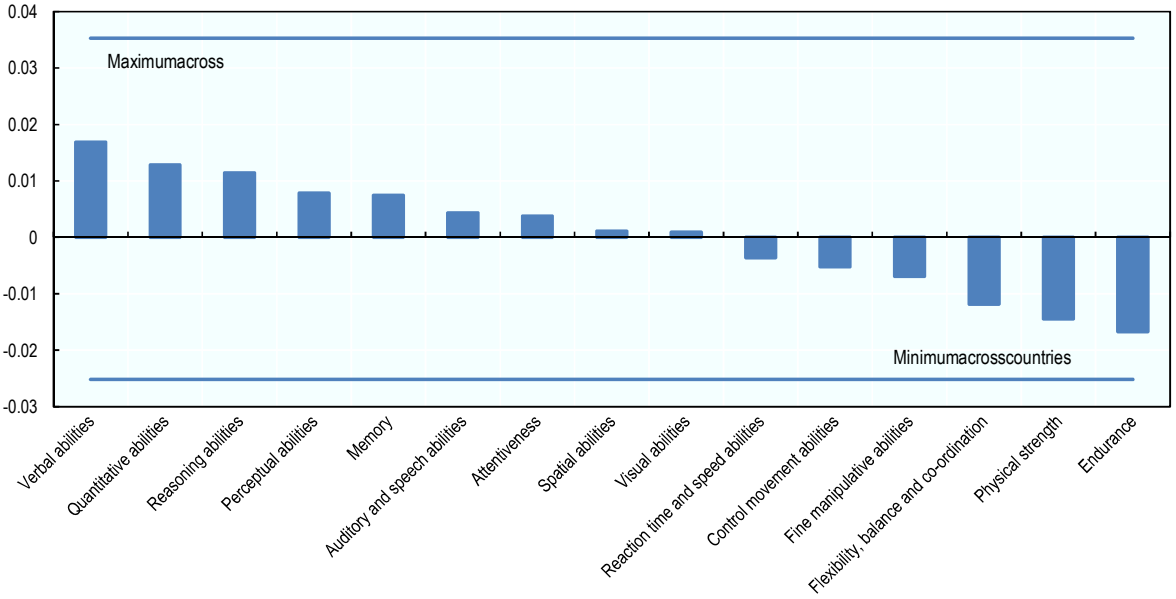


Figure 3.1. Knowledge, skills and abilities needs in Italy *(cont.)*

B. Skill needs in Italy



C. Abilities needs in Italy



Note: Latest available year.

Source: *OECD Skills for Jobs Database.*

Technological progress

Technological progress is reshaping the content and tasks of many, if not all, occupations in the labour market of most industrialised countries. The transition towards a digital economy, although underway for nearly half a century, has recently become quicker (OECD, 2017b) with the introduction of several new disruptive technologies. Computing power of ever-smaller devices has steadily increased in the last decade, allowing the development and implementation of a range of new digital technologies such as 3D printing, Internet of Things (IoT) and advanced robotics. The penetration of these new technologies in production processes as well as in the service sector is showing already substantial repercussions on the way jobs and tasks are carried out as well as by whom in the labour market.

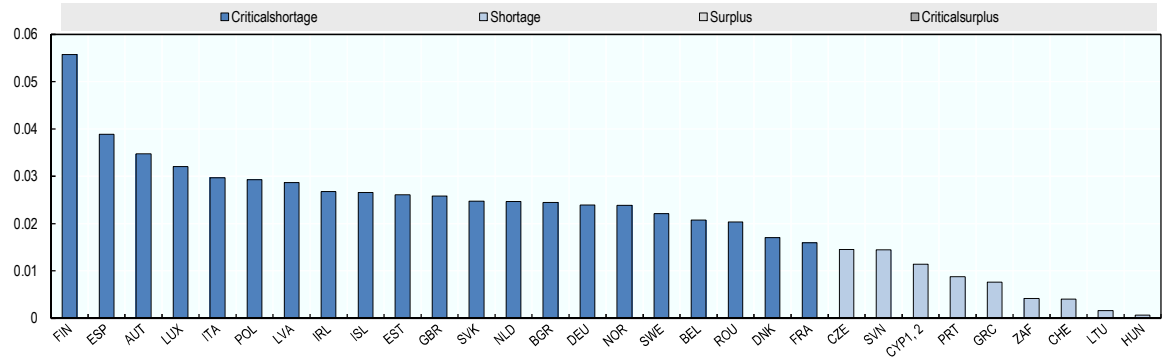
New technological discoveries are putting pressure on countries to develop skills in several different scientific domains. Even more strikingly, the skills and knowledge types required by labour markets are increasingly interconnected with each other. Physics, for instance, is more and more crossing borders with the computer and electronics field as, for instance, recent theoretical results confirm that quantum theory would open the possibility of performing new efficient and faster calculations, currently out of reach of classical computers.

All these rapid trends have a substantial impact on the demand for skills and are likely to be a major factor contributing to skill imbalances. Across countries, results in Figure 3.2 based on the *OECD Skills for Jobs Database* confirm the prevalence of skills shortages in several areas that are directly linked to the technological mega-trends discussed above. Shortages of workers with computer and electronics knowledge are, for instance, experienced in all countries examined. Strongest shortages are in Finland, Spain and Austria but critical shortages are also experienced in Luxembourg, Italy and Poland. Hungary, Lithuania, and Switzerland are, instead, showing smaller yet positive shortages of computer and electronics knowledge. Similar results are also found for the mathematics knowledge for which most countries show shortages. France and Denmark also show signs of shortages (though of a relative lower intensity) of workers with knowledge in physics, while Lithuania show signs of surpluses.

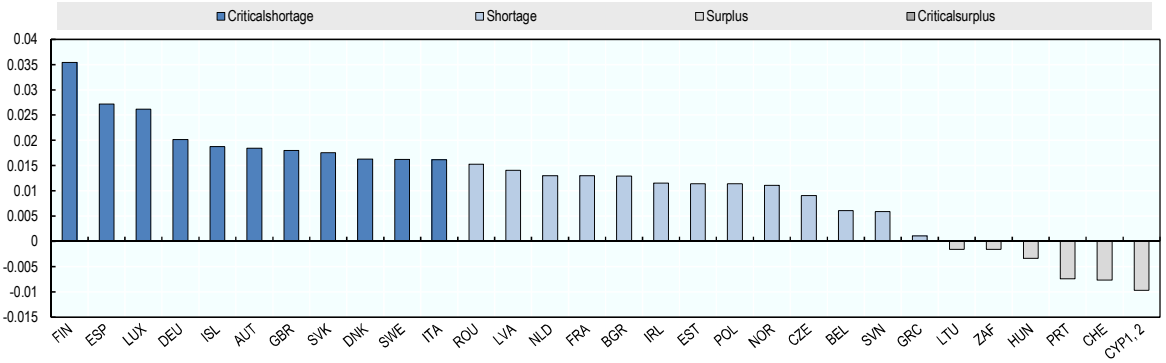
Italy is among the countries where shortages of Computers and Electronics skills are critical. This result goes in line with the poor performance in ICT skills of Italians as reported in the OECD Survey of Adults Skills (PIAAC). Reinforcing ICT skills is, therefore, a priority for Italy especially in the context of the fourth industrial revolution (*Industry 4.0*) that has been recently made a policy priority by the Italian Government and that is already gaining traction across many developed countries and direct competitors. Similarly, Italy is among the countries with critical shortages of mathematics knowledge. Much needs to be done to reinforce the quantitative abilities of Italy's young and adult workers through training in quantitative skills. Shortages in the knowledge of physics and engineering and technology are also important in the Italian labour market even if, at the moment, these pressures are relatively weaker.

Figure 3.2. Technology-related skill needs

Panel A. Computers and electronics



Panel B. Mathematics knowledge



Panel C. Physics

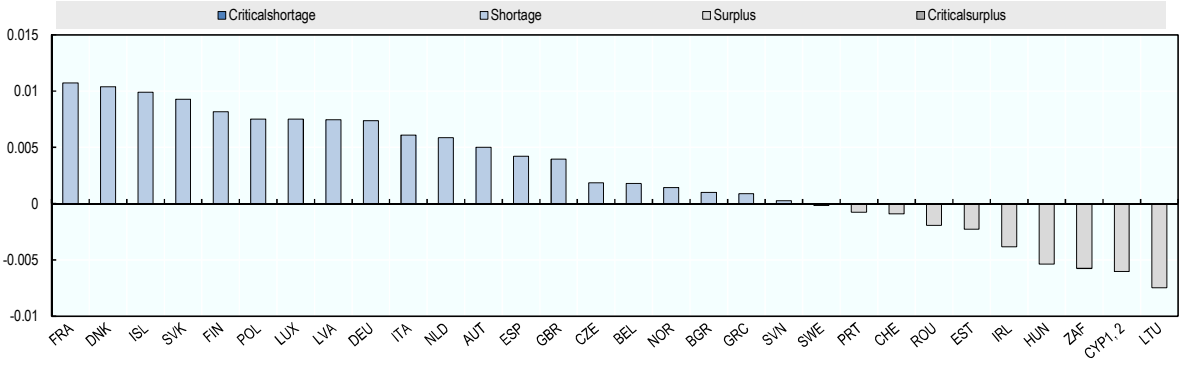
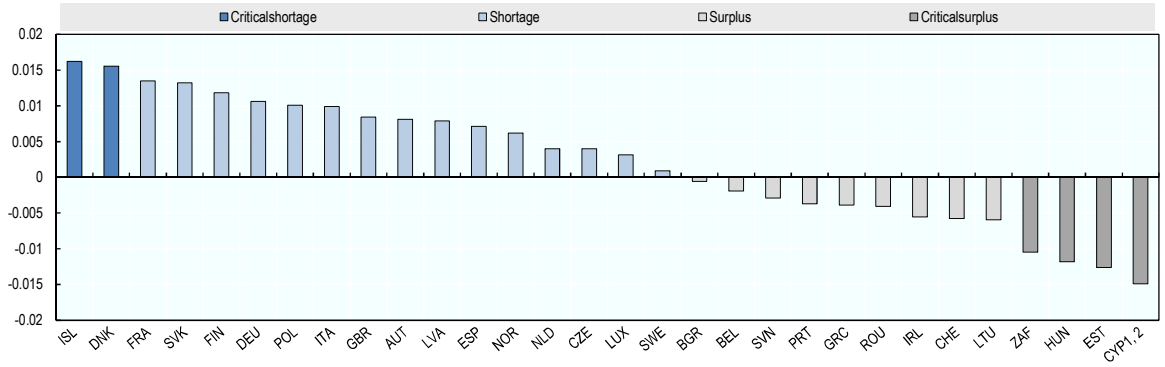


Figure 3.2. Technology-related skill needs *(cont.)*

Panel D. Engineering and technology



Note: Latest available year. Critical shortage (darker blue) is defined as the observations in the top quartile of the positive skill imbalance values across countries and skills. Critical surplus (darker grey) is defined as the observations in the bottom quartile of the negative values. Values for the Knowledge dimension vary between -0.040 and 0.056 across countries.

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Source: *OECD Skills for Jobs Database.*

Skill needs and automation

The term "technological change" encompasses a wide range of areas spanning from digital innovations, the production of new materials and advanced robotics, automation and artificial intelligence (AI). Among the different aspects of technological change, the advent of robotics has created special anxiety as to whether human labour will be eventually replaced by machines that will perform not only manual routine tasks but also, through AI, increasingly more complex routine cognitive tasks across a wide range of occupations.

In light of these concerns recent influential empirical work (Acemoglu and Restrepo, 2016) has been looking at the impact of automation and the simultaneous decline in the labour share and employment among advanced economies induced by these technological improvements to production. Results for the United States seem to suggest, for instance, that an increase in automation is likely to reduce the cost of producing using human labour, therefore, encouraging the faster creation of new complex tasks.[1] As such, advanced robotics, automation and their penetration in the production stream, is likely to release pressure (create surpluses) on manual and physical skills while, at the same time, creating substantial shortages (or at least increased demand) for non-routine cognitive skills.

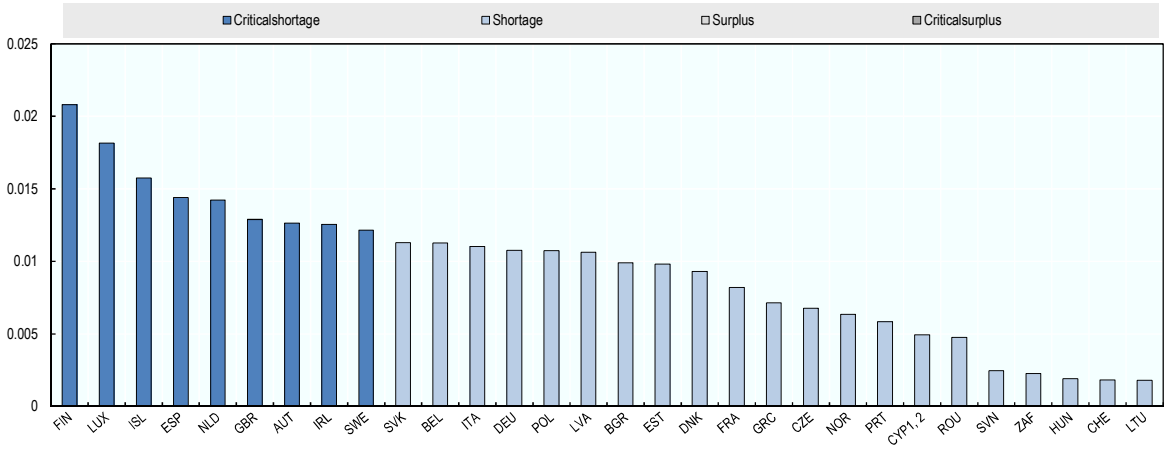
Results in Figure 3.3 confirm the existence of substantial shortages in a variety of cognitive abilities across countries. Deductive reasoning (i.e. the ability to apply general rules to specific problems), fluency of ideas (i.e. the ability to come up with a number of ideas about a topic) or information ordering (i.e. the ability to arrange things

or actions in a certain order or pattern according to a specific rule) are only some examples of abilities that are shown to be in shortage in all countries and that are yet difficult for machines to replicate adequately.

As for Italy goes, signs of shortages in the labour market are especially pronounced in the area of deductive reasoning. It is important to notice that these abilities are usually formed at a young age. The results for Italy highlight, therefore, the importance of strengthening education paths that make use of innovative teaching methods, able to spur the development of these cognitive abilities since primary education.

Figure 3.3. Cognitive skill needs

Panel A. Information ordering



Panel B. Deductive reasoning

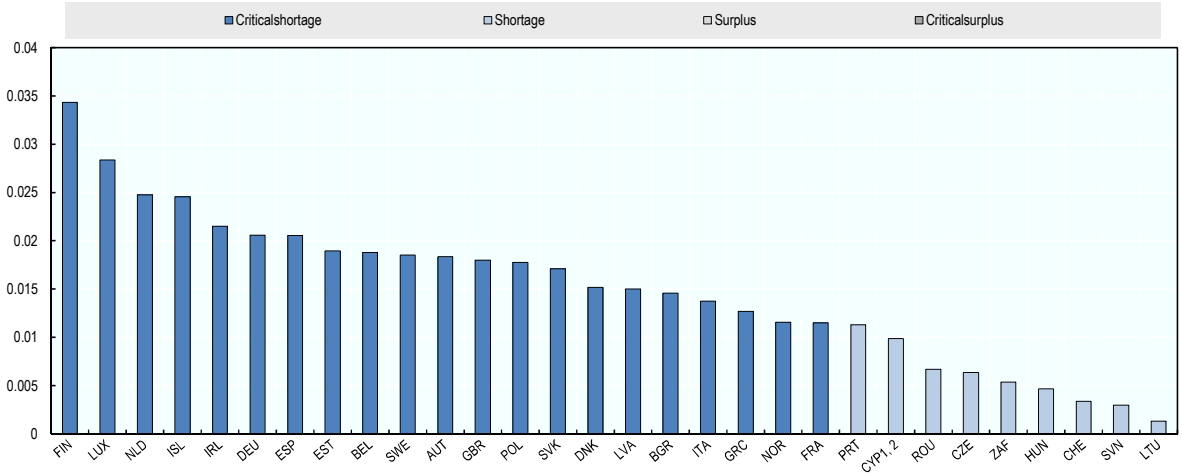
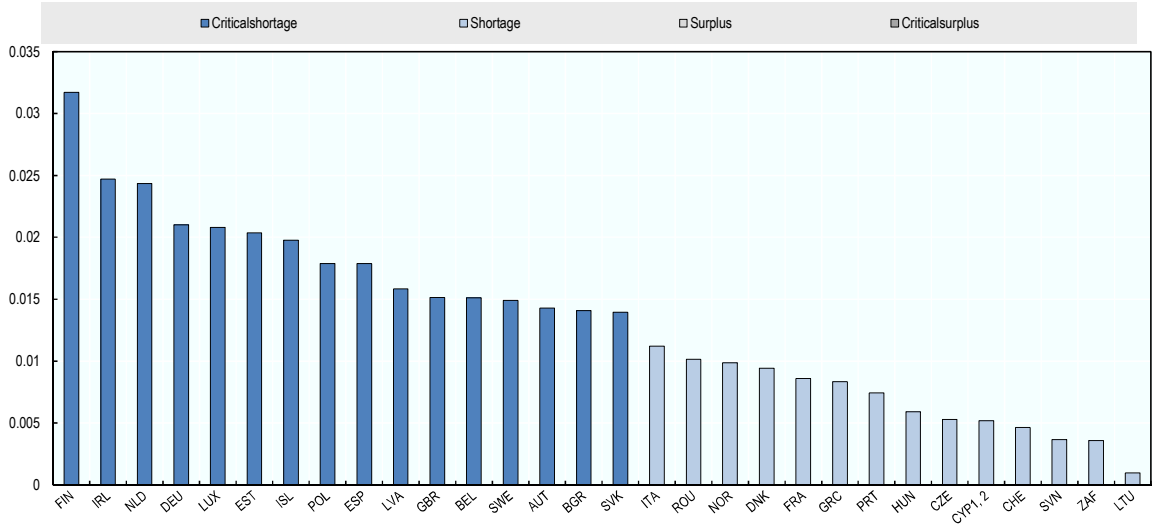


Figure 3.3. Cognitive skill needs *(cont.)*

Panel C. Fluency of ideas



Note: Latest available year.

Critical shortage (darker blue) is defined as the observations in the top quartile of the positive skill imbalance values across countries and skills. Critical surplus (darker grey) is defined as the observations in the bottom quartile of the negative values. Values for the Ability dimension vary in between -0.025 and 0.035 across countries.

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Source: *OECD Skills for Jobs Database.*

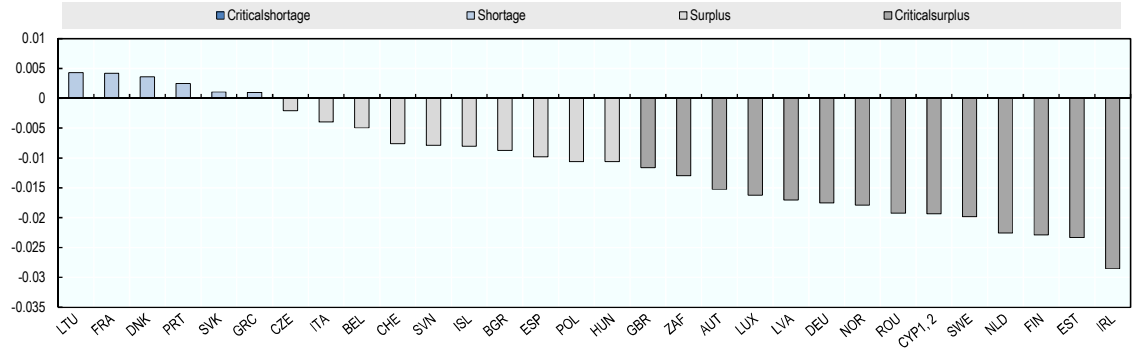
At the other end of the skill spectrum, the penetration of robotics and AI into production is likely to create surpluses in routine manual and physical skills and abilities. Results in Figure 3.4 seem to confirm this hypothesis. Control precision abilities (e.g. the ability to quickly and repeatedly adjust the controls of a machine or a vehicle to exact positions) used, for instance, in mining occupations such as roof bolters or mine shuttle car operators but also in other occupations such as crane and tower operators are shown to be in critical surplus across many of the countries examined. Stronger surpluses are experienced in Ireland, Estonia, Finland and Sweden.

As a matter of fact, tasks and jobs requiring routine skills such as control precision are in the process of being automated in many countries. Scania AB, a major Swedish manufacturer of commercial vehicles is, for instance, increasingly using the so-called "communicator" to collect data to monitor and analyse the efficiency of its vehicles (OECD, 2017b). Volvo is also investing in R&D and innovation on giant self-driving vehicles and caterpillar trucks weighing close to a million pounds used in open-pit mines. These trucks are autonomous and can be operated by AI which make human supervision redundant while, at the same time, increasing efficiency and productivity. Other abilities such as finger dexterity, peripheral vision or depth perception, easily and effectively automated through the use of smart sensors of sophisticated robots, are in surplus across a wide set of countries.

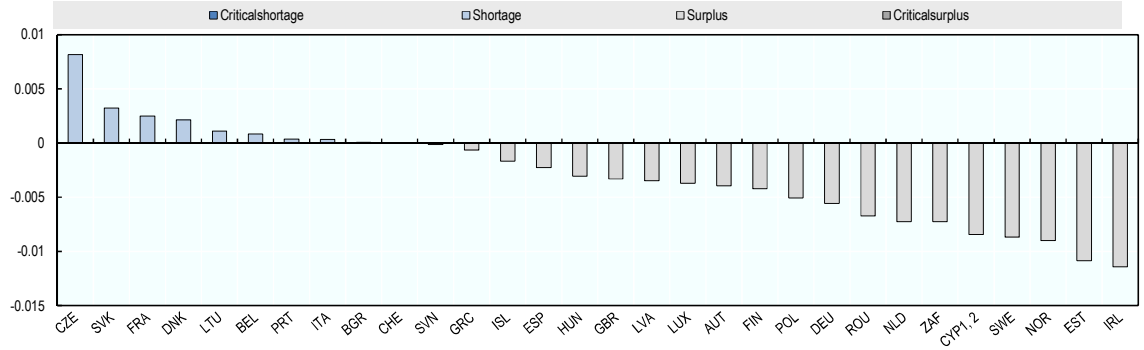
In Italy, routine manual and physical skills are in surplus, but the extent of these surpluses is relatively modest (in the case of finger dexterity close to be in balance) if compared to that observed in other countries. This result seems to suggest that Italy's aggregate demand of skills, differently from that in other countries, still relies considerably on manual and routine skills and that the process of automation may still be far from having produced a truly substantial impact on large areas of the labour market and productive sectors that remain, at the moment, based on traditional production processes. In this context, it is all the more important, therefore, to spur the adoption of new technologies while, at the same time, developing the cognitive skills that will be required to adopt and adapt to this technological and digital revolution. Similarly, lifelong learning and training opportunities should be strengthened for those workers who have been mostly employed in routine jobs as in the next future automation is likely to radically change the tasks and skills used at work.

Figure 3.4. Routine manual and physical skill needs

Panel A. Control precision



Panel B. Finger dexterity



Note: Latest available year.

Critical shortage (darker blue) is defined as the observations in the top quartile of the positive skill imbalance values across countries and skills. Critical surplus (darker grey) is defined as the observations in the bottom quartile of the negative values. Values for the Ability dimension vary in between -0.025 and 0.035 across countries.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: *OECD Skills for Jobs Database.*

Technology, organisational change in the workplace and skill needs

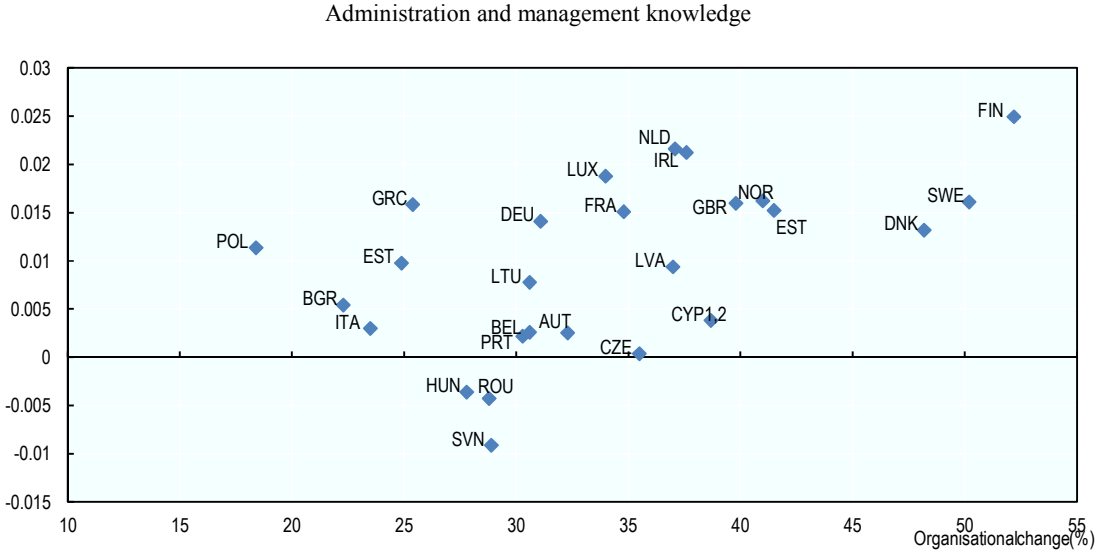
Adapting to rapid technological change is likely to require substantial changes in how work is organised in the workplace. Competitive pressures stemming from innovation and the speed of technological progress imply that the modern workplace is in a state of constant change (OECD, 2013). As a result of these dynamics, tasks and work are likely to be regularly reorganised either to support the introduction of technology or to reduce costs or improve productivity. The change in the organisation of work is already taking place. Across the OECD and EU countries a substantial proportion of workers are in workplaces that have introduced new technologies and/or undergone significant restructuring in the way jobs and tasks are carried out (Eurofound, 2012). These dynamics can have important repercussions on the intensity with which managerial skills are required to organise, monitor and effectively implement such organisational changes.

Evidence in Figure 3.5 shows the relationship between the share of workers who report to have undergone substantial restructuring or reorganisation in their current workplace (Eurofound, 2012) in the past three years and the needs of a variety of managerial skills, abilities and knowledge types in the labour market. Results show that countries that underwent substantial restructuring in the workplace (e.g. Finland, Sweden or Denmark and Estonia) are also those showing stronger pressures (shortages) in administration and management knowledge.

To put it differently, evidence shows that, across the economies analysed, the organisational restructuring in the workplace that stems from the need to cope with an increasingly more unpredictable future, is putting pressure on workers to develop autonomy in making decisions and independence in the organisation of tasks (OECD, 2017a). Similarly, other skills such as co-ordination with others and ability to lead others are on the rise in countries where organisational restructuring has been deeper (OECD, 2017a).

Italy is among the countries with the smallest share of workers that have been exposed to substantial reorganisation of the workplace, close to Poland and Bulgaria in the number of workers that have been exposed to such changes. Results from the *OECD Skills for Jobs Database* show, also, that the observed shortages in managerial skills are smaller in Italy than in countries where the restructuring of jobs has already taken place. Far from being reassuring, this result points to the need for Italy to embrace new technologies more widely through a substantial reorganisation of tasks in the workplace so as to increase productivity and competitiveness of all firms. Similarly, in the process, Italy will need to boost its managerial skills as the evidence proposed by the *OECD Skills for Jobs* highlights that restructuring in the workplace has put similar pressures to countries that already have undergone such transformation.

Figure 3.5. Link between organisational change and management-related skill needs (European countries)



1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

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Source: *OECD Skills for Jobs Database.*

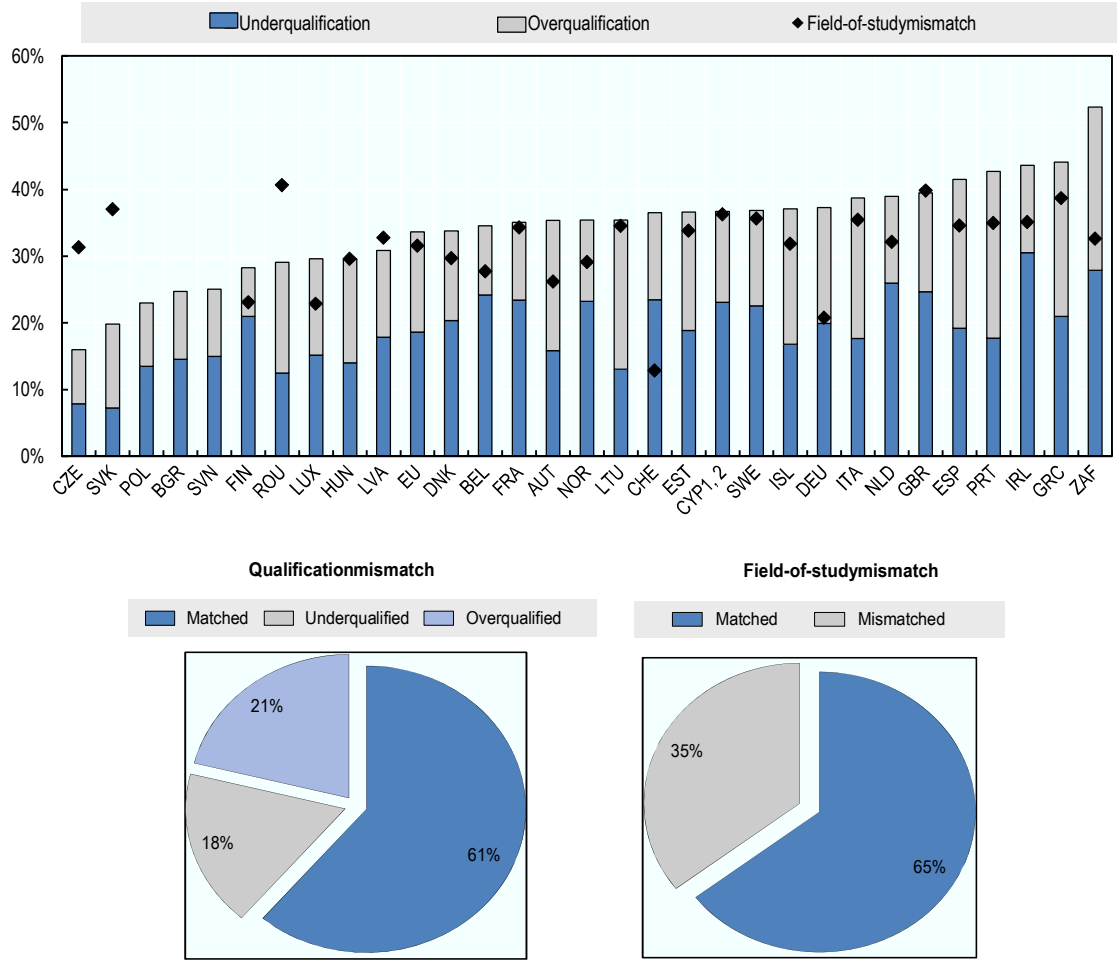
Mismatch indicators: Results and analysis

Individuals can be mismatched to their job in terms of qualification level and field of study. Figure 3.6 shows that countries differ widely in the degree of qualification and field-of-study mismatch. In the Czech Republic only 16% of workers are employed in a job that generally requires a different qualification, compared to 52% in South Africa. Overall, under-qualification is more common than over-qualification (in 19 out of 30 countries). The largest share of underqualified workers is found in Ireland (30%), and the smallest in the Slovak Republic (7%). Over-qualification is most common in Portugal (25%), and least common in Finland (7%). The share of individuals mismatched in terms of field of study ranges from 13% in Switzerland to 41% in Romania.

Qualification mismatch in Italy is above the average of countries analysed. Interestingly, the shares of over and under-qualified workers are roughly equal where a substantial number of the Italian workforce is employed in jobs with low demand of skills and others in jobs where skills are likely to be not sufficient to be truly productive. In Italy, field of study mismatch is also substantial with 35% of workers employed in jobs that are unrelated to their education background. Much needs to be done, therefore, to spur a better alignment between the development and use of skills of Italian workers. Many different reforms have been implemented in recent years in Italy and most go in the right direction of spurring the much needed dialogue between education providers and firms.

Figure 3.6. Incidence of qualification and field-of-study mismatch by country, Europe and South Africa, 2015

Share of employed aged 15-64



Note: Germany 2013 data. The European average (EU) is the unweighted average of available European countries.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

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Source: *OECD Skills for Jobs Database.*

Occupational mobility as a solution to imbalances in Italy: Adult learning and training profiles

Occupations differ in terms of the type of skills that they require, as well as the level of skills that is needed to carry out the associated tasks. Some occupations might have very different skill profiles while others might make use of fairly similar skills.

Individuals working in different occupations with similar skill profiles can switch relatively easily between these occupations. Although some training might be necessary to move between occupations with similar skill profiles, comprehensive (and time-consuming) reskilling is generally not needed given that the occupations have common fundamental skills.

From a skill-matching point of view, the comparison of occupations' skill profiles is useful for understanding where career moves are relatively easy and where skill matching could be potentially improved. This is particularly interesting for individuals working in occupations that are in surplus, whose employment prospects are poor (e.g. low wages and employment rates), and who would benefit from moving to occupations that are in high demand (or shortage).

Using clustering techniques it is possible to group occupations with similar skills, abilities and knowledge profiles. Figure 3.7 shows groups of occupations based on their *skills* profiles. The top part of the figure shows how the groups were created starting from one single group of all occupations (*dendrogram*). The final number of groups equals 13, with five groups consisting of one single occupation, and the largest group of six occupations.[2] The *dendrogram* gives an indication of the distance between the different groups in terms of their skill profile: groups that were separated in one of the final steps of the clustering process are more similar than groups that were separated in one of the initial steps. The *dendrogram* shows that the occupations are first split into a manual (right-hand side) and a more cognitive group (left-hand side). The cognitive group is then split into high-skilled and middle-skilled occupations. In subsequent steps, smaller groups are formed based on more detailed skills requirements similarities.

The bottom part of the figure shows occupation groups and the corresponding ISCO codes of each occupation in the group. The height of the bars represents the size of each occupation in total employment in Italy, while the colour signals whether the occupation is in shortage or surplus in the Italian labour market.

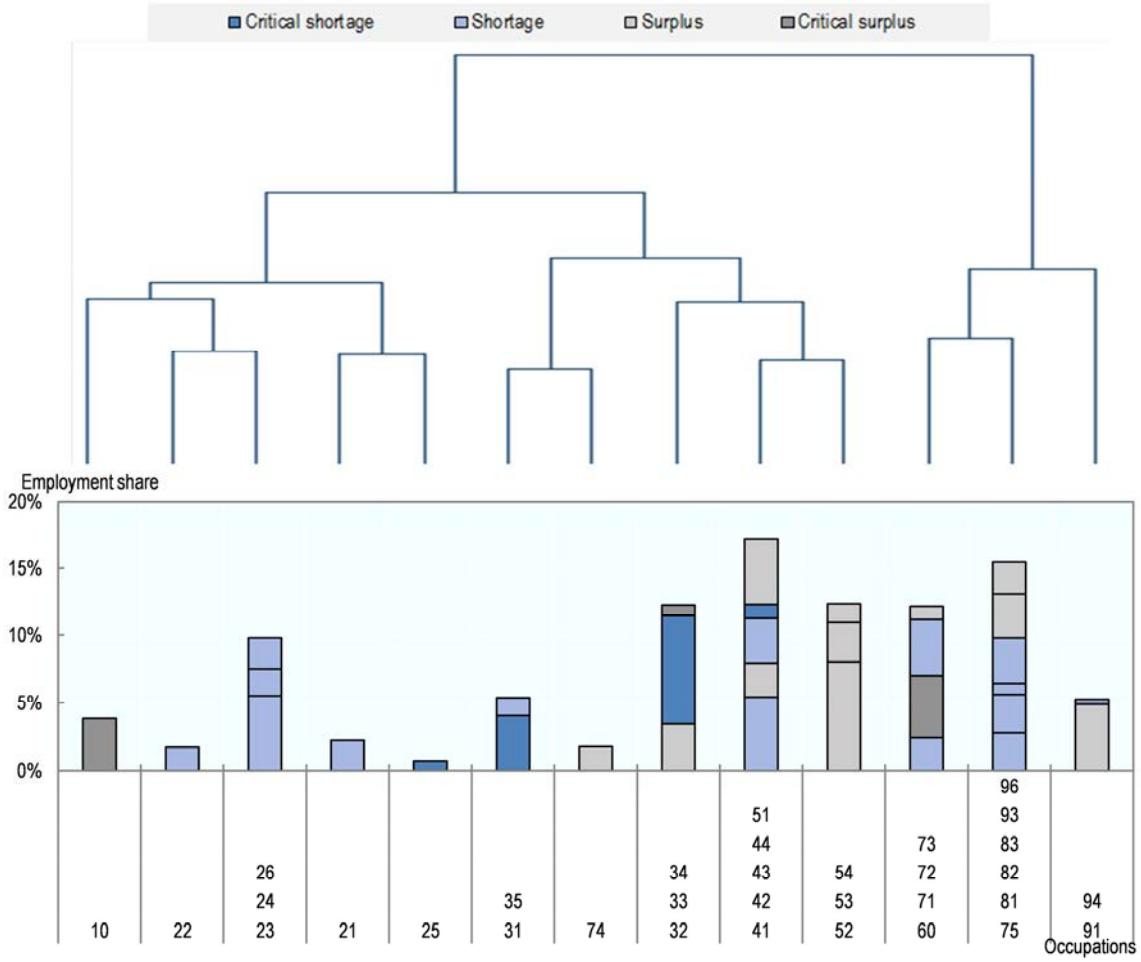
Individuals employed occupations that are similar in terms of skills (i.e. belonging to the same *skill profile* group) may still have very different labour market outcomes in terms of wages, employment and skill matching, being either in shortage or in surplus. Small difference in skills still exist, therefore, within the same skill-profile groups of occupations and specific retraining or up-skilling can help individuals to move from jobs with poor labour market prospects (e.g. surpluses) to others with a brighter wage and employment outlook (e.g. shortages) by contextually increasing skill matching in the labour market.

In Italy, for example, results from the *OECD Skills for Jobs Database* show that Legal, social and cultural associate professionals (occupation 34) are in surplus. Wages in this occupation have been declining steadily and, similarly, employment in this occupation has experienced a substantial decrease in recent years. Wages paid to Business associate professionals have instead been growing steadily and employment shrunk, highlighting recruitment barriers and shortages (OECD, 2017a). At the skill level, the main difference between Legal, social and cultural associate professionals (in surplus) and Business associate professionals (in shortage) are found in the superior command of mathematics, reading comprehension, negotiation active learning as well as of management of financial resources of workers employed in the former occupation. Targeted retraining provided to Legal, social and cultural associate professionals could help them make a career move to areas of the labour market such

as Business associate professionals that have currently a better labour market outlook. This, in turn, would increase skill matching and skill use in the labour market, with positive repercussions also in terms of productivity and well-being.

Similar examples can be extracted from the *OECD Skills for Jobs Database* for other occupations. Handicraft and printing workers (73) are, for instance, in surplus and would need specific retraining to switch to Metal, machinery and related trade workers. The *OECD Skills for Jobs Database (*http://oe.cd/skills-for-jobs*) provides updated information on training needs required to switch from* occupations in surplus to others shortages and with a brighter labour market outcome for all countries analysed.

Figure 3.7. Occupations grouped by skill profile: Italy



Note: The occupation labels are stacked to reflect the stacked bars, i.e. the bottom label (e.g. 23 in the third group) corresponds to the bottom bar, and the top label (e.g. 26 in the same group) to the top bar.

Critical shortage (darker blue) is defined as the occupations in the top quartile of the positive occupational imbalance values. Critical surplus (darker grey) is defined as the occupations in the bottom quartile of the negative occupational imbalance values.

Occupation 93 refers to occupation 92+93, occupation 96 to 95+96.

Source: *OECD Skills for Jobs Database*, O*NET, EU-LFS.

Notes

1. Also, according to Acemoglu and Restrepo (2016) for the United States, one more robot per thousand workers reduces the employment rate by about 0.18-0.34 percentage points and wages by 0.25-0.5%.
2. The optimal number of clusters was chosen based on the Duda-Hart index. See *OECD Skills for Jobs Database* (2017).

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Chapter 4

La Buona Scuola and the Italian education system: Elements to foster the alignment between education and labour market needs

This chapter discusses the reform of the Buona Scuola *and other elements of the Italian education system with a view to understand how the reform is addressing the long-standing skills imbalances in Italy. The chapter discusses the renewed incentives spurred by the reform to create bridges between education providers and the world of work and how these can play a fundamental role in reducing skill mismatch and shortages. The chapter also discusses the responses that the Italian Government put forward to reinforce the alignment between the supply of skills and its demand in Italy more broadly. Bottlenecks and barriers to the implementation of the reform are also discussed with a view to provide recommendations on how Italy could fully reap the benefits of these recent policy efforts.*

In July 2015 the Italian Government approved a comprehensive set of new education measures which go under the name of "*La Buona Scuola*" (the Good School) reform. The objective of the reform was to radically transform the Italian education system by addressing several of the long-standing issues that are at the core of the low level and quality of Italy's skills pool.[1]

A national plan of EUR 1 billion for the "*Digital School*" was promoted to strengthen the ICT skills of both teachers and students and to provide schools with new physical and technological infrastructure and internet connectivity. Resources for the operation of schools were also increased substantially and a new national recruitment process led to the hiring of around 90 000 new teachers in 2015. Performance-based components for teachers' salaries and stronger elements of school autonomy for principals to manage resources were also at the core of the reform.

Importantly, the reform had also the explicit objective of spurring stronger linkages between schools, students and the world of work so as to promote a smoother transition of Italian youth from education to jobs by providing students with better tools to develop those skills that are required by Italian firms.

Alternanza Scuola-Lavoro: The Italian way to build stronger links between education and the labour market

The *Alternanza Scuola-Lavoro* (ASL) is probably one of the most remarkable traits of the *Buona Scuola* reform as it introduces, for the first time, compulsory internship periods and work-based learning not only in technical and professional secondary schools[2] (e.g. *istituti tecnici* and *istituti professionali*) but also in the "humanistic and scientific gymnasium" – the *licei* – where the linkages between the education providers and employers have been traditionally extremely thin and sporadic.

The establishment of 400 hours of compulsory work-based learning for students in vocational education tracks and of 200 hours for students in general education gymnasium – *licei* – represents the core of the Italian ASL. The internships periods can take place either in the private sector or in the public administration and should be, at least in principle, well integrated in each specific education programme.

Introducing a strong work-based learning element into Italy's curriculum design has certainly the potential to contribute to reduce skills imbalances and, as such, the reform is moving in the right direction. Several implementation challenges have, however, the potential to hinder its full realisation and to hold back the reform's positive impact as a tool to reduce skills imbalances in Italy. These challenges are discussed below.

The ASL reform unfolds within a difficult context

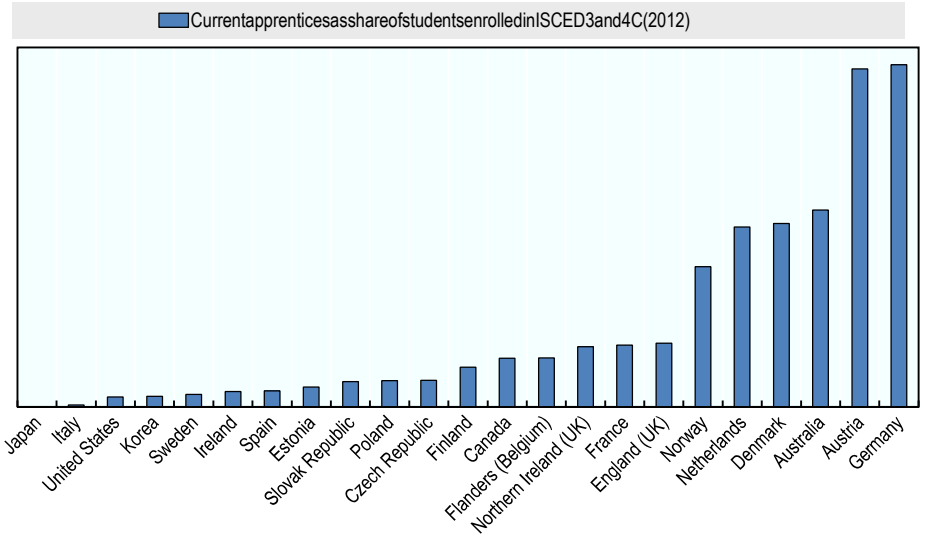
The ASL represents a substantial change to the Italian education system and traditions which brings interesting novel features especially in the Italian *licei*. In the case of Italy, it is particularly important to discuss the design of the ASL reform and place it within the current institutional framework and the (lack of) traditions of co-operation between education providers, firms and employers.

Differently from other countries, in fact, in Italy the very much needed links between schools and firms have not emerged spontaneously in the recent past. If anything, instead, Italy suffers a profound lack of dialogue and trust between schools

and firms. The status of TVET tracks is affected by a severe negative social stigma and education tracks built on links with the world of work have been traditionally perceived as leading to low-quality education. In Italy, the share of apprenticeships programmes is, for instance, extremely low if compared to other countries (Figure 4.1).

Figure 4.1. Current apprentices in programmes leading to upper-secondary or shorter post-secondary qualifications

Share of all students enrolled in ISCED 3 and ISCED 4C, 16 to 25 years old, 2012

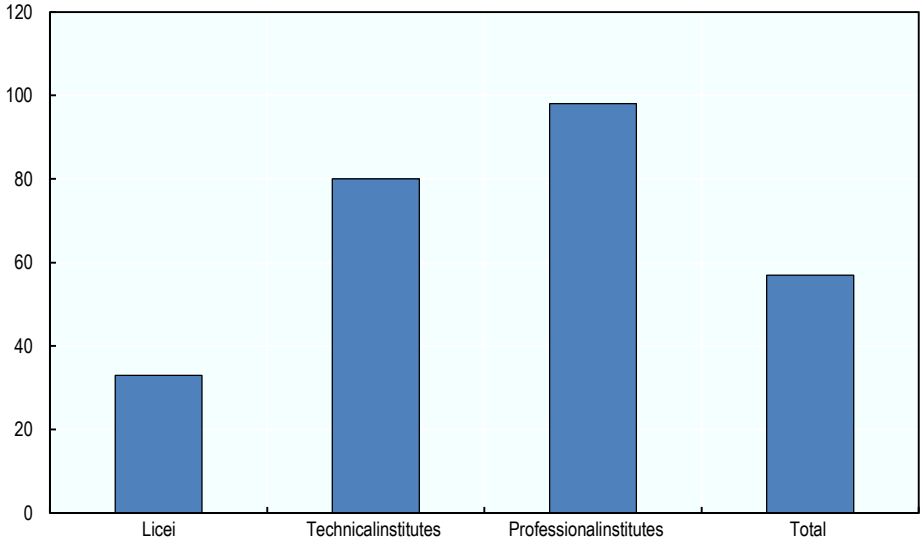


Note: In Ireland, Italy, Japan, Korea, Spain, Sweden and the United States, the estimated share of current apprentices is not significantly different from zero.

Source: Kuczera (2017), *Survey of Adult Skills (PIAAC) Database*, 2012, 2015.

Recent evidence from a study by Almadiploma (2016) shows marked difference in the extent of co-operation between education providers and employers in fostering dual education paths across different fields of study (Figure 4.2). The lack of co-operation is especially marked in the *licei* where two-thirds of students have not been involved in any work-related activity in 2015. Professional and, to a lesser extent technical, institutes are more intensively engaged in work-based learning as expected and given their specific nature.

Figure 4.2. Percentage of graduates who declare to have carried out any type of work-based learning activity by type of institute



Source: Almadiploma (2016).

Data from Excelsior (2016) in Table 4.1 show also an heterogeneous participation of students and firms to the ASL in 2015 and 2016 across regions as well as across firms of different sizes. Around 11% of firms in the north-west of the country have hosted (or plan to do so) students within their premises in internship activities linked to the ASL. This share, already relatively low, decreases in firms operating in the centre and south of the country in 2015 (8.5 and 4.4% respectively).

Table 4.1. Firms hosting ASL students by geography and size

	Have hosted ASL students in 2015					Plan to host ASL students in 2016				
	Total	1-9 empl.	10-49 empl.	50-499 empl.	500+ empl.	Total	1-9 empl.	10-49 empl.	50-499 empl.	500+ empl.
North West	10.9	8.6	15.7	29.8	31.7	11.5	8.7	17.1	32.9	43.6
Nord Est	12.3	9.30	19.6	34.0	34.6	12.8	9.5	19.8	37.4	46.5
Centre	8.5	6.60	14.4	24.9	31.5	9.5	7.6	14.1	27.0	42.2
South and Islands	4.4	3.50	7.4	15.2	27.4	5.7	4.6	9.5	18.5	37.7

Source: Excelsior (2016).

Against this backdrop – and with the aim of spurring the creation of linkages between the labour market and education providers – the Italian Government has opted to take a *top-down approach* by creating of a new regulatory framework (e.g. the compulsory work-based learning modules for all students) that provides a set of incentives, tools and financial resources to carry out the ASL and, with it, spurring the creation of linkages between schools and firms.

The Italian approach differs substantially from that of other countries where pathways of work-based learning have proven to be extremely successful (e.g. Germany) and where the linkages between firms and schools have emerged through a *bottom-up dialogue,* with little intervention from the government.

The efficacy of the approach proposed in Italy (*vis a vis* that in other countries) will need to be monitored. It appears important, however, to stress the difficult initial context that the Italian ASL had to face. An assessment of the ASL (which will need time to fully develop) and the remarks on its design and implementation should be, in fact, contextualised to the Italian case. The difficulties of putting forward a top-down ASL reform are, in fact, evident, but so are the reasons for the government to proactively spur the creation of better links between education providers and the world of work with a top-down approach in a situation where, historically, these linkages have not emerged when needed.

Schools need additional support to adopt and adapt to the ASL…

Given the breadth and especially the novelty of the ASL reform, its "*implementation phase*" becomes particularly important as the risk of finding the key stakeholders unprepared can be substantial. In Italy, schools and employers are slowly adapting to the introduction of the ASL and much still needs to be done for the ASL to be fully operational and for the relevant stakeholder to be ready to absorb the policy change.

At the moment, schools (especially the *licei*) find it difficult to integrate the ASL in their curricula and to create the necessary synergies between academic programmes and the vocational content of the internship periods.

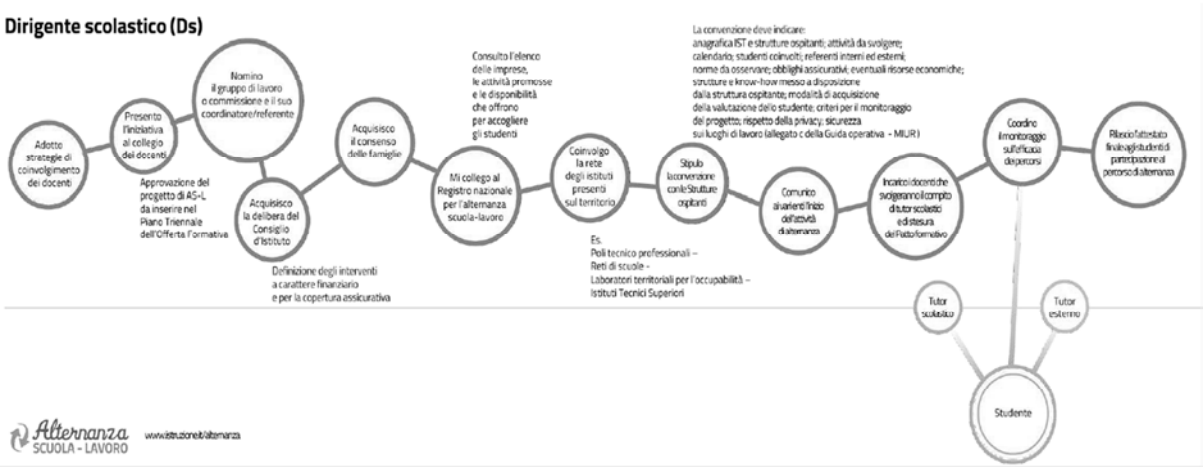
Differently from the experience of other countries where the planning of the academic and vocational programmes is a shared responsibility between education providers, firms and employers, in Italy the ASL reform gives little indication on the specific role of employers in identifying learning goals. Much of the burden related to the implementation of the ASL is, instead, left to schools.

The guidelines for the implementation of the ASL reform[3] developed by the Ministry of Education and Research (MIUR) suggest that a major role should be played by schools and school principals in: first, the analysis of local labour markets' skill needs (carried out through the use of the available skill needs information[4]); and, second, in the establishment of linkages (i.e. *convegni* or *protocolli d'intesa*) with firms in the territory so as to satisfy those local skill needs and create bridges with firms.

Recently, the decree 219 of 25 November 2016 identified in the network of Italian Chambers of Commerce a key partner to regions and the National Agency for Active Labour Market Policies (ANPAL) to strengthen the involvement of firms in the ASL. As an example, the chambers of commerce will provide assistance in the management of the national registry of ASL' firms (*Registro Nazionale Imprese-Scuola Lavoro*) as well as in the activities related to the certification of the skills and competences developed at the end of the ASL internship. More broadly, the chambers of commerce are called to play an important role in the identification of local and national skill needs and in strengthening skill matching across the while territory through the support to the ASL.

Despite the efforts put forward by the government and other actors to assist schools in the adoption of the ASL, the tasks of school principals remain extremely challenging and complex (see Figure 4.3), especially given the lack of specific training on labour market issues of many of school principals in Italy.[5] This situation can lead to the heterogeneous quality of the work-based learning activities both across different education institutes and geographically across regions in Italy.

Figure 4.3. The complex task of the school principal



Source: Attività di Alternanza Scuola-Lavoro. Guida operativa per la scuola. MIUR (2016).

The lack of effective co-operation between schools and employers in the definition of internships' goals is confirmed by the fact that many students have, so far, participated to the ASL's internships periods at the end of the academic year when courses have already been taught at school. The experience at the workplace has been often detached from students' studies and, while still valuable in most cases, it does not seem to robustly constitute an integral part of the students' education and learning paths.[6]

As a solution to the difficulties faced by school principals in establishing contacts with employers, schools are encouraged to create networks among them in order to rationalise their efforts in the analysis of local labour market information and of Skill Assessment and Anticipation[7] (SAA) results. The mechanisms and the incentives under which such collaboration should take place are, however, not clear and in most cases their creation is left to the organisational capacity and leadership of school principals.

To mitigate these implementation challenges, the MIUR's guidelines explicitly identify the *Poli Tecnico Professionali* (Technical and Professional Poles,[8] see Box 4.1), as key actors that can help schools create linkages with firms. Their effective involvement in the implementation of the ASL reform should be closely monitored and, if anything, strengthened further given the difficulties of many schools to adopt the ASL.

All in all, the implementation of the ASL reform requires more clarity on the division of tasks of stakeholders involved and greater support should be provided to schools and school principals in developing the adequate skills that are key to a successful implementation.

Noteworthy, within the *Buona Scuola* framework, the government committed to an ambitious plan to upskill teachers and school principals for the years 2016-19.[9] The implementation of this retraining plan, which is currently ongoing, comes with a considerable lag with respect to urgent needs of Italian schools. It is, however, very much needed and a step in the right direction. These efforts should be carefully monitored as they represent a crucial element for the overall success of the *Buona Scuola* and ASL reform.

Box 4.1. Technical and Professional Poles as the platform for education and world of work to collaborate

The Technical and Professional Poles are networks of technical and vocational schools, vocational training centers and accredited companies that are designed to promote the development of technical and scientific knowledge and to spur the employment of young people. They represent, therefore, key learning platforms in applied contexts that can help co-ordinate the creation and use of knowledge, technologies and professionalism.

The Guidelines for the Implementation of the Poles highlight how these constitute the functional interconnection between education providers and enterprises. The interconnection should ensure the integration of professional resources, logistics and human capital coming from technical and vocational schools, businesses, educational institutions accredited by the regions and technical colleges, universities and research centers. Noteworthy, the Pole's flexible organisation should favour their establishment at the regional level as a tool to address local skill challenges and imbalances.

Source: INDIRE.

…and firms should be given sufficient incentives to absorb the ASL

Italian employers are also generally unprepared to fully absorb the ASL reform. While their role in identifying the pedagogical contents of the internship periods is not clear, other challenges exist that are related to the practicalities of the ASL reform's implementation.

If, on the one hand, schools are in charge of informing students about their *twin-status* of student-worker (*doppio status di studente e lavoratore*) and of the rules regarding safety, hygiene ad health in the firm, employers, on the other hand, are usually in a difficult position when accepting minors within their premises as these need to be monitored constantly and their safety ensured.

Differently from other countries where firms are provided with clearer incentives to offer internship places, firms and employers in Italy have little incentives, if not disincentives[10] in some cases, to participate proactively to the ASL reform. In many cases firms participate within their *corporate and social responsibility initiatives* and the work-based learning activities, therefore, lack a clear bound with the firms' productive activities.

The difficulties to adopt the ASL reform are also linked to the size and geographical distribution of firms across the national territory. It is well known that the Italian productive fabric is based on small and micro enterprises and that a profound divide between the north and the south of the country exists. These aspects lead to very heterogeneous possibilities to establish internships programmes across the whole territory.

In the South, a sparsely-populated geography of small firms makes the task of establishing linkages with employers particularly difficult for school principals. Similarly, small firms that do not belong to larger networks and that work in low value-added productive activities may find it especially difficult to absorb students and minors within their premises, in most cases due to the lack of personnel to supervise and monitor them.

The implementation guidelines of the ASL reform foresaw this situation and contemplate the possibility, whenever linkages with firms cannot be established directly, to use "simulated enterprises" at school. These are laboratories that mimic the

work done in a real firm and the tasks of workers. While the simulated enterprise is an experience from which students can potentially learn several hard and soft skills, they fundamentally remain a second-best option as students are not always directly confronted with the, sometimes unexpected, challenges of real production (see Box 4.2).

Box 4.2. The SimuCentre: Giving more reality to a simulated experience

Simulated Enterprises are useful tools in contexts where the productive fabric is not well-developed and the establishment of co-operation between education providers and employers may be more difficult. They are, however, a second-best option as the skills and work experience that can be acquired through them is more limited when compared with the 360 degrees experience in a real firm. Trying to overcome this barrier, the ASL reform foresees that the set of simulated training enterprises can be linked together by a computer platform and network through a National or Local Central Office (SimuCenter). This system allows the virtual companies that are part of the network to simulate all the actions related to their specific areas and entrepreneurial activities in a more "real" and sophisticated manner. Similarly, the SimuCenter allows the simulated enterprises to connect to the real world through the Chambers of Commerce, the national Tax agencies and the national company register.

For the correct functioning of this part of the reform, resources should be allocated for hiring and internal tutor with the necessary skills within the school personnel, as defined by Law 107/2015, article 1, paragraph 63.

Source: MIUR, http://www.istruzione.it/alternanza/allegati/L'Impresa%20Simulata.pdf.

Tools exist to create bridges between education providers and employers

In the attempt to streamline and encourage collaboration between schools and firms the Italian Government created a specific web portal (*Registro Nazionale Imprese-Scuola Lavoro*[11]) where firms can register to advertise their availability to propose stages and internships. At the moment of registering, firms need to provide information about the number of students they are capable of accepting as well as the period in the year when the ASL internships can take place. The National Register allows also sharing information related to the activity carried out by the firm and on the firm's infrastructures, technology and organisational capacity. For school principals, the National register represents an essential tool to get insights into the characteristics of the enterprises (i.e. number of employees, turnover, net assets or its relationships with other operators) and to start planning the "contracts" for the ASL.

The WEGO tool

The geographical distance between schools, students' residences and firms can represent a barrier for students to participate to work-based activities and it can potentially limit the establishment of contracts between schools and firms. The UPI (*Unione Province d'Italia)* and ANG (*Agenzia Nazionale Giovani*) developed an innovative tool (WeGO Italia) which provides geo-referenced information about the firms that are willing to establish collaborations within the ASL pathways. This is a new and very useful piece of information for school principals to start planning the collaborations with firms. Unfortunately, the web platform is, at the moment, only available for the metropolitan area of Milan in Lombardia but this example could be extended to other geographical areas, both in those where the geography of firms is sparsely populated (to provide a bird-eye view to principals of where the training possibilities are) but also in those where the number of firms is instead relatively high (to provide school managers with the necessary filters to choose only those firms that are geographically close to schools and discard others).

Certification of competences and skills in the ASL needs to be strengthened

The *assessment* and the *certification* of the work-related skills acquired during the ASL period are fundamental. The assessment of the acquired skills is important to monitor the quality of the training activities and the certification of qualifications is fundamental to allow students to use the acquired skills in the labour market across the whole national territory.

In countries where the dual work-based learning pathways are well-established, the certification of skills plays a fundamental role for students to signal their work-experience and so, to access their national labour market and be mobile within it. In Germany, as argued by Ballarino and Checchi (2013), the success of the dual TVET system does not merely reside in the establishment of internships periods in firms but, more essentially, on the fact that the ASL is i) co-managed by firms and schools and that the skills and competences that result from the internship periods are ii) fully recognised as trustworthy credentials in the labour market.

The ASL in Italy is still weak in both dimensions. On the one hand, as discussed above, the planning of the work-based learning component of the Italian ASL is only weakly integrated into the academic programmes of schools and firms do not yet play a fundamental role in shaping their contents. On the other hand, in Italy, firms also play a minor role in the assessment and validation of the skills acquired by students during the ASL.

While the ASL guidelines foresee the collaboration of firms and employers at the moment of assessing and recognising ASL qualifications, commentators of the Italian ASL reform[12] have been sceptical about the effective role played by the enterprise-tutor in the overall assessment of the competences acquired by students during the ASL (Box 4.3).

Much of the assessment is still done by school teachers[13] who, in many instances, lack the adequate or specific work-experience to comprehensively judge on the work-related skills acquired by students. That being said, ANPAL, in collaboration with the MIUR recently launched a programme of co-operation aimed at helping schools in the selection of tutors so as to strengthen the implementation of the ASL as well as the certification of the skills acquired by students. As for now, the co-operation programme foresees the recruitment of around 1 000 tutors who should also work to identify job and training opportunities for students.

The heterogeneous quality of the ASL activities across Italian regions represents also a crucial challenge. The skills acquired by students during internship periods spent in larger firms in the north of Italy are generally regarded as superior relative to the competences acquired in other regions (or in smaller firms) where skills are generally acquired through weaker work-based learning done, in some cases, in simulated enterprises.

All in all, more should be done to integrate Italian firms both in the design of the work-based learning tracks and in the assessment of the skills acquired by students during the ASL. This latter element is especially important to build the necessary trust around the ASL skills so that these can be effectively used in the labour market. It is also crucial to raise the quality of skills acquired in the south of the country and in smaller firms as their status is still relatively low and their value in the labour market weak.

Box 4.3. Certifying the skills of the ASL

The certification of the skills acquired during the ASL periods needs to include minimum elements of proof as indicated in art. 6 of Legislative Decree 13/2013. Among these, the personal data of the student and the educational establishment; references to the type and content of the agreement which characterised the work-based learning path; the skills acquired as well as the work context and the methods of learning and the language used. The certification of skills developed through the ASL is included in the curriculum of the student with the purpose of mapping her/his skills and represents an integral part of their evaluation in the examination of state.

The Law 107/2015 introduces, in paragraphs 37 and 40 of Article 1, a further innovation by requiring schools and students involved in the ASL to give, at the end of the school year, a specific assessment of the training activities. Students can express an opinion on the effectiveness and consistency of ASL paths within their field of study while school principals are called to draw up an assessment of the facilities with which the conventions were signed, highlighting specifically their educational potential and any difficulty encountered in establishing the collaboration.

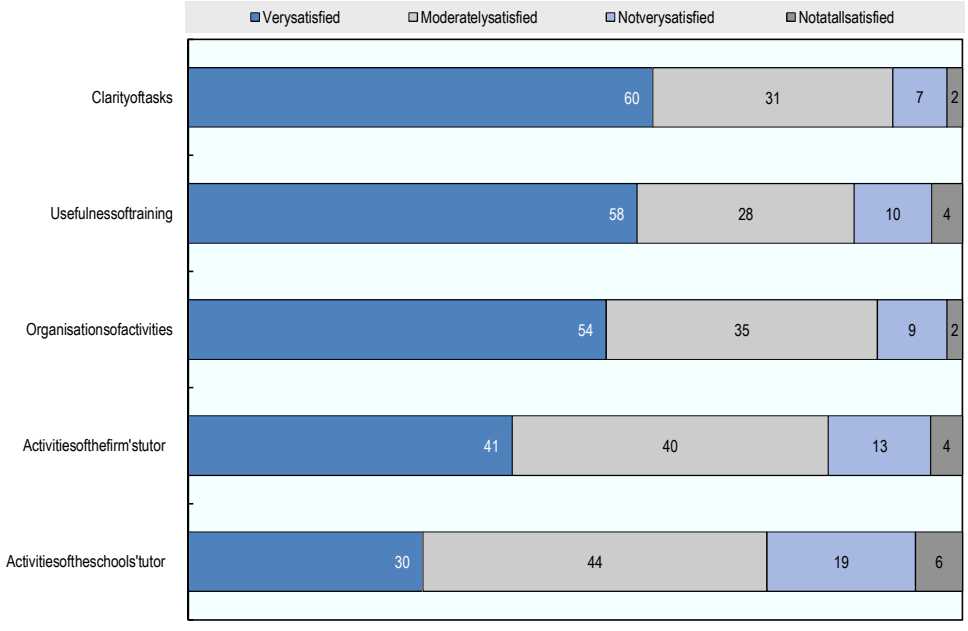
Source: Registro Nazionale per l'Alternanza: portale della Camera di Commercio.

Despite the difficulties the perception of the quality of ASL is positive

Despite the difficulties mentioned above, the perception of students regarding the quality of the ASL is rather positive. This is encouraging as it points to the broad acceptance of young Italians of such shift in the educative paradigm.

Almadiploma (2016) shows that the clarity of the tasks, the organisation of the activities and the usefulness of the ASL and work-based learning activities are highly valued by students (Figure 4.4). If anything, the activities of school tutors could be strengthened so as to match the quality of those of the tutor from the firm.[14]

Figure 4.4. Satisfaction of students towards the ASL and work-based learning activities



Source: Almadiploma (2016).

TVET education in Italy suffers from low visibility and fragmentation…

While the ASL reform is facing several challenges, especially in *licei* and in economically depressed geographical areas of Italy, its implementation has been relatively smoother in the context of technical and professional institutes (i.e. *Istituti Tecnici* and *Istituti Professionali*) where the tradition of creating bridges between schools and firms already existed in the past.

That being said, TVET more broadly in Italy is still facing several challenges that undermine its potential to reduce skills imbalances. Major challenges relate to the fragmentation and lack of visibility of the TVET supply. In Italy, TVET education is provided through three distinct models: i) technical institutes, ii) professional institutes, and iii) regional TVET programmes (IeFP). These different TVET pathways are largely overlapping and have grown in a somehow disorganised manner over time (Ballarino and Checchi, 2013).

A recent study by ISFOL (2016)[15] shows, for instance, that one-third of Italians interviewed did not know the existence of IeFP programmes and that around 70% confounded these programmes with technical or professional institutes. The low visibility of TVET goes hand in hand with a profound social stigma towards it that started in the 1970s in Italy (see Box 4.4).

Box 4.4. The origin of theTVET stigma: The primacy of academic studies onTVET learning

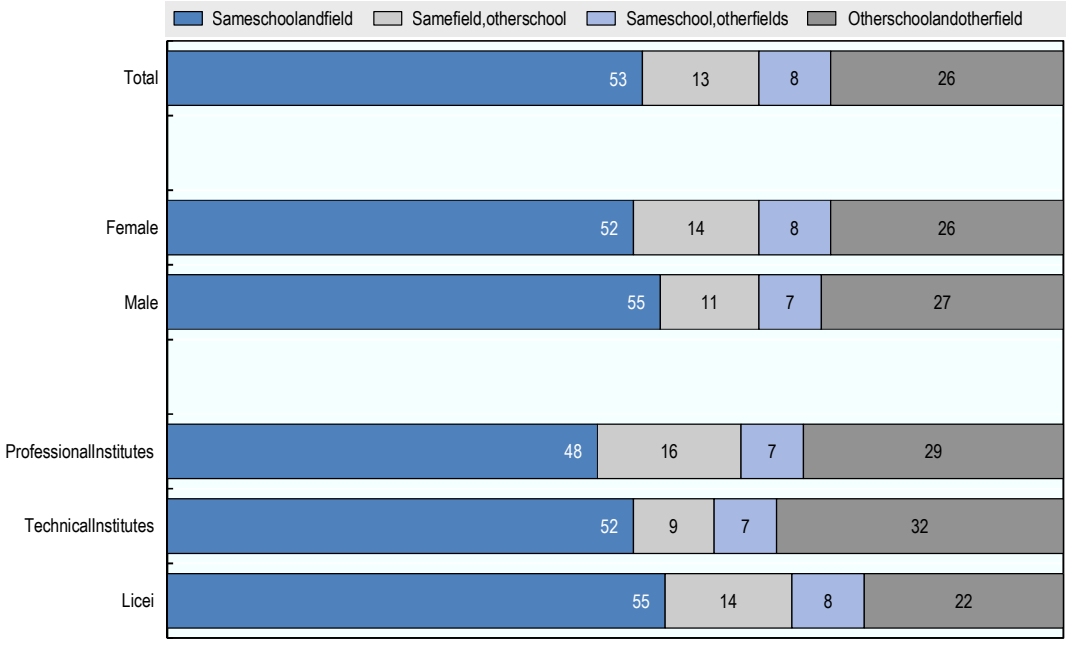
Technical institutes were established for the first time in Italy at the end of the 19th century as a response to the specific needs of a dynamic labour market where industrial production was quickly developing. At the beginning of the 20th century, the nationalisation of these private technical institutes absorbed them into the national education system. In parallel, in the 1950s, the professional institutes – three-year long programmes - were designed to target low skilled and disadvantaged youth through courses that were meant to introduce them to the labour market (the avviamento professionale) and whose quality was already perceived to be inferior to that of the licei as these would not allow to progress to tertiary education. More recently, however, bridging courses were designed so that students from the professional institutes could proceed to further education similarly to those of the technical institutes. In the meantime, the TVET programmes in the technical institutions started losing part of the TVET content in favour of an increasing emphasis on more general programmes. It is, however, only in between the 1970 and 1980s that, with the Italian economic boom and a general improvement in living standards also for more disadvantaged social classes that the number of students enrolled in licei started to increase relative to those in technical and professional institutes. This phenomenon is very likely linked to the ambition of working class families to emancipate from their condition through education pathways that were perceived to be of higher quality.

…and the perception of the quality of TVET programmes is still mixed

Despite the low visibility of TVET tracks, results from Almadiploma (2016) show that young students that are enrolled in technical and professional programmes are generally satisfied with their choice. However, the figure at average level hides significant variation across education pathways. While students in *licei,* for instance, show only slightly higher satisfaction rates than those in TVET tracks, it is interesting to notice that the share of "totally unsatisfied" – those who would change both school and field of study – varies a lot across fields of study (Figure 4.5). Unsatisfied students in technical (32%) and professional (29%) institutes are many more than in *licei* (22%).

Figure 4.5. Satisfaction towards schools and field of study

Share of students who would choose again the following options if given the chance



Source: Almadiploma (2016).

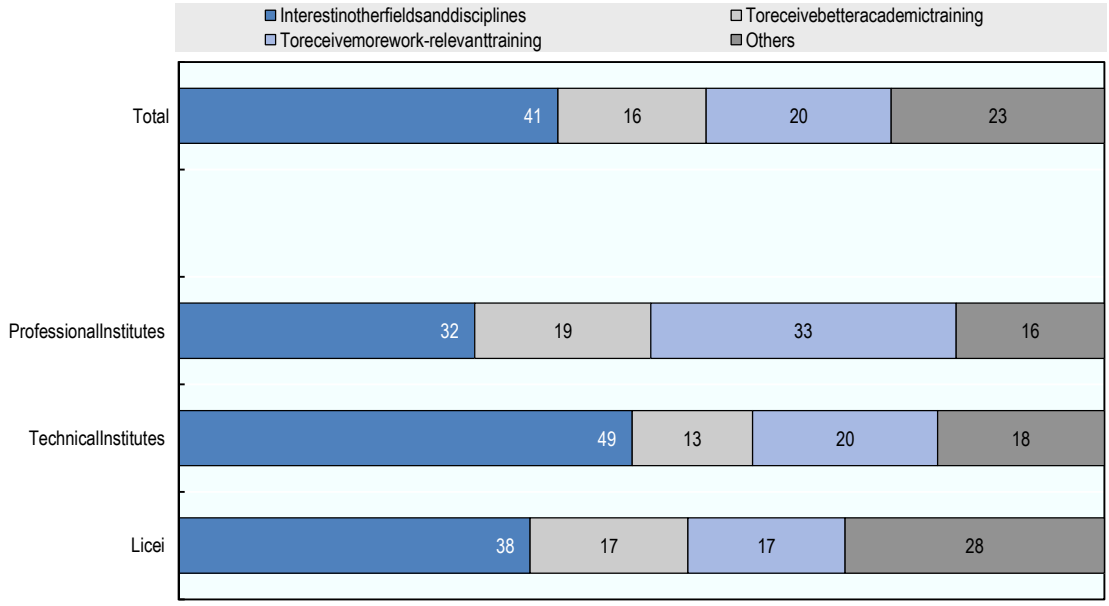
Almadiploma investigates the reasons behind students' dissatisfaction (Figure 4.6). Interestingly, up to 33% of the unsatisfied students in professional institutes have a negative perception of the work-related skills they have acquired during their studies.

This is worrying as work-based learning pathways such as those of professional institutes are, in principle, based on relevant hands-on activities in which students can experiment with new technologies, tools and instruments that will eventually use in their future jobs. The interviewed students are, also, rather negative about the quality of laboratories in schools. The dissatisfaction towards laboratories' infrastructures is highest in *licei* (53%) but it is also widespread among students in professional (47%) and technical institutes (46%).

Raising the quality of the work-based learning and of the infrastructures of TVET institutes is, therefore, fundamental. Several commentators among employers, in fact, argued that young Italians are too often trained on old technologies and that their work-related experience, when exiting schools, is far from being adequate to make them interesting candidates for the scarce jobs available.

In light of these challenges, the Italian Government is planning to redesign the functioning of Professional Institutes. The areas of study will pass from 6 to 11 and each school will be able to tailor the provision of courses to the needs of their local territory consistently with the priorities identified by regions. Moreover, activities in laboratory are going to be strengthened. In the first two years, more than 40% of the hours will be dedicated to teaching activities in laboratories with the idea, also, to allocate 10% of the time to personalised and work-based learning, starting in the second year of courses.

Figure 4.6. Reasons for students' dissatisfaction and decision to change school/field



Source: Alamdiploma (2016).

The regional IeFP programmes target disadvantaged youth, but their visibility and status is still too low

Along with professional and technical institutes, the programmes of *Istruzione e Formazione Professionale* (IeFP – Vocational Education and Professional Programmes) are three to four-year pathways that provide vocational education. IeFP are funded by regions, autonomous provinces, the Ministry of Labour and the Ministry of Education, and supplied by public and private education providers at the secondary education level and in various TVET fields. The IeFP programmes, established in 2003 as a pilot project, are now a consolidated option in the Italian TVET panorama.

Given their regional and local design, the regional IeFP have the potential to provide tailored solutions for skills imbalances that are specific to the territory. This is particularly important in a country like Italy where economic, social and education challenges can change dramatically from one region to the other. IeFP pathways, however, face several challenges and, at the moment, do not seem to be able to fulfil their potentially important role of aligning the local supply of skills to the demands of the employers. The reasons are several.

IeFP programmes generally target disadvantaged youth at high risk of dropping out from the education system and with an irregular curriculum. This is a positive aspect of their design as this provides youth with difficulties with a second chance and it reduces the number of those who can potentially become NEETs. ISFOL (2016) shows, however, that in between 60% and 70% of students in IeFP programmes have used them as a makeshift and have enrolled without a clear objective[16] and with little drive and motivation.

Apart from some exceptions, the IeFP programmes are perceived as low-quality courses. This contributes to a vicious circle that negatively selects less prepared

teachers into these tracks (see Ballarino and Checchi, 2013) and that contributes to their low-quality. Even more than in the case of professional and technical institutes, the IeFP programmes lack visibility and status.[17]

…and local fragmentation is a problem…

While flexibility in the allocation of funding at the local level is a potentially positive aspect of regional IeFP programmes, the fragmentation of the legislative framework contributes to the weak performance of IeFP. Standards for the delivery of IeFP courses and systems of quality assurance of education providers are not working homogeneously in all regions. ISFOL (2016) shows that while some virtuous regions have long identified a clear legislative framework, others are still in the process of doing so. This affects the overall quality of the IeFP as well as its status and visibility nationally.

With the objective of strengthening the IeFP track, the government has recently allocated additional EUR 27 million a year since 2015 to push for the establishment of a stable dual learning system in IeFP. The resources (additional to the ordinary annual funding) will come initially from the Ministry of Labour and Social Affairs but the plan envisages the active collaboration of regions in the effective management of funds to keep the important linkage with the local territory. Much of the resources will be devoted to reinforce the "*apprendistato di primo livello*" for young Italian aged 25 or below.

Apprenticeship contracts as a channel to reinforce the linkages with firms

The recent decree of 15 June 2015 No. 81 establishes new rules and definitions for the apprenticeship contracts in Italy. The main novelties are already outlined in Article 41when reading the definition of apprenticeship. On the one hand, in fact, it is confirmed that this type of contract is to be considered as "*permanent contract aimed at training and employment*". On the other hand, the internal articulation of two types of apprenticeships (first and third level) has been largely modified while the one related to the "professional apprenticeship" (*apprendistato professionalizzante*) has remained unchanged. The first-level apprenticeship contract has been expanded in its scope such that it not only allows to obtain a 3-year qualification, a professional diploma in IeFP as before, but also to obtain the certificate of "*specializzazione tecnica superiore*" as well as the diploma of upper-secondary education.[18] If the first level apprenticeship contract has been expanded, the third-level has instead been revised to restrict and sharpen its focus to tertiary education masters, first-level tertiary degrees as well as doctorates and research activities.

As highlighted by Buratti (2015), the new normative contains an indication of the principle for which the apprenticeship should be explicitly structured so as to combine firm-level training and vocational and work-based training as depicted in the regional regulations. Importantly no contracts of this type can be activated if work-based learning tracks are not an integral part of the activities. In the intentions of the Italian Government, the new normative, more explicit on the work-based learning component, should help relaunch the apprenticeship contracts in Italy as a renewed way to promote dual vocational training in a similar fashion to the German example. That being said, the government acknowledges the potential difficulties in renewing the social status of this vocational track (Bobba, 2014) and, as such, the new apprenticeship contracts were

launched first with a pilot project. Importantly, the new normative has also drastically reduced the costs for firms to adopt the new normative so as to spur their pro-active engagement in apprenticeship. The hours spent in training by the apprentice outside the firm are, in fact, interpreted as leading to the acquisition of an education title and, as such, not paid as wage to the apprentice anymore.

Career guidance and education choices, still a family matter?

The visibility and status of different education tracks is closely related to the quality of information that students receive at school through career guidance and counselling services. That said, the orientation provided by families is equally important.

Almadiploma (2016) investigated the satisfaction of Italian students towards the career guidance and counselling support they received while in secondary school. Perhaps surprisingly, more than half of the students interviewed (56%) has a positive opinion of the counselling support they received. Satisfaction increases in technical institutes (62%) and it is the lowest in *licei* (53%).

The perceived quality of career guidance in schools, however, does not immediately lead to smaller shares of *undecided* students. Table 4.2 shows, for instance, that while the satisfaction towards career guidance is higher in technical institutes it is also in those institutes that the highest share of undecided students are found (21%).[19]

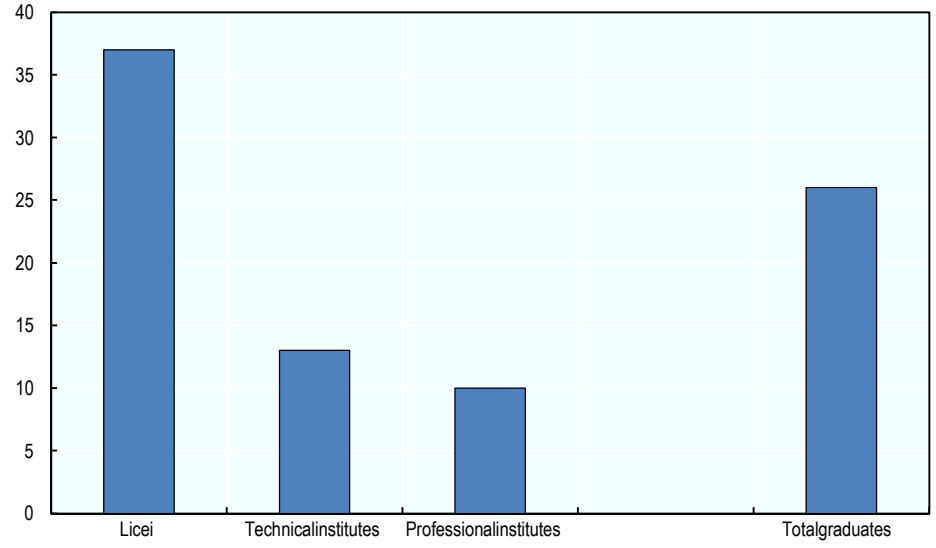
Table 4.2. Career guidance and undecided youth

	Satisfaction towards career and counselling activities at school	Share of students who are undecided on what to do after graduation
Licei	53%	7%
Professional Institutes	54%	19%
Technical Institutes	62%	21%

Source: Almadiploma (2016).

Along with career guidance and counselling in schools, the decisions over the education of minors in Italy are strongly influenced by families. The help and support that Italian students receive from families is undoubtedly positive and important. However, an undesirable social *lock-in* effect can sometimes emerge. Evidence from Almadiploma (2016), Figure 4.7, shows that the socioeconomic and education background of families, especially in disadvantaged ones, can end up playing a far too important role in the education decisions of young students. Around 37% of students whose parents have at least a tertiary education degree choose to enrol in *licei* against 13 and 10% who choose technical and professional institutes respectively.[20]

Figure 4.7. Enrolment decisions of students whose parents have tertiary degree



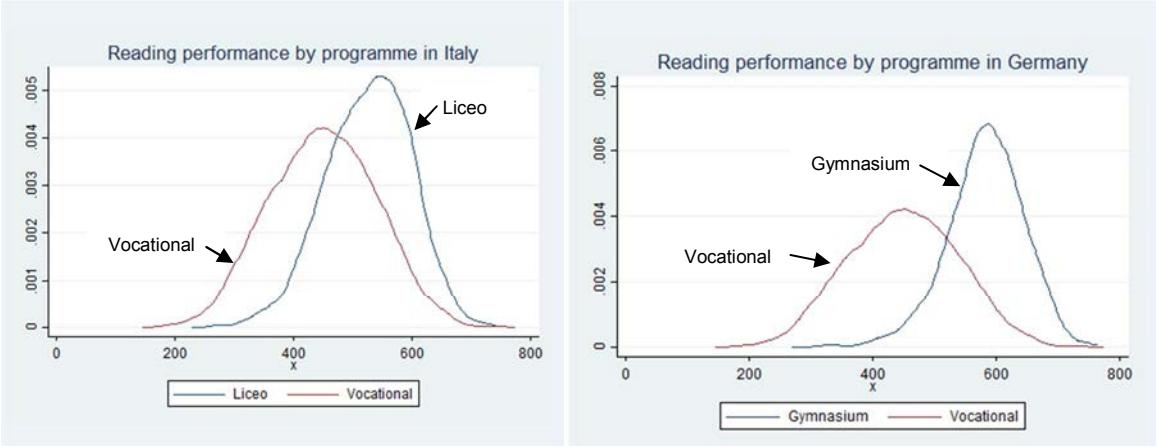
Source: Almadiploma (2016).

As pointed out by Ballarino and Checchi (2013), the effect of families' socioeconomic background on students' education decisions goes in two directions. On the one hand, too few young Italians from disadvantaged backgrounds tend to choose the *licei* when, instead, they would have the adequate skills and abilities to do so.[21] On the other hand, students coming from advantaged backgrounds, and who would do better in professional and technical institutes, usually dismiss the possibility of enrolling in TVET tracks as these are perceived to be of lower quality.

In other countries such as Germany, the socioeconomic context of students' families plays a far smaller role in the education decisions at the upper-secondary level while the assessment of school teachers is, instead, predominant and binding. The differences between these two systems can have notable effects on the allocation of talent across schools and fields of study.

In Germany, for instance, the literacy skills of students who exit secondary schools and enrol in *licei* are clearly distinguishable from those of students who enter technical and professional institutes (vocational). In Italy, instead, where the socioeconomic background of families plays a much more prominent role in enrolment decisions, there is, instead, a strong overlap between the literacy skill levels of students in *licei* and those in TVET programmes (Figure 4.8). Socioeconomic background rather than merit seem to play a much more important role in Italy than in Germany when it comes to enrolment to different types of schools.

Figure 4.8. PISA literacy (reading) scores by type of education institution, 2015



Source: OECD calculations based on OECD PISA, 2015.

No system is perfect. Education decisions taken solely on the basis of families' social status can lead students from disadvantaged backgrounds – but who proved to have high literacy skills – to enrol in professional or technical institutes and not in *licei*. *Viceversa*, students with lower literacy proficiency but high socioeconomic background may be encouraged to transit to *licei* not matter what their skills are.

That being said, the enrolment of highly skilled students to TVET tracks should be generally reinforced and not discouraged by socioeconomic and status' prejudices. Families and schools in Italy should work more closely together to strengthen the orientation and counselling given to students. Similarly, the Italian Government should boost the publicity campaigns used to increase the status and visibility of TVET programmes and highlight, both among students and families, the good employment outlook of these programmes.

Eduscopio: A tool to inform families, students and teachers

If the role of families in education decision is fundamental, the dissemination of high-quality information on education and career prospects can play a key role to improve the way youth are matched to the different education pathways. Better information on career and education prospects has, ultimately, an important positive impact on reducing skills imbalances.

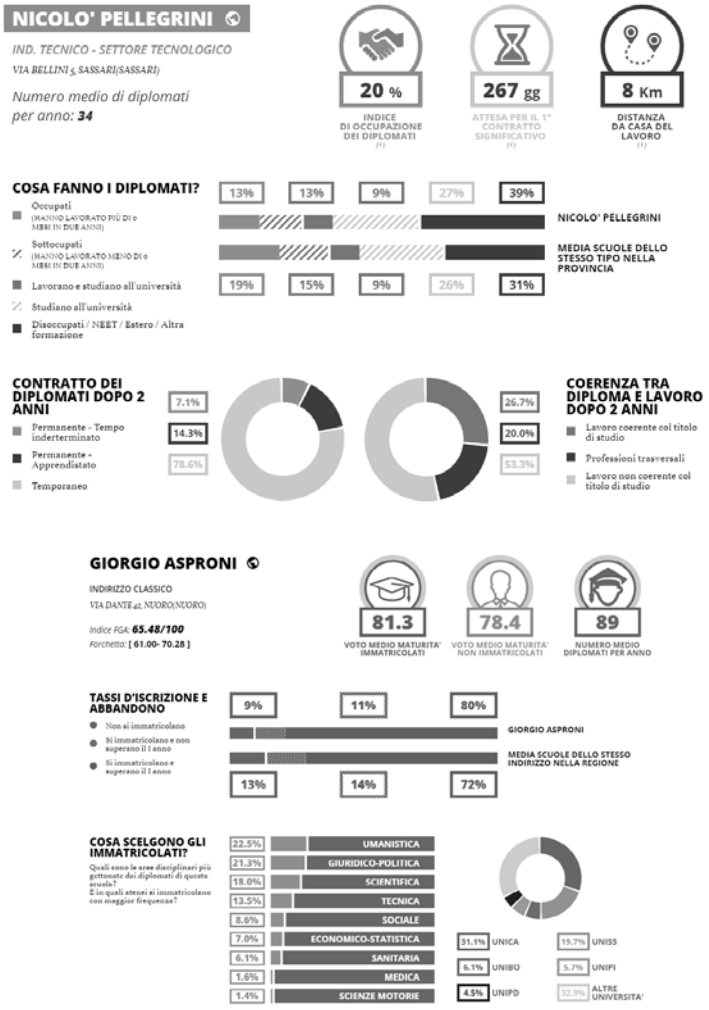
With this in mind, the *Fondazione Agnelli* launched an online tool (Eduscopio[22]) with the goal of offering students, families and teachers simple and comparable information on schools as well as detailed statistics on how these prepare their students for the world of work.

The online tool presents a direct comparison of schools on the basis of several fundamental indicators such as the percentage of graduates that are employed,[23] the time to the first "significant" contract after graduation and the alignment between studies, qualifications and jobs' requirements. Similarly, information is provided on the grades of university students who graduated from each secondary school.

Several aspects of the Eduscopio web platform make it an interesting tool and a case of best practice in the dissemination of skill-related information. First, Eduscopio

is extremely user-friendly and it tailors the information to different users' needs, being these those of students or of adults (families or teachers) (Figure 4.9). The results presented are easy to understand. Charts and boxes are complemented with and online help tool. Second, the results are based on the analysis of administrative data. As an example, information on the number of exams, the credits earned and grades obtained by students in the first year of university are used to assess the quality of the training, the goodness of the study methods and the usefulness of guidance suggestions acquired in the secondary schools of origin. This allows for a granular representation of labour market and education outcomes of most schools across the Italian territory. Caveats to the interpretation of these data apply, however. Self-selection of students from more advantaged backgrounds to certain schools may lead to their more favourable labour market or university outcomes and *viceversa*. Data and results, therefore, needs to be critically assessed by the user as reverse causation may be an issue and bias the results.

Figure 4.9. Eduscopio data: Granular information on most Italian secondary schools



Source: Eduscopio's website.

Qualifications are too often a black-box which provides little information about graduates' skills…

Qualifications can be interpreted as the "visible" credentials through which a worker advertises her/his skills to employers. Qualifications, however, can be very weak predictors of workers' true skills. This situation results in information asymmetries that pose severe challenges to the skills-matching process that eventually contribute to the emergence of skills imbalances.

Noteworthy, the more *qualifications* diverge from the *skills* of workers and the more it will be difficult for an employer to identify the right candidate for the advertised job. In those cases where qualifications provide weak or incorrect/incomplete information about the skills of an individual, potential mistakes in the recruiting process tend to emerge. These, in turn, lead to the suboptimal matching of workers' skills to job requirements.

The weak signalling power of certain qualifications (e.g. how well they describe the true skills of graduates), and the imperfect recruiting decisions that can stem from it, can entail large costs for economies and individuals as they lead to lower productivity or to the need of providing additional training to workers who are lacking the skills required by their job.

Data from the OECD survey of Adults Skills (PIAAC) allows to indirectly measuring the skill-signalling power of qualifications (e.g. their strength to inform about true skills) across fields of study. This can be done by computing the share of those who are mismatched by qualifications (say over-qualified) but who are, at the same time, well-matched by (true) skills in their job. This group of workers goes under the name of "*apparently* over-qualified" (Box 4.5). High shares of apparently over-qualified signal a low signalling power of qualifications as these do not fully map into skills.

Box 4.5. Only apparently mismatched?

The reasons behind apparent qualification mismatch can be various. Apparent over-qualification (e.g. when a worker has a qualification level that is above the one theoretically required by the job but his/her skills are, nonetheless, well matched to the job requirements) may appear due to the so-called credentialism (i.e. the belief that acquiring further academic or other types of formal qualifications is the best way to signal a worker ability to do a particular job). Credentialism can work both in the supply and demand of skills. Bulmahn and Krakel (2002) argue, for instance, that employers may be tempted to inflate recruitment criteria with the idea that this will help them selecting the best candidates. Similarly, individuals may try to acquire higher qualification levels than really necessary (i.e. qualifications that bring only little marginal additions to their true skill set while, however, inflating their curriculum) if they believe these extra-qualifications to be essential to signal their skills in very tight and competitive labour markets. Apparent under-qualification may appear, instead, when workers are able to acquire informal skills and competence at work (or through experience) but these skills are only partially reflected and recognised in their formal qualifications and titles.

Source: OECD (2017), *Getting Skills Right: Sweden*, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264265479-en.

In Italy, the share of workers who are *apparently* over-qualified is high (79%) but yet lower than in other OECD countries. The qualifications obtained in certain fields of study, however, convey better skill information than others as shown by the different shares of apparently over-qualified workers in Table 4.3.

Table 4.3. Apparent over-qualification by field of study in Italy

Major	Over-qualified but under-skilled	Over-qualified but well-matched	Over-qualified and over-skilled
	(%)	(%)	(%)
Teacher training and education science	0	92.3	7.7
Agriculture and veterinary	0	86.7	13.3
General programmes	5.9	85.3	8.8
Services	10.3	82.8	6.9
Engineering, manufacturing and construction	2.6	82.1	15.4
Social sciences, business and law	5.2	81.8	13
Health and welfare	0	76.9	23.1
Humanities, languages and arts	5	71.7	23.3
Science, mathematics and computing	3.3	68.9	27.9

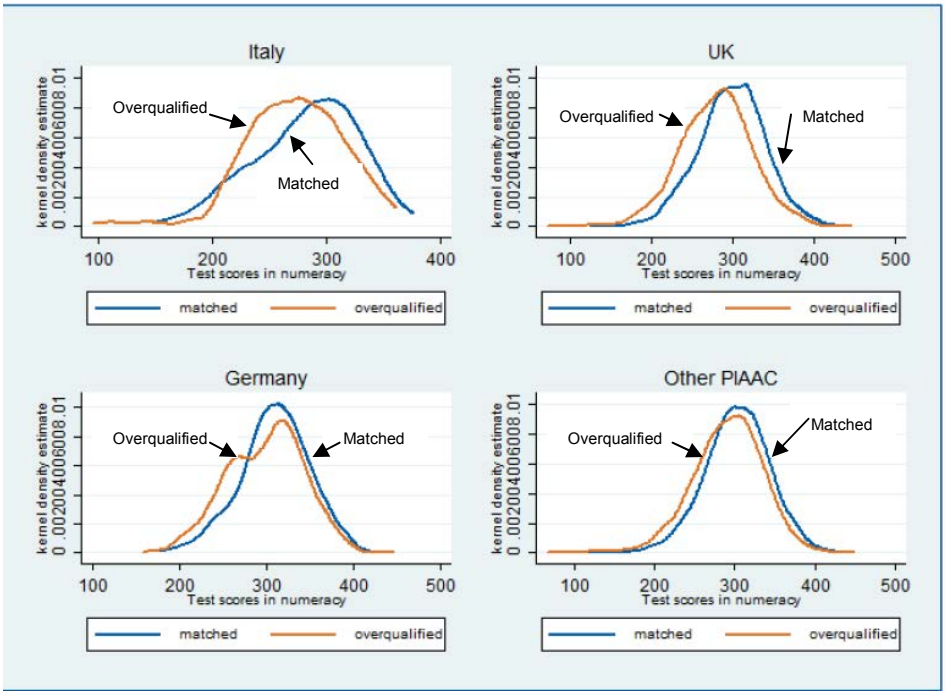
Note: Fields of studies are ranked according to their skills signalling power starting from the weakest to the strongest.

Up to 92% of over-qualified workers who graduated from the Teacher, training and education science field are, in fact, well-matched by skills (e.g. only *apparently* over-qualified). On the contrary, less than 69% of graduates in the Science, Mathematics and Computing field are apparently mismatched and about one-quarter of workers are indeed *both* over-qualified and over-skilled for their jobs (e.g. *genuinely* mismatched).

Results highlight, therefore, that certain qualifications (e.g. teacher, training and education or agriculture and veterinary) are weak predictors of the true skills of their graduates. Crucially, the existence of these information asymmetries stemming from weak skill signalling of qualifications is among the reasons for Italian employers to revert to the use of personal or informal selection channels to hire candidates. The use of these channels is widespread and more than formal channels (see Mandrone et al., 2016 and later).

Similar results (Figure 4.10) are found by Monti and Pellizzari (2016) who show how the skills (measured as test scores in PIAAC) of over-qualified workers in Italy are lower than those who are, instead, well-matched in their job. These results highlight that much of the observed over-qualification among Italian graduates may, in fact, be only "*apparent*".

Figure 4.10. The skills of over-qualified and well-matched university graduates



Source: Monti and Pellizzari (2016).

All in all, more needs to be done to strengthen the skill-signalling power of Italian qualifications to make them robust signals for employers. Much can be achieved by creating bridges between education providers and the world of work while, at the same time, strengthening the work-based learning component of formal education.

High-quality professional training in universities leads to better labour market outcomes

If the qualifications acquired by students in certain fields of study can be weak predictors of graduates' skills, those students who graduate from university programmes that provide high-quality professional training are well-rewarded in the labour market and are likely to quickly transit to high-quality jobs.

Figure 4.11, based on data collected by Almalaurea on Italian graduates[24] suggests the existence of several linkages between i) the quality of the professional training provided by universities in different fields of study, ii) the overall usefulness[25] of the university degrees in the graduate's current job and iii) the average salaries paid to workers.

First, data on students of the *laurea triennale*,[26] shown in Figure 4.11, highlight that students from the health and welfare, safety and defence, and teaching and education[27] fields of studies are those reporting the best alignment between the professional and technical training received during their studies and the skills required by their current jobs (e.g. the "quality" of the professional training). The fields of study of geo-biology, humanities and political science show, instead, a relatively weaker

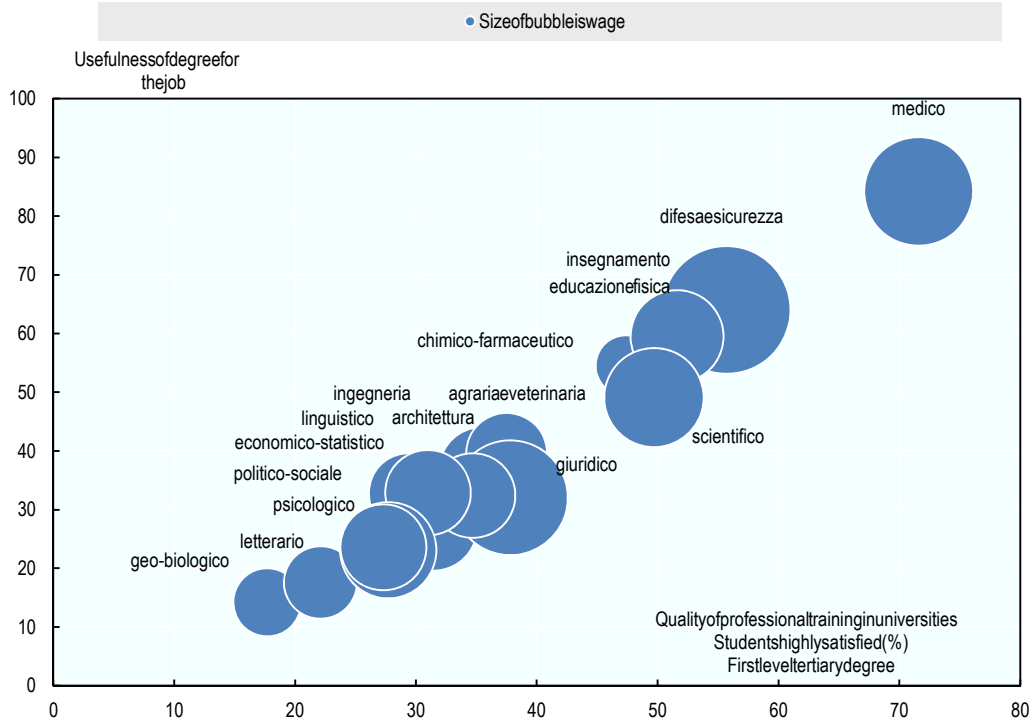
alignment between the professional and technical content of the university programmes and the skills required by employers in the job.

Second, the quality of the professional training received at university is also associated to a better opinion of students towards the overall usefulness of their degree for the job they are carrying out. This highlights a positive correlation between technical and professional education, skill use at work and satisfaction towards the degree as a tool to find employment.

Third, all the dimensions mentioned above (i.e. quality of professional training and usefulness of the degree for the current job) are positively and strongly associated with higher wages.

In a nutshell, evidence in Figure 4.11 seem to suggest that students who graduate from fields where the professional training is better tailored to the requirements of students' future jobs will also be able to extract higher value from these skills in their jobs. This situation is, in turn, also rewarded by higher salaries in the labour market.

Figure 4.11. Quality of professional training in universities, usefulness of the degree for the job and wages by field of study



Source: OECD calculations based on Almalaurea (2016).

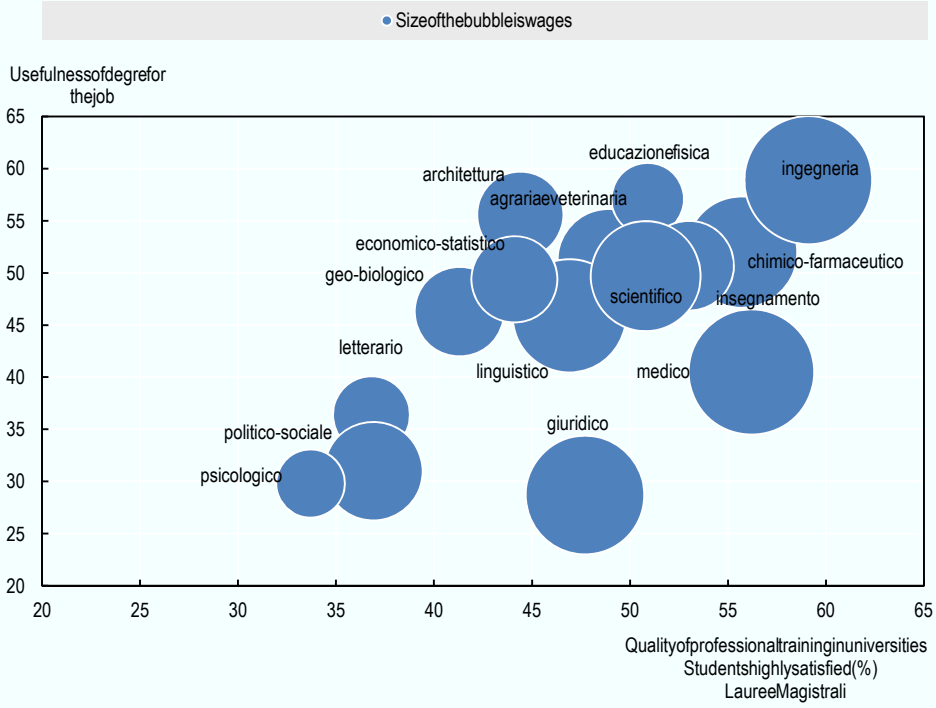
Results remain qualitatively similar when examining the students graduating from the so-called "specialistic" programmes *(lauree magistrali*) with some notable exceptions in the Health and Welfare and in the Law fields of study (Box 4.6).

Box 4.6. The 3+2 *magistral* degree: Does it pay off everywhere?

Graduates from the lauree magistrali are required to complete a 3+2 years degree (where the last two years are meant to provide students with more specialised skills in their respective fields of study). A notable exception to the pattern of results found for first-level tertiary degrees is, however, found in the Health and Welfare and Law fields of study. The satisfaction towards the professional and technical skills taught in the "3+2 courses" as well as the perception of the usefulness of the study programme for the jobs decreases substantially relative to that expressed by students of first level degrees. This result seems to suggest that the two extra years of specialised training acquired in these fields do not map into a stronger alignment of those degrees to the skill needed by employers. Again, this seems to point to a skill-demand issue where the demand is not capable of absorbing the supply of high skills in specific sectors.

Villosio (2011) also argues that while choosing a 3+2 degree may lead to higher skills, graduating later in life reduces the attractiveness of a graduate relative to a similar worker with more years of work-experience. The choice of pursuing a 3+2 degree rather than a shorter one may, therefore, be not immediately rewarded by the labour market when the additional skills acquired are not work relevant.

Figure 4.12. Quality of professional training in Universities, usefulness of the degree for the job and wages by fields of study in *Lauree Magistrali*



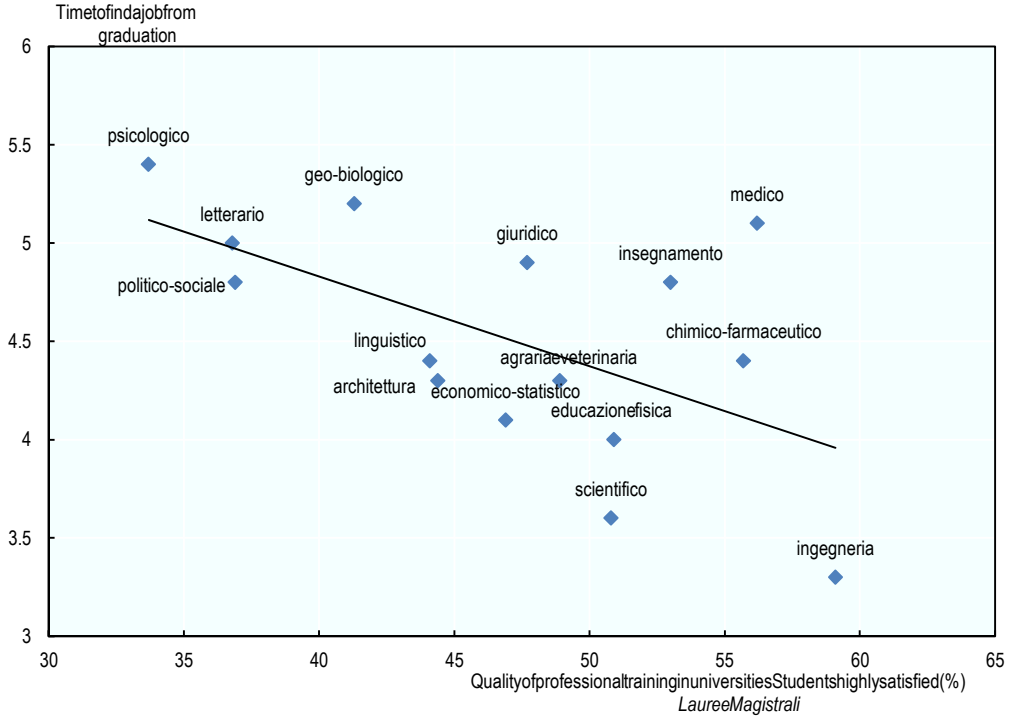
Source: OECD calculations based on Almalaurea (2016).

…and to a quicker transition to high-quality jobs…

The alignment between the professional and technical training received by tertiary graduates and the skill requirements of their current jobs is also strongly associated to a smoother transition from education to the labour market (Figure 4.13). As an example, students graduating from the engineering and chemical-pharmaceutical fields (where the content of the professional training is generally better aligned to skills requirements

in the labour market) transit to their first job much more quickly than students from the fields of psychology and humanities (where the quality of professional training provided by universities to jobs' requirement is lower).

Figure 4.13. Time to first significant job and quality of professional training in universities by field of study



Source: OECD calculations based on Almalaurea (2016).

A quick transition from education to jobs may, in certain specific cases, be masking employment in low-quality jobs, being these latter generally easier to fill. In those cases where shorter job-search does lead to low-quality jobs, these are also usually associated to workers' higher propensity to look for another job while employed[28] being these latter unsatisfied with the current one.

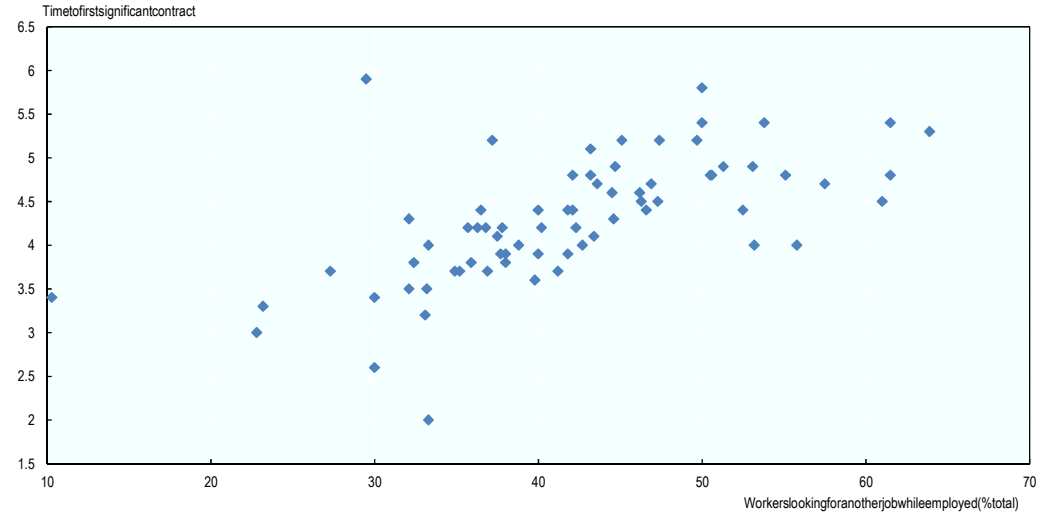
Figure 4.14 seems to suggest that this is not the case in Italy. On average, graduates who are able to transit from education to the labour market more quickly are also less likely to be looking for a job while employed (e.g. they are more satisfied in their current job). The result seems to indicate that better alignment of professional training received at university to job-requirements spurs a quicker transition to jobs that are, in fact, high quality, better and more satisfying jobs.

Worryingly, instead, graduates from universities and fields of studies where the alignment between the professional training and jobs' requirements is weaker, tend to find a job later. Longer job-search periods, in addition, do not seem to be associated to a better and more satisfactory matching in the labour market. They are, instead, associated to higher job-turnover and to lower salaries.[29]

The picture of a strongly polarised labour market emerges. High-quality and relatively well paid jobs in Italy are scarce and these are quickly filled by candidates

who have developed the adequate skills in universities and fields of study that provide a robust alignment between skill supply and skills demanded by employers. In Italy, however, low-quality jobs are also scarce, given the relative large supply of candidates who are unemployed in the Italian labour market. The job-search and matching process for graduates who are endowed with poorer skills is relatively longer[30] than for better equipped students and, worryingly, this leads to low-quality jobs where the final match is poor both in terms of workers' satisfaction and wages.

Figure 4.14. Time to first significant contract and quality of the match



Note: Each dot represents the average value for students graduated in each university institution in Italy covered by the Almalaurea data.

Source: OECD calculations based on Almalaurea (2016).

Istituti Tecnici Superiori and *Lauree Professionalizzanti*: A bottom-up or top-down response to employers' skill shortages?

Results above show that a strong alignment between the technical and professional training provided by universities and the skills required by employers is key to spur a quicker and more stable transition from education to the labour market into better quality jobs.

The fundamental question is, therefore, that of finding ways to align university programmes to the needs of employers so as to start a virtuous circle leading to a reduction of skills imbalances and improve job-matching and workers' satisfaction.

Generally speaking, the alignment between education programmes and employers' needs can be spurred by a *top-down* approach, where the government and universities design the training programmes so as to respond to the requests of the labour market or through a *bottom-up* approach, where firms are strongly involved in the identification of training priorities for students.

Both approaches can, in principle, lead to successful results, but the challenges facing their specific implementation are extremely different. Italy is now addressing the *puzzle* related to the implementation of both approaches simultaneously through, on the one hand, the establishment of the so-called *Lauree Professionalizzanti* (professional tertiary degrees – where the government and universities take the lead in

the design of programmes to satisfy labour market needs) and, on the other hand, the creation of the *Istituti Tecnici Superiori* (Higher Technical Institutes – ITS, where the firms play a key role in the provision of training for their own needs).

Istituti Tecnici Superiori (ITS): A bottom-up response to skills imbalances

ITS are meant to provide short-cycle vocationally-oriented tertiary programmes to prepare students for a quick transition into the labour market through the development of work-relevant skill. The novelty brought by ITS to the Italian education panorama is the strong bottom-up involvement of firms and employers (see Box 4.7) in the design of curricula as well as in the provision of internships periods that form integral part of the education programme. ITS courses are implemented with a strong focus on local needs and individualised training routes.

Box 4.7. ITS: Involving many towards one goal

Around 75 ITS foundations were active in 2015 in Italy delivering 349 education pathways and 7 838 students admitted to the courses. In 2015, the 75 Italian ITS involved around 1 335 partners of whom 509 companies, 248 Secondary Institutes of grade II, 188 training agencies, 132 local authorities, 68 university departments, 42 scientific and technological research institutions, 27 employers' associations, 23 professional orders, 11 chambers of commerce, 6 trade unions, 3 banks, 3 foreign partners and 75 other entities of a different nature.

Source: Cartellette INDIRE.

ITS foundations operate across multiple technological areas. The highest number of ITS (30 ITS, 40% of the total) belongs to the area of new technologies for the made in Italy which operates mainly in the context of the agri-food area (12 ITS) and of the mechanical production and mechatronics (11 ITS). The technological area of sustainable mobility (13 ITS) is followed by that of energy efficiency (11 ITS), innovative technologies for cultural heritage and activities - tourism (10 ITS), technologies of information and communication (6 ITS) and new technologies of life (5 ITS).

ITS foundations are autonomous entities established by a mix of public and private institutions. The tight links with the world of work are evident in the high number of firms (on average 25%) among ITS' founding partners as well as in the number of teachers (38%) delivering the training who directly come from firms.

The involvement of firms in education and training is most useful when these set goals, priorities as well as assessment criteria and quality assurance of the programmes. When partnerships are designed this way, students can, not only acquire skills that are truly required in the labour market, but also have them assessed and certified by firms so that these become credible qualifications spurring skill matching and labour market mobility.

Aligning training and skill needs from the bottom, a problem of coherence…

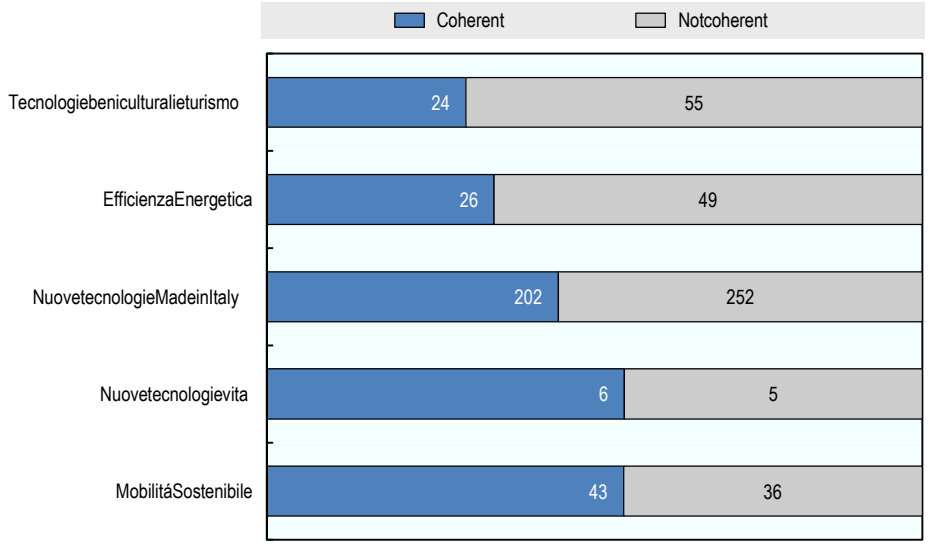
Many commentators argue that one of the peculiar strengths of the ITS lies in the flexible design of their programmes that allows employers to continuously monitor their needs and adjust education programmes accordingly. As an example, the

approach taken in Emilia Romagna in the area of the mechatronics led to the decision of carrying out strategic foresight analysis of the regional skill needs over the short and medium run which then fed into the design of the ITS training programmes.[31]

Once skill priorities are identified by firms, however, much still needs to be done to ensure that training programmes truly lead to the development of the skills that are (and will be) needed by employers. Probably one of the most important steps towards achieving a coherent alignment of training programmes to firms' skill needs is the design and implementation of effective internship periods where students can get valuable hands-on work experience that will be crucial for their future career.

A national decree establishes that ITS foundations operating in a specific technological area should be assigned several NACE[32] codes within which the ITS should activate internships or apprenticeships contracts. The rationale behind matching ITS areas to NACE codes is that of fostering the creation of internships in firms whose technological characteristics are truly aligned to ITS programmes and avoid, instead, the promotion of internships in firms that provide non-relevant work-experience to students. Data from INDIRE[33] (2013) in Figure 4.15 shows, however, that the coherence between ITS technological areas and internships is not always ensured. Internships are, most of the times, incoherent to the assigned NACE code.

Figure 4.15. Share of coherent and non-coherent internships by ITS technological area



Source: INDIRE (2013).

By crossing information from INDIRE (2013) and ITS' graduates labour market outcomes (Almalaurea, 2016) it is possible to extract a partial[34] indication on the importance of strengthening the coherence between internships and ITS' technological areas to develop of truly relevant internships paths.

Figure 4.16 shows, in fact, that the coherence of internships to NACE code[35] (e.g. the share of internships activated in firms operating in areas that are close to the ITS technology programmes) seems to be positively associated to better labour market outcomes (employment rate) of ITS graduates.[36] The lowest coherence in internships is in the *Efficienza Energetica* area. This is also the area showing the lowest employment

rate (51%), well below the average of 72% for all ITS. The area of *Mobilitá Sostenibile* shows the highest share of coherent internships as well as the second highest employment rate (76%) after that of *Nuove Tecnologie della vita* (84%), areas where, however, the coherence of internships remains relatively low (29%).

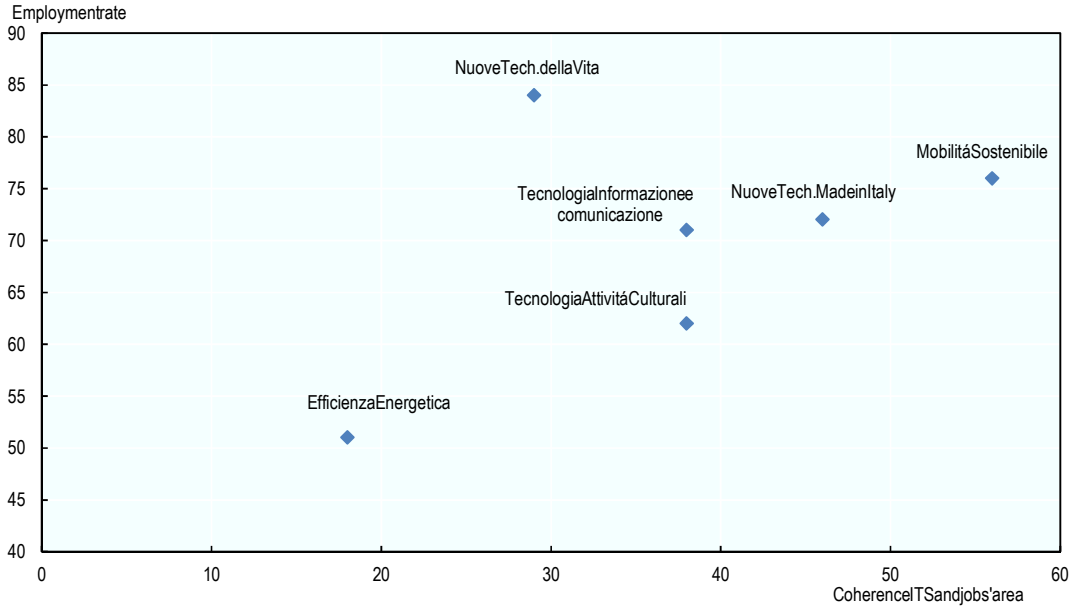
Box 4.8. Coherent or incoherent internships?

The incoherence between the NACE code and the internship has been used as an indicator of the weaknesses of the training programme. This criteria has been challenged by several ITS representatives under the assumption that the NACE classification is outdated and that it does not fully reflect the complexity of the Italian productive system today. The argument is that, in many instances, the internships proposed in a specific technological area aim to develop transversal skills and they can, therefore, be carried out in firms that do not belong directly to the NACE associated to the specific ITS. Apparently incoherent internships, in the opinion of some ITS commentators, still ensure a coherent and effective training and work-based learning.

Other commentators, however, argued that the matching between fields of studies and some internships can yet be improved in many areas and that some ITS have been created with weak linkages to real firms' needs.

All in all, Italy needs to strengthen its support to ITS by developing more granular criteria for the assessment of the coherence of their internships periods with their underlying ITS technological area. This could be done, perhaps, through the use of an updated classification system whose criteria are recognised by all stakeholders involved. Providing this support is key for two reasons. First, it can help ITS streamline their activities and place students in increasingly better-quality internships programmes, more aligned to the needs of the labour market and to the ITS technological areas. Second, developing an enhanced and more granular set of criteria to measure the alignment of internships paths to the ITS education programmes is important as this can help assess ITS' outcomes and link the funding decisions to robust and shared criteria. The coherence of internships to the NACE is currently used as one of the criteria to allocate funding to ITS.

Figure 4.16. Coherence of ITS internships to programmes' technology area and employment rates

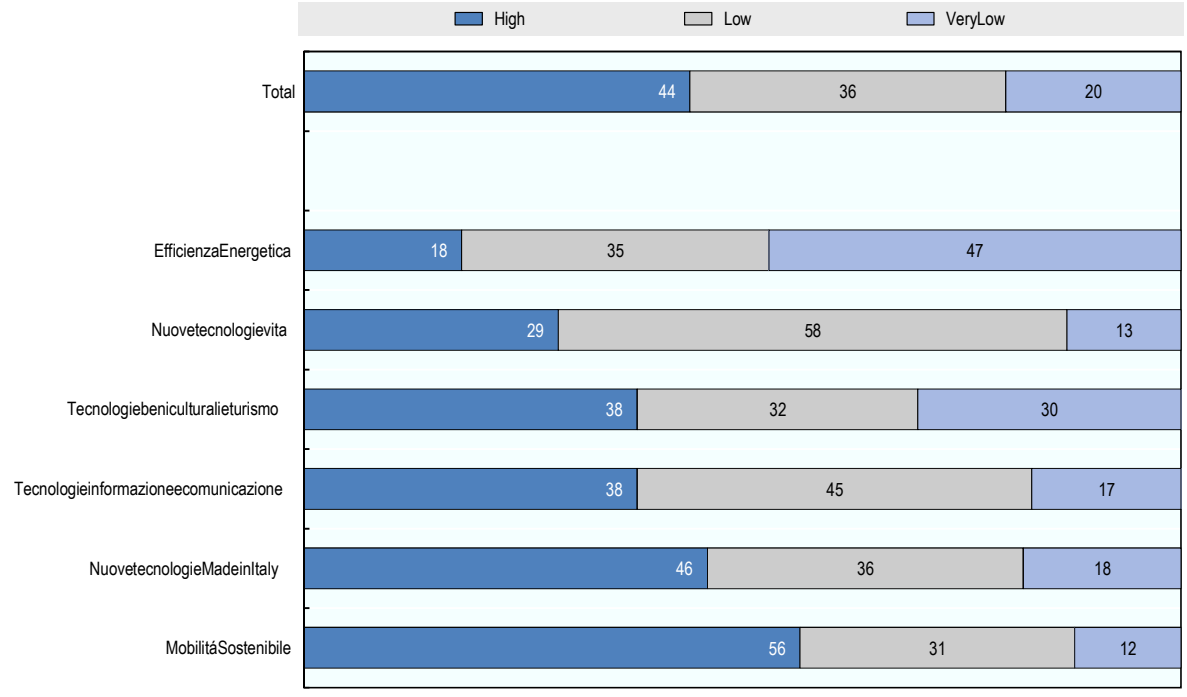


Source: OECD calculations based on INDIRE (2016) and Almalaurea (2016).

…which can potentially affect training and labour market outcomes…

Other dimensions seem to suggest that ITS in certain technological areas do better than others both in terms of the coherence of the training provided and in terms of employability results.[37] Data from Almalaurea (Figure 4.17) show that students in the area of *Efficienza Energetica* declare the lowest match between the skills developed during their ITS studies and those required by their jobs. Graduates from the *Mobilita Sostenibile* area, instead, report the highest match between skills developed in ITS and those used in their job one year after graduation.

Figure 4.17. Coherence between ITS technological area and current job

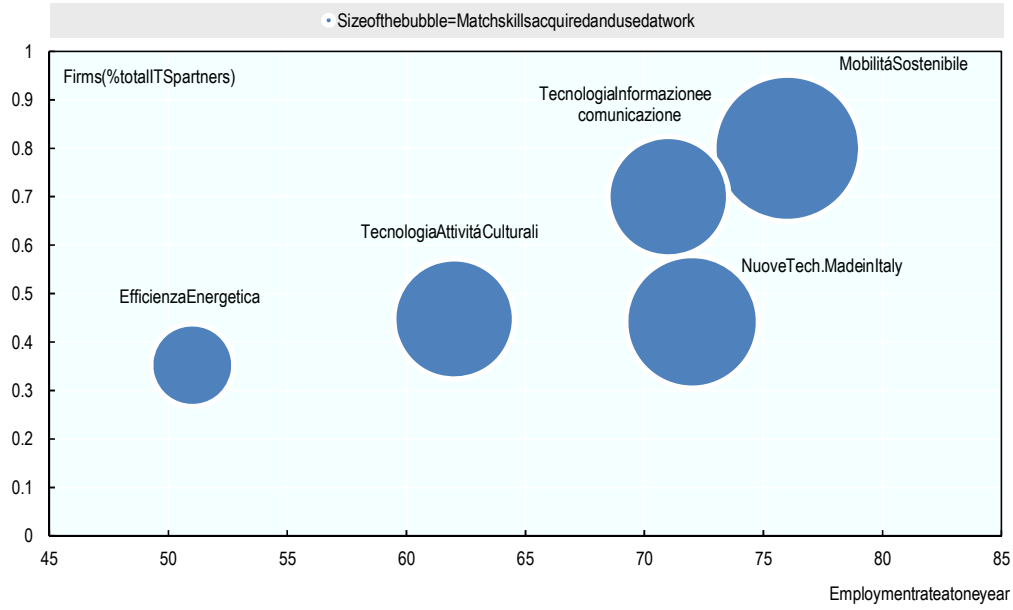


Source: Almalaurea (2016).

One possible reason behind the stronger performance of certain ITS relative to others may be found in their organisational structure and in the number of firms participating to it. INDIRE (2013) collects data on the average number of firms among the founding members of each ITS by technology area.[38]

Preliminary evidence in Figure 4.18 seems to signal that, on average, ITS foundations in areas where the engagement of firms is stronger show a better alignment between the skills of its graduates and those required by their jobs. In addition, those ITS also show brighter labour market outcomes in terms of employment rates.

Figure 4.18. Involvement of firms in ITS structure, employment rates and match between skills acquired and used at work



Source: OECD calculations based on INDIRE (2013) and Almalaurea (2016).

As an example, the area of *Efficienza Energetica* and *Tecnologia and Attivitá Culturali* show a relatively low engagement of firms in the establishment of the ITS (measured by the share of firms over the total ITS partners). These areas also show lower employment rates and a more negative opinion of graduates towards the alignment of the skills they acquired and their usefulness at work.[39] Results seem to suggest, therefore, that increasing the presence of firms among the founding partners of the ITS leads to better outcomes under many key dimensions such as employability skills alignment/use at work and graduates' satisfaction.

Having too many founding partners, however, may create co-ordination issues. The assessment of ITS made by INDIRE (2013) highlights that one of the major weaknesses of ITS foundations lies in their governance structure. The flexibility and responsiveness of the training offer can be hindered, in fact, when agreement on education targets and skill priorities has to be reached within an enlarged board of directors. INDIRE (2013) also points out that bureaucracy is a hurdle to ITS management as foundations typically have a complex legal and administrative status which can, sometimes, even undermine their autonomy. On top of that, as of now, every ITS can develop different funding and accounting strategies.

While a certain degree of flexibility in the management structure of ITS is certainly positive, the absence of a national framework guiding the functioning and structure of ITS foundations can lead to the creation of a fragmented system with varying experiences and capacity at the national level. The Italian Government should, therefore, provide clearer guidance to streamline the normative behind the establishment and functioning of ITS foundations with the aim of ensuring the same efficacy of the foundations across the whole national territory.

ITS are too small and concentrated in certain geographical areas: Visibility remains an issue

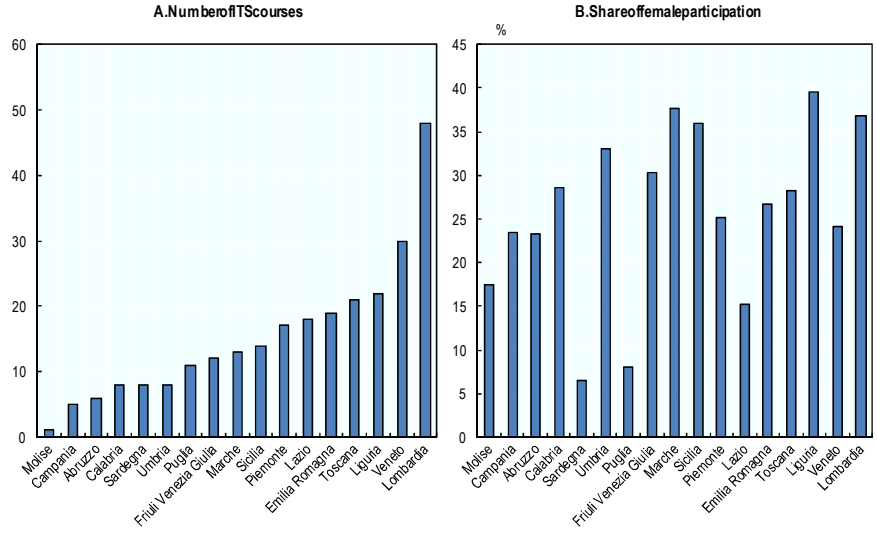
ITS represent an extremely interesting innovation in the Italian TVET panorama but they are, as of now, a small reality. Too few students enrol in ITS each year and the number of graduates that ITS are able to produce is not sufficient to fill the skill gaps that Italian employers are facing in specific technical areas. ITS are also an experience that is geographically concentrated in Italy's most industrialised regions.

The geographical concentration of ITS foundations is not surprising and it is directly related to the well-known North-South economic divide. Commentators highlighted that it will be difficult for ITS to grow in number (while keeping their efficacy and nature) as the Italian productive fabric (mostly small enterprises) is not fertile to such experiences everywhere across the national territory. That being said, the new industrial reform *Industria 4.0* (see Chapter 5) could potentially unlock the productive potential of southern regions and spur both economic convergence and stronger skill demand to be filled through the creation of new ITS also in economically lagging regions.

Challenges remain in increasing the status and visibility of ITS however. Around 59.2% of ITS students have completed a technical upper-secondary degree with final marks that are slightly above the average of their peer students in technical institutes but yet largely below those of students from *licei* who then continue to university. Needless to say, students proceeding from *licei* or with a university background are extremely rare among those who choose ITS.[40] Women's participation is also extremely low (Figure 4.19). This disappointing result is related to the cultural and social stigma towards technical training which is especially strong among women. Drop-out rates are also considerable (22.3%). Against this backdrop, the MIUR has recently decided to increase the resources to ITS and to allocate part of such increase to strengthen national campaigns to increase their attractiveness among students.

Figure 4.19. The offer of ITS courses remains concentrated in most industrialised regions with low female participation

Year 2016



Source: Banca dati ITS, INDIRE, MIUR.

Lauree Professionalizzanti to fill the gaps?

As mentioned, ITS are a small reality in the Italian education panorama and, taken alone, these will not able to fill the skill needs of Italian firms in several key technical areas. While some commentators argue that ITS should be accompanied by other education programmes of similar nature, the challenge is that of providing new options in the tertiary education landscape that can effectively bridge between education and labour market needs.

The *Lauree Professionalizzanti* (tertiary degree programmes designed by universities with a strong work-based component[41]) have been recently proposed by the government[42] as a possible solution to fill the skill needs of employers in different areas where skill shortages have emerged.

Striking a good balance between the need to support the development of ITS and that of strengthening the education system with a more varied TVET offer at the tertiary level is a complex task. Some commentators suggest that universities and ITS should work more closely together and that the former could redirect students that are not performing well to ITS to provide them a second chance. This strategy poses major co-ordination challenges and it is likely to lead to a potentially negative perception towards ITS. Both aspects are undesirable.

Other critics of the *Lauree Professionalizzanti* argue that their implementation will likely repeat the unsuccessful experience of the so called "*specialistic degrees*" (*Lauree Magistrali* 3+2) and, on top of that, that the new offer at the tertiary level will also distort the incentives to enrol in ITS. There are reasons to believe that the *Lauree Professionalizzanti* may not achieve their challenging objective especially if a strong bound between university and firms – stronger than the one experienced in the past – is not established effectively.

The success of this experiment, in fact, calls for the creation of strong links between universities and employers from the very beginning. While much needed, these linkages have emerged only in sporadic cases so far. Among the reasons of past failures, the lack of dialogue between tertiary education institutions and the world of work and the difficulties of integrating technical and professional programmes into tertiary academic programmes, these latter usually favouring theory over practical and hands-on teaching and learning.

Monitoring the creation of linkages between universities and firms will be key to assess the success of the *Lauree Professionalizzanti*. As it stands now, the decree that establishes the creation of these tertiary programmes foresees the accreditation only to those institutes for which 80% of graduates will be employed one year after graduation. The decree, however, does not clearly identify the strategy and tools through which the complex collaboration between universities and firms should be initiated and strengthened.

Italy needs younger teachers with up to date skills and stronger knowledge of the labour market

Other, more general, challenges relate also to the disconnect between university teaching staff and the world of work as only few university teachers have up to date technical and professional experience. Achieving the goal of increasing the ties between education providers and the world of work requires rethinking the functioning

of the Italian education system from primary to the tertiary level. Much needs to be done, for instance, to upskill Italian teaching professionals at all level so that these can be able to meet the challenges of the future of work.

The *Buona Scuola* reform has recently put efforts to potentiate schools and to increase investments in training for teachers and school principals. Substantial challenges remain, however. Teachers in Italy are old and much older than in other OECD and EU countries (Table 4.4).

Table 4.4. Teachers' average age by education programme in Italy

	Sex	Primary education (ISCED2011 level 1)	Total secondary education (ISCED2011 levels 2 and	Total tertiary education (ISCED2011 levels 5 to 8)	Upper secondary general education (ISCED2011 level 3 programme 4)	Upper secondary vocational education (ISCED2011 level 3 programme 5)
Less than 30	Total	0.5	0.3	1	0.2	0.2
	Women	0.5	0.2	1.4	0.1	0.2
	Men	0.7	0.6	0.8	0.3	0.2
Less than 40	Total	9.6	8.9	16.2	6	7.6
	Women	9.5	9	19.7	6	8.3
	Men	11.6	8.4	14.1	5.8	6.4
30 to 39 years	Total	9	8.5	15.2	5.8	7.4
	Women	9	8.8	18.2	5.9	8.1
	Men	10.9	7.9	13.3	5.5	6.2
40 to 49 years	Total	32.5	26.3	30.2	25.1	23.2
	Women	32.7	28.2	34.3	26.7	25.3
	Men	29.2	21.3	27.8	20.6	19.6
50 to 59 years	Total	41.9	45.5	30.2	51	50.7
	Women	42.1	44.7	29.1	51	50.4
	Men	36.8	47.4	30.8	51	51.2
60 and over	Total	16	19.4	23.4	18	18.5
	Women	15.7	18.1	17	16.3	16
	Men	22.5	22.9	27.3	22.5	22.8

Source: OECD.stat.

Only 10% of teachers in primary education are aged 40 or less. Around 9% and about 16% in secondary and tertiary education respectively are also less than 40 years old. Numbers in upper-secondary education are even lower, with more than half of the teachers being in between 50 and 59 years old. The relatively old age of teachers represents challenge as these may lag behind the fast developments of new technologies and of labour market needs. In addition, in Italy, the large share of relatively old teachers discourages youth to become teachers as their career progression and wages are not attractive.

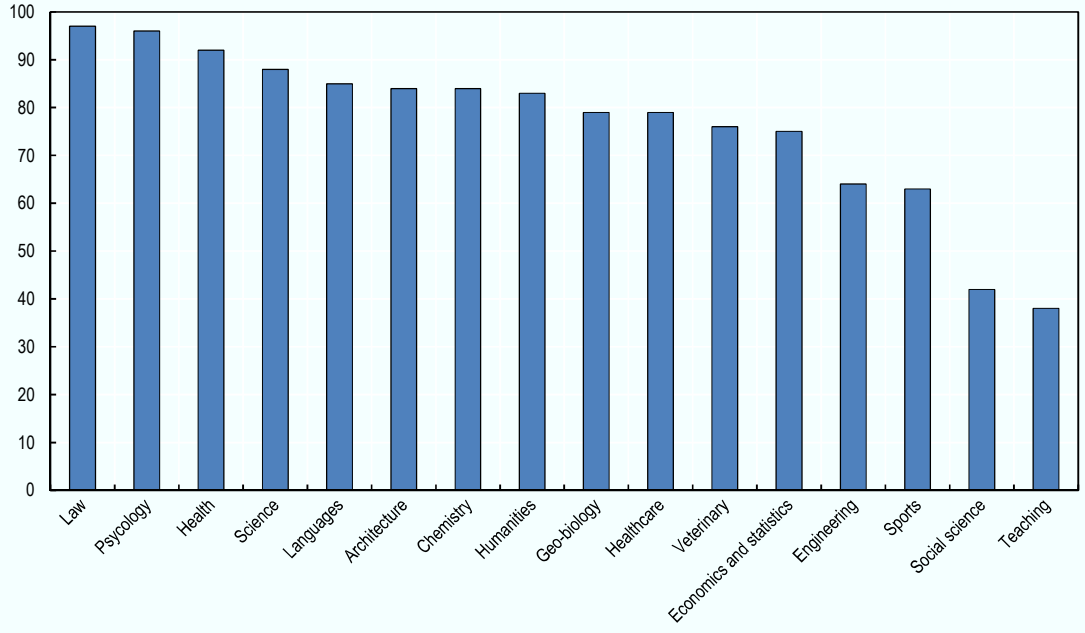
Data from Almadiploma (2016) show that up to 62% of upper-secondary students enrolling in tertiary education in the teaching field of study are not happy with their choice (see Box 4.9).

Much of the negative perception of young Italians towards careers in teaching professions may be linked to the fact that graduates working in the education sector end up in workplaces that are not innovative (Figure 4.21) or stimulating.

Box 4.9. Teachers: Satisfied with your field of study?

Interestingly, dissatisfaction towards the choice of field of study in the teaching area does not seem to be directly related to its poorer labour market outcomes (which is similar to that of other field of studies) but, possibly, to a more complex set of reasons. Students enrolling in the area of Law or Psychology face similar labour market prospects than those in the Teaching area but, differently from this latter, the satisfaction for their choice is relatively high. Weak career progression, low wages and poorly innovative workplaces may be at the core of such discontent.

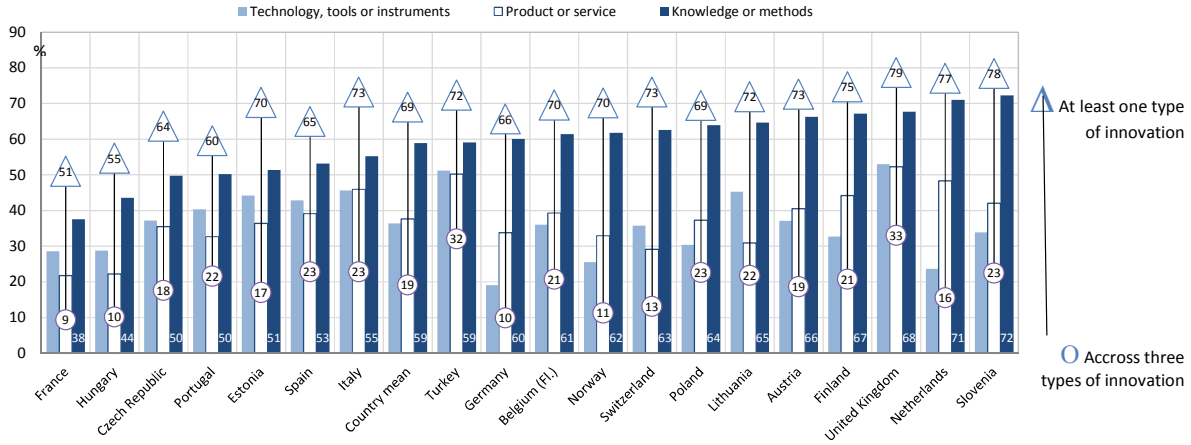
Figure 4.20. Share of upper-secondary students satisfied with their choice of fields of study in tertiary education



Source: Almadiploma (2016)

Figure 4.21. Education professionals in highly innovative workplaces, by innovation type and country

Percentage of graduates working in the education sector who perceive their workplace as highly innovative, 2005 or 2008



Note: Data are ranked in ascending order of the percentage of graduates who perceive their workplace in education sector to be highly innovative for knowledge or methods innovation.

Hungary, Lithuania, Poland, Slovenia and Turkey refer to HEGESCO (2008). Austria, Belgium (Flemish Community), the Czech Republic, Estonia, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Switzerland and the United Kingdom refer to REFLEX (2005).

Source: Figures 1.3, 1.5 and 1.7 from OECD (2014), *Measuring Innovation in Education: A New Perspective*, Educational Research and Innovation, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264215696-en.

Low wages and issues related to the geographical mobility of teachers remain among the well-known and long-standing problems of the Italian education system. Around eight out ten teachers in Italy have been trained (and reside) in the south of the country (*Mezzogiorno*). However, only a third of the available vacancies in the education sector was advertised in that area of the country in 2016. Wages paid to teachers do not adjust for such geographical imbalances and incentives for teachers living in the South to move to the North are very thin. This creates dissatisfaction which has, in many cases, resulted in strong teachers' protests against the reforms trying to relocate teaching staff from the south to the north of the country.

All in all, the imbalances of teaching professionals at the regional level contribute to perpetuate the skill divide between the north and the south of the country. A better designed set of incentives, stronger career progression and wages can boost the attractiveness of the profession and provide teachers with adequate incentives for mobility.

Notes

1. Projections in the 2015 National Reform Programme suggest that, of all the ongoing reforms in Italy, the school reform is likely to have the largest positive impact on GDP in the long-term (Ministero dell'Economia e delle Finanze, 2015, pp. 110-111), reaching an increase of 2.6% of GDP (OECD, 2017a).
2. Internships in these institutes have been already in place for a long time.
3. See "Attivitá di Alternanza Scuola Lavoro: Guida Operativa per la Scuola", MIUR.
4. The guidelines suggest to consider reports from ISFOL, ALMALAUREA and others from, for instance, UNIONCAMERE and Excelsior.
5. Some commentators also argue that the recent selection process that led to the hiring of a substantial number of teachers within the Buona Scuola reform has culpably neglected to assess some of those teachers on, among other criteria, their knowledge of the labour market dynamics which would have proven to be essential for the implementation of the Buona Scuola itself.
6. The guidelines to the implementation of the ASL reform also mention that the work-based learning activities should be based both on students' aspirations and labour market analysis of firms' skill needs.
7. For a definition of SAA exercises see OECD (2016).
8. These are networks of public and private local stakeholders.
9. See MIUR, http://www.istruzione.it/alternanza/formazione_docenti.shtml.
10. In the initial phases of the implementation of the ASL reform, Italian firms have been required to pay a fee of EUR 150 to enrol in the national registry of the ASL. The fee has now been dropped.
11. http://scuolalavoro.registroimprese.it/rasl/home.
12. Firms but also social partners interviewed by the OECD secretariat during several meetings in Italy.
13. Mostly within the activities of the school council (*consiglio di classe*). In other contexts such as in Germany, the involvement of firms in such assessment is more profound. Final exams, for instance, are run directly by firms that are also bearing the associated costs.
14. Results (not shown) also highlight that students' satisfaction is higher in those institutes where the work-based learning activities are more diffused and better established.
15. Istruzione e formazione professionale A.F. 2014-15.
16. https://servizi.anpal.gov.it/approfondimenti/Pagine/Il-sistema-di-IeFP.aspx.

17. ISFOL (2016) shows, for instance, that the possibility of moving from and to an IeFP without having to take specific exams, by using bridging programmes (passerelle) is unknown by most people.

18. The age of first-level apprentices is between 15 and 25 years and the maximum duration of the contract is three years to obtain a qualification or four for the professional diploma.

19. A similar inverted relationship can be found for professional institutes and *licei*.

20. A similar pattern applies to students coming from advantaged socioeconomic backgrounds with higher income levels who are more likely to enrol in *licei* than in TVET programmes.

21. This hinders also their possibility to progress into further education at the tertiary level.

22. http://eduscopio.it/.

23. Those who have worked for more than six months in two years. https://eduscopio.it/dati-e-metodologia.

24. The sample refers to graduates interviewed one year after completion of their thee-year first level degree (*laurea di primo livello*) in Panel A and to graduates of the 3+2 specialistic (*Magistrale*) in Panel B degree who have been or are currently employed after graduation.

25. Usefulness is defined as both the importance of the specific degree to find a job and the use given to the skills acquired during education in the actual job.

26. First level three-year tertiary degree.

27. The classification of fields of study used by Almalaurea is slightly different from the one in the OECD Survey of Adults Skills.

28. Searching for a new job while employed is one indicator of low job satisfaction as well as of potential mismatch.

29. Results are correlation and should not be interpreted as referring to a direct causation between time spent looking for a job and the willingness to look for another job. However, data seem to point to a strong positive association between the two dimensions.

30. Probably due to the resistances of graduates to accept low-quality jobs.

31. The foresight effort done on Emilia Romagna's labour market heavily involved the firms in the territory with the objective of identifying skills priorities and how the introduction of new technologies would/could impact the productive structure of the region and skill needs altogether.

32. ATECO in Italian. The need of establishing coherent internships is established by the MIUR-MLPS decree, 7 September 2011.

33. INDIRE is the institute that assesses the performance of ITS under several aspects and that manages funds allocation to ITS.

34. Data on this issue are scarce and results should be taken with caution.

35. Share of coherent internships established in each technological area.

36. This is measured at one year from the completion of the ITS programme.

37. Data are scarce and results should be taken with caution.

38. Institutions other than firms can be founding members of the ITS foundation

39. Not surprisingly, these are also the areas where the overall satisfaction of students is lower as shown by Almalaurea (2016).

40. Some 35% of ITS students has been employed in the past but is unemployed at the moment of enrolling in ITS. This signals the fact that ITS may be used as a form or retraining or up-skilling by unemployed and that this can potentially play an important role in aligning the skills of the unemployed to labour market needs.

41. The *Lauree professionalizzanti* are foreseen to be three-year programmes where one year will be devoted to traditional university programmes and the remaining 2 years will be devoted to technical studies (in labs) and to work-based learning in firms.

42. A recent decree signed by the new Italian Government on the 12 December 2016 established the *lauree professionalizzanti* as a pilot project for the year 2017.

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Chapter 5

Industria 4.0: Tackling weak skill demand and poor skill use in Italy

This chapter discusses the recent set of measures that goes under the name of Industria 4.0 and how this has the potential to boost the demand for skills in Italy by helping the country to transit to the use of new digital technologies and innovative production strategies. The chapter discusses how technical and soft skills will become increasingly important in the adoption of these new technologies. The chapter also discusses the importance of lifelong learning to ensure that workers of all ages are part of the digital revolution and contribute meaningfully to Italy's growth.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The increase in data availability (e.g. big data) that has been triggered by the dramatic expansion in the use of new digital interfaces and by the increase in computational power poses challenges to countries and workers as to how to adopt and adapt to these technological changes. These mega-trends, however, represent an enormous chance to reshape and upgrade economies' productive systems and to rethink the associated skills of a country so as to become more competitive, productive and enjoy higher living standards.

Italy, more than other countries across the OECD, is likely to struggle to adjust to these technological changes as the skills of its workforce will need to go through a substantial transformation. Albeit difficult, this transition can also lead to great rewards.

The Italian Government has recently introduced a set of ambitious industrial measures with the objective of igniting a radical shift of the Italian productive system towards the use of new and high value-added technologies. The set of reforms goes under the name of *Industria 4.0* (I4.0), recalling the terms used to identify the digital revolution that is taking place across many developed economies (Box 5.1) and that is radically changing their manufacturing sectors.

Box 5.1. A revolution 4.0

The terms "Industry 4.0" are used to define the recent phase in the digitisation of the manufacturing sector, driven by four disruptions: the rise in data volumes, the increase in computational power and connectivity, especially new low-power wide-area networks; the emergence of analytics and business-intelligence capabilities; new forms of human-machine interaction such as touch interfaces and augmented-reality systems; and improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D printing. The four trends are not the reason for the "4.0," however. Rather, this is the fourth major upheaval in modern manufacturing, following the lean revolution of the 1970s, the outsourcing phenomenon of the 1990s, and the automation that took off in the 2000s.

Source: Mckinsey, http://www.mckinsey.com/business-functions/operations/our-insights/manufacturings-next-act Manufacturing's next act.

Big Data Analytics, Cloud Computing, Industrial Internet, Additive and Advanced Manufacturing (i.e. 3D printing and interconnected robots) are among some of new technologies that the I4.0 measures aim to stimulate through a mix of public and private investments in new infrastructures, R&D initiatives and programmes to upskill the Italian workforce. The skill component of the I4.0 measures is, therefore, pivotal for its implementation and success. Several challenges lie ahead, however, and these are discussed below.

Distance from technology frontier, firm size and lack of product diversification help explain the Italian sluggish skill demand...

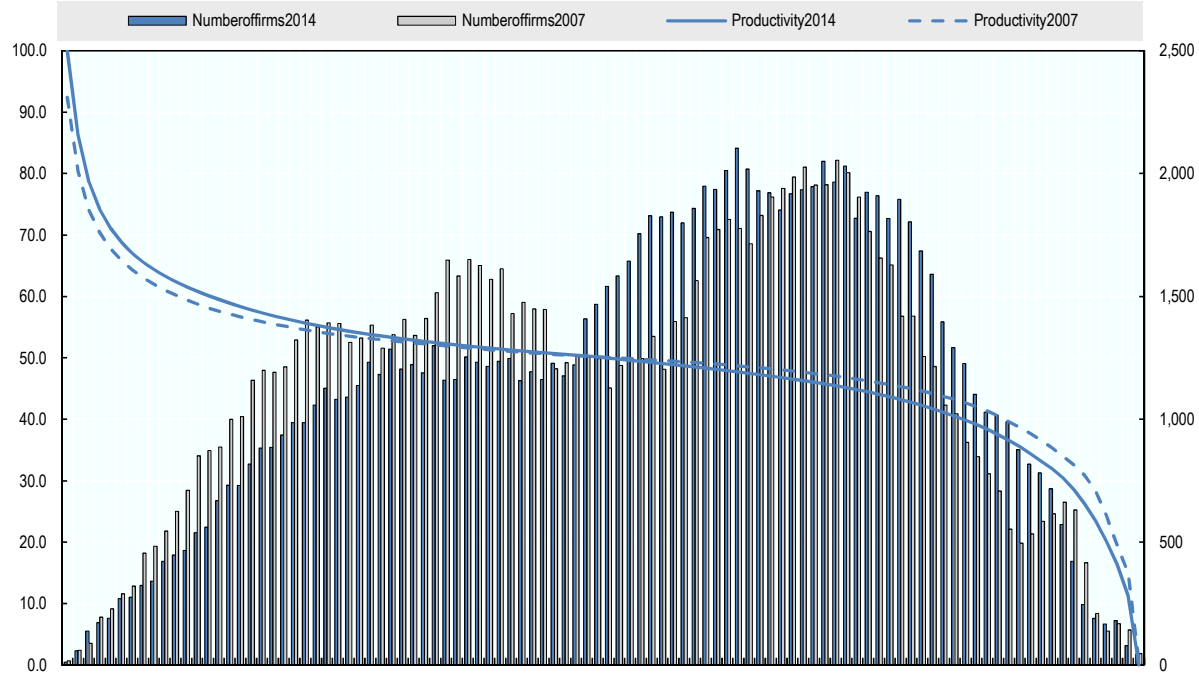
The complexity of the challenges facing the implementation of the I4.0 measures revolves around (at least) two intertwined aspects; the distance of the Italian productive system from the so-called "*technology frontier*" (e.g. the extent of the Italian technology gap) and the weaknesses of its workforce's skills (e.g. how "skill-ready" Italian workers and managers are to switch to I4.0 technologies).

While the analysis of the multiple reasons behind the long-standing Italian *productivity puzzle* is beyond the scope of this review, the relationship between firms' size and productivity assumes particular relevance to explain the skills challenges that Italy will have to face when implementing the I4.0 measures.

Recent evidence from *Confindustria* (2016) shows that the low level of Italian aggregate productivity is the reflection of the high variability in the performance of large and small firms. A polarised picture emerges when analysing Italian productivity: some (few and relatively large) firms are highly productive while others (many and relatively small firms) show extremely low productivity levels.[1] Empirical evidence (Figure 5.1) suggests that the productivity gap between large and small Italian firms has increased in between 2007 and 2014 and that fewer larger firms are now converging towards the world "technology frontier" (e.g. the highest productivity levels experienced in other countries). An increasing number of smaller Italian firms, instead, is unable to absorb innovations developed elsewhere and, as a consequence of it, they show extremely low productivity levels.

Figure 5.1. Productivity in manufacturing sector by centiles, 2014 and 2007

Distribution of labour productivity in descending order (percentiles)
Left axis: productivity, right axis: number of firms in each percentile



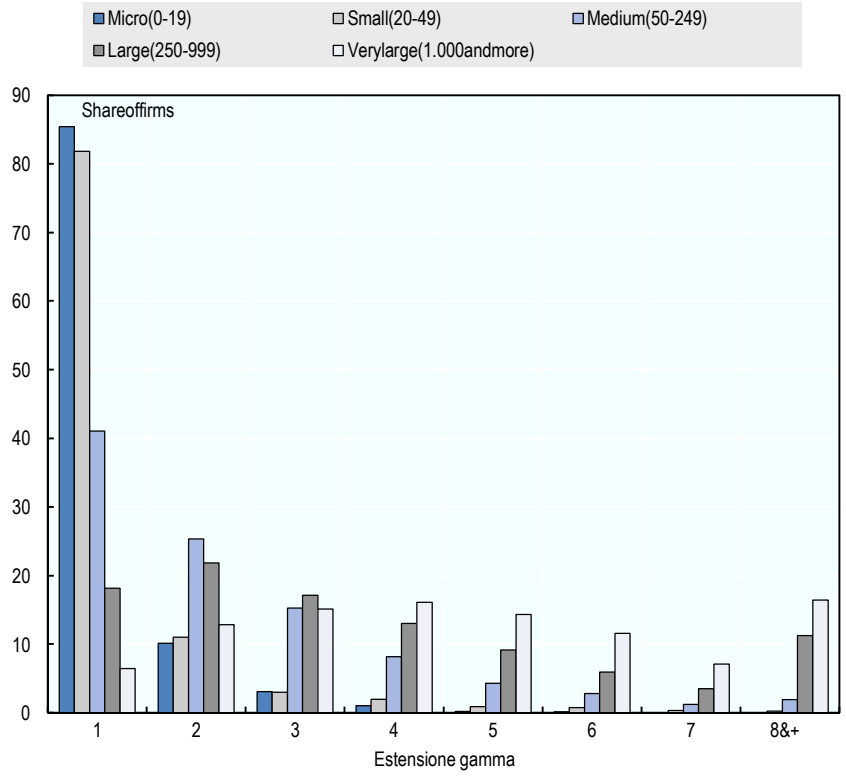
Source: Centro Studi Confindustria on data of Bureau Van Dijck.

Evidence from *Confindustria* (2016) also suggests the existence of a threefold relationship between i) product diversification (e.g. the number of different products produced by each firm), ii) firm size and iii) the extent and quality of skills demand in Italy.

In 2013, 65.4% of Italian firms was specialised in the production of one single good, 15.4% in that of two and only 7.6% in three different products. The number of

firms showing a more diversified production pattern (e.g. producing ten or more different goods) was only 0.8%. Figure 5.2 shows that product diversification is strongly correlated to firm size (and so to productivity levels). Some 85% of small Italian firms (e.g. those with less than 20 employees) produced only one good in 2013, no firms of that size produced more than five different products. Conversely, only 6% of large firms produced only one good and around 16% produced more than eight different products.[2]

Figure 5.2. Firms size and product diversification in Italy



Source: Centro Studi Confindustria.

Being small is, therefore, associated to a less diversified and innovative production. This, in turn, leads to a weaker demand for skills. Data from Excelsior (2016) show that, on average across all sectors in Italy, around 30% of firms that are developing new products or services will also recruit new workers in the coming year. The share of firms recruiting new workers decreases substantially (14.4%), instead, among those that are not developing new products[3] and that remain anchored to their traditional productive patterns.

The reasons for recruiting new workers (and to attract human capital and skills) are, therefore, very different between large and small firms. Table 5.1 shows that large and more productive/innovative firms tend to recruit new human capital mostly due to the expansion of the enterprise and, crucially, to develop new products and services which will require a highly skilled workforce for the firm to compete in larger international markets.

Some 36.3% of small firms (less than ten employees) that plan to recruit in the coming year will do so, instead, due to an increase in the demand for their goods. Expansion, internationalisation and development of new goods and services are only seldom the reason to hire new workers for the many small Italian firms.

It is evident that both i) the skill needs of large and small firms i) and the reasons to recruit are, therefore, radically different. A set of few/large/innovative Italian firms seeks workers with high/technical skills to reinforce their position in global and international markets. Smaller firms, instead, react to upward (or downward) swings in the demand for their goods. In good times, this means hiring workers, but in bad times the recruitment and skill needs may cease.

The fact that the skill needs of small firms depend on short-term cyclical demands may also lead them to invest less in the development of the skills of their workforce, as this tends to be recruited to fill immediate labour gaps rather than to pursue a strategic vision for the future. The different reasons to recruit across large and small firms can also help explain the different "quality" of skills that firms seek in the labour market. Larger firms are usually after technical and high skills to develop new and more technologically advanced products while the needs of small firms are driven by production in traditional sectors and, therefore, less skill demanding.

Table 5.1. Recruiting and its reasons across firms in Italy by firm size

Firm size	Foresee hiring	Growing demand	Firm expansion	Internalisation of jobs	Development of new products	Replacement of workers in retirement	Seasonal activities	Other
1-9	11.0	36.3	3.9	1.9	3.4	22.6	20.2	15.7
10-49	29.9	34.1	4.5	3	3.4	31.7	15.3	16
50-249	65.1	26.8	8.7	6.4	5.6	44.5	14.5	24.2
250-499	91.2	15.4	18.8	12.3	9.6	61.8	23.8	21.5
500+	97	9.5	19.1	10.4	11.1	70.3	27.7	22.9

Source: Excelsior: La domanda di professioni e di formazione delle imprese italiane (2015).

It is interesting to notice that a similar pattern can be observed when analysing the propensity to recruit across geographical areas in Italy and the associated reasons (Table 5.2). Firms in the more productive and technologically advanced Northern regions foresee to recruit more workers than do firms operating in other areas of the country. The development of new goods and services are, again, among the most important reasons for firms in the North to hire new workers. Swings in the demand for goods are, instead, driving recruiting needs of the more traditional firms in the Centre and South/Islands regions.

Table 5.2. Recruiting and its reasons across firms in Italy by geographical area

Firm size	Foresee hiring	Growing demand	Firm expansion	Internalisation of jobs	Development of new products	Replacement of workers in retirement	Seasonal activities	Others
Nord Ovest	16.3	28.9	6.3	4.4	4.9	37.9	16.1	18.6
Nord Est	18.5	29.7	6.2	3.8	4.6	36	19.7	16.4
Centro	15.7	31.6	6.4	3.4	4.4	31.9	19.6	17.5
Sud e Isole	15.6	37.5	5.9	3	3.9	22.7	21.6	17.2

Source: Excelsior: La domanda di professioni e di formazione delle imprese italiane (2015).

The polarisation observed between, on the one hand, few/large/innovative and skill-intensive firms (operating mostly in the north of the country) and the many/small/traditional and skill non-intensive firms in the south of Italy can help make sense of the evidence for which a large supply of low-skilled workers can coexist with large shares of over-skilled workers and, at the same time, with large shares of under-skilled workers and shortages in certain sectors.

On the one hand, the large share of under-skilled workers[4] and the emergence of skill shortages are the reflection of the skill needs and demands of big and productive firms that the Italian workforce (being generally low-skilled) is not able to fill. On the other hand, the large shares of over-qualified workers emerge as the result of the weak demand for skills coming from the many small and traditional firms for which even the low-skills of the Italian workforce results to be eventually in excess.

All in all, it appears that the skills of the Italian workforce are *trapped* at a level which is too low to satisfy the demands of large firms, but too high relative to the weak demand of small ones.

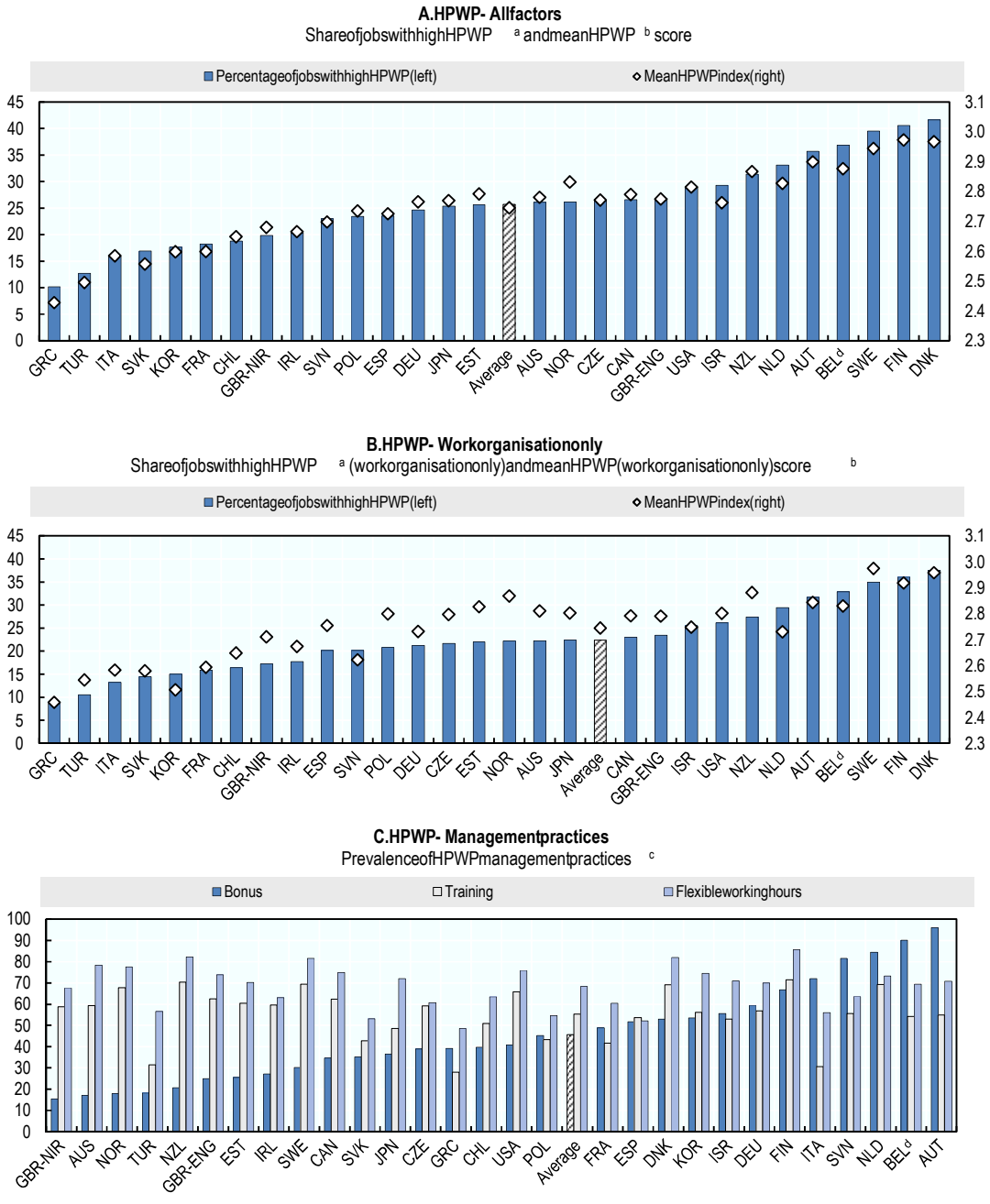
…but I4.0 can ignite a virtuous circle if managerial skills are boosted at all levels

The small size, low productivity and limited product diversification of many Italian firms represent a major challenge to the Italian skill system as this situation is leading to a weak demand for skills in most sectors while creating shortages in few others.

Industria 4.0 can play a pivotal role in boosting the Italian sluggish skill demand by helping smaller firms to become more innovative, connected to the world technology frontier and open to international markets. Achieving this result, however, requires strengthening the entrepreneurial and managerial skills of Italian employers to make them pro-active actors of the digital revolution.

Bandiera, Prat and Sadun (2013) provide empirical evidence for the hypothesis that firms' management structure affects the performance of the firms and that family CEOs seem to weaken it. Weak management practices are a long-standing issue in Italy as the share of family owned and managed firms is very high. Figure 5.3 shows that Italy ranks very low in the share of jobs with high performance workplace practices (HPWP).[5] The use of flexible hours or of training is especially low by international standards and too many workers in Italy end up in jobs where their skills are not used and/or developed effectively. While larger firms show better results in terms of HPWP than smaller ones, work organisation practices in Italy are still extremely low across firms of all sizes (Figure 5.4).

Figure 5.3. High-performance work practices across countries



a) Share of workers in jobs where the summary HPWP is above the top 25th percentile of the pooled distribution.

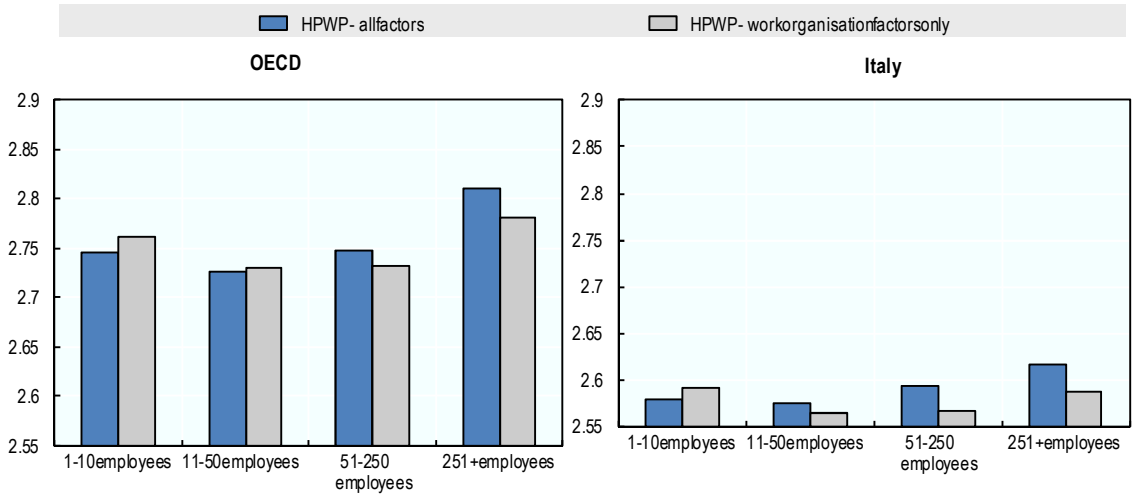
b) Average value, across jobs, of the HPWP index. The HPWP index is a sum scale of all subcomponents shown in Figure 2.9 (Panel A) or summing the scales of the work organisation subcomponents only (Panel B).

c) Share of workers receiving bonuses (bonus), having participated in training over the previous year (training) or enjoying flexibility in working hours (flexible working hours).

d) Data for Belgium corresponds to Flanders.

Source: OECD Survey of Adult Skills (PIAAC), 2012, 2015.

Figure 5.4. High-performance work practices in Italy and OECD by firm size



Source: OECD Survey of Adult Skills (PIAAC), 2012, 2015.

Several commentators, many of them also among employers, acknowledged the fact that Italian "family" managers lack, in many cases, the key skills needed to face the challenges prompted by globalisation and internationalisation (see also OECD, 2017c). This weakness, peculiar to the Italian tradition, contributes to the vicious circle for which Italian firms remain small and concentrated in traditional sectors, making use of low skills and producing (with some notable exceptions) low value-added goods.

Identifying the skill needs of a firm as well as planning the adequate training programmes to meet those needs is one of the main challenges for Italian managers. Managers, especially those in small firms, struggle to identify their own firm-specific skill needs and, while some tools exist to retrain and upskill managers (e.g. *Formazienda*), their use is still limited.

Against this backdrop, *Assolombarda* (the employers' organisation in the Lombardia region) in collaboration with ECOLE (*Enti Confindustriali per l'Education*) recently implemented the pilot programme T.I.M.E (Training Innovation Management Experience). This programme, targeted to SMEs, provided personalised counselling services to SMEs' managers to guide them through the steps that are needed to effectively identify their skill needs and to plan adequate "skill development programmes". The approach is based on the construction of a "*skill needs grid*" where different types of skills and qualifications are inputted based on the observation of the average skill needs of similar firms, sectors and industries. SMEs participating to T.I.M.E then use this generic grid/list to identify their specific needs (and discard others that do not apply to their specific case). Once skill needs are identified, tailored training and upskilling programmes for their workforce are developed.

Advocates of this simple, but effective, approach argue that this could be scaled up at the national level[6] to design a more comprehensive skills-needs grid that will help firms that struggle to express their skill needs, to do so more effectively. Similarly, others argued that this tool (or similar ones) could be used by policy makers to monitor skill demands to implement more coherent policy interventions[7] at the local level.

I4.0 has developed tools to help firms absorb the change and react to low-skills challenges

As mentioned above, many Italian firms lag far behind the technology frontier and the skills of both managers and employees should be boosted if Italy wants to transit towards the use of new I4.0 technologies. Raising awareness (and not only skill proficiency) among employers and employees about the potential economic returns that stem from the use of new technologies is, however, equally important as many Italians are not familiar with the use of new technologies (Box 5.2).

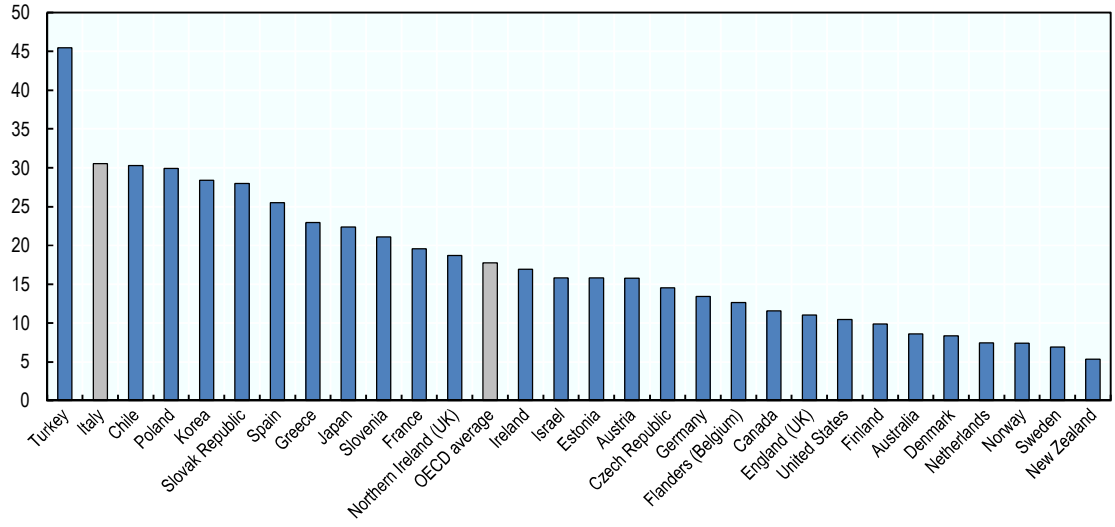
Box 5.2. Information and communication technology (ICT) is not used enough in schools

In 2013, some 31% of lower secondary teachers in Italy reported that they use ICT "frequently", or "in all or nearly all lessons", for project or class work with students – compared to an average of 40% across OECD countries. In 2012, a majority of 15-year-old students (57%) reported that they do not use the Internet at school during a typical school day (the OECD average was 36%). A lack of preparation among Italian teachers may contribute to below-average levels of the use of ICT. Indeed, even if 53% of lower secondary teachers reported in 2013 that they had participated in professional development activities, over the previous year, to improve their ICT skills for teaching, some 36% of teachers – the second-highest proportion among countries participating in the OECD Teaching and Learning International Survey (TALIS) – still reported a high level of need for developing their ICT skills.

Source: OECD (2016*), Education at a Glance: OECD Indicators*.

Much more than in other OECD countries, firms, employers and employees in Italy are, in fact, not familiar with the use of ICT technologies (Figure 5.5). This represents a major impediment to the take-up of the I4.0 measures in the first place.

Figure 5.5. Italian adults lack ICT skills

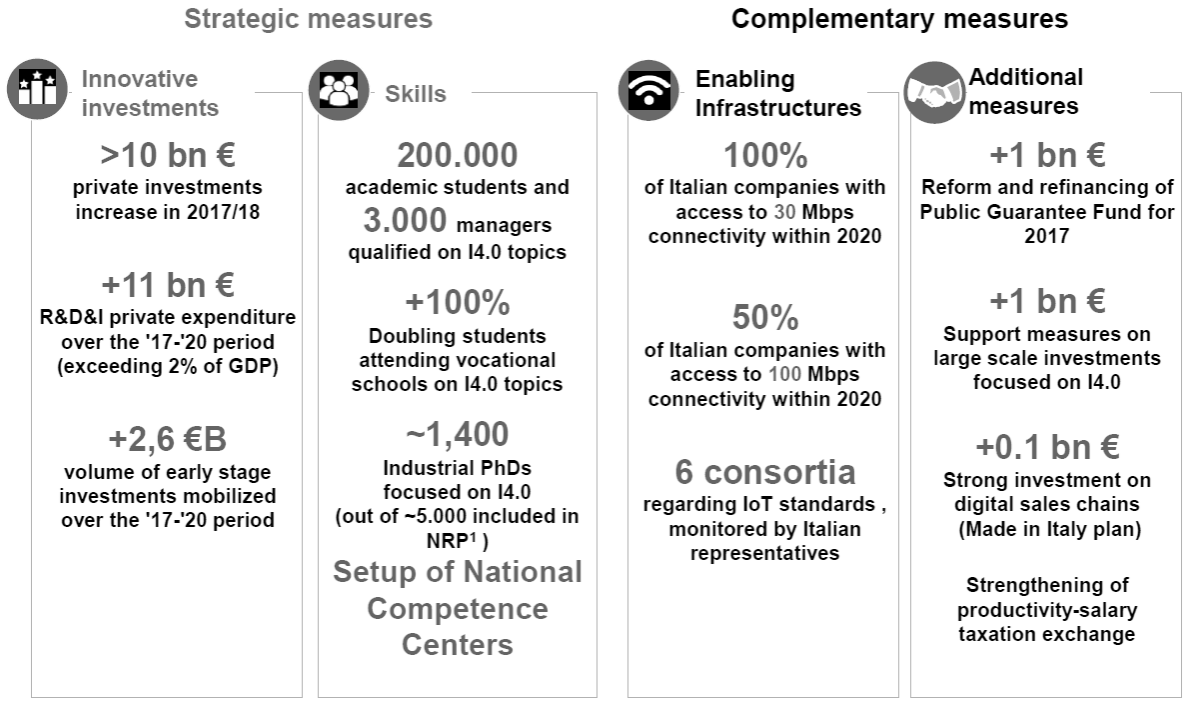


Source: *OECD Skills Outlook 2013*.

The incentive structure behind the I4.0 measures is largely based on the assumption that the combination of i) better information on the potential of new technologies, ii) public investments in developing technology infrastructures (i.e. Digital Innovation

Hubs – DIH, and Competence Centres) and iii) education programmes boosting the ICT skills of the workforce will eventually trigger private investments which will, then, lead to the adoption of the new I4.0 technologies (Figure 5.6).

Figure 5.6. *Industria* 4.0 National Plan: 2017-20 targets



Source: Steering committee *Industria* 4.0.

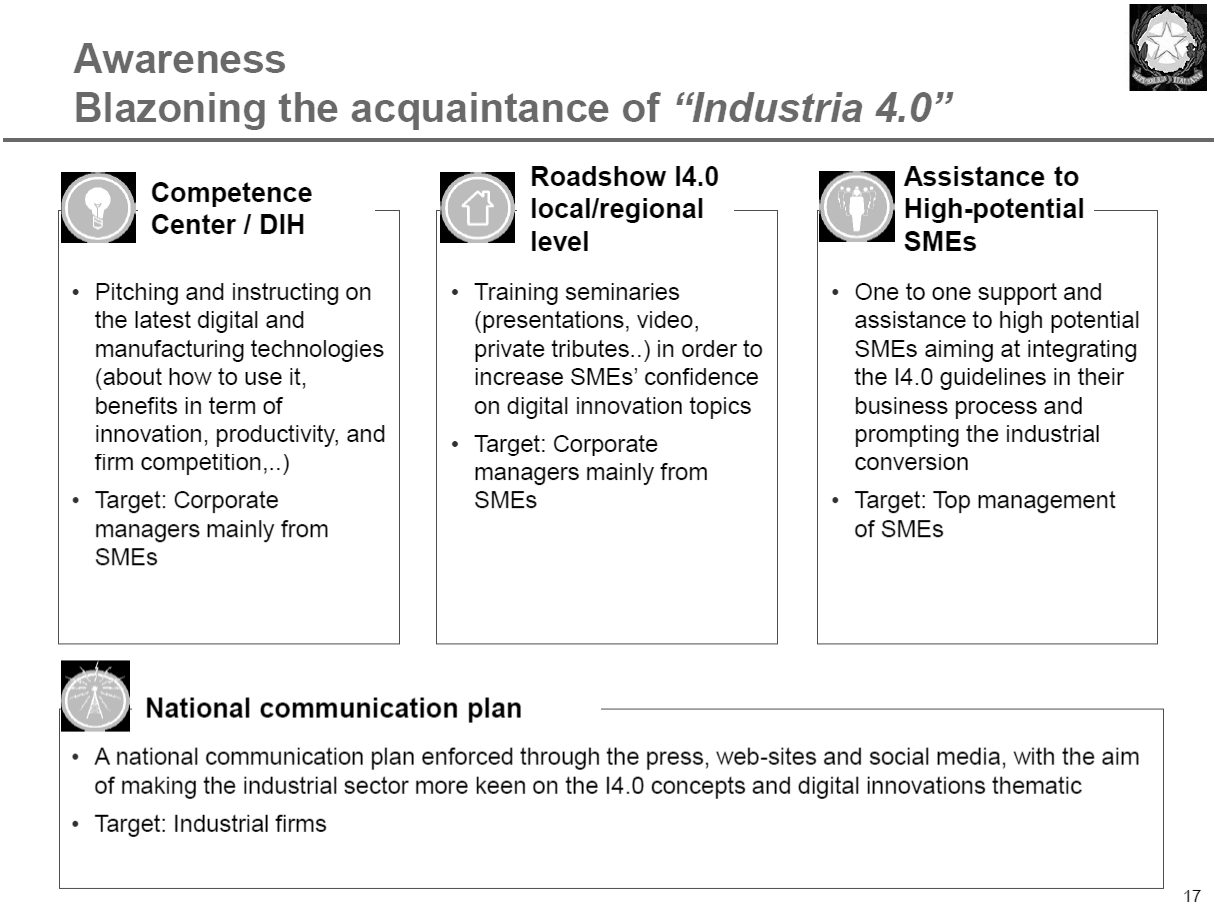
A "hyper and super-depreciation" tax benefit scheme has been designed for firms investing in new tangible assets, devices and technologies enabling companies' transformation to "*Industria* 4.0" standards. Similarly, a tax credit of up to 50% on R&D investments has been designed to encourage private investment in Research and Development for product and process innovation so as to boost the competitiveness of Italian enterprises in the future. In the plans of the government, the tax credit is going to be comprehensive as it applies to all expenditure on basic research, industrial research and experimental development: hiring of highly qualified and technically specialised employees, research agreements with universities, research institutes, enterprises, innovative start-ups and SMEs, depreciation on laboratory equipment and instrumentation, technical know-how and industrial property rights. This financial measure is meant to support innovative enterprises at all stages of their life cycle and to spur the creation of Italy's start-up ecosystem by enhancing firms' business culture, innovation and openness towards international markets.

A recent analysis carried out by the Observatory MECSPE and SENAF[8] suggests that around half of Italian firms foresee to increase investments in technologies I4.0 by around 10% in the coming year. The increase in investments is linked to the new I4.0 incentives planned by the government as well as to the recent improvements of the manufacturing sector more generally. That being said, only half of the firms interviewed by SENAF declare to have a clear vision on how to integrate the

I4.0 technologies in their production streams. Around 30.6% of SMEs contacted by SENAF reported to have invested in technologies related to cybersecurity, 20.7% in robotics, 20.1% mechatronics, 16.5% in cloud-computing technologies and 16.2% in simulation-related technologies. The integration of many of these technologies is perceived to be important by SMEs and 79% of the interviewed believes it can positively affect the optimisation and quality control of production processes. Similarly, half of firms believe that I4.0 technologies will play a key role in the management of real-time supply chain as well as in the remote control of production and in the optimisation of energy consumption.

To spur the buy-in of the set of new measures, the Ministry for Industry and Economic Development (MISE) designed an "Awareness" plan aiming at informing employers (especially those of SMEs) about the use and potential productive returns of new ICT technologies applied to manufacturing. Tailored demonstrations, informative sessions and discussions on the productive-enhancing potential of new technologies are at the core of the plan (see Figure 5.7).

Figure 5.7. The "Awareness" plan to disseminate *Industria 4.0*



Source: Ministry of Economic Development (MISE).

The Awareness Plan provides tailored support not only to small firms but also to top managers of larger enterprises.[9] Other training and awareness activities have been recently launched by several other stakeholders (Box 5.3).

Box 5.3. Check-up Industry 4.0 and Vanguard: Leading by example initiative

The *Associazione per le Piccole e Medie Imprese* (Association for SMEs – API) and SIAM 1838, a well-established TVET provider, recently launched the "check-up Industry 4.0" initiative. This involves building up a team of technology experts and engineers with the aim of contacting firms all over the Italian territory to show the potential uses and the returns of new technologies applied to their local context. The one-day training is targeted to firms that are potentially interested in digitalising part of their production. The training ends with a survey of the firm's skill needs that will help them identify the best way to tackle future skill imbalances and challenges.

In Emilia Romagna, the ASTER consortium for technology transfer and innovation launched the Vanguard Initiative to promote the I4.0 measures through the creation of demonstration plants where employers can easily gauge on the real effectiveness of new technologies applied to production. It has been argued, in fact, that part of the technological gap experienced by small firms is due to the hesitations of small firms to invest in technologies whose economic returns and usability is not clear to the manager.

While demonstration plants can be fundamental in increasing awareness of the returns of different technologies, these plants are relatively expensive, especially when these are designed to satisfy the needs of different types of firms. More funds should be made available to experience similar to Vanguard as they prove to be useful information channels for SMEs to familiarise with I4.0 technologies.

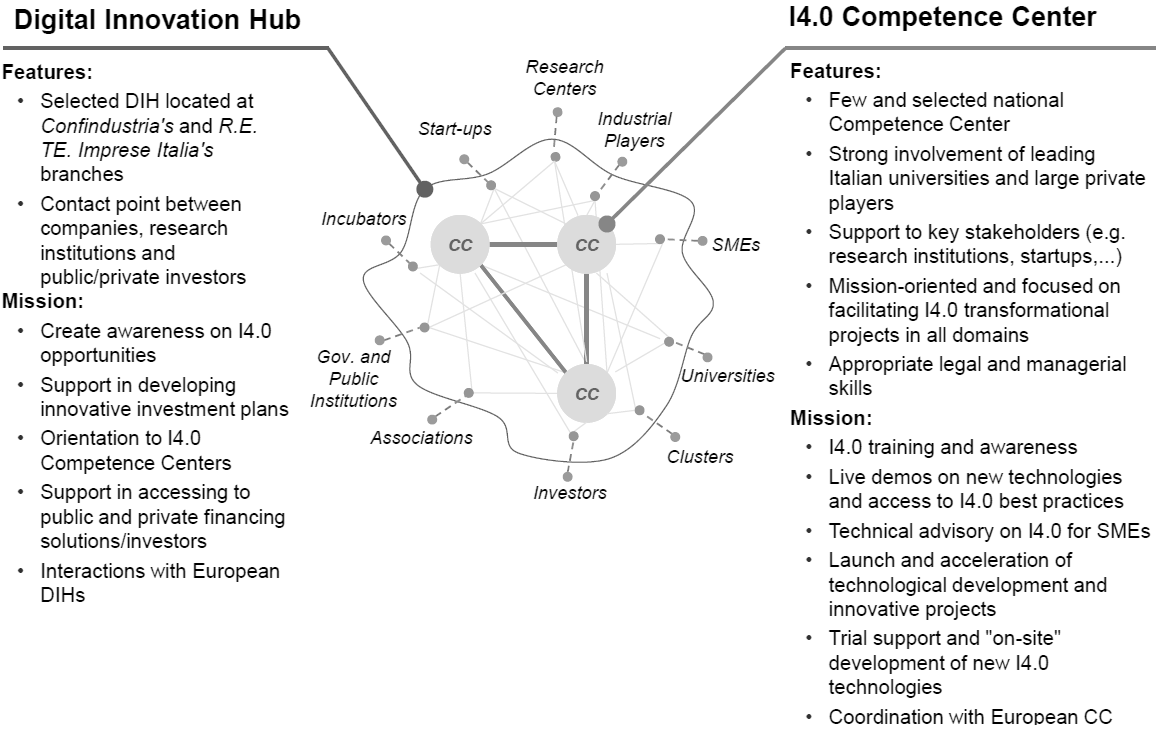
Source: Associazione per le Piccole e Medie Imprese (API), http://www.apmi.it/.

The I4.0 measures foresee the allocation of substantial public investments in technology infrastructures and in the creation of Digital Innovation Hubs and Competence Centres (Figure 5.8). These infrastructures and technology platforms are expected to create a bridge between Italian firms demanding I4.0 skills and the stakeholders (universities, research centres but also schools) that are in charge of creating the supply of workers with technology-intensive skills.

Interestingly, many of the skills that will be key for the successful adoption of the I4.0 measures are expected to materialise as the result of the *Buona Scuola* through the implementation of the *Alternanza Scuola Lavoro* and the *Digital School* reform or the establishment of ITS foundations in key technological areas.

As an example, around EUR 355 million (see Table 5.3) will be invested[10] in the implementation of a National Plan for the Digital School to promote Italian youth's digital skills through work-based learning activities. Many of these activities will be financed through funds allocated to the ASL[11] and are eventually expected to create the supply of skills needed to absorb the I4.0 revolution. Technology laboratories and tailored education programmes will also be financed through funds channelled from the *Buona Scuola* reform. Around EUR 70 million will be, for instance, invested in potentiating ITS foundations that offer programmes aligned to the skills required by the I4.0 measures.[12]

Figure 5.8. Skills: Digital Innovation Hub and I4.0 Competence Center



Source: MISE, MIUR website.

While this shows a very much welcome high degree of policy coherence between the different sets of interventions pursued by the Italian Government, it also poses the fundamental question of whether the implementation challenges to the *Buona Scuola* reform (see above) – if not addressed successfully – will translate into additional hurdles potentially hindering the implementation of the I4.0 measures too. Constant monitoring of the two sets of reforms and support to their simultaneous implementation will be key to extract full returns from the efforts that the Italian Government is putting forward.

Table 5.3. Guidelines for *Industria 4.0* to develop relevant skills

Key directives: Skills
Cumulated investments 2017-2020

Initiatives	Private investment	Public investment
Implementation of the National Plan for the Digital School- Directives *Skills for manufacturing 4.0: creative ateliers, technology courses and laboratories I4.0* *Territorial labs: linkages education-firms, development of digital skills for the Made in Italy* *Digital CVs: development of 25 CV with a digital focus on I4.0 areas* *Computational thinking: development of computational and quantitative skills in the primary* Focus on the Alternanza Scuola-Lavoro on tracks relevant for the I.40	**0**	**355**
Specialised university courses, masters and master executive in areas of the I4.0. Development of partnerships with technology and industrial players Increase in the number of students in ITS in areas connected to I4.0	**30**	**70**
Boost to technological clusters "Smart Enterprise" and "Agrifood" *Linkages with other technological clusters and industrial stakeholders* Boost to PhDs in technologies related to I4.0	**70 approx.**	**170**
Creation of selected Competence Centres at the national level in areas of the I4.0	**100**	**100**
Lifelong learning through the Fondi Interprofessionali	*Budget under approval*	
Total	**200 approx**	**700 approx**

Source: Adapted from the Ministry of Economic Development (MISE).

Adapting to a "hard" revolution requires "soft" skills

Technical skills are certainly crucial to adopt and use new technologies. Boosting their supply will be key for the implementation of the I4.0 measures in Italy. That being said, several commentators argue that the labour market challenges stemming from rapid technological change can be effectively addressed only through a combination of hard and soft/transversal skills. While a commonly agreed definition of soft skills does not exist, they generally encompass skills or character qualities such as leadership, initiative, adaptability and persistence. The growing importance of social skills in the labour market has already been documented in the literature (OECD 2017a). Deming (2015), for instance, shows that in the United States employment growth in jobs with high social skill requirements has been substantial in the last decades. Growth has been particularly strong in jobs that combine high levels of both cognitive and social skills. It is argued by many that technological progress could be a potential explanation for the growing importance of social skills, as social skills cannot (easily) be automated.

Skills that allow to easily switching from one occupation to others (or between tasks within the same occupation) will be increasingly important in the future. *Learning to learn* will be one the crucial characteristics of future workers' skill set as this will help them adopt and adapt to new technologies and face rapid changes in labour market demands.

A recent survey[13] run across four European countries shows that, on average, employers' perception towards the adequacy of young individuals' soft skills is rather negative. Some 48% of the employers indicate that youth lack written communication skills as well as "self-critical" and "conflict management" interpersonal skills. Flexibility, the ability to make a professional introduction or being punctual are among the skills that employers struggle to find in young graduates and, in many cases (46%), the lack of one of these skills results in employers discarding an otherwise suitable candidate for the advertised vacancy.

Italy is not an exception. In the opinion of Italian employers and heads of human resources interviewed by the *Fondazione Agnelli*,[14] most Italian graduates lack adequate soft and transversal skills. As highlighted by Mangano (2014), the heads of human resources of large firms such as Edison, EPTA or Bosch acknowledge that education titles and qualifications are nowadays outdated recruitment criteria and that excellent work performance can only be obtained by a combination of technical and transversal skills.

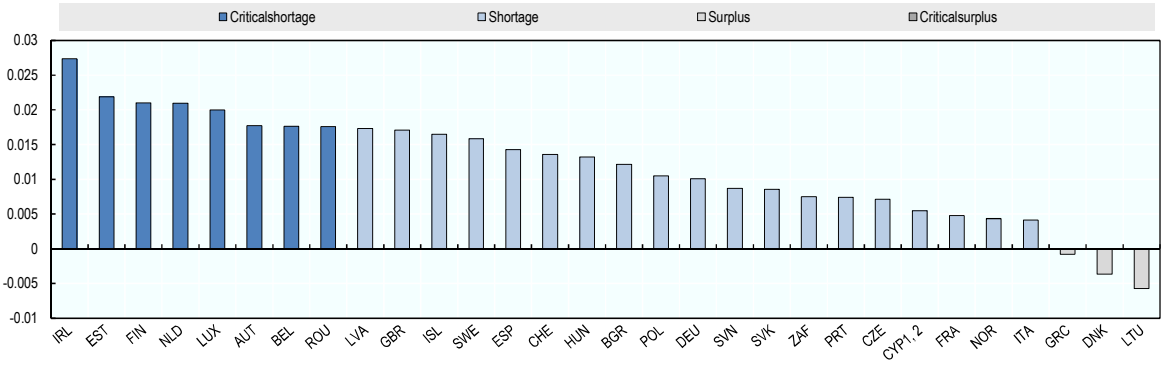
Internationally comparable measures of soft skills are difficult to find. The new *OECD Skills for Jobs Database* provides cross-country evidence on imbalances across several different types of soft skills (Figure 5.9). When compared to other countries, Italy shows small shortages in skills such as adaptability and leadership. More substantial shortages are, instead, found in areas such as that of "persistency" in the face of obstacles and, especially, in the one related to the "attention to details" (e.g. being careful about detail and thorough in completing work tasks).

If soft skills will be increasingly important in the future, one key skill challenge for most countries lies in finding suitable ways to help students develop these skills throughout the period they spend in education. This is, indeed, an extremely complex task as soft skills are, in most cases, developed through interpersonal interaction, social context and personal and work-related experiences.

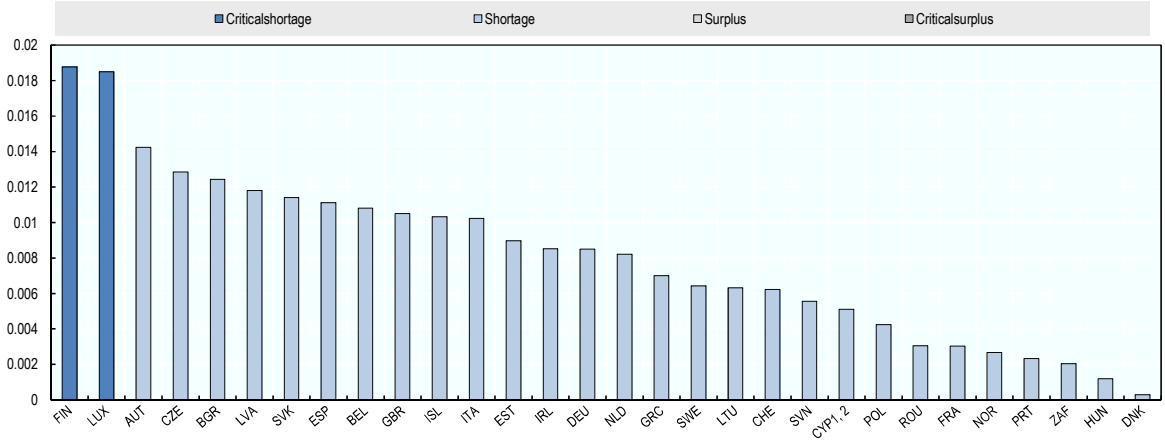
Schools and teachers can play an important role as educators and provide support to students in developing soft skills through innovative teaching methods. The Italian education system seems, however, to be unprepared for this challenge. As an example, Italian school and universities have historically favoured traditional teaching over innovation (Figure 5.10). Several commentators also argue that Italian schools and universities focus too much on delivering strictly disciplinary contents and that soft and transversal skills are, instead, learnt only later at work.

Figure 5.9. Selected imbalances in soft skills

Panel A. Adaptability/Flexibility



Panel B. Attention to details



Panel C. Leadership

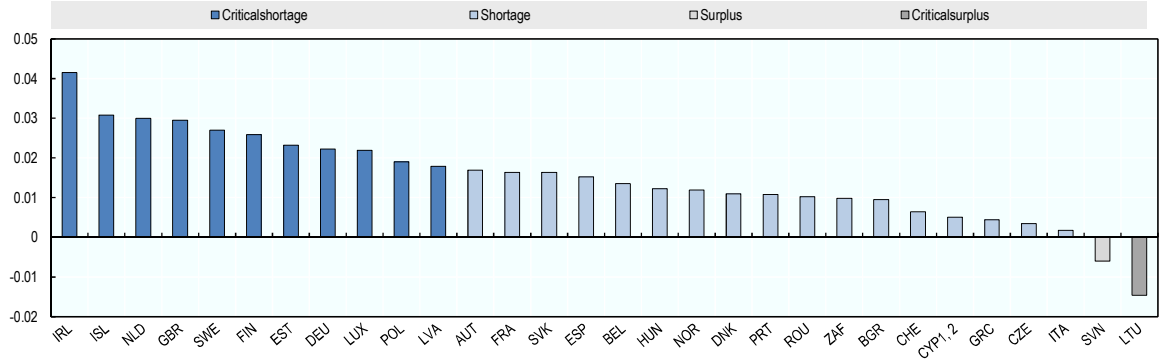
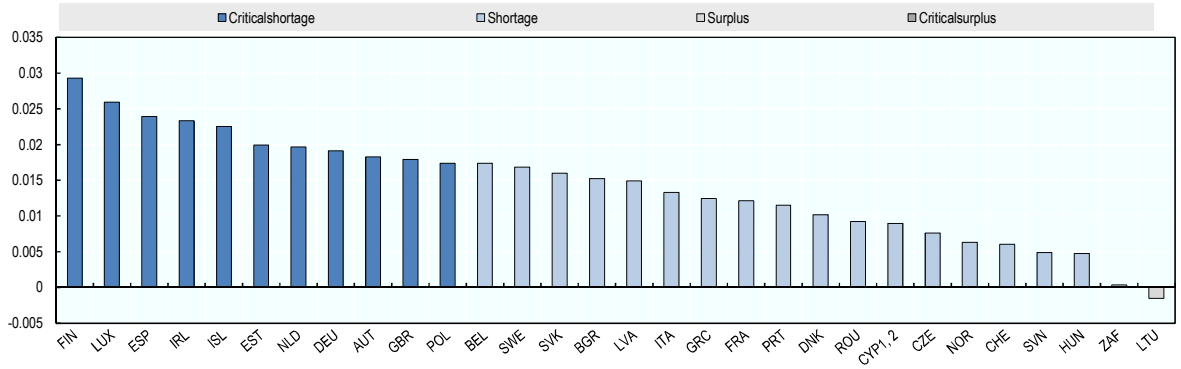


Figure 5.9. Selected imbalances in soft skills *(cont.)*

Panel D. Persistency



Note: Latest available year.

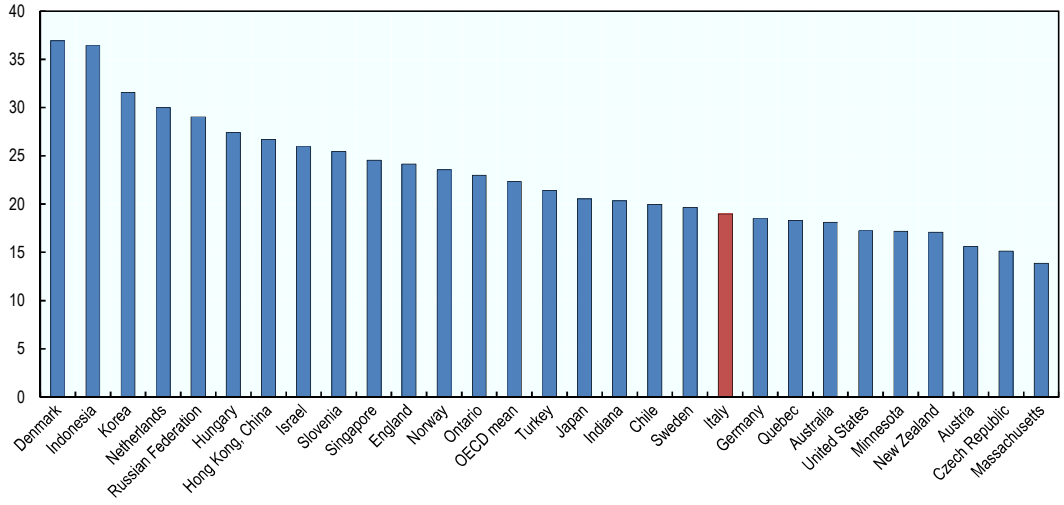
Critical shortage (darker blue) is defined as the observations in the top quartile of the positive skill imbalance values across countries and skills. Critical surplus (darker grey) is defined as the observations in the bottom quartile of the negative values. Values for the Work Styles dimension vary between -0.019 and 0.053 across countries.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: *OECD Skills for Jobs Database*.

Figure 5.10. Overall composite education innovation index, 2000-11



Note: The composite innovation index is based on average absolute effect sizes of changes reported across a set of indicators in Measuring Innovation in Education: A New Perspective (2014). A large value on the index shows that changes have occurred across different aspects of that education system, whether reductions or increases in a particular practice. Each set of indices, including the overall indices is calculated separately; it is not possible to sum two or more sets of indices to replicate this overall measure.

Source: Measuring Innovation in Education: A New Perspective (2014).

Building bridges between education and the world of work is a good strategy to "teach" students work-relevant soft skills such as team-working, punctuality and flexibility. The *Alternanza Scuola-Lavoro* (ASL) reform (see above) is certainly a step in the right direction as this provides support to young students in developing technical skills while also familiarising with soft skills such as punctuality or team work. If anything, more effort should be put into strengthening these experiences to reinforce and broaden the skill set of young Italians.

Lifelong learning should be strengthened to support adult workers in adapting to changes in skill needs induced by technological progress

Across countries, the Adult Skills Survey (PIAAC) shows that older individuals (55-64) have significantly lower proficiency in literacy and numeracy than their younger counterparts (25-32). This can be explained both by differences in quantity and quality of education across generations (i.e. cohort effect) and the deterioration of skills with age (i.e. age effect). Better skill use and on-the-job training could reduce skill gaps between younger and older workers (Paccagnella, 2016).

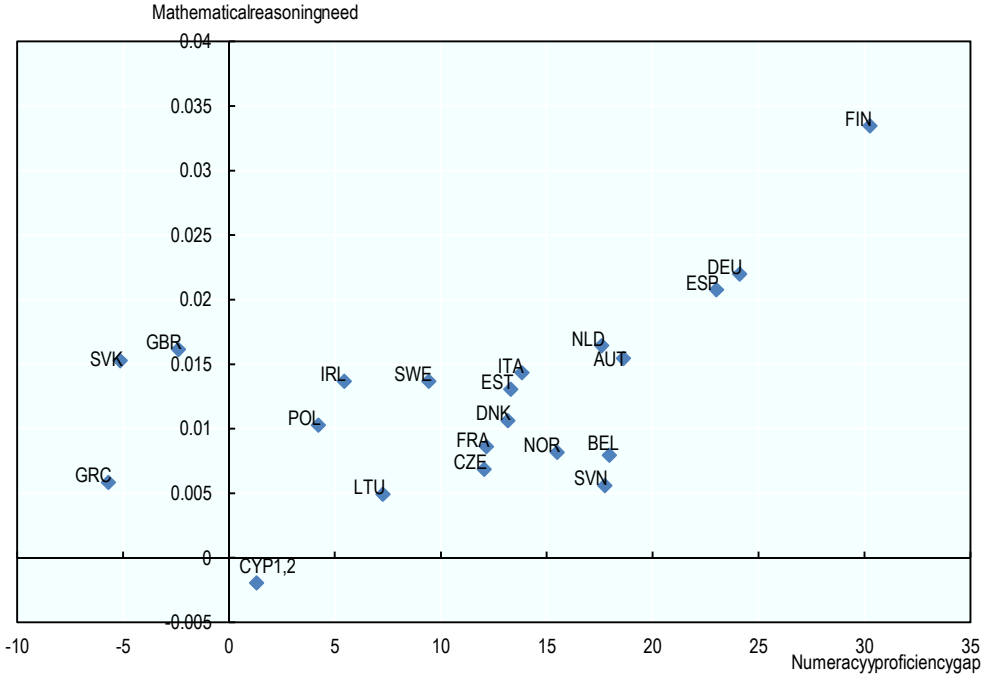
Results from the *OECD Skills for Jobs Database* (2017a) also show that in countries where the cognitive skill gap between older and younger workers is bigger, shortages in key information processing skills could be expected to be bigger. Figure 5.11 confirms this relationship for mathematical reasoning (but similar results are found for reading comprehension and written expression). Results show that, in countries where the gap in numeracy proficiency between young and old cohorts is larger, the shortages in mathematical reasoning are also substantially large and that the comparatively lower skills of older cohorts drive such shortages. Italy shows moderate differences between the skill of young and older cohorts (both similarly low) and slightly above-average shortages of mathematical reasoning.

Rather than being comforting, this evidence points to the need for Italy to raise the skills proficiency of all workers and that such improvement needs to take place across all age groups equally. Evidence in Figure 5.11 shows that neglecting the importance of developing and maintaining the skills of adults and older workers can lead countries to suffer significant shortages in key-processing skills. All this is especially important in the context of the I4.0 measures that have been recently implemented in Italy and that have the potential to reshape its skill demand towards the use of technology-intensive skills of workers of all ages. Italy is in the position to anticipate these future changes and to reap full benefits from it by boosting its lifelong learning system.

Figure 5.11. Link between age-related skill gaps and information processing skill shortages

25-34 year-olds minus 55-64 year-olds

Mathematical reasoning



Note: For literacy and numeracy proficiency United Kingdom only includes England, Belgium only includes Flanders.

Skill proficiency gaps are corrected for gender, education, immigrant and language background and parents' educational attainment.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

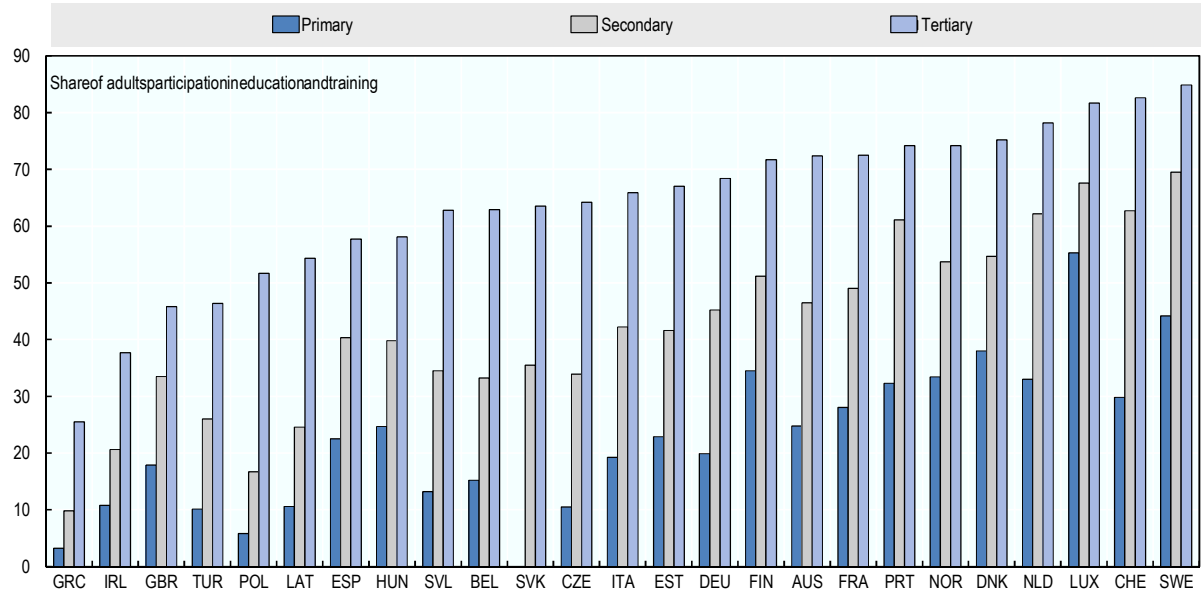
2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: *OECD Skills for Jobs Database*, PIAAC.

While young workers are in a relative better position to fill the skill gaps that are likely to emerge from the adoption of new technologies, older workers can (should) also play an important role in the implementation of the I4.0 measures. The risk is, in fact, that older workers – less familiar with new technologies – may be displaced and mismatched when I4.0 technologies are adopted in the production workflows of firms.

Retraining and upskilling programmes can help workers of all ages to become familiar with new technologies and to reduce the depreciation of their skills induced by rapid technological change. Italy, however, lags behind other countries when it comes to the participation of adult workers in education and training (Figure 5.12).

Figure 5.12. Adult education in Italy



Note: Share of adults (aged 25-64) participating in education and training refers to year 2011.

Source: OECD (2017b) The Next Production Revolution: Implications for Governments and Business, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264271036-en, using Eurostat, Adult Education Survey and Secretariat calculations using PIAAC.

The reasons behind this poor result can be several. Commentators argued, for instance, that public funds for training are not easily accessible to firms, especially to small ones. Burdensome administrative procedures limit the use of available funds for retraining and LLL.[15]

The recent economic crisis has also had a considerable impact on training and LLL activities in Italy. A survey conducted by API (2014) on a sample of firms that requested financial assistance to local regional governments through different channels (FCI, FSE and *Fondi Interprofessionali*) shows a reduction in training activities carried out by firms (34.8% on average). The reduction has been especially sharp in firms operating in the North-East and Centre regions of Italy (Table 5.4).

Table 5.4. Consequences of the crisis on training providers by geographical area, 2012

	Total	North-w est	North-east	Centre	South and Islands
Sample	100	35.8	8.8	25.6	29.8
Reduction in training activities	34.8	39.4	57	40.1	18
Reduction in teaching personnel	27.5	23.1	6.3	21	44.6
Recruitment through atypical contracts	12.8	7.1	14.8	10.1	21.4
Delays in paying staff	10.7	10.1	7.6	15.6	8.1
Introduction of flexible w ork arrangements	6.8	12	1	5.8	3
No information	7.5	8.4	13.3	7.4	4.9

Against this backdrop training providers have tried to diversify their offer (47.5%) and retrained their own workforce (12.9%) to provide training programmes that are

more aligned to labour market needs, responding more effectively to the requests of employers. Much needs, however, to be done to ease the access to funds for training to small firms and to reduce administrative burden to promote innovative retraining and LLL programmes. Data from Excelsior (2016) highlights that the training provided to workers to perform new tasks – and so to face the upcoming challenges of the labour market – has been steadily decreasing in between 2009 (18.8%) and 2015 (11.4%). Regional difference emerge also (Table 5.5) in the quantity and quality of training provided by firms as the north of the country provides substantially more training to its workforce than the south and centre of the country. This result is also likely to be the reflection of the different size of firms across the territory as medium and larger firms provided training in 64 and 82% of the cases respectively while micro (1-9 employees) and small (10-49 employees) firms have provided training in merely 16 and 30% of the cases.

Table 5.5. Firms that provided training in 2015

Percentage

Size	Total	Training to new hires	Upskilling or re-training of current employees	Training of current employees to perform new tasks
1-49	16.5	3.4	85.2	11.3
10-49	30.6	3.5	84.4	12.1
50-499	63.9	6	83.9	10.1
500	81.7	19.7	67.9	12.4
North-west	23.4	4.6	84	11.4
North-east	24.1	5.6	81.9	12.5
Centre	19.5	4.8	83.8	11.4
South and Islands	16.9	3.4	86.4	10.2

Source: Sistema Informativo Excelsior 2016 – La domanda di professioni e di formazione delle imprese italiane.

Adult and lifelong learning passes through the activities of local networks

Over time Italy has developed robust local networks with the objective of providing adult and lifelong learning opportunities to both employed and unemployed individuals. These local networks consist of several different actors and stakeholders whose activities span from the provision of formal to informal training. Apart from traditional education and training providers, the *Poli Tecnico-professionali* (Technical-professional Poles) play a fundamental role in aligning the provision of training to the needs of local labour markets.

As highlighted by ISFOL (2017) universities, businesses, chambers of commerce and the Internal Migration Observatory (*Osservatorio sulla migrazione interna*) are also integrated in the local networks for lifelong learning with the idea of spurring the development of a wide and varied supply of training alternatives for Italian workers and unemployed.

Within the broad range of actors involved in lifelong learning in Italy, a special mention goes to the *Centri Provinciali d'istruzione per gli adulti* (CPIA – Provincial Centres for adult education). The CPIA are involved in two key activities. On the one hand, they are responsible for the provision of formal education and training to adults

at the secondary level. On the other hand, they are also involved in the validation of competences and skills of adult workers as well as in their guidance and in counselling activities. While the activities of the CPIA are mainly targeted to meet skill and training needs at the local level, with the view of favouring a tailored approach to skill development in the territory, CPIA have also formed a national network, the "*Rete Italiana Istruzione degli Adulti*" (Italian National Network for Adult Education – RIDAP) which aims to further strengthen the existing tools to monitor prior learning and skills acquisition (both formal and informal) across the whole national territory.

At the tertiary level, the *Poli Tecnico-professionali,* the Universities and the AFAM (*Alta Formazione Artistica e Musicale*) supply a similar service which spans from the validation of skills and competencies to the provision of flexible programmes with the view of satisfying the training needs of a varied audience of adults. Similar to the CPIA, 33 Italian universities have also developed a national network to promote lifelong learning at the tertiary level, the *Rete Universitaria Italiana per l'Apprendimento Permanente* – RUIAP. This national network is integrated in the European experience of the EUCEN (http://www.eucen.eu/) whose objective is to encourage high standards in all areas of lifelong learning and to harmonise levels and quality of lifelong learning among its international members.

The wide range of stakeholders operating at the local level can help tailoring the provision of training opportunities to the needs of the territory but, at the same time, the articulated structure and linkages across stakeholders can potentially end up in the delivery of heterogeneous services across regions. While the creation of the national networks (RIDAP and RUIAP) already mitigates the co-ordination challenges, the recent legislative decree 150/2015 has also promoted the creation of a specific network, the "*Rete dei servizi e delle misure di politica attiva del lavoro*" (network for the provision of active labour market policies) that puts the new National Agency for Active Labour Market Policies (ANPAL) at the centre of such network, bridging and linking the activities of other existing stakeholders such as the *Istituto nazionale Assicurazione Infortuni sul Lavoro* (INAIL), the Public Employment Service centres, the Inter-professional funds (see later), INAPP, the chambers of commerce and universities as well as secondary schools. Careful monitoring of the effective co-ordination across these stakeholders is imperative, especially in the aftermath of the constitutional referendum that has modified the prerogatives and role that the Jobs Act foresaw for the ANPAL (see Chapter 6).

Fondi Interprofessionali can be powerful tools to develop skills…

While financial constraints may be an important barrier for small firms to provide training and LLL to their employees, several tools do exist in Italy to support companies in keeping their workforce's skills up to date. Among the most important ones are the *Fondi Interprofessionali* (Inter-professional Funds). The *Fondi Interprofessionali* finance training plans at the sectoral and regional level that firms, either alone or in association, may decide to create for their employees. The inter-professional funds can also finance individual training plans, as well as additional educational activities.[16] Training plans may also involve employees with apprenticeship contracts and project.

A recent report (ISFOL, 2017) highlights the strengths and weaknesses of the functioning of the system. Despite an increase, in 2014, in the number of workers involved in training supplied through the inter-professional funds, this upward trend

has reversed in 2015. The most updated figure (ISFOL, 2017) reports 1.3 million firms participating to the *Fondi Interprofessionali* in 2016, with 1.255 million adhering to the funds providing training to workers and approximately 29 000 to the funds to train managers.

The important resources available and the number of firms adhering to the training plans are challenged by the fragmented allocation of funds to activities other than training. ISFOL (2017), highlights how, over time, part of the funds have been diverted from training to pursue other strategic objectives of the firms and have been used, for instance, as welfare measures and for the *Cassa Integrazione Guadagni* (CIG). Strikingly, in 2016, out of the EUR 781 million available, only 62% have been devoted to training initiatives. Similarly, in between 2009 and 2016, 20% of resources have been devoted to activities other than training.

In a context where Italian workers are low-skilled and shortages are pervasive in specific key knowledge areas, it is imperative for Italy to take a closer look at the way inter-professional funds are used and to limit the extent by which these are employed for purposes other than the upskilling and retraining of firms' workforce and managers.

While the share of funds allocated to training activities has to increase vis a vis other uses, the content of the training courses has also to improve as funds are employed, in too many instances (26% of the times), to provide training in areas that are already compulsory *ex lege,* as for instance, in the area of safety at the workplace.

A closer look at *Fondimpresa*

The largest[17] inter-professional fund in Italy is *Fondimpresa*. Firms adhering to it devote 0.3% of the social security contributions paid to the National Social Insurance Agency (INPS) to the fund and, in return, they can access 70% of these contributions to develop training plans and LLL activities for their workers.

The funds allocated to training plans need to be approved by the board of directors of *Fondimpresa* which is composed by representative of social partners (CGIL, CISL, UIL and Confindustria). It is interesting to notice that the 74 614 training programmes approved by *Fondimpresa*[18] until 2014 sum up to almost EUR 2 billion of investments in training activities. These have involved around 4 million workers and 56 000 firms.[19]

The considerable financial resources available through *Fondimpresa* make the fund a remarkable tool to address skills imbalances through LLL and tailored courses to adapt to the rapid changes in labour market needs. It is, therefore, fundamental that the training programmes funded through this channel really meet the skill needs of firms and that resources are not diverted, instead, to activities other than developing the necessary skills to address future labour market challenges.

…training programmes should better target the true skill needs of firms

Since its inception, *Fondimpresa* has grown considerably. It still remains, however, a tool that is used primarily by SMEs in the manufacturing sector (51.3% of adhering firms) and in the Lombardia region (23.1% of employees involved in the activities). When analysing the information on the recipients of training programmes (Fondimpresa, 2016) data show that the training activities mostly involved older workers. Up to 55% of participants were age 45 or above and 21% were age 55 or

above. Only 14% of workers was age 33 or below. Most workers participating to the training activities were low-skilled (38%) while workers with a tertiary degree were involved considerably less (16% of participants). Training Programmes involved a relatively low share of women (around 30%).[20]

While many Italian workers are lacking basic ICT skills, have only basic knowledge of foreign languages and lack a wide range of soft and hard skills, too much of the Fondimpresa's training funds has been used to provide courses in areas that are only marginally related to the development of those skills that would be needed to tackle the challenges arising from rapid technological change and globalisation.

Information from Fondimpresa (2016) shows (Table 5.6) that around 39.4% of activities (49.4% of total workers involved in training) were devoted to courses on "safety in the workplace" (*sicurezza sul lavoro*).[21]Though important, the training on safety regulations in the workplace is already compulsory by law and it should be provided by employers by default.

The allocation of funds to provide training on safety regulations frustrates the spirit and objectives of the Fund to act as a tool to provide workers with a flexible tool to adapt their skills to the challenges arising from rapid technological change and globalisation. It is imperative, therefore, to boost the provision of courses to develop language or ICT skills by diverting resources to these programmes from others that are, instead, financing less relevant training programmes.

Table 5.6. Training areas of the *Conto Formazione of Fondimpresa*

	Areas of the Conto Formazione Plan 2016			
	Actions (% total)	Hours of training (% total)	Participants (% total)	Cumulated hours (% total)
Personal abilities	16.9%	14.6%	16.8%	18.2%
Other	2.0%	2.3%	2.5%	3.0%
Accounting - finance	1.2%	1.7%	0.9%	1.3%
Business and management	5.9%	7.8%	4.2%	6.5%
Environmental impact	1.0%	1.3%	0.9%	1.1%
ICT	7.4%	10.8%	5.2%	9.3%
Clerical skills	0.4%	0.3%	0.3%	0.3%
Languages	9.3%	19.2%	4.2%	9.4%
Marketing and selling	4.9%	3.9%	5.4%	4.2%
Quality	4.2%	4.6%	3.7%	4.6%
Safety at the workplace	39.4%	21.3%	49.4%	30.7%
Production techniques	7.5%	12.1%	6.4%	11.2%
Total	**100.00%**	**100.00%**	**100.00%**	**100.00%**

Source: Fondimpresa (2016).

Notes

1. While similar results can be found in other countries too, the large share of small firms in Italy makes the problem more prominent than in other countries and so, also, the productive gap more evident.
2. Estimates from Confindustria point to a potential increase in GDP per capita of 7.3% if Italian firms were able to increase the variety of their production by 10 percentage points.
3. A similar pattern, where innovative firms recruit new workers twice as much as firms that stick to their traditional products, is observed when analysing each productive sector separately.
4. The percentage of under-skilled workers in Italy is the highest across OECD countries participating to the OECD Survey of Adults Skills.
5. HPWP include both aspects of work organisation – such as team work, autonomy, task discretion, mentoring, job rotation, applying new learning – and management practices – such as employee participation, incentive pay, training practices and flexibility in working hours. The Survey of Adult Skills collects information on a number of job aspects that are often associated with HPWP, including: whether workers have any flexibility in deciding on the sequence of tasks they perform, how they do the work, the speed of the work, and working time; how often they organise their own time and plan their own activities; how often they co-operate or share information with others; how often they instruct, teach or train other people; whether they participated in education/training in the previous 12 months; and whether they received a bonus payment.
6. The TIME pilot project was carried out in the Lombardia region only.
7. Commentators also argued that the scaling up of such programmes needs a clear separation between training providers and bodies assessing skill needs in order to avoid potential conflicts of interest.
8. http://www.mecspe.com/, http://www.senaf.it/senaf/chi-siamo/.
9. The immediate returns from the use of I4.0 technologies may be larger in larger firms, at least in the early phases of the implementation of the I4.0 measures. This, in turn, may stimulate the interest of other, smaller, firms and contribute to the buy-in of the reform.
10. Investments are for the period 2017-20.
11. Commentators argued that, while boosting youth's digital skills is fundamental in the long-run, the appeal of these measures to overcome the *current* skill deficiencies of the Italian workforce is very limited and, as such, the impact of these tools to tackle the skill needs urged by the implementation of the I4.0 measures.
12. A similar boost to investments in research doctorates in I4.0 areas is foreseen as well as investments to strengthen technological clusters.

13. App-titude project: http://www.vfu-ffi.be/fr/outils/app-titude/. The countries covered are the Netherlands, France, Luxembourg and Belgium.

14. Fondazione Agnelli funded a study carried out in collaboration with the GRISU (*Gruppo di Ricerca Interdisciplinare sui Sistemi Universitari*), Almalaurea and Unioncamere/Excelsior to analyse graduates and employers' perception towards the importance of soft and transversal skills in the labour market: http://www.dafist.unige.it/?page_id=1898/09062011IIRAPPORTODILAVOROCARED.pdf.

15. As an example, public funds for training can only be accessed by firms with a minimum number of employees and training funds for self-employed are rare and barely used.

16. As detailed in the Law 148 of 14/09/2011.

17. In terms of employees and firms involved across the national territory.

18. For the sole financing channel of the "Conto Formazione".

19. See "Le Attivitá di Fondimpresa" (2016).

20. Training programmes are concentrated in male-dominated areas such as the construction, metal mechanic and chemical sectors.

21. Similar shares (44.5%) are found when looking at all interprofessional funds, see ISFOL (2017). As for Conto Formazione, this marks an increase in both hours and workers involved in courses focusing on safety at the workplace since 2014 were the figures were (38.4 and 48.6% respectively).

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Chapter 6

The Jobs Act: Improving skill matching across the national territory

This chapter discusses how elements of the recent labour market reform Jobs Act are providing renewed incentives for skill matching in Italy. The chapter discusses the way skill supply meets the demand in the Italian labour market and how this process can be strengthened to ensure that workers are employed in jobs that fully make use of their skills across the whole country. The chapter also discusses the recent introduction of the new National Agency for Active Labour Market Policies (ANPAL) and how this can play a key role in spurring skill matching in Italy. Bottleneck and challenges for the future are also discussed.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Italy is a country of profound contrasts and, in many cases, of diverging experiences and practices that need to be brought together by a coherent policy response. A deep economic and productive divide has for too long contributed to the divergence of labour market performances between southern and northern regions of the country but also within regions in these broad areas.

Labour market reforms have the potential to provide the right incentives to the *Mezzogiorno* (the south of Italy) to catch-up with the most productive regions of the country and to foster a more equal and inclusive growth across the whole territory in the long run. Better matching of the available skills to local labour market needs is, in Italy's fragmented context, fundamental to increase productivity and well-being of all Italians.

In 2015, the Italian Government ratified the Jobs Act, a comprehensive labour market reform which addresses, among other long-pending issues, the roots of Italy's labour market duality through a new regulatory framework that is reshaping the relationships between employers and employees. Notably, the Jobs Act introduced a new single open-ended contract with increasing levels of protection according to workers' job tenure (*contratto a tutele crescenti*). At the same time, firing costs were made less uncertain for firms by restricting the grounds for reinstatement in cases of dismissal without just cause.[1] Finally, the Jobs Act introduced generous – albeit temporary – social security cuts for workers hired under the new permanent contracts.[2]

While the Jobs Act and the temporary social security cuts seem to have boosted the creation of permanent contracts in the first year, the potential gains stemming from the reform should be assessed in the medium and long run as these are expected to work through a renewed set of implicit incentives given to i) employers to recruit and to ii) workers to develop adequate skills to meet employers' demands.

The Jobs Act also aims to substantially increase the supply of active labour market policies through the creation of a new National Agency for Active Labour Market Policies (*Agenzia Nazionale per le Politiche Attive* – ANPAL). The ANPAL has been designed to provide renewed incentive for unemployed to retrain and upskill in order to meet the needs of the labour market. The rejection of the constitutional reform proposed through a national Referendum in December 2016 has, however, modified the initial plan for which the ANPAL would have centralised the mandate over the delivery of ALMPs in Italy. As it stands now, the delivery of ALMPs is a shared competence between the ANPAL and the regional governments. This can potentially create co-ordination challenges (see below).

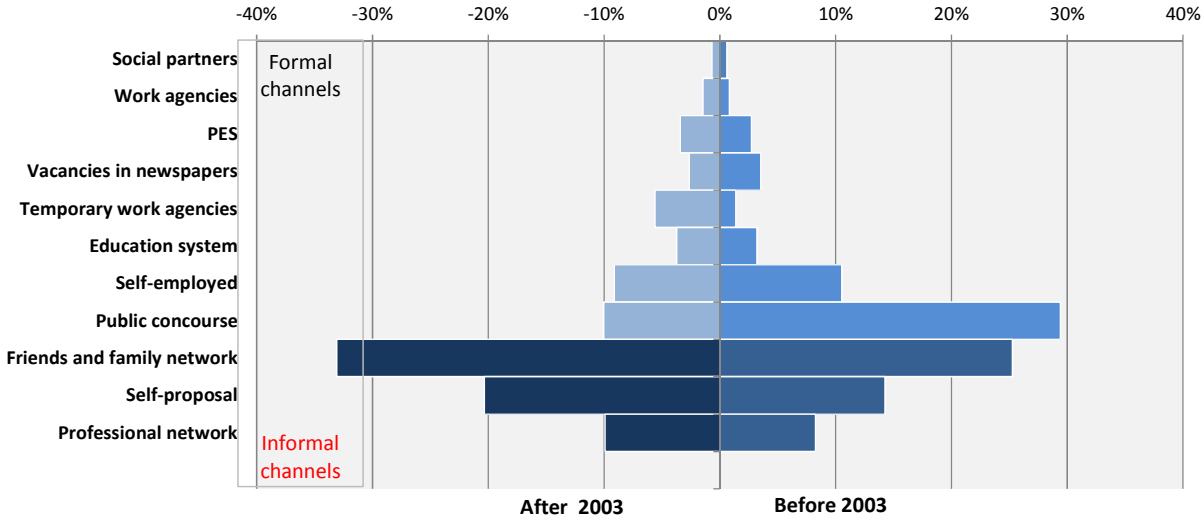
All in all, several challenges lie ahead the implementation of the Jobs Act and these hurdles can substantially reduce the positive effects expected from the reform. The challenges that are directly linked to skills imbalances are discussed below.

A "hidden" labour market hinders the match between skills and jobs

Many of the available vacancies in the Italian labour market are hidden and not visible to those who would, in principle, be able to supply adequate skills to fill jobs. As pointed out by Landi et al. (2016) evidence collected through the survey *ISFOL Plus* (2014) shows that the process of skill matching in Italy suffers from a severe lack of transparency.[3] The study's results (Figure 6.1) show that around two-thirds of vacancies are not publicly advertised but they are only visible through informal and personal/social networks.

Professional and family networks represent, by far, the most important channels of diffusion of labour market information and play a major role in matching vacancies to workers and so, to skills. The share of those jobseekers that rely on parents, relatives or friends to find a job has increased in Italy after 2003.

Figure 6.1. Formal and informal channels of diffusion of information on vacancies



Source: Mandrone et al. (2016) based on ISFOL Plus Survey, 2014.

Several reasons may lie behind the mechanism for which vacancies tend to "disappear" from the public domain. On the one hand, as discussed above, Italian employers – especially those in SMEs – struggle to identify their own skill needs and in many instances prefer to rely on their restricted professional or social/family networks instead of "risking" to hire someone from "outside" their circle and whose characteristics are unknown.

Managerial skills should be, therefore, boosted and employers supported through programmes that allow them to identify their specific skill needs. *Assolombarda*, ECOLE and FEDERMANAGER have developed some interesting cases of best practice where managers have received tailored training and support in the identification of their firms' skill needs and in planning coherent training activities (see Chapter 5).

If boosting the skills of managers is important to spur a better matching, other factors come also into play that can weaken its quality. *Information asymmetries*, for instance, arise when employers are not able to judge on a candidate's skills due to the low skill-signalling power of her/his qualifications and education titles. These asymmetries can severely undermine the matching process.

Generally speaking, the risk of hiring a candidate with an inadequate set of skills increases all the more the information embedded in qualifications and education titles diverges from the true skills of the workers. In Italy, qualifications are poor predictors of skills and their skill signalling power (i.e. the efficacy with which they are able to signal a candidate's true skills) is low. On top of that, the relatively high firing costs – in force until the Jobs Act – discouraged employers from taking the risks of hiring a candidate

from outside their networks[4] as any matching mistake would have implied a substantial cost for the firm to rectify it (i.e. usually providing more training than expected or even firing the "wrong" candidate).

The combination of high firing costs, low managerial skills and of poor skill-signalling power of qualifications has historically hindered skills matching in the Italian labour market. This, in turn, led to a suboptimal allocation of talent and to the widespread use of informal networks to recruit workers through temporary contracts.

The three reform pillars (i.e. the Jobs Act, the *Buona Scuola* and *Industria 4.0*) can potentially tackle these challenges in a complementary way. The Jobs Act contributes to reducing firing costs and the implicit risk associated to hiring candidates who could be mismatched by skills. The *Buona Scuola* provides students with work-relevant skills through ASL for them to be more aligned to labour market needs. *Industria 4.0* can increase the demand for high-quality skills. Altogether they can truly provide the much needed incentives to employers to hire on permanent and better-quality jobs and contribute to enhance skill matching. To do so, however, Italy still needs to address several challenges.

Regional divides persist due to an immobile labour market

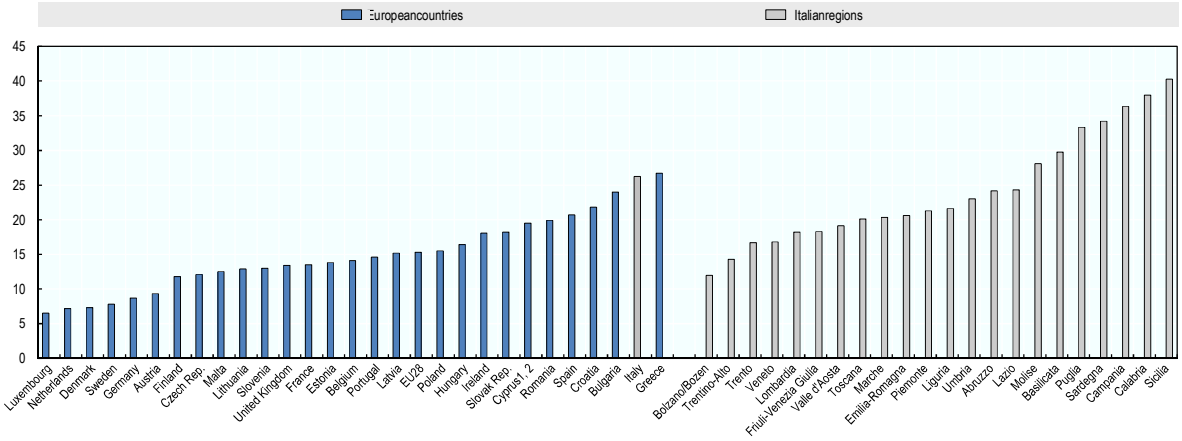
Data on the participation of young Italians to the labour market show a dramatic divergence between the experience of those living in the north of Italy and those in the South and in the main islands (Figure 6.2). The average share of Italian NEET (population aged 15-29 who is neither in employment nor in education or training) is extremely high by international standards (around 27%) and it was second only to Greece in 2014. The aggregate national figure, however, only masks an even more worrisome picture where regions from the south of Italy show shares of NEET as high as 40%.

Young – as well as older – workers in the south of Italy face a challenging tight labour market, with few job opportunities concentrated in low value-added and low-skilled occupations. Despite this situation, residential mobility in Italy is very low (Figure 6.3) as many Italians do not have sufficient incentives to relocate.

As pointed out by OECD (2017), mobility can entail important psychological and financial costs for those individuals concerned. Supportive policies need to be strengthened, such as accommodating housing-market policies and relocation subsidies, greater flexibility of work arrangements, family support (in the form of subsidised childcare and schooling) should be considered as integral policy measures to support labour mobility.

Figure 6.2. Italian youth is neither in employment nor in education or training (NEET)

Population aged 15-29



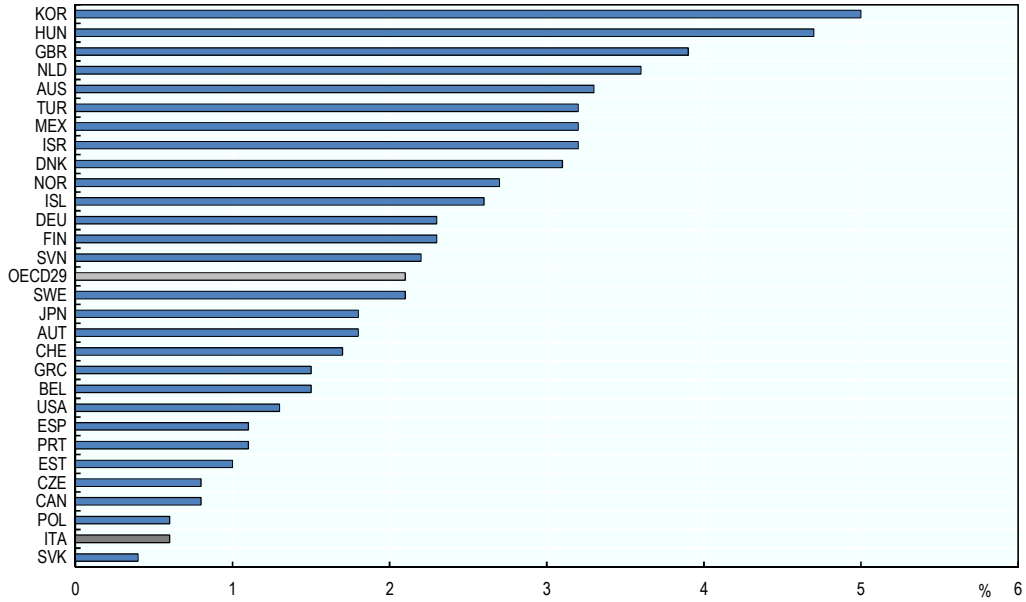
1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

2. Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Source: ISTAT, NOI-ITALIA Database, 2016.

Figure 6.3. Residential mobility is low in Italy

Percentage of people that changed province within the same country, percent of total population, average 2011-13



Source: OECD (2016), *Regions at a Glance*.

Historically, regional divergence has been accentuated in Italy by a fragmented system for the recognition of qualifications which, *de facto*, has significantly reduced labour mobility and contributed to the emergence of skill mismatch and shortages. Until recently, in fact, separate Regional Qualification Frameworks (*Quadri Regionali di Standard Professionali*) have been used by each Italian region to certify formal qualifications.[5] The implementation of different standards and procedures at the local level has eventually led regions to recognise only their own qualifications, reducing intra-national labour mobility.

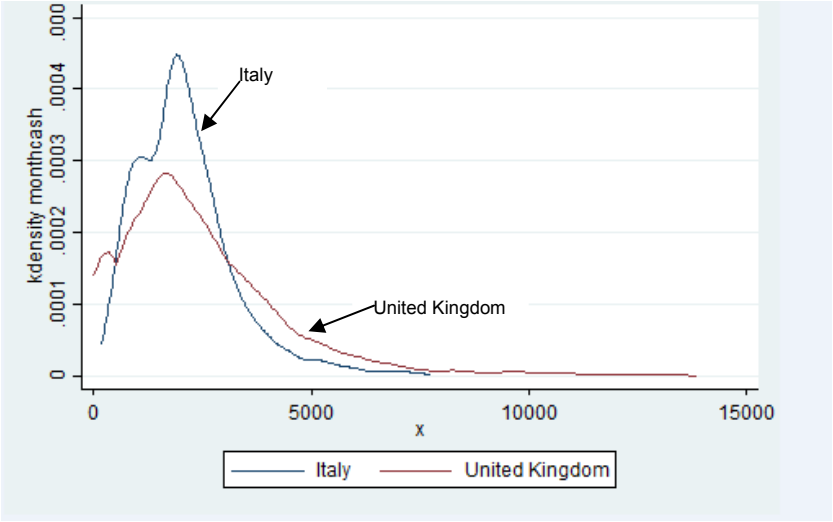
Against this backdrop, in 2013, a legislative decree[6] strengthened the regulatory framework by identifying common rules for the certification of qualifications which should have been applied homogeneously across the country. The full implementation of these directives has been slow. It finally culminated in a state-regions agreement stipulated in 2015 where an operational framework for the implementation of common standards (*Quadro Nazionale delle Qualificazioni*) has been enacted. As of today, around 3 000 regional professional qualifications can be recognised nationally and, in fact, the established national agreement makes the standardisation of regional qualifications compulsory for all regions, finally providing the necessary conditions to spur workers mobility.

Along with the recognition of formal qualifications, strengthening the validation of informal learning can also lead to higher labour market mobility.[7] As pointed out by several stakeholders, in Italy both institutions and social actors agree on the importance of Recognition of Prior Learning (RPL) in non-formal and informal contexts. That being said, despite the efforts of the Ministry of Education and of the Ministry of Labour and Welfare a solid system for RPL at the *national level* has not been developed yet. Standards for RPL, instead, do exist at the regional level but their fragmentation represents a limitation to the functioning of the whole system that contributes to the emergence of skill mismatch and shortages.

Wage incentives should be strengthened to promote better skill matching across the territory

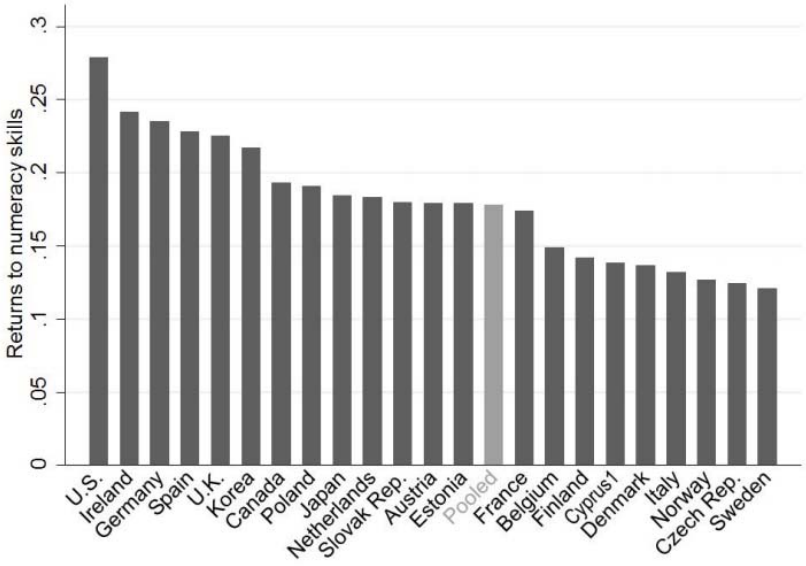
Low residential and labour market mobility are associated to insufficient incentives for the workforce to relocate in areas where their skills may be more in need. It is interesting to notice that wages are usually used by employers to select and attract workers to jobs where the supply of skills is insufficient to fill firms' needs. If wages are a powerful incentive for relocation, In Italy more than in other countries (see the United Kingdom for instance, Figure 6.4), the wage distribution is relatively compressed and the returns to education and skills (e.g. the wage premium paid to those having higher skills[8]) are generally low (Figure 6.5).

Figure 6.4. Wage distribution in Italy and the United Kingdom



Source: OECD calculations based on EU Labour Force Surveys.

Figure 6.5. Returns to numeracy skills across countries



Note: Coefficient estimates on numeracy score (standardised to std. dev. 1 within each country) in a regression of log gross hourly wage on numeracy, gender and a quadratic polynomial in actual work experience, sample of full-time aged 35–54.

1. Note by Turkey: The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".

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Source: Hanushek et al. (2015), OECD PIAAC data.

The wage differentials between the north and south of the country are also small (around 7%). In addition, the higher costs of living in the North contribute to reduce these differences even further so that workers with a stable job have usually weak incentives to move in response to skill shortages arising somewhere else in the country. This hinders the incentives for labour market mobility and, contextually, the quality of skill matching.

The situation is, however, different for those who are unemployed. The main drivers of intra-national migration (usually from the South to the North) are not wage incentives but the likelihood of being employed, the latter being higher in the northern part of the country.

The fact that intra-national mobility is driven mostly by employability prospects – rather than wage differentials – is the reflection of both a weak aggregate demand for skills[9] and of a tight labour market. Both aspects, in turn, lead many workers to accept jobs for which they are usually over-qualified and, in many cases, also mismatched by field of study. The individual costs associated to accepting jobs for which a worker is mismatched are, however, substantial. These materialise in large wage penalties (Table 6.1) that are suffered by mismatched workers relative to other well-matched workers.

Evidence from Montt (2015) shows that Italian workers who accept a job in a field different from the one they have specialised in suffer an average wage penalty of 9%. Similarly, workers accepting a job for which their skills exceed those required receive wages that are around 13% lower than those paid to well-matched workers. Finally, being simultaneously over-qualified and mismatched by field of study implies a 17% wage penalty in Italy.

Table 6.1. The relationship between field-of-study, qualifications mismatch and wages

Field-of-study mismatch only	-0.09**
Over-qualification only	-0.13**
Over-qualification and field-of-study mismatch	-0.17***

Note: Linear regression with log(wages) as the dependent variable. Model includes dummy variables for educational attainment as well as controls for age, age-square, tenure, type of contract and firm size.

, * statistically significant at 5 and 1% respectively.

Source: Montt (2015) using OECD, PIAAC (2012).

Linking wages to productivity is, therefore, imperative to spur a better skill match as this can provide workers with the adequate pecuniary incentives to develop and use their skills in jobs that make full use of their human capital. Similarly, by anchoring wages to productivity, employers will have more incentives to attract the right type of skills for their vacancies.

Among the different aspects that still contribute to the disconnect between wages and productivity in Italy, there is the collective bargaining system which is commonly argued to be overly rigid finally creating barriers to the optimal allocation of skills as well as to the ability of firms to extract full returns in terms of productivity from their human capital. Two intertwined issues deserve attention in this context.

First, the *Contratti Collettivi Nazionali di Lavoro* (CCNL – National Collective Labour Contracts) regulate the tasks, responsibilities and duties associated to each

"*inquadramento professionale*" (occupational status or job). In most cases, the tasks associated to each job in the CCNL are extremely detailed and, as such, the CCNL end up hindering the possibility of workers to move from one duty to the other if (and as) required by employers. In the context of rapidly evolving labour market's needs and changing productive requirements, such rigidity ends up undermining the ability of firms to exploit its existing human capital, eventually hindering productivity and the optimal allocation of talents to productive tasks.

Second, along with the rigidity of CCNL, wage progression in most Italian jobs follows a *vertical* trajectory (i.e. wage increases are linked to workers' seniority in the firm) rather than an *horizontal* one (i.e. wage increases are based on the observed productivity of each worker regardless of her/his seniority).[10] As a consequence of this situation, in 2014 the generational pay gap between who was about to conclude his career and who was about to start it was 107%.[11]

In addition, in those (relatively few) cases where performance bonuses have explicitly been established in contracts, these are characterised by a low degree of variability and diversification and take the form, in many cases, of wage redistributive tools that apply to all workers rather than to the most productive ones only.

It is important to notice, that the rigidity of the wage progression ("*scatti salariali*") is not a direct consequence of a particular legislative/normative constraint which would impede employers to link wages to productivity but it is, instead, the reflection of several perverse incentives that lead to a vicious circle for which workers are not rewarded through performance-based schemes or incentivised (through wages) to be more productive.

On the one hand, commentators argue that horizontal wage progression (the one linking wages to productivity rather than to seniority) has been neglected by Italian employers as a tool to spur productivity as this would imply the risk of losing direct control over labour costs (which could fluctuate as a consequence of claims from workers over productivity bonuses). This has been especially true in labour intensive sectors where wages continue to be a decisive factor for the company's competitiveness and where employers have stronger incentives to control wage dynamics through pre-established wage progression schemes rather than linking them to a variable productivity performances scheme. Similarly, trade unions have tended to support vertical (as opposed to horizontal) wage progression since a decentralised wage bargaining system – where wages would be set at the individual level and linked to each workers' productivity – would have implied weaker unionisation and loss of consensus of their base.

Such perverse set of incentives to both employers and unions has contributed to hinder the productivity of many labour intensive and small Italian firms. This also led to the compression of Italy's wage distribution by reducing, consequently, the incentives to better allocate talent to tasks and productive activities. Some exceptions and cases of best practice, however, exist but remain isolated cases (see Box 6.1)

Box 6.1. Linking wages to productivity: A case of best practice

In 2010, during the renewal of the collective agreement, the Tesmec group has expressed the will to plan a long-term project aimed at strengthening the professional development of its workforce. Similarly, trade unions proposed the introduction of an individual productivity bonus based on objective evaluation procedures and tightly linked to the professional performance of its workers. In the collective agreement, signed in February 2011, these intentions were finally transferred to a project called New Resource Development that established training programmes to meet individual workers' needs and to fill firm's skills gaps. Within this context, the management and the trade unions agreed on an appropriate scheme to enhance the skills and workers' professionalism by linking these to an explicit wage bonus plugging a pay award.

The establishment of a set of wage incentives and of training programmes was attached to a well-defined scheme to evaluate workers' performances. Such evaluation should have taken place annually and the criteria set collaboratively by managers and employees with support from the Human Resources office.

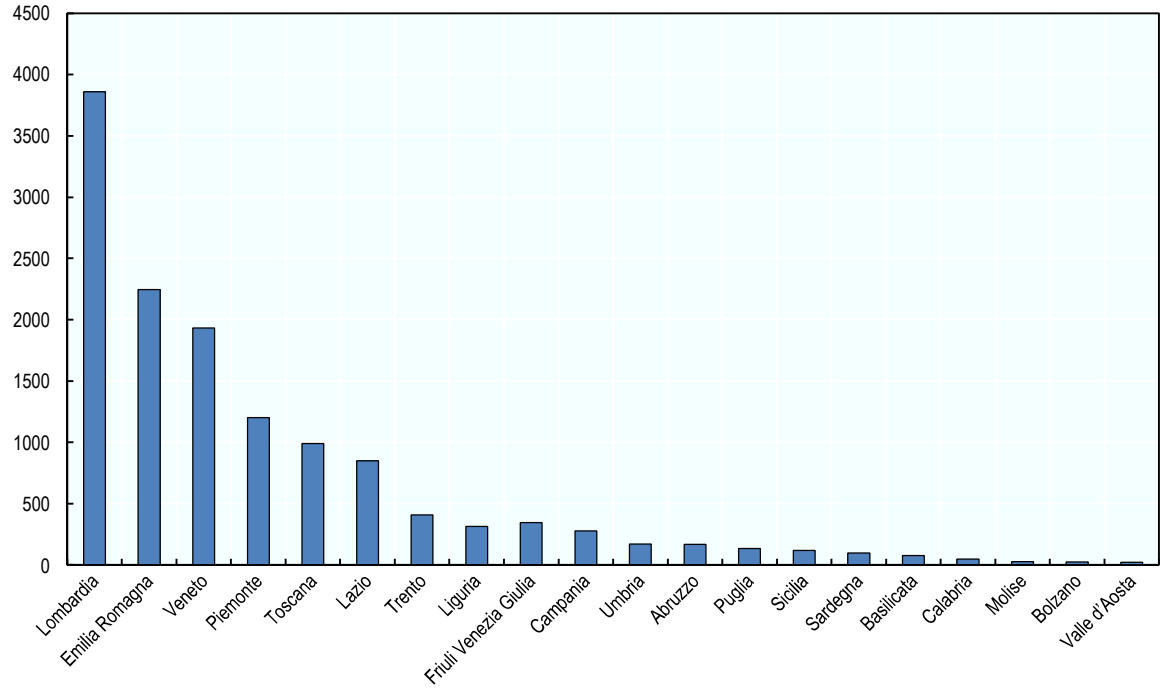
The skills assessment has been, therefore, based on shared evaluation parameters, broken down into two main categories (flexibility and distinctive elements of the performance) and further fragmented into eight evaluation factors, with different weights.

Source: Mosca and Tomassetti (2016).

Within the recent policy interventions to link wages to productivity, the new Budget Bill for 2017 (*Legge di Stabilitá*) allows firms to benefit from a substantial tax reduction on the "productivity bonuses" (*premi di produttivitá*) paid to their most productive workers. The diffusion of the *contratti di produttivitá* (contracts that explicitly foreseen productivity bonuses) is, however, very much heterogeneous across regions (Figure 6.6) and should be strengthened in the centre and southern regions of Italy as a tool to spur better skill match.

The special tax rate[12] for contracts establishing salary bonuses has been designed to promote greater productivity by shifting negotiations to the company level and introducing a positive correlation between increases in efficiency and increases in workers' salaries. Ideally, this should promote the integration of company welfare with forms of public welfare (e.g. supplementary pension schemes, additional medical insurance, etc.) as well as promote workers' participation in the organisation of work.[13] All in all, estimates from the Ministry of Labour and Social Affairs indicate that around 20 000 territorial contracts that include wage premiums have been established until March, a number that is, however, steadily growing each month. Of these contracts, 15 583 aimed at achieving productivity goals, 11 693 increase in profitability, 8 091 increase in quality.

Figure 6.6. Number of "*contratti di produttivitá*" established in 2015 by region



Source: Ministero del Lavoro e delle Politiche Sociali.

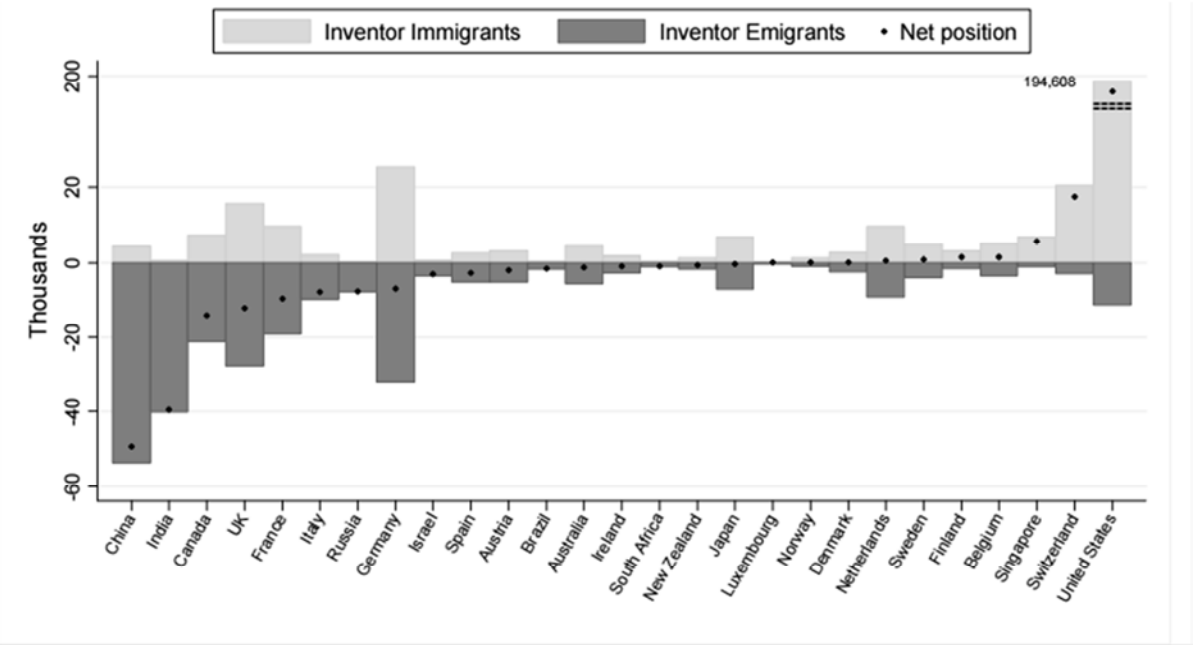
Poor wage incentives lead to brain drain

While Italy suffers from severe skills imbalances and mismatches, not all jobseekers are willing to accept a substantial wage penalty or to be mismatched by skills or field of study. The weak aggregate demand for skills in conjunction with the limited number of jobs available in Italy has contributed to the emergence of a substantial *brain-drain* effect, with many young (as well as old) Italians looking for high-quality and well-paid jobs abroad.

While international migration driven by the desire of finding a better skill match is usually positive as it allows a better allocation of talent, the drain of a nation's human capital does represent a major problem if the origin country is not able to attract from abroad the talent required by its own labour market in specific areas.

International estimates of skills migration flows are scarce. Evidence from Miguelez and Fink (2013) (Figure 6.7) show that Italy's scientists' net migration position in between 2001 and 2010 has been negative, with many Italian scientists moving abroad and going to the United States (2 501 researchers in between 2001 and 2010). Differently from Italy, the neighbouring Switzerland has been able to become a magnet for skills and researchers and it now shows a strongly positive net migration position, second only to the United States.

Figure 6.7. Scientists' net migration position, 2001-10



Source: Miguelez and Fink (2013), "Measuring the International Mobility of Inventors: A New Database", WIPO Economics & Statistics Series.

The Global Talent Competitiveness Index (GTCI) 2017, edited by INSEAD each year, provides an in-depth analysis of how countries are competing globally to grow better talent, attract the talent they need and retain those workers who contribute to competitiveness, innovation, and growth of each country. The GCTI places Italy in the 40th position worldwide, after Poland and Costa Rica and just before Hungary and Saudi Arabia. When looking at the sub-components of the GTCI index, Italy ranks only 64th in terms of its ability to attract human capital.

In 2010 the legislative decree 78/2010 stipulated a two year reduction of 90% on income tax for Italian researchers living and working abroad to return to Italy. The fiscal incentives, initially designed to last no more than five years, are now under discussion again as the government is proposing to extend them indefinitely to all researchers wishing to move back to Italy. This is an interesting initiative whose effectiveness needs to be monitored carefully. Along with that, however, other initiatives are needed to endogenously spur a stronger demand for those skills that have been developed nationally as well as to attract international talent to fill shortages when needed.

Active and passive labour market policies and the ANPAL: Pushing for a switch from passive to active labour market policies

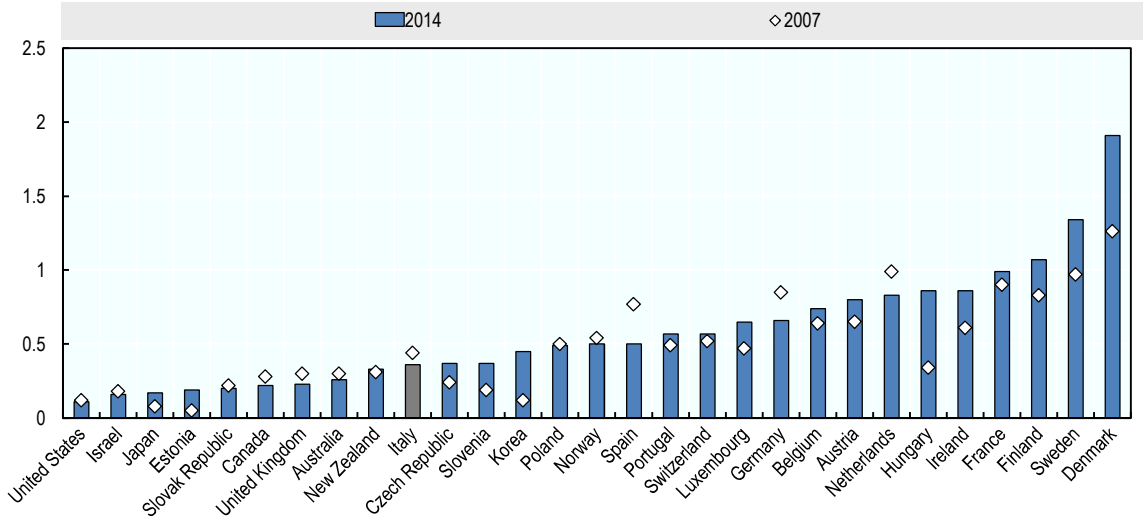
The legislative framework of the Jobs Act is broad and comprehensive. Noteworthy, the labour market reform touches upon the delivery of active labour market policies (ALMPs) through the establishment of the new Agency for Active Labour Market Policies (ANPAL).

Before discussing the challenges facing the implementation of ALMPs and the functioning of the ANPAL it is important to remind the context within which this part of the Jobs Act reform unfolds in Italy. Italy has a long tradition of passive labour market policies. Wage-topping mechanisms such as the *Cassa Integrazione Guadagni* (CIG) have been largely used a "*the*" solution to temporary crises and labour market challenges in the past. Since the onset of the crisis passive interventions have increased substantially. Unemployment benefit expenditures including CIG – as reported in the OECD/DG Empl LMP database[14] – increased from 0.5% of GDP in 2000-03 (17th highest out of 28 countries reporting) to 1.5% in 2012 to 2014 (5th highest of 30 countries reporting). Relative to GDP, Italy's benefits' coverage increased sharply from 2000 (0.5% of GDP when unemployment was near 11%) to 2008 (0.7% of GDP when unemployment was below 7%).

In between 2007 and 2012, during the peak of the economic crisis, Italy's total expenditures in passive labour market policies increased by 134% (up to 1.6% of GDP) while the already low expenditures in active labour market policies *decreased* by 7% (down to 0.3% of GDP) (Figure 6.8).

Figure 6.8. Spending in active labour market policies is low and skewed to passive measures

Active labour market policies spending, percentage of GDP



Note: ALMP cover services and activities of the public employment services (PES) and labour market policy (LMP) measures that provide temporary support for groups that are disadvantaged in the labour market. The data shown should not be treated as strictly comparable across countries or through time, since data at the level of individual countries in some cases deviate from standard definitions and methods; see notes to Annex Table Q of the *OECD Employment Outlook 2016* available at http://www.oecd.org/els/emp/employment-outlook-statistical-annex.htm. 2014 or last year available; United Kingdom 2011, Spain, Poland and Ireland 2013.

Source: *OECD Employment and Labour Market Statistics* and *OECD Economic Outlook: Statistics and Projections* (databases).

The creation of the ANPAL, the National Agency for the Provision of Active Labour Market Policies represents, therefore, a major shift in the way Italy approaches labour market policies. Such shift has notable repercussions on the way Italy develops and matches skills.

Active and passive LMP fundamentally differ in the way they see skills as a tool to address labour market challenges and crises. Passive LMP, such as unemployment benefits, can help to provide relief to the unemployed from the strains of their labour market condition. This is done by supporting the incomes of unemployed but not directly their skills. Active LMP, instead, aim to provide workers with tools and support to retrain and upskill so that these can return to employment in the best possible job match through an enhanced skill set.

Several commentators argued that, in a context like the Italian one – where the tradition of passive LMP has been extremely strong – putting emphasis on active interventions is going to face several ideological barriers. This is certainly one of the main obstacles facing the creation of the ANPAL. Needless to say, the solution to these challenges can be found in creating the necessary "*political capital*" to spur the buy-in of these reforms. In the aftermath of the Italian referendum, the political situation in Italy is particularly uncertain and creating such political capital and consensus among Italians can be a difficult task, though a necessary one.

Other issues relate also to the specific implementation and functioning of the ANPAL and are equally important and challenging. These issues relate to: i) the co-management of ALMPs between regions and the state and ii) the creation of robust infrastructures for the delivery of the active programmes.

Lack of co-operation between national and local actors can undermine the success of ALMPs

The devolution of labour market policies to regional governments started in Italy in 1997. This was prompted by the belief that decentralisation would have spurred a more rational and effective delivery of services, tailored to the needs of local labour markets. Unfortunately, the lack of co-ordination at the regional level led to an extremely fragmented delivery of services whose quality has also varied greatly across regions.

Against this backdrop, the Jobs Act was initially designed to promote the ANPAL as the actor that would have centralised all competences related to the delivery of ALMPs by homogenising standards and practices across regions. The rejection of the constitutional reform,[15] however, established that the tasks and responsibilities for the delivery of ALMPs should have remained a shared competence between national and regional governments.

De facto, in the aftermath of the constitutional referendum, the ANPAL has lost part of the powers that were foreseen for it in the initial draft of the Jobs Act. Co-ordination issues with regions, especially with regards to the interpretation of *minimum standards* for the delivery of services to jobseekers are likely to emerge. These can potentially end up undermining the role of the ANPAL itself.

This situation is all the more troubling as the ANPAL was not merely meant to co-ordinate the heterogeneous activities of regional actors but, also, and most importantly, to be the "champion" pushing for the homogenous delivery of the "new" active labour market policies.

Doubts remain, therefore, on how the constellation of different experiences at the local and regional level will be able to homogenously adapt to the radical change in

labour market policy orientation especially in a context where regional actors are not fully accountable to the national agency.

Some commentators (see Giubileo, 2015) argue, in fact, that the real challenge for the Italian system has not been the devolution of powers to the regions (see Box 6.2) but, instead, the lack of mechanisms to hold these accountable when failing to deliver services of a minimum common standard. It is, therefore, imperative for Italy to design adequate mechanisms to strengthen co-operation between regional and national stakeholders. This can be done by identifying clear criteria on which regions and providers of services have to be hold accountable across the whole national territory.

Box 6.2. AFOL: A case of good practice in the delivery of labour market services at the regional level

Several experiences at the regional and local level can be considered cases of best practice in the delivery of services to jobseekers and their founding aspects should be extended to other regions in Italy. AFOL-Milano is, for instance, a public company owned and operated by the metropolitan area of Milan and 22 municipalities, including the city of Milan.

Its aim is to provide employment and counselling services as well as training to long-term unemployed and foreign born. Their services span from traineeship opportunities for young and skilled people (AFOL promotes more than 2000 traineeships per year) to vocational and education training courses. One of the strengths of AFOL lies in the tailored services provided many of which are targeted to meet the needs of disadvantaged groups through the activities of public and private accredited employment agencies. Finally, it is important to stress the key role played by the Region Lombardia in planning the allocation of financial resources over the medium term. This has become a fundamental aspect of the overall delivery of the services and instrumental to the success of AFOL's activities as it granted continuity to providers' activities and ensured the delivery of high-quality and effective services.

Source: Dente, G. and A. Vergani (2016), "Regional Active Labour Market Policy in Italy: The Employment Unified Endowment", Fondazione Giacomo Brodolini.

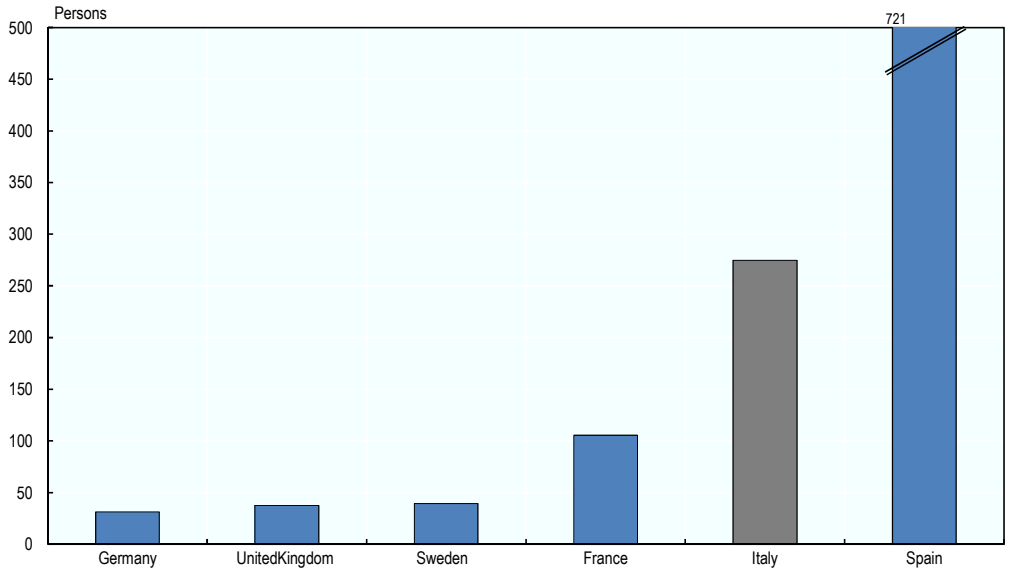
…and a boost in PES infrastructures and methods are needed for the reform to be successful

One major challenge facing the ANPAL will be making the best use of scarce resources for the delivery of ALMPs. The Italian jobseeker-to-staff ratio in Public Employment Services (PES) is very high compared to other European countries (Figure 6.9) and reducing this ratio will be key to deliver effective services ALMPs.[16]

Enhancing the delivery of the ALMP services, in a context of scarce resources and limited physical infrastructures[17] can be achieved through the development of sophisticated skills profiling tools that can help PES case workers to streamline their activities and provide more tailored and effective support.

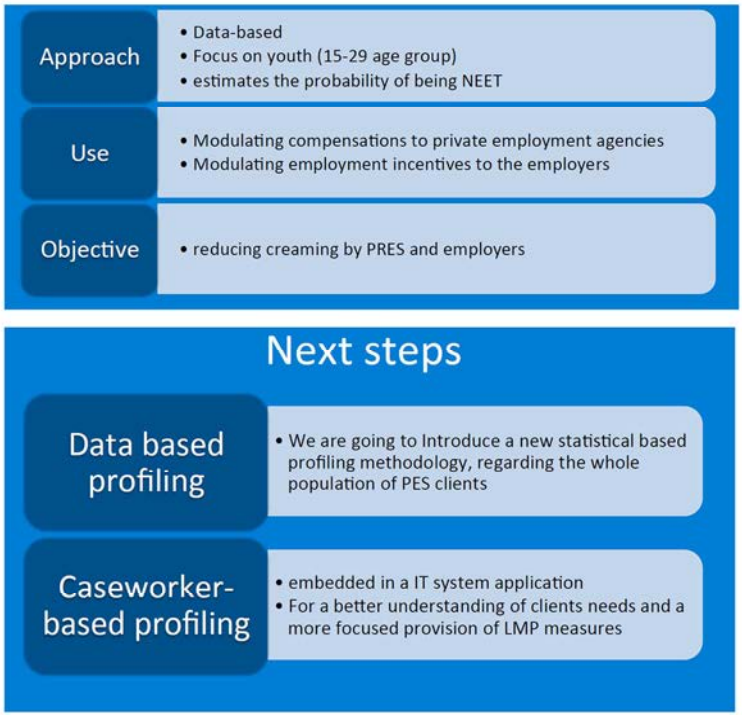
As pointed out by Pirrone (2016), profiling tools have already been implemented in Italy within the Youth Guarantee (YG) scheme in 2014 and their positive experience should be capitalised also for the delivery of ALMPs (Figure 6.10). New statistical tools are in the process of being developed by the ANPAL to back up case-workers activities and should lead to a more effective and quick response to jobseekers and employers' needs.

Figure 6.9. Jobseeker-to-PES staff ratio across countries



Source: Mandrone (2014) and OECD (2017).

Figure 6.10. The experience made within the Youth Guarantee programme and the next steps for Italy's profiling tools



Source: Pirrone (2016).

Along with the development of new skills-profiling tools, the ANPAL is going to manage a web portal whose aim is to provide information to both jobseekers and employers on vacancies and skills available in the labour market. The basic registration procedure to the portal will be the same for the two main types of recipients (jobseekers and employers) who will, however, be able to browse specific information relevant to their profile.

Jobseekers will be able to upload their CV and to search through the available vacancies while employers will be able to upload their information on the "*comunicazioni obbligatorie*" (e.g. compulsory information that firms need to provide to the government on new contracts and cessations).[18] While this is a laudable initiative, it will be important to monitor the effective functioning of this web tool and, especially, its integration within the regional informative systems and with the national network of statistical information promoted by ISTAT and INAPP (*Sistema Informativo delle Professioni*[19]*).*

In such complex period of transition from passive to active labour market policies, Italy can surely take advantage of the experience of other countries that already developed and used digital tools for job-matching. An interesting case of good practice is that of the Swedish PES (Box 6.3) that could inspire some of the elements of the Italian experience.

Box 6.3. Digital matching tools in Sweden

While many countries are developing increasingly sophisticated tools, it has become evident that many of the proxies that are currently used to measure skills (e.g. education or qualification levels, job titles) are an imperfect approximation of each individual true skills and competencies. In this context, the Swedish PES is working to refine its existing "digital matching tool" to allow both jobseekers and employers to search for each other through a system of skill tags inputted by the final users. This system goes beyond the use of the usual occupations, fields of study or qualifications proxies and it will enable jobseekers, employers and PES caseworkers to have a greater amount of information when searching for specific skills as well as when matching vacancies to jobseekers.

Jobseekers, for instance, will be able to provide information on their education titles as well as on the specific skills they acquired both formally (e.g. through education, for which they have a title) or informally at work. An IT engineer will be able to promote her/his CV (listed in the PES website) by adding skills like C++, Javascript, HTML or PHP. Employers, in turn, will be able to look for those specific skills instead of being constrained to search through job titles or qualifications, proxies that are unable to capture the depth and specificity of the competences required for the job or the skills owned by the jobseeker. Additionally, the digital matching tool will provide information on the jobseekers' availability to move geographically (nationally or only locally) and this will be used along with other variables to produce a ranking of the "quality of the match" between the jobseeker's attributes and the skills sought by the employers. Interestingly, one of the major improvements relative to the old PES matching system will be that those jobseekers whose profiles do not "exactly" match the request of a specific employer's vacancy will still show up in the list of possible candidates for that job, even if the match between jobseekers' skills and the job requirements is imperfect. A similar interface, based on the same set of skill tags and taxonomy, is also under development with the aim to extract skills tags from the job offers uploaded by employers to the PES system in form of free-text. This refinement is expected to speed up and improve jobseekers' search of available jobs that are matching their skills.

Source: OECD (2016), *Getting Skills Right: Sweden*.

Notes

1. For unfair dismissals the monetary compensation is two gross monthly salaries per year of tenure (a minimum of four months and a maximum of 24 monthly wages). The amount of such compensation is still very high, considering the OECD average of 14 months at 20 years of tenure (see OECD, 2017).
2. New contracts established during 2015 were exempted from social security contributions (capped at EUR 8 000 annually) for the first 3 years; exemptions were reduced in 2016 to EUR 3 250 for two years only.
3. Meliciani and Radicchia (2014) also show that informal recruitment channel significantly increases the employer-employees mismatch by increasing overeducation both directly and indirectly by reducing migration.
4. Cingano et al. (2010), Haltiwanger et al. (2013) and OECD (2010 and 2013) provide evidence on that firing restrictions make it more difficult for firms to adapt the workforce's skills to their changing needs by lowering the incentives to hire on permanent contracts in the first place. Adalet and Andrews (2015) also show that reducing the stringency of regulations on permanent contracts from the maximum levels to the median levels across OECD countries is associated with roughly a 3 percentage point reduction in skill mismatch. Recruiting with temporary contracts is not a solution either as evidence shows that employers have low incentives to provide training to these workers as they may be more prone to leave the firm.
5. Several commentators argue that the fragmentation of the regional certification system and the lack of clarity in its design have represented a problem also for multinationals that operate simultaneously in different parts of Italy. Certain regions, therefore, started adopting the EU qualification framework model but these practices have remained limited to certain sectors.
6. Decreto legislativo 13/2013.
7. Other desirable effects stemming from the recognition of informal learning can be that of avoiding duplication of training, maximising the value of vocational education and training expenditures and providing pathways to higher qualifications to people who may not have had previous access to training.
8. Or more years of education.
9. See above for a discussion of its causes.
10. Mosca and Tomassetti (2016).
11. Osservatorio Jobpricing: http://www.jobpricing.it/blog/blog.php?sez=3.
12. This is targeted to private sector employees who had an income from employment of no more than EUR 80 000 in the previous year as well as to companies achieving increases in productivity, profitability, efficiency, quality and innovation

13. The flat tax rate of 10% on bonuses that are awarded for productivity increases has been put a ceiling of EUR 3 000 or EUR 4 000 in case workers are also involved in the organisation of work. The bonus may be replaced, entirely or in part, with socially useful goods and services or by supplementary pension schemes, additional medical insurance, insurance coverage of loss of self-sufficiency or educational services.

14. Category 8, out of work income maintenance.

15. The constitutional referendum took place in December 2016.

16. Evidence shows that by lowering caseloads, PES offices could intensify counselling, monitoring and sanction efforts as well as contacts with local firms, resulting in shorter benefit durations. The costs of hiring additional caseworkers could be offset by decreased benefit expenditure after a period of ten months (OECD, 2015).

17. Italy counts around 8 000 PES caseworkers. In France these are around 36 000.

18. Finally, the portal will have a section called "Europe", devoted to the promotion and co-ordination of programs financed by the European Social Fund and containing information and links to other portals dedicated to European programmes on employment and mobility (Your First EURES Job, Erasmus plus, etc.) and their specific implementations in Italy.

19. For a discussion of its functioning see above.

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Italy

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