

“UNEMPLOYMENT AND SKILL MISMATCH IN THE ITALIAN LABOR MARKET”

A project coordinated by IGIER-Bocconi,
supported by J.P. Morgan



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Jérôme Adda, IGIER-Bocconi
Paola Monti, Fondazione Rodolfo Debenedetti
Michele Pellizzari, Università di Ginevra
Fabiano Schivardi, IGIER-Bocconi
Antonella Trigari, IGIER-Bocconi

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ABOUT THE PROGRAMME

The JPMorgan Chase global New Skills at Work programme focusses attention on what can be done to overcome unemployment, ranging from macro strategies to boost job creation, expand labour market participation and develop the skilled workforce for the future, through to specific innovations that improve the skills of the workforce and meet local employers' needs.

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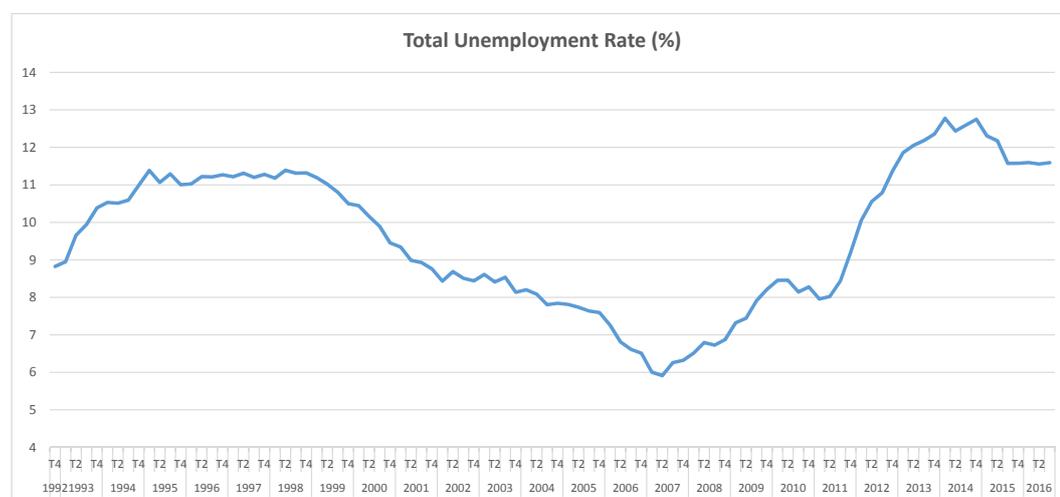
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1. Executive summary

- This is the first report of a **three-year research program** that Bocconi-IGIER is carrying out in collaboration with J.P. Morgan. The results of the research for the first year were presented at a conference held at Bocconi University on October 27th 2016, the program of which is reported at the end of this document. This report contains both the analysis presented at the conference and a summary of the discussion that ensued.
- The research project aims at investigating **the roots and consequences of skill mismatch** in the Italian labor market. The goal of the research for the first year is to set the stage in terms of the basic facts that describe the situation of the Italian labor market and the extent of the skill mismatch that characterizes it. The report is made up of two chapters. The first is on the performance of the labor market during the great recession. The second is on the degree of skill mismatch that characterizes the Italian labor market in comparison with other OECD economies.
- It is well known that the disappointing growth performance of the Italian economy over the last 20 years is due to persistently low labor productivity growth. Interestingly, the performance of the labor market during the same period has been characterized by different phases. After a sharp increase following the 1992-93 recession, the **unemployment rate** started to decline towards mid-1999. The decline continued till mid-2007, when it went below 6% for the first and only time in decades. Unfortunately, the decrease came to a sharp stop with the beginning of the crisis, when it started to increase until it reached a record level of almost 13% in the fourth quarter of 2014.

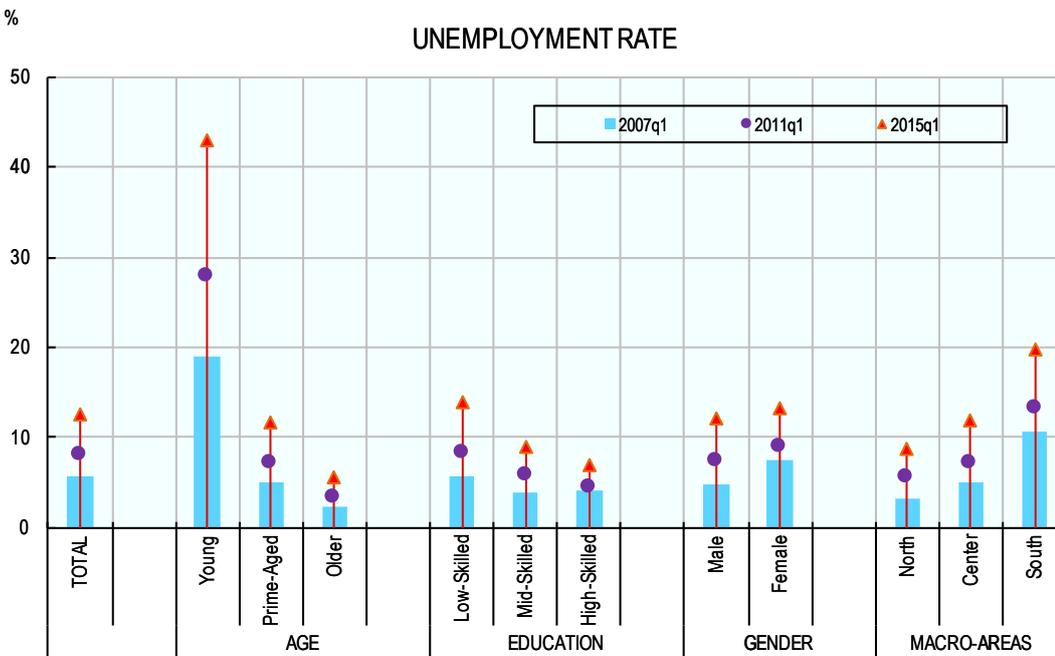
Fig. 1.1 - Unemployment rate in Italy, years 1992-2016



Source: Labor Force Survey (Istat)

- The first chapter of this report offers a comprehensive picture of the **evolution of the labor market in Italy during the crisis**. It does so by considering not only total unemployment, but also other indicators, such as long term unemployment, discouraged individuals, involuntary part-time workers and, among the youth, the NEET (not in education, employment or training).
- The key findings are summarized by the following figure, which reports the unemployment rate in the first quarter of 2007, 2011 and 2015 for the different demographic groups. Against a doubling of the overall unemployment rate, **younger workers recorded a record increase**: in 2015 their unemployment rate was well above 40%. The increase was smaller for prime-age and especially older individuals. In terms of other demographics, the categories that suffered the most were the less-educated and those living in the South. The overall picture is therefore one in which the most fragile segments of the labor market paid the higher price. These findings are confirmed and reinforced when considering other indicators of labor market performance that focus more on the structural aspects of the unemployment status, such as the long-term unemployment rate and the share of NEET among young workers. One noticeable exception is gender: although the unemployment rate for women in 2015 remained above that for men, they recorded a smaller increase during the crisis.

Fig 1.2 - Unemployment rate by demographic groups, 2007-2015



Source: Labor Force Survey (Istat)

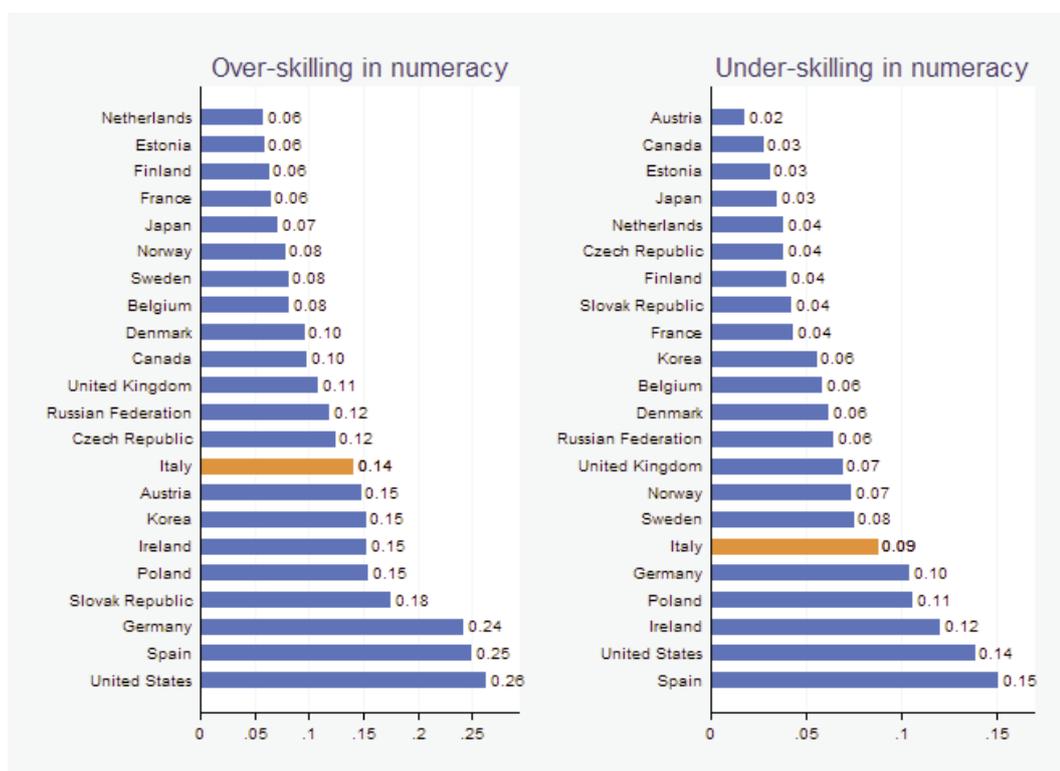
- These developments stopped and reversed a trend of reduction in inequality in the job market, in terms of the employment rate across demographic groups, that had started at the end of the nineties. The decrease in the unemployment rate that occurred up to 2007 in fact benefitted the weaker demographical groups more, in relative terms the young, the less-educated and those living in the south. During the crisis, the gap with respect to the category with the lowest unemployment rate – males, aged 40-45, college educated, living in the North – widened again. This implies that the crisis, in addition to dramatic aggregate consequences, also had **strong negative redistributive effects**.
- The key policy conclusion is that there is a clear group that has borne a disproportionate burden in the crisis: **younger individuals, particularly with low education and living in the South**. Older workers display lower unemployment rates and suffer less from long spells of unemployment. Therefore, the recent focus of Italian policy makers toward older individuals might be misdirected. Addressing geographical disparities is also a long-standing issue.
- The presentation of the report was followed by an address by the Deputy-Minister Tommaso Nannicini and by a discussion with Maurizio Del Conte (Bocconi University and President of the Agenzia Nazionale per le Politiche Attive del Lavoro – Anpal) and Paolo Sestito (Head of Structural Economic Analysis Directorate, Bank of Italy), moderated by Fabiano Schivardi (Bocconi University and IGIER). The speakers focused on the **recent reforms of the regulation of the labor market** and on what still has to be done to complete them.
- The pillar of the **“contractual” component of the reform** was the introduction of the open-ended contract with employment protection increasing with seniority (“contratto unico a tutele crescenti”). It was motivated by the need to overcome the dual system generated by previous reforms, with rigid open-ended contracts on one side and extremely flexible fixed-term contracts on the other. Tommaso Nannicini noted that it is still too early to evaluate the effects of the reform, given also the contemporary introduction of tax exemptions for new hires. He also pointed to the fact that a debate based on month-to-month variations in labor market outcomes is detrimental to a rigorous assessment of the reform. In fact, its aim was to improve the quality of job matches and therefore the long-run performance of the labor market, and not to create jobs in the short run.

1. Executive summary

- The discussion focused on the second pillar of the reform: **unemployment policies**. All speakers agreed important steps were made toward the transformation of the Italian protection system into a more universal one. In the words of Tommaso Nannicini, Italy is moving “from the traditional protection of jobs to the protection of workers”. The progress have been noticeable in terms of income support for the unemployed. The current challenge is the development of a new system of active labor market policies. This part of the reform still needs to be completed. All of the speakers agreed that it is an important, ambitious and difficult task. There were three key insights from the discussion: a) the reform is an ongoing process; b) experimentation and learning are key; c) it is important to build consensus around the reform, as without it the process cannot continue and is at risk of reversing.
- The potential **mismatch between the skills and qualifications of the workforce and the needs of employers** is a recurrent issue in the public debate. The objective of the second chapter is to use the best available data to describe the phenomenon of labor market mismatch in Italy in comparison with other OECD countries. A mismatch arises when a worker possesses a level of skills that is either higher or lower than the one required for the job. The analysis uses the PIAAC data, a recent OECD survey on adult skills, as well the Excelsior database, an Italian survey sponsored by the Italian Association of the Chambers of Commerce that provides forecasts on the demand of labor from employers and on the incidence of hard-to-fill vacancies.
- Numeracy and literacy **skills of Italian employees are among the lowest of OECD countries**, across all age groups and qualifications levels (the only exception being STEM graduates). Italy is also characterized by a high geographical variation in proficiency scores, with southern regions largely lagging behind the rest of the country.
- Due to its specialization in traditional, low-tech sectors and to the predominance of SMEs, **labour demand in Italy is less skills intensive than in other countries**, especially among highly skilled white-collar occupations. Skill requirements are particularly low in small business, although the Italian productive system seems to have a low demand for skills across all business sizes. Skilled blue-collar occupations are an exception: for this specific group of jobs, minimum skill requirements in Italy are higher than in other PIAAC countries. In addition, highly skilled technical jobs are among the occupations with the highest share of hard-to-fill vacancies.

- Italian employers do face some hiring difficulties. However, the salaries and working conditions of the most difficult jobs to fill do not seem to have improved in recent times. The **centralized system of collective bargaining** might be an impediment to adjusting salaries and working conditions to attract more and better candidates. Increasing the coverage of decentralized bargaining may be helpful in adapting working conditions to local needs, as hiring difficulties seem to be less pronounced in sectors where second-level collective bargaining is more widespread, in particular at company level.
- The international comparison summarized in the figure below shows that **Italy ranks high in terms of both under-skilling and over-skilling**: the labor market does not match the demand for and supply of skills efficiently. The low demand for skills coming from Italian employers may be responsible for the high level of over-skilling among university graduates (STEM graduates in particular). Under-skilling in Italy is particularly prominent in skilled blue-collar occupations, where it reaches 23% of employees (against the Italian and PIAAC averages of, respectively, 9 and 6%). High quality vocational training might alleviate tensions in this specific segment of the labor market. The findings highlight that the overall level of skill mismatch in Italy is the result of a relatively low demand for skills coming from Italian employers combined with a relatively unskilled workforce.

Fig 1.3 - Skill mismatch in numeracy across PIAAC countries



Source: OECD-PIAAC data

1. Executive summary

- The presentation was followed by a round table discussion moderated by Dario Di Vico (Corriere della Sera) with the participation of Gustavo Bracco (Human Resources Senior Adviser Pirelli), Andrea Gavosto, Director of the Fondazione Giovanni Agnelli, Glenda Quintini (Senior Economist at the OECD) and Monica Poggio (President of ITS Mechatronics Lombardia).
- The discussion focused mostly on the supply of skills, that is, on the **shortcomings of the education system**. Italian teaching methods are still very traditional and not sufficiently connected to the needs of the labor market. Moreover, the country lacks a system of lifelong learning, so typically after leaving school an individual does not go back to it anymore. There is also an insufficient supply of highly skilled technicians, and from this perspective, it would be important to extend the coverage of the Istituti Tecnici Superiori, which were introduced in 2007 but still enroll very few students. This might be an important port of entry into the labor market for a country that maintains a high manufacturing presence.
- The low propensity of firms to offer **on the job training** can be attributed to the high share of SMEs, that often do not have the resources to carry this type of activity. One tool to overcome this shortcoming may be to organize collective training programs, which have been successfully experimented in some OECD countries.





2. Labor market inequalities across Italian demographic groups: a focus on the youth and the long-term unemployed

Italy has gone through several years of economic recession that have left profound wounds to its economy. The unemployment rate has increased markedly since the last crisis and reached double digits in 2012, with little improvement since then. Specifically, long-term unemployment mainly drives this steep rise. The situation is however very different across demographic groups and across regions. Young individuals and people living in southern Italy are the categories with the most adverse labor market outcomes. In addition, the recent financial crisis has aggravated those disparities.

In this chapter, we start by characterizing the disadvantage of particular groups in terms of labor market outcomes focusing on the period 2012-2015. The phenomenon is complex and we look at various measures, as unemployment statistics alone may not fully capture the problem. In particular, we also focus on discouraged individuals or those who are in involuntary part-time work, and show that they amount to a substantial fraction of the working-age population. Throughout the analysis, the youth emerge as one of the categories with the greatest weaknesses in terms unemployment and labor force participation. Since this picture might be in part biased because young individuals are more likely to stay in education, we study another indicator of the conditions of the young population: the NEET. This measure sheds light on other worrying sides of the employment prospects of the youth.

Next, we look at how the last financial crisis has affected the labor market status of particular groups. The crisis hit particularly hard the socio-economic groups that were at a disadvantage before the crisis, including the young – and among them the 20-30 age group and those living in the southern parts of Italy. One notable exception is the gender disparity in labor market outcomes that decreased during the period. In addition, using our alternative measure of labor underutilization, which includes discouraged workers and involuntary part-time workers, we keep track of its evolution over time in order to understand which categories have been

most affected by the economic downturn.

Finally, we investigate how labor market disadvantage has evolved over a longer period, consisting of the last two decades. Over that period, there has been a decrease in inequality across socio-economic groups, mostly before the last crisis, which points to a longer run convergence, albeit a slow one.

The results highlight the need for policies that target specifically the long-term unemployment and non-employment of younger individuals, rather than focusing on other age groups. In Italy, pre-retirement workers still have much lower unemployment rates and suffer less from long spells of unemployment. One particularly fruitful target is the 20-30 age group, who suffer disproportionately from unemployment, but tend also to drop out of the labor force altogether. When in work, this group is also more likely to face involuntary part-time work. Therefore, the recent focus of Italian policy makers toward older individuals might be inappropriate. Addressing geographical disparities is also a long-standing issue.

2.1 The current situation: a country of sharp inequalities

2.1.1 Short-term and long-term unemployment, labor force participation

In order to understand the reality and the complexity of the Italian labor market, we rely on extensive micro data from the Labor Force Survey collected by ISTAT, the Italian Statistical Institute. We look at the various demographic groups (men and women, the young and prime-age individuals, for instance) and determine their labor market performance on several dimensions using a number of indicators. The goal is to identify the main inequalities and disparities in the country across different categories. We focus on the period from the third quarter of 2012 to the second quarter of 2015, which includes the latest figures that are available. We refer the reader to the appendix for a more complete description of the data.

We first compute the average distributions of unemployed individuals by demographic group, distinguishing between short-term and long-term unemployment. In terms of demographics, we look at the distributions by age, gender, geographical area and education level. In order to assess the degree of inequality across demographic groups, we compare the distributions of both the short-term unemployed

and the long-term unemployed to a reference distribution: the labor force distribution. In the absence of inequalities across demographic groups, the distributions should coincide. Take age for example. If young individuals represent a certain share of the labor force, but a larger share of the short-term unemployed, then it means that the youth are over-represented among the short-term unemployed.

Figure 2.1. Distributions of short-term unemployment and long-term unemployment by demographic groups, pooled data 2012-2015

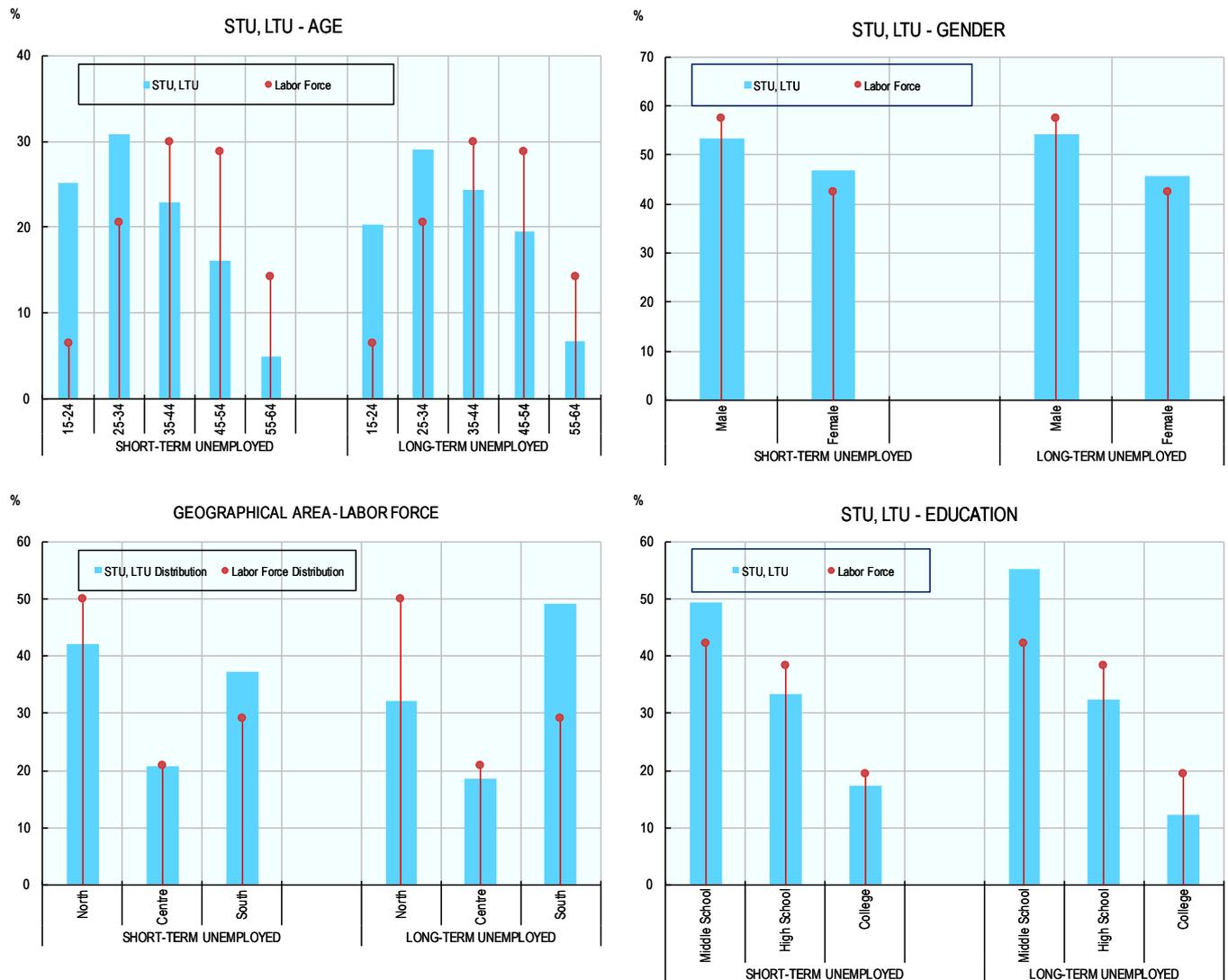


Figure 2.1 presents the results. It plots the distributions of the short-term unemployed and the long-term unemployed (denoted by blue bars) against the labor force distribution (denoted by red vertical lines) by age, gender, geographical area and education.

In the first plot, we consider five age groups: 15-24, 25-34, 35-44, 45-54 and 55-64. The figure shows that the youth are over-represented among the unemployed. While young individuals aged 15-24 only represent 6.5 percent of the labor force, they represent a striking 25.2 percent of the short-term unemployed, and an even more striking 20.3 percent of the long-term unemployed. There may be good reasons why the youth have higher short-term unemployment rates than older age groups. Typically, the youth have just entered the labor force and are thus still searching for their "true call" in the labor market. In a well-functioning labor market, in order to find their most suitable match, young individuals may go through a sequence of spells in short-term employment interspersed with spells of short-term unemployment. Another reason could be a difference in the composition of the labor force by age. For the youth, individuals with high ability would typically not be part of the labor force but in education, leading to adverse selection into the unemployed group at that age. However, it is difficult to rationalize the magnitude of the incidence of short-term unemployment among the youth simply due to search friction or adverse selection. Even more troubling is the fact that so many young individuals experience periods of unemployment lasting more than six months, i.e., they experience long-term unemployment.

Long-term unemployment is likely to have disruptive consequences for these young individuals, and more so for those negatively selected. The literature has extensively documented that the long-term unemployed have a higher probability of suffering from mental health and low self-esteem, as well as social isolation and disruption of family ties. Further, the long-term unemployed tend to have lower re-employment rates after accounting for observable

characteristics and, conditional on finding a job, lower re-employment wages. Long-term unemployment among the youth may signal that Italy has a problem in the school-to-work transition. The labor market is unwilling to absorb young individuals who have just completed their education - perhaps because of a skill mismatch between the abilities required by the employers and those learnt at school.

The second plot on the top focuses on gender. It shows that the distributions of unemployment are only slightly biased against women, relative to the labor force distribution. In fact, gender inequalities mostly emerge in labor market participation, rather than in labor market outcomes conditional on participation.

The third plot, on the other hand, reveals sharp inequalities across Italian geographical areas. From a geographical perspective, we look at three macro-areas: North, Centre, and South (which includes the Islands). In general, the situation worsens as we move from the northern to the southern regions, with the South representing a larger share of the short-term unemployed relative to their share of the labor force. While 29 percent of the Italian labor force lives in the South, it accounts for about 37.2 percent of the short-term unemployed.

The distribution of long-term unemployment in those southern regions reveals an even more worrisome situation. The South's share of the long-term unemployed is 49.3 percent against a share of the labor force of 29 percent. This is a sign of the relative malfunctioning of the labor market in the South.

Finally, in the last plot, we consider three education levels: those who completed middle school at best, those who completed high school, and those who have a college degree or more. The figure indicates lower incidence of unemployment at higher levels of education. In fact, individuals who have obtained at most a middle school qualification are disproportionately represented among the unemployed: they represent 49.4 percent of the short-term unemployed

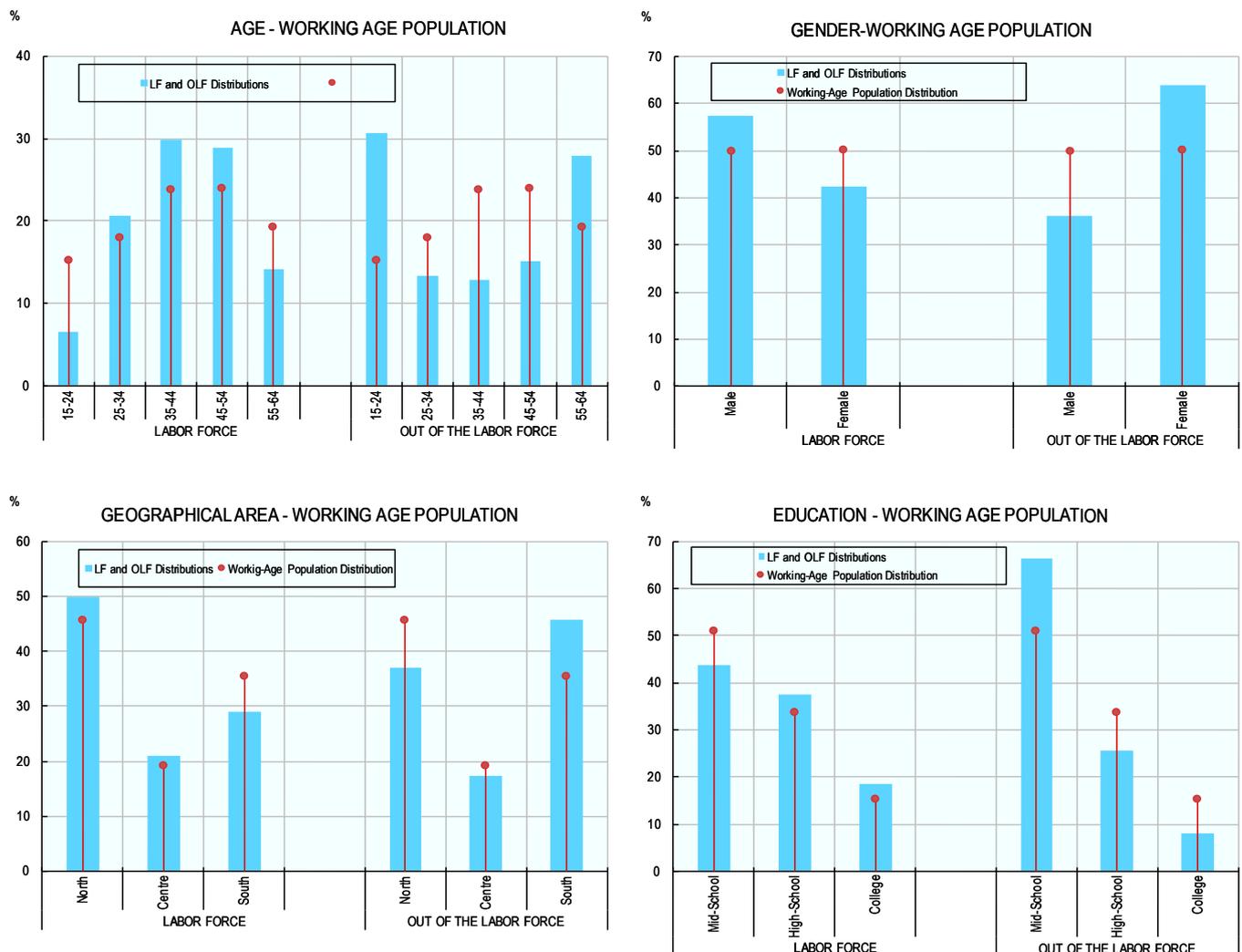
2. Labor market inequalities across Italian demographic groups: a focus on the youth and the long-term unemployed

and 55.2 percent of the long-term unemployed, but only 43.8 percent of the labor force. Their share of the long-term unemployed is more than 10 percentage points higher than their share of the labor force. At the opposite end of the spectrum, having a college degree reduces the incidence and especially the duration of unemployment: individuals with a college degree account for 18.7 percent of the labor force, 17.3 percent of the short-term unemployed, but only 12.3 percent of the long term unemployed.

In order to obtain a more detailed picture, we broad-

en our attention to encompass the entire working-age population. Indeed, we acknowledge that not everyone is part of the labor force: among the working-age population, there are also individuals who neither have a job nor look for one and accordingly are defined as out of the labor force. We fix our attention again on distributions by age, gender, geographical areas and education levels. In contrast to the analysis above, we compare the distributions of individuals in and out of the labor force to the distributions of individuals of working-age. The outcomes are depicted in the four plots in *Figure 2.2*.

Figure 2.2. Distributions of individuals in and out of the labor force by demographic groups, pooled data 2012-2015



The first chart shows the distributions by age of individuals who are in and out of the labor force (the blue bars) against the distribution by age of the working age population (the vertical red lines). As before, if all age groups have equal labor status patterns, the distributions should coincide. Unsurprisingly, individuals aged both 15-24 and 55-64 are over-represented among the out of the labor force group. These age groups represent 15.2 percent and 19.2 percent of the working age population, but 30.6 percent and 28 percent respectively of the out of the labor force group. This discrepancy might in part corroborate our earlier conjecture: young, high-ability individuals are typically not part of the labor force because they are still in education. Older individuals could have already exited the labor force because they have retired. However, it is important to understand whether the non-participation of younger and older individuals has changed recently and what the reasons are behind this. During times of economic crisis, the opportunity-cost of pursuing higher-level education decreases since it is more difficult to find a job. As a result, younger individuals may have decided to remain in education and not to enter the labor force. At the same time, the recent pension reforms, which have raised the minimum retirement age, may have caused higher participation among the older segments of the population because they were forced to remain in the labor force for longer.

The second plot on the top outlines patterns by gender, where the difference between males and females is large. While women account for about 50 percent of the working age population, the share of women among participants is lower and amounts to 43.8 percent. Hence, the apparent low inequality by gender shown in *Figure 11.1* in terms of unemployment does not hold true when one considers labor market participation. The analysis clearly identifies a marked disadvantage for women. This result is consistent with the well-known fact that the Italian female participation rate - currently 54.4 percent - is one of the lowest in Europe, and very far from the Lisbon target of 60 percent. Later we will shed some light on the reasons for this.

The labor market disadvantages of Italy's southern regions that were highlighted in *Figure 2.1* are also present for labor force participation, as the third plot of *Figure 2.2* makes clear. While the South accounts for 36.1 percent of the Italian working age population, it only represents 29 percent of the labor force. This contrasts with the central and northern regions, where a greater share of the labor force is located relative to the corresponding share of the working age population. It remains true, however, that the greatest regional disparities emerge in terms of the incidence of long-term unemployment, followed by those associated with the incidence of short-term unemployment and non-participation. Policies specifically targeted at reducing long-term unemployment in the South appear to be key to addressing regional labor market inequality.

A long list of structural weaknesses may contribute to explaining the dire labor market outcomes of individuals living in the South. Recently, Boeri, Ichino and Moretti (2016) have emphasized the role of nominal wage compression across different geographical areas (caused by national union contracts) and large disparities across regions in terms of labor productivity (which is typically lower in the South). The resulting higher real output cost in the South, given the prices of traded goods, depresses local labor demand, causing higher unemployment in the South. At the same time, migration flows resulting from the adverse labor market conditions in the South increase housing prices in the North relative to the South, implying a relatively lower cost of living in the South. The Consumer Price Index in 2011 ranged from about 97 to 150 in the North and from around 72 to 97 in the South, with the difference being driven primarily by housing prices.

Large differences in the cost of living across Italian regions and a welfare system that is not indexed to such differences may, in turn, generate different incentives to search for work across regions, and contribute in part to explaining the duration of unemployment or the incidence of long-term unemployment. Consider a worker looking for a job and receiving unemployment insurance benefits while unemployed. Unemployment benefits will be higher in real terms in the South than in the North generating differential incentives to continue searching for work, rather than accepting a certain, but possibly low, wage offer.¹ Other means-tested welfare transfers targeted at the poor also have eligibility rules that are homogenous at the national level and thus do not account for the differential cost of living across regions. Being higher in real terms in southern regions, these transfers imply a relatively lower cost of non-employment, unemployment and non-participation in those regions.

¹ Real wages will also be higher in the South but this affects equally both the costs (in terms of foregone wage incomes) and the gains from continued search (in terms of potential future wage offers).

Finally, we look at the disparities in terms of labor market participation across different education levels. The last plot in *Figure 2.2* shows that participation is disproportionately lower among the less educated. We should note, however, that this could be explained at least in part by a cohort effect implying that a large share of the less-educated have already retired. Older generations were less likely to pursue higher levels of education, so they are likely to represent a significant share of the less-educated. In addition, until recently, the Italian pension system was designed in such a way as to allow early retirement, giving rise to the so-called “baby retirees” – people still of working age but no longer active.

2.1.2 Reasons for being out of the labor force

To further understand the underlying mechanisms behind the disparities in labor market participation, we study the reasons why individuals choose not to participate in the labor force. We group the reasons for non-participation given by respondents as follows: i) education and training; ii) health reasons (including permanent inability to work); iii) discouragement (i.e. people do not look for a job because they believe they will be unable to find one); iv) family reasons (including taking care of children or the elderly); v) waiting to go back to work (from Cassa Integrazione Guadagni², for instance) or waiting for the results of past search actions; vi) retirement. We also consider a residual category for those individuals who could not state a reason, or said that they did not care about finding a job. As we will see, the reasons for being out of the labor force vary widely across demographics groups.

² The Cassa Integrazione Guadagni (CIG), literally Wage Guarantee Fund, is a special public fund used to protect workers' income, financed by contributions and the state and administered by the National Institute of Social Insurance (INPS). In cases laid down by law, the Wages Guarantee Fund makes up the pay of employees affected by lay-offs or short-time working.

Figure 2.3. Distributions of reasons for being out of the labor force within age groups for males and females, pooled data 2012-2015

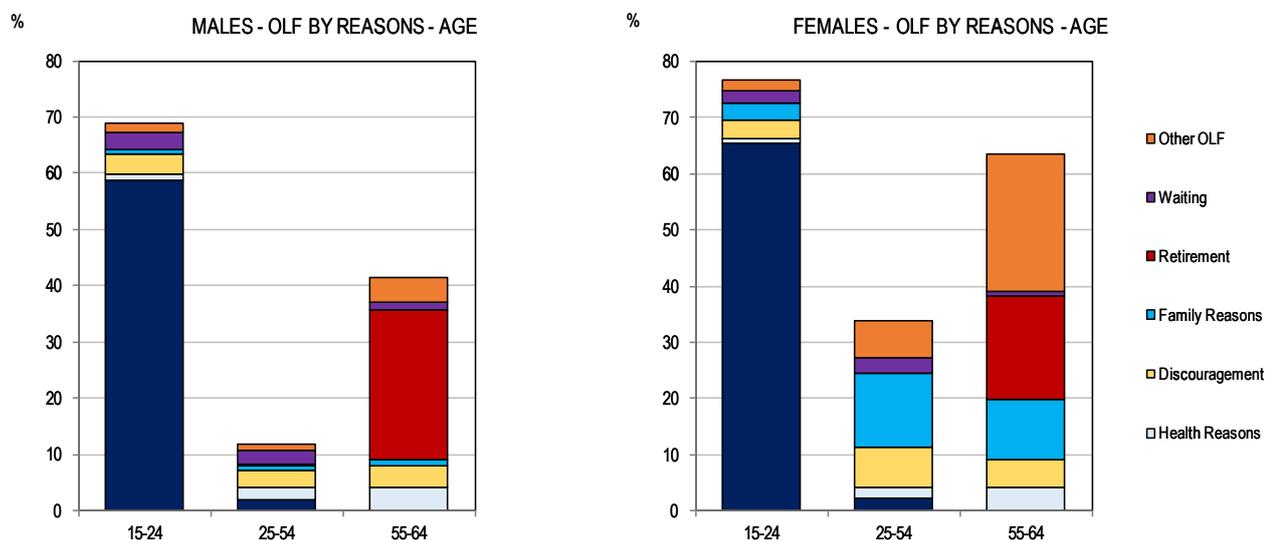


Figure 2.3 plots the distribution of the reasons for being out of the labor force by age categories, for both females and males. The distributions are expressed as a share of the entire working age population, so that the overall height of the bars represents the non-participation rate of each demographic group. Non-participation rates differ by gender, with women less likely to participate in the labor force overall. A closer look at the decomposition by reason highlights a number of disparities by gender that are not always against women. Specifically, for women a higher share (about 5 percent more) of individuals between 15 and 24 years of age are in education or training. This might point to a higher

average skill level for women, as they stay in education for longer than men. The picture, however, is considerably different if one focuses on older age groups. Women from 25 to 54 years of age are significantly more likely to stay out of the labor force for family reasons. At the same time, their share of discouraged in the 25-54 age category is slightly higher than for males. Finally, among individuals aged above 55, there is a marked gender difference in terms of retirement rates. The great majority of males who are out of the labor force are retired (26.6 percent out of around 40 percent). By contrast, the largest out of the labor force category for women is “other reasons”.

Figure 2.4. Distributions of reasons for being out of the labor force within geographical areas and education groups, pooled data 2012-2015

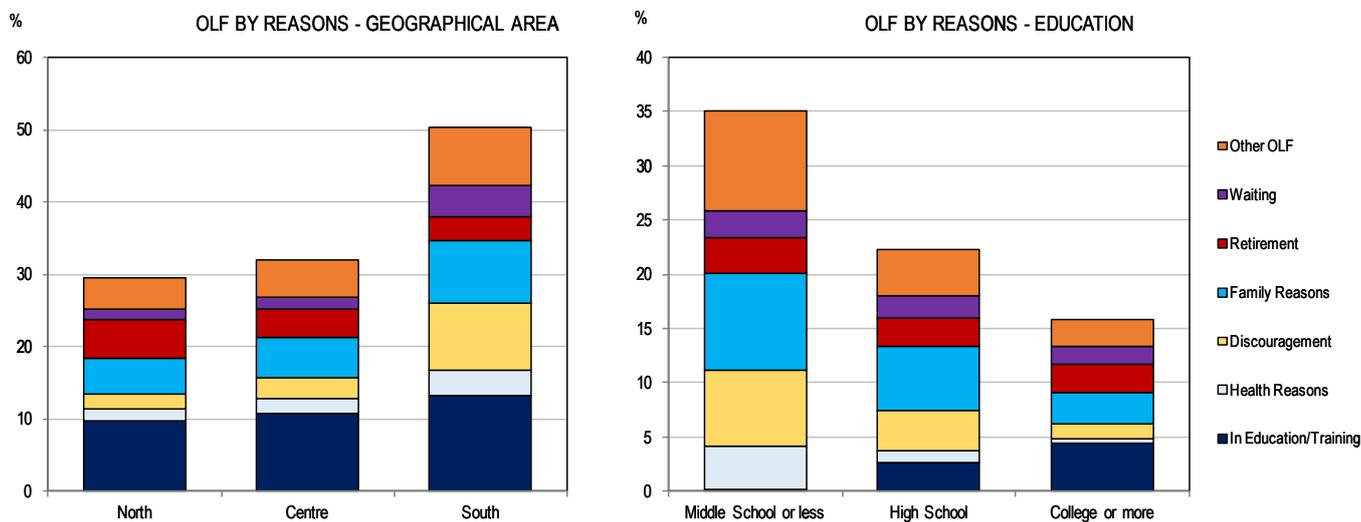


Figure 2.4 focuses on disparities in participation across regions and education levels. As previously noted, the first plot shows that the South is characterized by an extremely low labor market participation. The inactivity rate is about 50 percent in the South, while it is only 30 percent in the North. What explains these regional differences? The data clearly point to discouragement as one of the main drivers. In the South discouraged workers make up 9.4 percent of the working age population, whereas in the North the figure is 2.1 percent. Family reasons are another important determinant of geographical differences in participation. Finally, we note that the share of retired individuals is slightly lower in the South than in other regions.

The second plot of the figure illustrates that labor market participation decreases with education. The inactivity rate is about 40 percent for the less-skilled, less than 25 percent for the medium skilled, and just above 15 percent for the highly skilled. Besides the greater incidence of retirement for the less-skilled and the higher incidence of training and education for the highly skilled, the chart reveals that family reasons and discouragement explain a significant part of the difference. The higher inci-

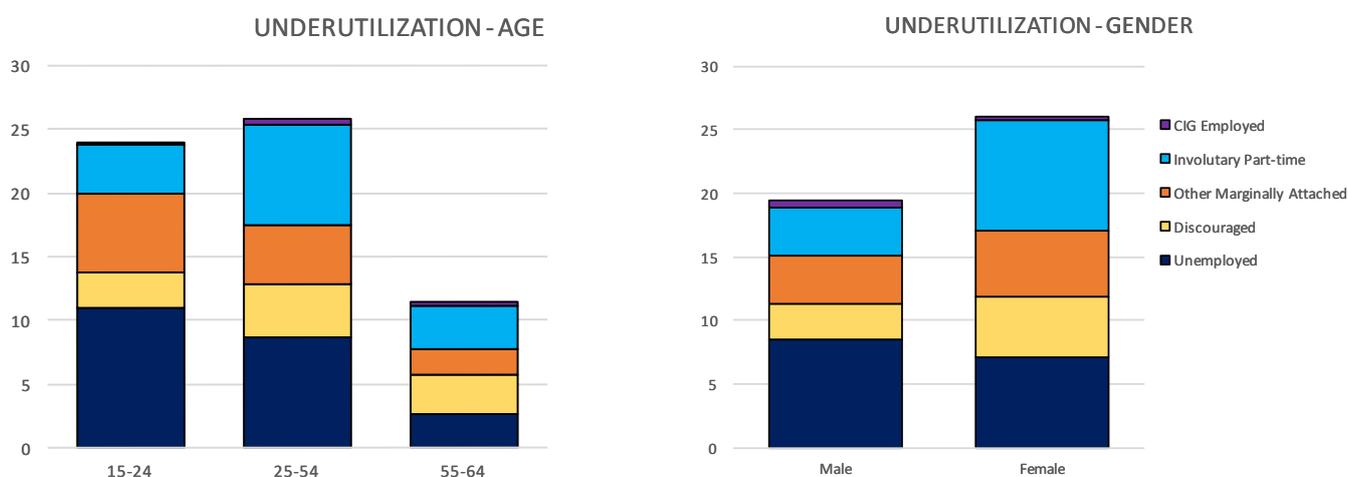
dence of retirement among the less skilled may have different explanations: a cohort effect, as previously mentioned; or the lower opportunity cost of non-participation in terms of loss of wages in the case of early retirement, because the wages of the less-skilled are lower. The lower opportunity costs may also explain the higher incidence of non-participation due to family reasons. Finally, health reasons also contribute to the non-participation of the low-skilled. As before, a cohort effect may be behind this if a large share of the low-skilled are in the 55 to 64 age group and thus more likely to have health problems associated with their age. At the same time, it may be that the nature of the jobs of the low-skilled (arduous and physically demanding jobs) has consequences for health that raise the likelihood of exiting the labor force. Similar reasons may explain why the residual category “other OLF” is also large for the less-educated. This category includes, for example, those individuals who answered that they did not mind about not finding a job, possibly because of age reasons. It would be interesting to understand why discouragement is higher for the less-educated. One reason could be that the labor market is less willing to absorb them.

2.1.3 Alternative measures of labor underutilization

The unemployment rate receives much policy and media attention, but paints an incomplete picture of the functioning of labor markets since it does not capture adequately the utilization state of labor market resources. Broader measures than the standard unemployment rate are needed to capture the effective utilization state of labor market resources. First, some individuals who are not actively looking for work, and are thus not counted among the unemployed, state they would be willing to accept a job if one was offered. These individuals are thus marginally attached to the labor force. Among them, there are the discouraged workers, who want a job but have not searched for one because they perceive that they have no chance due to adverse job market conditions. The third category we consider are the involuntary part-time workers, who would have preferred a full-time job but could not find one. The final category we consider is peculiar to the Italian

case and concerns individuals who receive the “Cassa Integrazione Guadagni (CIG)”. CIG is an Italian institution aimed at providing support to firms facing temporarily adverse economic conditions. It relieves those firms of the cost of an unutilized workforce by contributing a payment to workers who are temporarily laid-off or on reduced hours. Despite the temporary nature of this institution, workers often receive payments for a long period, as the CIG can be extended for up to three years. While workers receiving CIG are classified as employed in official statistics, because in principle they are waiting to return to their jobs, they remain attached to poorly performing firms and, eventually, often end up in unemployment. We therefore build a broader measure of joblessness, which we label underutilization of labor or underemployment into which we group all these categories, including of course the unemployed. In this section, we normalize the number of individuals belonging to all components of labor underutilization by the working-age population.

Figure 2.5. Distribution of underutilization within age groups and gender, pooled data 2012-2015



The first chart of *Figure 2.5* presents a frequency plot of labor underutilization and its components by age group. Unemployment often constitutes less than half of the more broadly defined group of individuals who face adverse labor market outcomes. This clearly shows that focusing only on unemployed may present a distorted picture of the degree of underutilization of the labor resource. Among the other categories, discouragement plays an important role especially for prime-age individuals. On the other hand, involuntary part-time is particularly important for individuals aged 25 to 34, and represents almost 10 percent of the working-age population. The absolute incidence of involuntary part time tends to decline with age. A problematic school-to-work transition may explain the prominent role of involuntary part-time among the youth, as part-time jobs may serve as stepping-stones to full-time jobs.

The second chart in *Figure 2.5* focuses on gender and shows that involuntary part-time is the main source of the discrepancy in underemployment between women and men. This is surprising. Note that involuntary part-time only includes those who have a part time job but would prefer a full-time job. It does not include, for example, part-time for family reasons (i.e. for taking care of the children and the elderly). Involuntary part-time typically rises as economic conditions deteriorate. On the labor-demand side, employers may reduce the numbers of paid hours in an effort to cut costs. On the supply side, in recessions workers may be more willing to accept a reduction in worked hours in order to remain employed. It is difficult, however, to rationalize why involuntary part-time is so much higher for women. Labor market discrimination against women is among the possible explanations.

Figure 2.6. Distribution of underutilization within geographical areas and education groups, pooled data 2012-2015

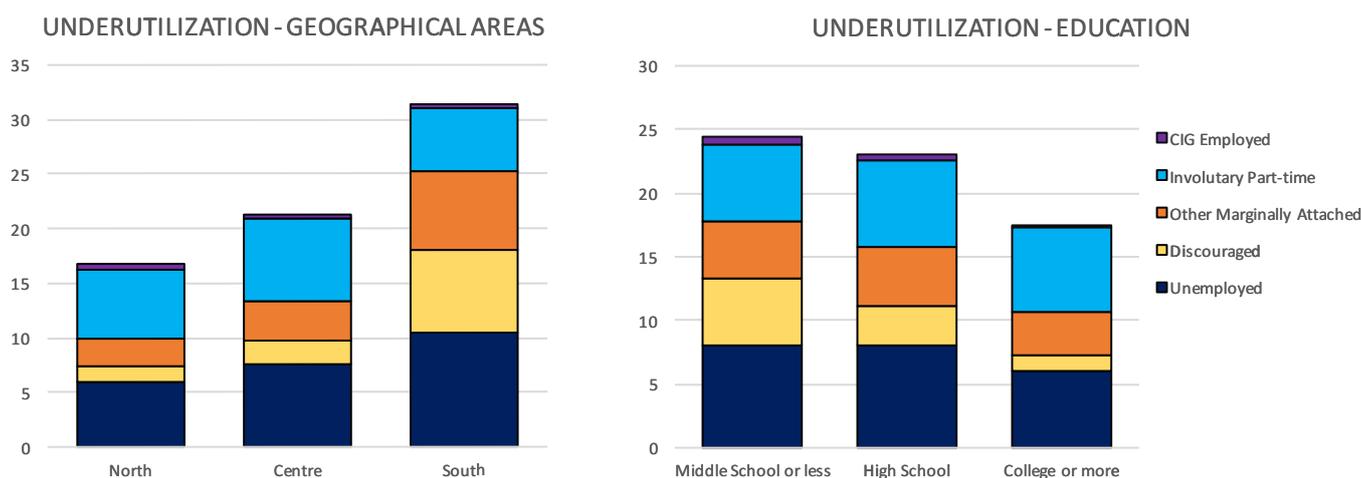


Figure 2.6 shows that the share of discouraged workers in the South is five times greater than in the North (7.6 percent of the working age population in the South versus 1.5 percent in the North). Similarly, the share of other marginally attached is about three times greater (7.3 percent in the South versus 2.5 percent in the North). Overall, marginally attached workers account for about 15 percent of the working age population in the South and only 4 percent in the North. In absolute terms, the shares of both discouraged and other marginally attached individuals in the South are large and together amount to more than that of unemployed individuals. The presence in the South of discouraged or marginally attached workers reflects long-term unemployment, which is also much higher in the South. Several economic studies have demonstrated that unemployed individuals who remain without a job for a long period become gradually discouraged, reduce the intensity with which they search for a job, until they exit the labor force.

The second plot shows that discouragement and marginal attachment is the main cause of differences in labor underutilization also among educational classes. More skills reduce the incidence of both.

Summing up, the analysis reveals a critical situation for the youth whose high share among the long-term unemployed is alarming. This age category also fares worse for other measures of joblessness. It also reveals sharp inequalities in terms of labor force outcomes between the North and the South and, to a minor extent, between low-skilled and highly skilled individuals. In section 3 we will

try to understand whether this is a result of increased inequalities during the crisis, or, on the contrary, whether the crisis has closed a wider pre-existent gap.

2.1.4 NEET

The analysis conducted so far has clearly shown that the youth are particularly disadvantaged in terms of employment performance. However, the majority of individuals in this age group are in school, so those who actually look for a job constitute a residual category. Hence, unemployment is not the most suitable measure of employment performance for the youth. We therefore introduce an alternative measure of labor market weakness for young individuals: the NEET. The NEET are youth who are neither employed nor in education or training. While we focus on the 15 to 29 age group, we note that the upper age boundary for this group is unclear and varies across countries. These individuals are vulnerable in terms of labor market prospects, as they are neither increasing their human capital through education nor acquiring work experience in the key years immediately following completion of education. NEET are therefore more likely to be unemployed as they enter the labor force.

In this section, we look at the composition of the youth working-age population within each demographic characteristic according to the following categories: i) employed; ii) in education; iii) in training; iv) NEET (which also includes the unemployed). We do not analyze the composition within education classes as most of these young individuals, due to their age, have not yet completed high school or college.

Figure 2.7. Share of NEET in the working-age population by demographic group, pooled data 2012-2015

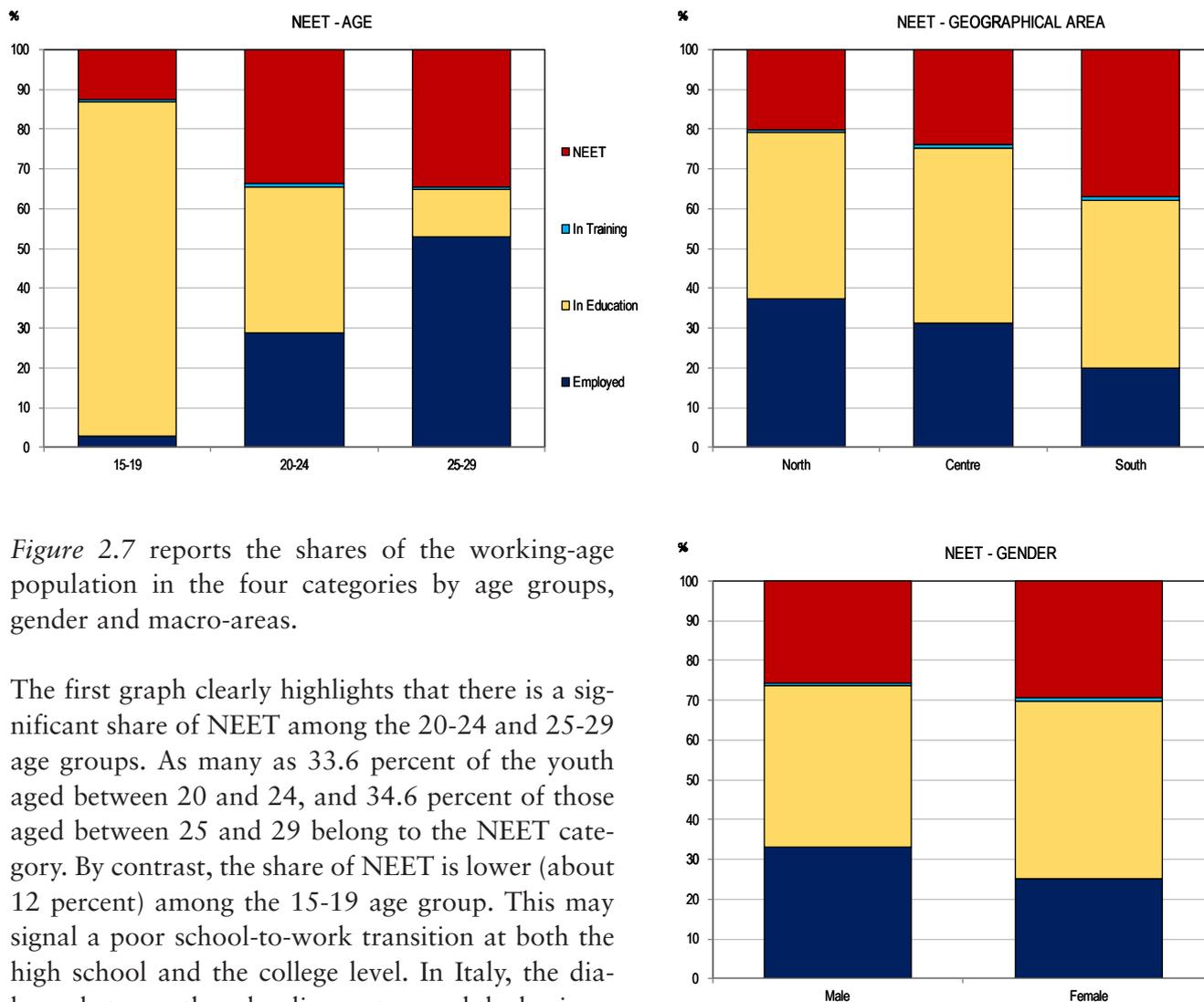


Figure 2.7 reports the shares of the working-age population in the four categories by age groups, gender and macro-areas.

The first graph clearly highlights that there is a significant share of NEET among the 20-24 and 25-29 age groups. As many as 33.6 percent of the youth aged between 20 and 24, and 34.6 percent of those aged between 25 and 29 belong to the NEET category. By contrast, the share of NEET is lower (about 12 percent) among the 15-19 age group. This may signal a poor school-to-work transition at both the high school and the college level. In Italy, the dialogue between the schooling system and the business world has traditionally been limited. On the one hand, vocational schools do not seem to provide the professional skills needed by firms. On the other hand, only recently has the university system introduced compulsory apprenticeships/training for graduates in order to ease the transition from college to work. Also, while the reform of the “laurea breve” (3-year bachelor degree) in the early 2000s, has raised the number of Italian graduates to the level of other OECD countries, the labor market has not proved ready to absorb the new graduates, with unemployment among them rising.

The second chart confirms the dire situation in the South, with about 37 percent of the youth aged 15 to 29 in NEET, compared to about 20 percent in the North. Since the share of young individuals in education is almost the same in the three regions (about 40 percent), the gap across macro areas must be accounted for in large part by individuals who do not enter the labor force once their education is completed. Thus, the school-to-work transition seems to be more inefficient in the South than in the North. Finally, the third plot shows that NEET is not correlated with

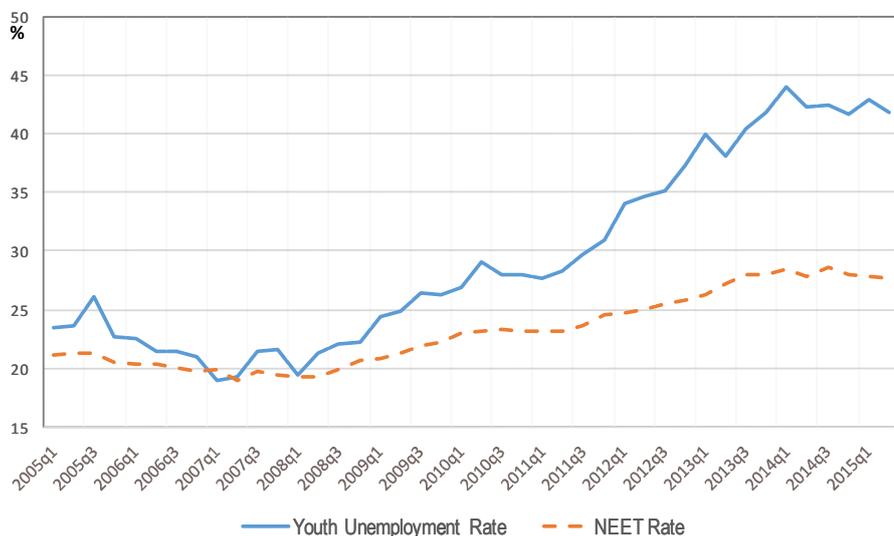
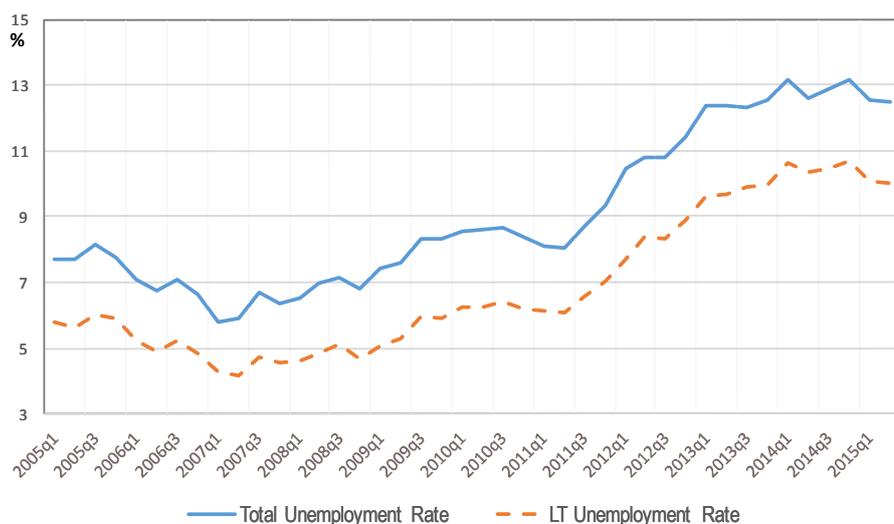
gender, as we observe only a slight disadvantage for females. This could be due to the fact that the defective school-to-work transition is gender neutral.

2.2 The crisis: how things got worse

Figure 2.8 plots the unemployment rate in Italy from 2005 to 2015, together with three other indicators of joblessness. The first is the long-term unemployment rate. The second is the unemployment rate of youth aged 15 to 24. The third is the percentage of individuals aged 15 to 29 who are nei-

ther employed nor involved in education nor training, usually referred to as the NEET rate. The three additional indicators aim to capture the specific vulnerabilities of the long-term unemployed and the youth. They address a broader array of vulnerabilities among young individuals, including early school leaving and discouragement. Because the young belonging to the NEET category are neither improving their future employability through human capital accumulation in education nor gaining experience on the job, they are particularly at risk of both labor market and social exclusion.

Figure 2.8. Unemployment, long-term unemployment, youth unemployment and NEET rates, 2005-2015



The first plot of *Figure 2.8* shows that both the unemployment rate and the long-term unemployment rate more than doubled from the start of the financial crisis in 2007 until 2015. The unemployment rate increased from 5.8 percent to 12.5 percent, while the long-term unemployment rate increased from 4.3 percent to 10 percent. Both rates experienced a mild decline in 2010, until the sovereign debt crisis hit and took them back to their rising trajectory. At the same time, over the entire period, the long-term unemployment numbers are alarmingly close to the unemployment numbers, indicating that a significant share of the unemployed experience long periods of joblessness. The second plot reveals that the youth unemployment rate increased from an already elevated 19 percent at the onset of the crisis to a peak of almost 43 percent in 2015. The NEET rate also increased significantly over the crisis years; from about 20 percent to almost 30 percent.

2.2.1 Short-term and long-term unemployment rates and NEET rate during the crisis

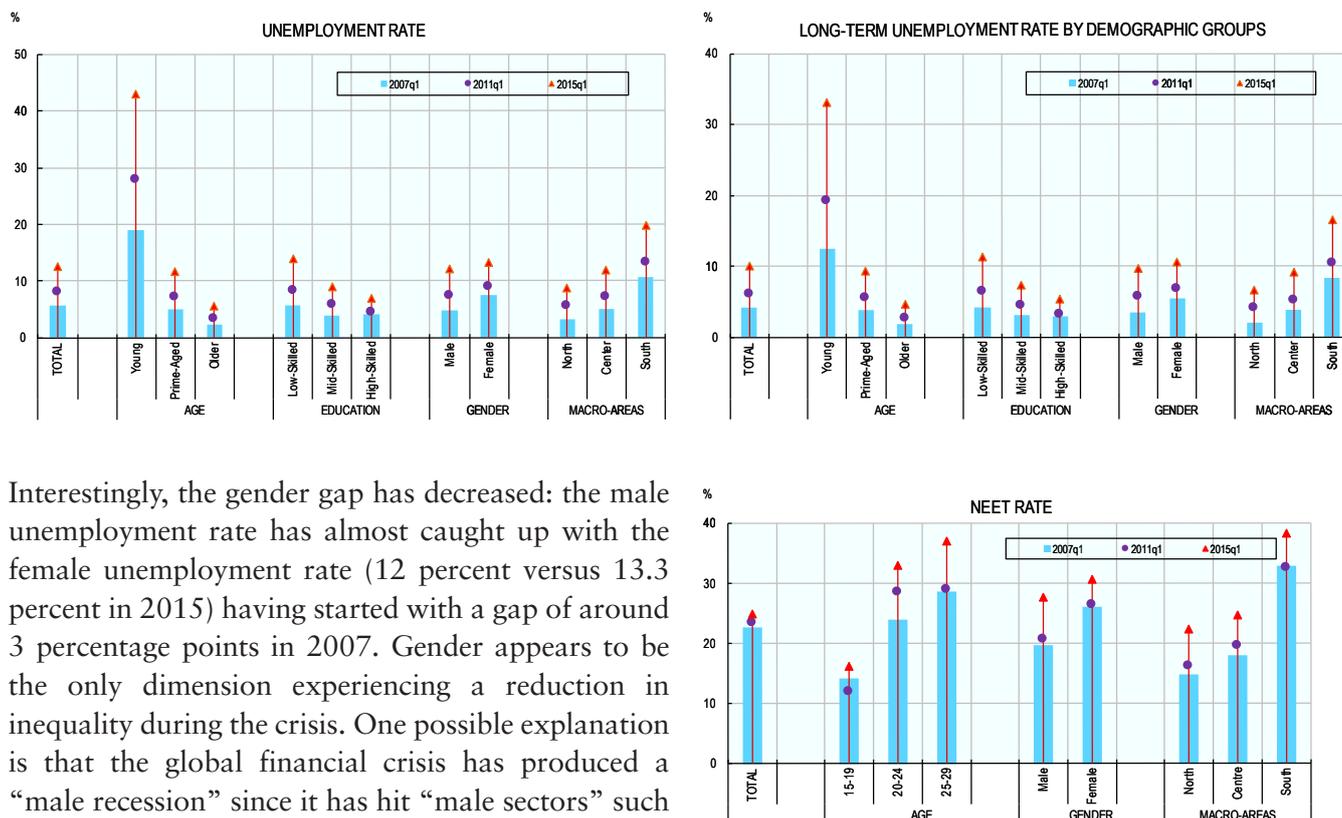
Figure 2.9 reports the evolution over time of the unemployment rate, the long-term unemployment rate and the NEET rate by demographics. The blue bars indicate data in 2007, the violet circle data in 2011 and the orange triangle data in 2015. The first plot focuses on age.³ As we noted, the increase in youth unemployment is dramatic: from 19 percent

in the first quarter of 2007 to 42.9 percent in the first quarter of 2015. It is true, however, that those in the labor force are only a small subset of the individuals aged 15 to 24, as most of them are still enrolled in school. This is why focusing on the NEET rate is important. It is still the case, though, that the youth unemployment rate has more than doubled in only eight years and does not seem to be recovering despite recent improvements in the Italian economy. It would be interesting to know the extent to which the increase in the youth unemployment rate is the result of a larger inflow from employment, via higher layoff rates, or the result of a larger inflow from outside of the labor force. This would require further analysis and different data. The figure also reveals that during the recessionary years the unemployment gap between the young and prime-age workers has increased, from about 14 percentage points to 31 percentage points. Similarly, over the crisis, the gap between the less-skilled and the highly skilled has widened, rising from 1.8 to 4.8 percentage points.

The crisis has also exacerbated regional disparities. The gap in the unemployment rates between the North and the South has risen from 7.3 percentage points to 11.2 percentage points. Indeed, the unemployment rate in the South increased by as much as 9.2 percentage points, a clear sign that the latest downturn has severely affected that region.

³ In the figure, young individuals are 15-24 years old; prime-age individuals are 25-54 years old; and older are 55-64 years old.

Figure 2.9. Unemployment, long-term unemployment and NEET rates by demographic groups, 2007-2015



Interestingly, the gender gap has decreased: the male unemployment rate has almost caught up with the female unemployment rate (12 percent versus 13.3 percent in 2015) having started with a gap of around 3 percentage points in 2007. Gender appears to be the only dimension experiencing a reduction in inequality during the crisis. One possible explanation is that the global financial crisis has produced a “male recession” since it has hit “male sectors” such as housing and construction more severely.

In *Figure 2.9* a cursory look at the first and second panels together reveals a long-term unemployment situation that mirrors qualitatively that of unemployment. From a qualitative point of view, both the distribution across demographics in 2007 and the evolution from 2007 to 2015 are in fact very similar for both rates. The youth, the less skilled, those living in the South and, to a lesser extent, women, had higher long-term unemployment rates in 2007, and the gap compared to the most advantaged categories generally increased by 2015. The gap increased for the youth compared to prime-age individuals - from 8.7 percentage points to 23.8 percentage points - with

the youth long-term unemployment rate peaking at 33.2 percent in the first quarter of 2015. It increased for the less-skilled relative to the highly skilled - from 1.4 percentage points in 2007 to 6 percentage points in 2015 - with the long-term unemployment rate for the less-skilled individuals reaching 11.4 percent at the end of our sample period. Similarly, long-term unemployment in the South increased more than in the North - by 16.7 percentage points and 6.7 percentage points, respectively. The only exception was the gender gap that narrowed during the crisis, with the unemployment gap decreasing from 2 percentage points in 2007 to 0.9 percentage points in 2015.

The third plot, at the bottom of *Figure 2.9*, concentrates on the NEET rate. The figure shows that the categories that started as most disadvantaged in 2007 remained so in 2015. These are individuals living in the South, in the 25 to 29 age group, and females. We note, though, that the highest increases were experienced by individuals aged 20 to 24 (plus 8.9 percentage points versus 8.3 percentage points for individuals aged 25 to 29), males (plus 8 percentage points versus 4.6 percentage points for females) and those living in the North (plus 7.6 percentage points versus 5.4 percentage points in the South).

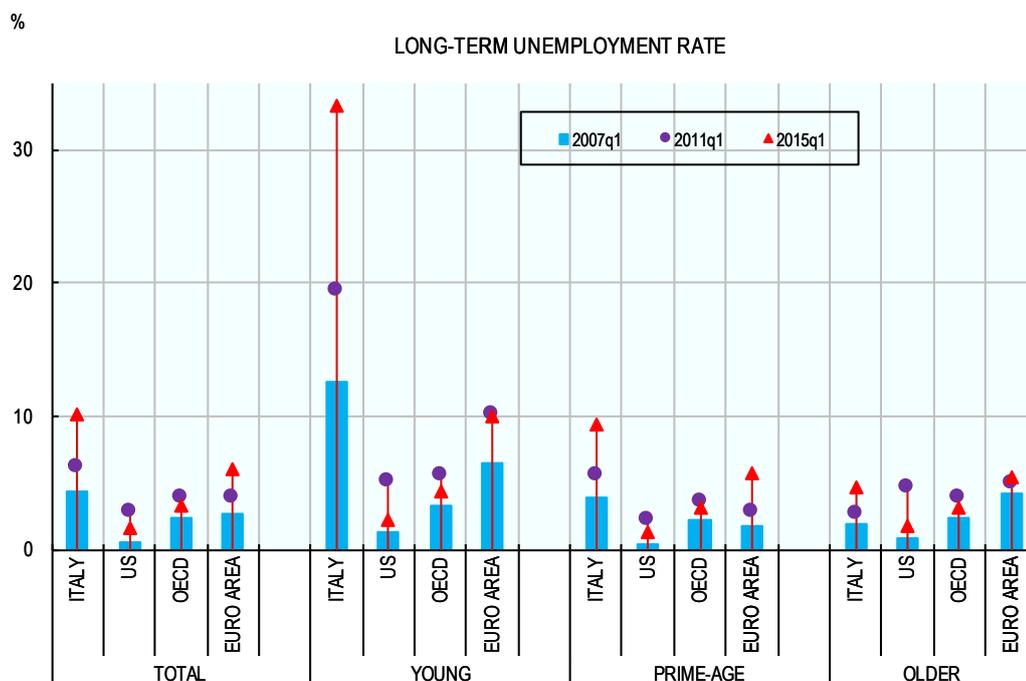
Of particular interest is the NEET rate by gender. In principle, we would expect a higher NEET rate for females than for males since women, possibly also young women, are more likely to remain out of the labor force for reasons related to family and house care. This is what we observe in 2007: a considerably higher NEET rate for women than for men. What is less obvious to rationalize is that during the crisis the NEET gender gap has been closing. This may be due to the closing unemployment gap discussed earlier. The greater increase in unemployment for males compared to females may be behind the higher increase in the NEET rate for men than for women.

Finally, *Figure 2.10* compares Italy to the US, to the Euro area average, and to the OECD average according to the distribution of the long-term unemployment rate by age.

The comparison between the Italian case and the international context is very informative. Four key results emerge. First, there were significantly higher long-term unemployment rates in Italy than in other countries across all age categories before the

crisis, as they were already present in 2007. At the start of the financial crisis, the overall long-term unemployment rate was 4.3 percent in Italy, 2.6 percent in the Euro area, 2.3 percent in the OECD countries and 0.6 percent in the US. Second, during the crisis, Italy has experienced an increase in long-term unemployment across the entire age distribution that has been considerably greater than in other countries. It peaked at 9.6 percent in Italy, compared to 4.6 percent in the Euro Area, and even less in the US and the OECD. Moreover, while in Italy long-term unemployment continued on a steep rising trend over the entire period, both the OECD and Euro Area countries experienced on average a stabilization of the rate from 2011 to 2015, and the US even experienced a reversal of the trend. Third, at the onset of the crisis, long-term unemployment in Italy appears to have been significantly more unevenly distributed across ages, and higher among the youth, than in other countries. While all countries have a higher incidence of long-term unemployment among the youth, which may be due in part to a negatively selected sample among 15 to 24 year olds, who are typically in school at that age, the much higher disparities across age categories that we observe in Italy point to more structural factors. Finally, the increase in long-term unemployment was also much more unequally distributed among age groups in Italy than in other countries. That is, the crisis has worsened disparities across age categories more in Italy than in other countries. In Italy, the gap between the long-term unemployment rates of the young and prime-age individuals rose from 8.7 percentage points in 2007 to 21.2 percentage points in 2015. In the US, it increased from 0.8 percentage points to 1.5. In the OECD it remained stable and Euro Area it increased by only 0.5 percentage points.

Figure 2.10. Long-term unemployment rate by age groups, cross-country comparison, 2007-2015



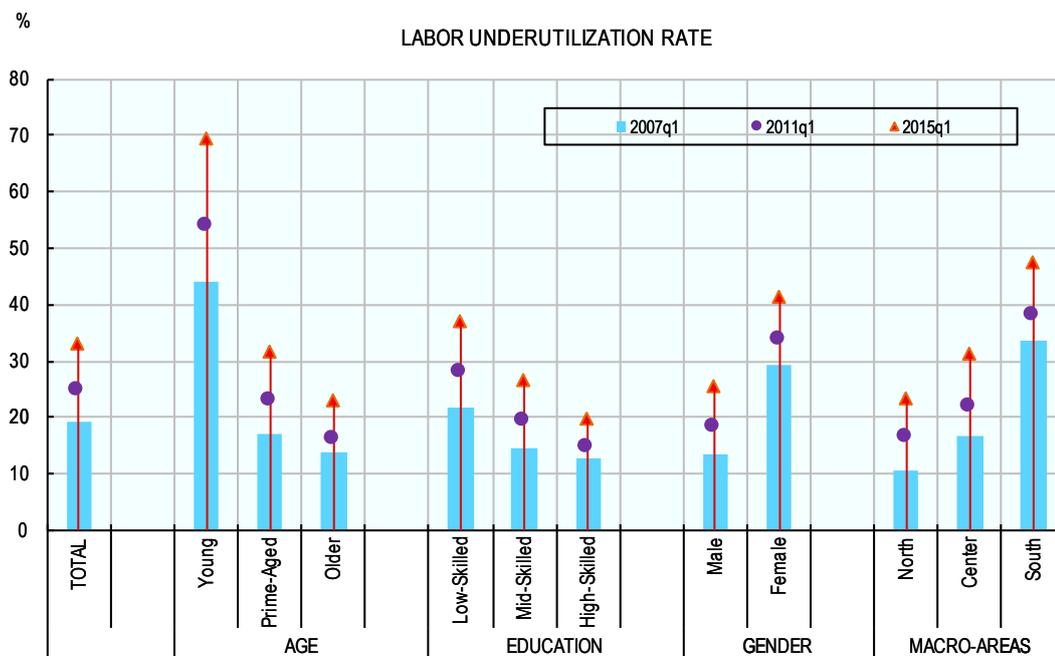
In summary, we have shown that the recent prolonged economic downturn has exacerbated disparities in labor market outcomes across demographic groups along several dimensions.

2.2.2 Labor underutilization and its components during the crisis

The previous section shed light on the incidence of inequality and its deterioration during the crisis by focusing on the unemployment rate, the long-term unemployment rate, as well as the NEET rate. In this section, we concentrate on labor underutilization and its components, among which there are

categories of individuals who typically do not appear in official statistics. Our measure of underutilization comprises not only individuals who are unemployed or discouraged, but also other marginally attached individuals, involuntary part-time workers and the “cassintegrati”. We first look at the labor underutilization rate, which is defined to be the number of underutilized workers normalized by the relevant labor force (the sum of individuals employed and classified as underutilized). *Figure 2.11* provides a brief representation of how the rate has evolved across demographic categories during the last economic crisis.

Figure 2.11. Labor underutilization rate by demographic groups, 2007-2015



As for other measures of joblessness, sharp inequalities existed before the crisis and concerned the usual demographic groups (the youth, the low skilled, females and the South). Labor underutilization rates were high overall and in 2007 ranged from about 10 percent to about 45 percent. While the crisis has worsened significantly the situation for all groups, with rates in 2015 ranging from 20 percent to 70 percent, the crisis has also increased the gap between age and education groups, but not those at the regional level and by gender. For young individuals the underutilization rate rose from less than 45 percent to 70 percent, while for the low skilled it rose from about 20 percent to almost 40 percent. In particular, the increase in the rate of underutilization of the low-skilled was larger than the increase in their unemployment rate. This may indicate that during the

crisis a substantial share of the low-skilled individuals, though not officially unemployed, remained at the margin of the labor force, or were employed part-time because they could not find a full-time occupation.

Then we further investigate the drivers of the growth of underutilization by breaking down its evolution during the crisis into the individual contribution of each component. Rather than looking at the underutilization rate (that is, normalized by the relevant labor force), here we calculate the net growth rate of the number of underutilized individuals. The overall net growth rate is then broken down into the weighted sum of the net growth rates of its components. In this way, we identify the contribution of each category to the total evolution of underutilization.

Consider the net growth rate of underutilization from time t to time $t+s$. Making its components explicit, it can be written as:

$$\frac{U_{t+s}^7 - U_t^7}{U_t^7} = \frac{U_{t+s} + D_{t+s} + MA_{t+s} + PT_{t+s} + CIG_{t+s}}{U_t^7} - \frac{U_t + D_t + MA_t + PT_t + CIG_t}{U_t^7}$$

where U_t are unemployed workers at time t , D_t are discouraged workers at time t , MA_t are other marginally attached workers at time t , PT_t are involuntary part-time workers at time t , and CIG_t are workers under CIG at time t .

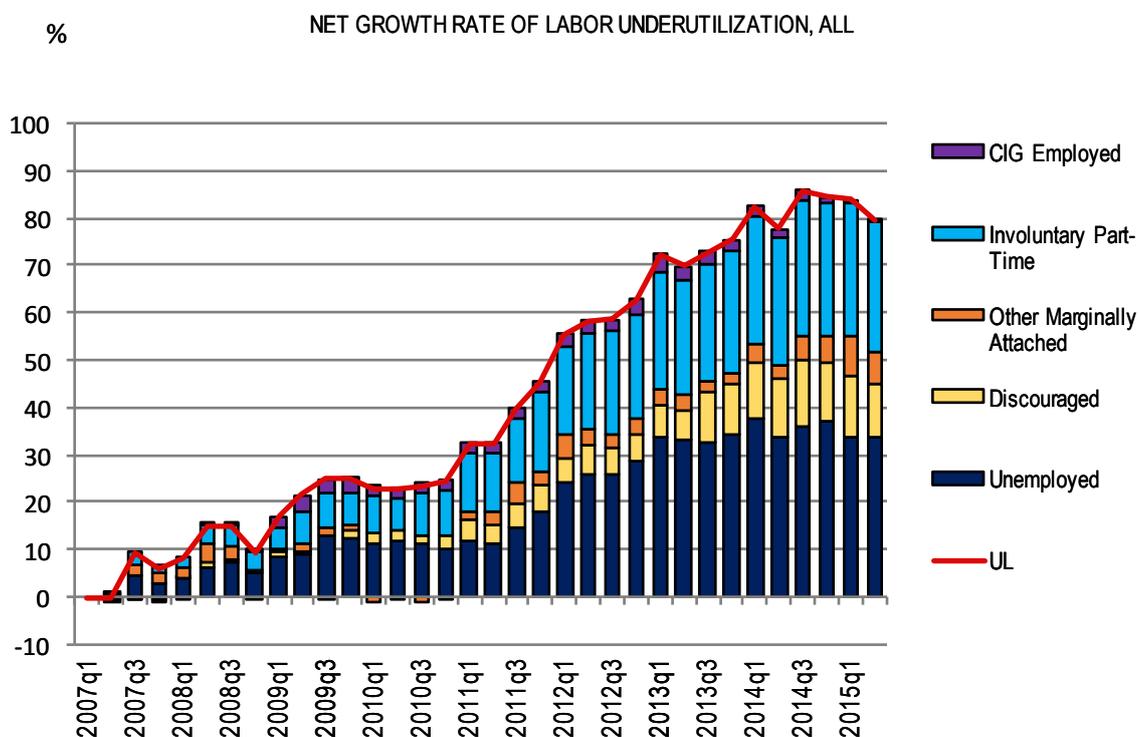
In turn, the right-hand side can be rearranged as the weighted sum of the net growth rates of the components of underemployment from t to $t+s$, with the weights given by the share of each component over the total at time t . We have:

$$\frac{U_{t+s}^7 - U_t^7}{U_t^7} = \frac{U_t}{U_t^7} \cdot \frac{U_{t+s} - U_t}{U_t} + \frac{D_t}{U_t^7} \cdot \frac{D_{t+s} - D_t}{D_t} + \frac{MA_t}{U_t^7} \cdot \frac{MA_{t+s} - MA_t}{MA_t} + \frac{PT_t}{U_t^7} \cdot \frac{PT_{t+s} - PT_t}{PT_t} + \frac{CIG_t}{U_t^7} \cdot \frac{CIG_{t+s} - CIG_t}{CIG_t}$$

We then take t to be 2007Q1 and s indexing quarters, that is, we calculate the net growth rate of the components from 2007Q1 to each subsequent quarter, until 2015Q1. We weight each term by its share of the total in 2007Q1. For each period, the weighted sum of the net growth rates of the components gives the overall net growth rate.

Figure 2.12 plots the results. The red line indicates the net growth rate of underutilization from 2007Q1 to each subsequent quarter until 2015Q2, while the bars indicate the weighted net growth rates of the components over the same period.

Figure 2.12. Net growth rate of underutilization and components, all workers, 2007-2015



The figure shows that the number of underemployed workers grew steadily over the entire period, with acceleration occurring from 2011, to which all the components contributed, but with the unemployed and involuntary part-time contributing to a greater extent. After reaching a peak of 85 percent growth reversed from 2014, albeit only marginally. One important aspect, which is not immediately apparent, is the relative evolution of the number of unemployed workers and marginally attached workers (including the discouraged) after 2013. After 2013, the number of unemployed workers remained constant (as did the number of involuntary part-time), while the growth of discouraged workers and those marginally attached to the labor force became the principal cause of the increase in underutilization. Two points can be made here. First, these dynamics can be explained

by the severity and the persistence of the recession: initially a significant number of workers became unemployed and, given the persistence of the recessionary conditions, these newly unemployed could not find a job in the short run, became long-term unemployed, then became discouraged, reduced their job search activity and eventually exited the labor force. Second, the unemployment rate continued to rise in Italy both before and after 2013. Before 2013, it grew due to the increase in the number of unemployed (the numerator); after 2013, it grew due to the reduction in the labor force (the denominator). These are obviously different mechanisms, which are somehow obscured by the unemployment rate measure. Considering the alternative measure of underutilization turns out to be key to identifying the correct mechanism and designing appropriate policy measures.

We now focus the analysis on age classes, distinguishing between the components and evolution of underutilization for the youth (aged 15 to 24) and older workers (aged 55 to 64). An initial remark is needed: since we are considering net growth rates, one should not be surprised that this indicator grows more for the more advantaged category, being older workers with lower numbers of underemployed individuals at the start. Equal absolute increases in underutilized workers will generate higher growth rates for the most advantaged. The most informative comparison is thus between net growth rates of components within each age group, as opposed to between growth rates across age groups.

Figure 2.13 reports the net growth rate of underutilization and its breakdown for the youth. Unemployment is by far the category that contributes most to the overall growth rate, followed, to a lesser extent, by involuntary part-time. Instead, discouraged workers and other marginally attached either remain

stable over the period or experience a narrowing in some quarters. This contrasts with the general trend observed before. We also observe a notable improvement in the indicator starting from 2014. The main driver of the decline in the net growth rate of about 10 percent is a contraction of the unemployed and involuntary part-time categories. At the same time, the number of young people who are out of the labor force but not marginally attached (not included in this figure) increases over that period. This suggests that young individuals responded to the crisis by postponing their entrance into the labor market. One possible reason is that in recessionary times the expected value of education increases relative to the expected payoff of a job, since the probability of finding a job is lower and the risks associated with it higher.

By contrast, for older individuals the unemployment component and the involuntary part-time component contribute equally. The most salient difference with respect to the youth, however, is

Figure 2.13. Net growth rate of underutilization and components, young workers, 2007-2015

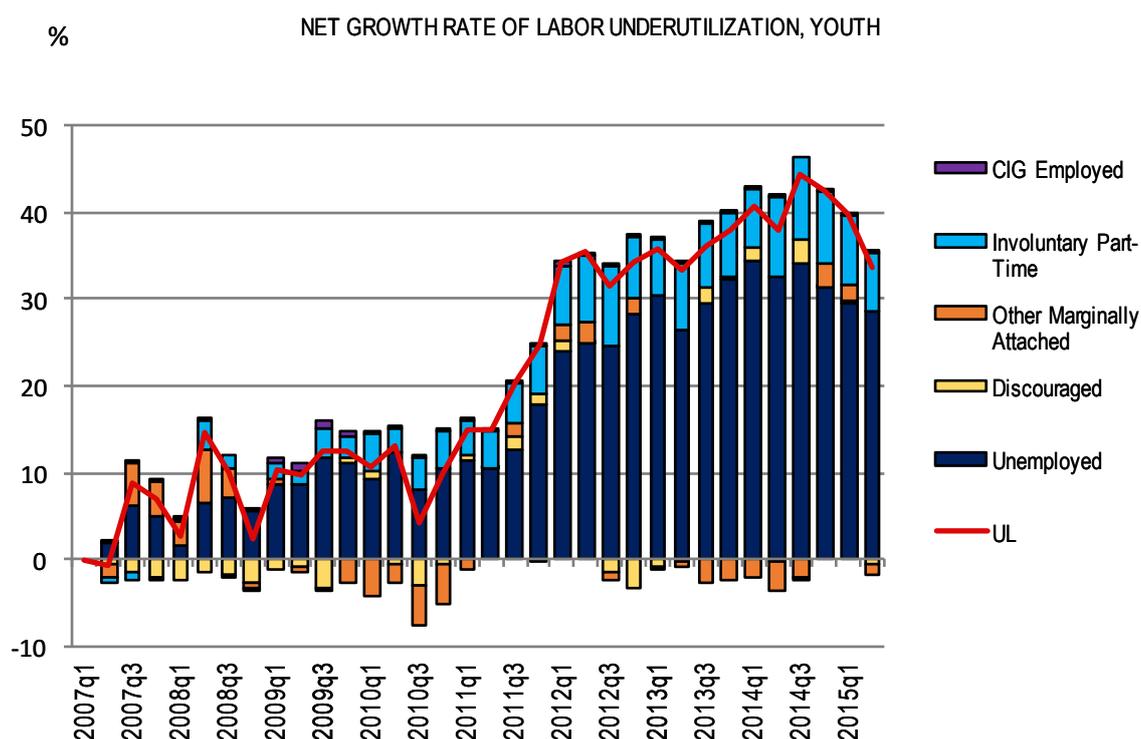
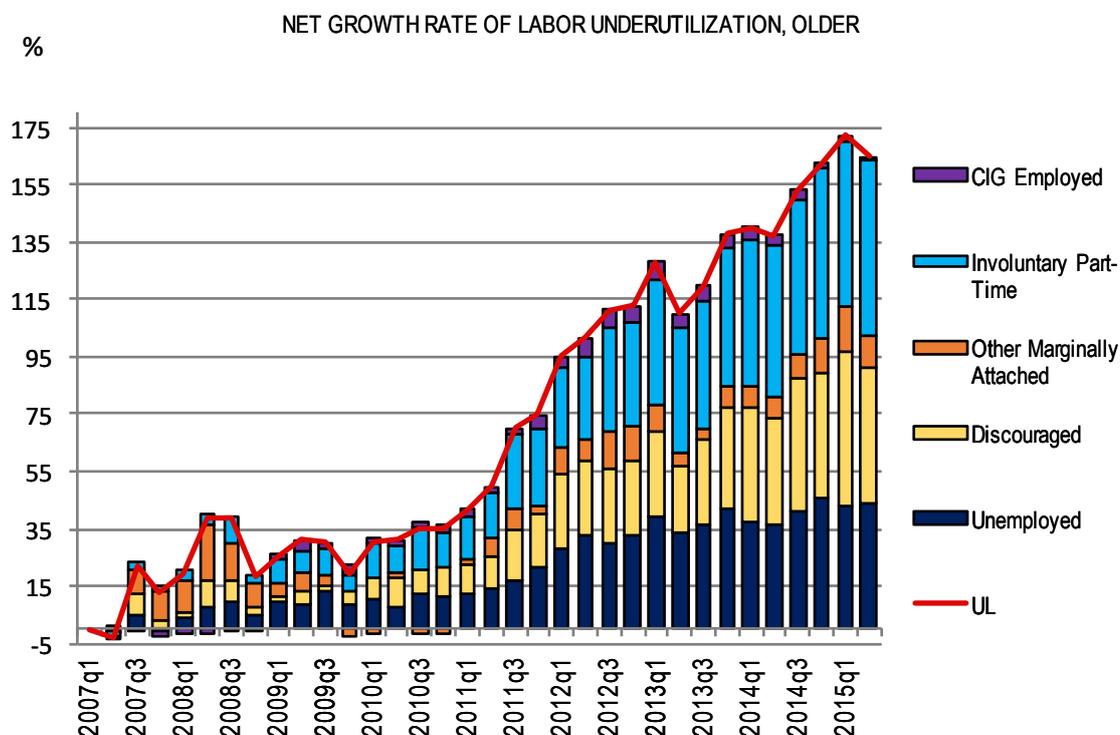


Figure 2.14. Net growth rate of underutilization and components, older workers, 2007-2015



the steady increase of discouraged individuals since the onset of the crisis. *Figure 2.14* also makes it clear that after 2013 the contribution of unemployment to underutilization is virtually stable. What determines the steep rise in underutilization from 2013 is involuntary part-time, discouragement and, to a minor extent, marginal attachment. The latter two components represent individuals who would like a job but, since they cannot find one, become discouraged and stop searching actively. A significant share of individuals in this age group find themselves at the margin of the labor market, unable to return to the labor force. Very different mechanisms are thus behind the exit of the youth and older people from the labor force. For the youth, recessions are good times to remain longer in education rather than to enter the labor force. In both cases, focusing solely on standard measures of unemployment would provide only a partial representation of the effects of the crisis.

2.3 The long-term: inequality as a long-lasting condition

In this section, we study the long-term evolution and underlying causes of inequality in labor market outcomes. Specifically, we try to understand how inequality has evolved across demographic groups from 1993 to 2015 and what demographic characteristics are most relevant in explaining it. As a measure of labor market outcomes, we focus on the likelihood of being unemployed. As a measure of inequality, as we explain below, we pick the gap between the most advantaged and the most disadvantaged category. Previous sections have highlighted that certain demographic groups are at a significant disadvantage when it comes to unemployment. For example, individuals who live in the South, individuals who have obtained at most a middle school diploma and especially younger individuals are disproportionately represented among the unemployed, relative to other groups. We have also highlighted that during the crisis inequalities have been

magnified between the most and the least disadvantaged groups. However, what the former analysis cannot tell us is the separate contribution of each demographic characteristic to adverse labor market outcomes. To be clear, the higher incidence of unemployment in the South could be caused by a purely regional factor or by a higher density of young or less-skilled individuals. Those categories increase the level of unemployment, since they have a higher unemployment likelihood because of their age or education level. These two scenarios, despite leading to the same outcome, have a completely different cause. To tackle effectively the unemployment issue it is essential to isolate the correct causal link.

In order to estimate the contribution to unemployment inequality of each demographic characteristic, controlling for all other characteristics, we adopt the following procedure. First, based on our previous analysis, we identify the most disadvantaged profile, as well as the most advantaged one, in terms of unemployment incidence. Accordingly, we identify the most advantaged type: a male, aged 40 to 44, living in the North and holding a college degree. On the opposite side, the most disadvantaged category is that of a woman, aged 20 to 24, living in the South, and holding at most a middle school qualification. Second, we take the most advantaged type as the reference category and estimate how each sepa-

rate demographic characteristic contributes to determining the higher likelihood of being unemployed for the most disadvantaged category, holding all other characteristics constant.

For instance, we assess the role of gender by estimating how being a woman changes the probability of being unemployed compared to the most advantaged category, *ceteris paribus*. That is, we estimate the difference in the probability of unemployment for a woman, aged 40-44, living in the North, and highly skilled, relative to the reference category. Proceeding analogously for all other demographic characteristics – age, education and geographical location – we can decompose the gap in the probability of being unemployed between the most and the least advantaged category into the different demographic factors. We do this for each year starting from 1993. The analysis allows us to establish whether the gap has increased or decreased over time and what factors are behind its long-term dynamics. We adopt the gap between the likelihood of the most advantaged category and the most disadvantaged one as a proxy for inequality. Consequently, the greater the gap, the wider the extent of the inequalities across categories.

Specifically, we run, year by year, the following linear probability model:

$$\begin{aligned} unem_i = & \\ & \alpha + \beta_1 female_i + \beta_2 age20_24_i + \beta_3 age25_29_i + \beta_4 age30_34_i + \beta_5 age35_39_i + \\ & \beta_6 age45_49_i + \beta_7 age50_54_i + \beta_8 age55_59_i + \beta_9 age60_64_i + \beta_{10} center_i + \beta_{11} south_i + \\ & \beta_{12} midschool_i + \beta_{13} highschool_i + \varepsilon_i \end{aligned}$$

where $unem_i$ is a dummy variable equal to 1 if individual i is unemployed and 0 otherwise, and where the explanatory variables are dummies taking the value of 1 if individual i belongs to the indicated demographic group and 0 otherwise. In our regression

framework, each β -coefficient embodies the change in the likelihood of being unemployed relative to the reference individual, determined by each demographic category.

Figure 2.15. Gap in the probability of unemployment: from the most to the least advantaged, 1993-2015

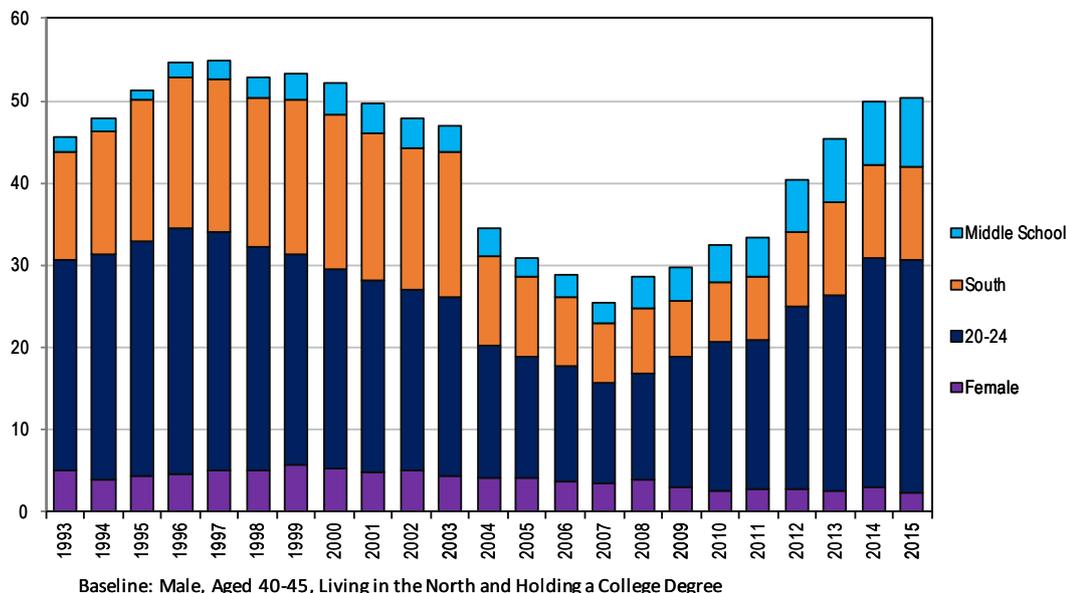


Figure 2.15 displays the results. Each column plots the probability gap between the most and least advantaged category over the time interval. In other words, the additional unemployment probability of a woman, aged 20 to 24, living in the South and holding a middle-school degree with respect to our reference category in each year, from 1993 to 2015. The total difference is decomposed into the separate contributions of gender, age, and geographical and educational factors.

When interpreting the outcomes, however, we need to account for the fact that in 2004 the Italian Labor Force Survey went through a major redesign, both in terms of sampling method and questionnaire configuration. For this reason, the 1993-2003 series and the 2004-2015 series are not exactly comparable. Even though the figure reveals continuity in the trends, the unusual gap observed between years 2003 and 2004 is likely to be due to the redesign. We thus compute averages separately for the two periods, but still discuss trends overall.

The analysis finds that the likelihood of being unemployed is significantly higher for the most disadvantaged group relative to the reference group. The probability gap is on average 50.7 percentage points in the first sub-period and 35.8 percentage points in the second period. A common feature of the two time intervals is that age (that is, belonging to the 20-24 age category) has always given the predominant contribution to the extra likelihood of being unemployed. On average, it accounts for 25.9 percentage points of the gap in 1993-2003 and 18.7 percentage points in 2004-2015. In both periods, it contributes at least 9 percentage points more than any other category. The second contributing factor, in order of magnitude of the coefficient, is living in the South. On average, it contributes 17.3 percentage points in years 1993 to 2003. It is followed by being a female, which contributes 4.87 percentage points, and then by being less-skilled, which contributes 2.6 percentage points. From 2004 to 2015 the second most relevant factor continues to be the South, which accounts for 9.1 percentage points, the

third one is middle school, which contributes 4.8 percentage points, and lastly there is gender with 3.2 percentage points. Hence, the high unemployment rate in the South cannot be explained only by low educational achievements, nor by differences in the age structure. In addition, the amount of the regional contribution seems to be stable in both time intervals. In contrast to the youth effect, it is not markedly affected by the crisis. Hence the regional effect is not due to the economic downturn, while half of the increase in the youth coefficient is likely to derive from the adverse economic conditions.

Moving from the analysis of averages to the analysis of the longer-term trends, we observe that the gap between the most advantaged and most disadvantaged category decreased from 1997 to the inception of the crisis, while it started to increase and at a relatively high rate after 2007. This increase is mainly due to age, geographical factors and education factors, while for gender the relative disadvantage kept decreasing. We therefore identify a general increase in the unemployment probability gap caused by the three factors. When decomposing the total probability gap we see however that the three factors do not increase evenly during the crisis, and that their relative weight

changes. Even though they all rise in absolute value, age and middle school gain relevance compared to the South. In 2007 age accounts for 48.4 percent of the gap, while in 2015 it accounts for more than half: about 56 percent. Similarly, the education factor explains 9.4 percent of the gap in 2007 and 16.4 percent in 2015. The South starts out in 2007 with a relative weight of 28.9 percent, but decreases to 22 percent in 2015. Finally, gender goes from explaining 13 percent of the gap in 2007 to representing only 4 percent in 2015.

Finally, we turn our attention to the youth. We determine how labor market inequality has evolved for young individuals from 1993 to 2015 and how different factors have contributed over time. We take the probability of being NEET as the most appropriate measure of labor market outcomes for this demographic group and we conduct a similar exercise to the one focusing on the probability of being unemployed described above. We take as the most advantaged category a male, aged 15 to 19, living in the North and, as the most disadvantaged category a female, aged 25 to 29, living in the South.

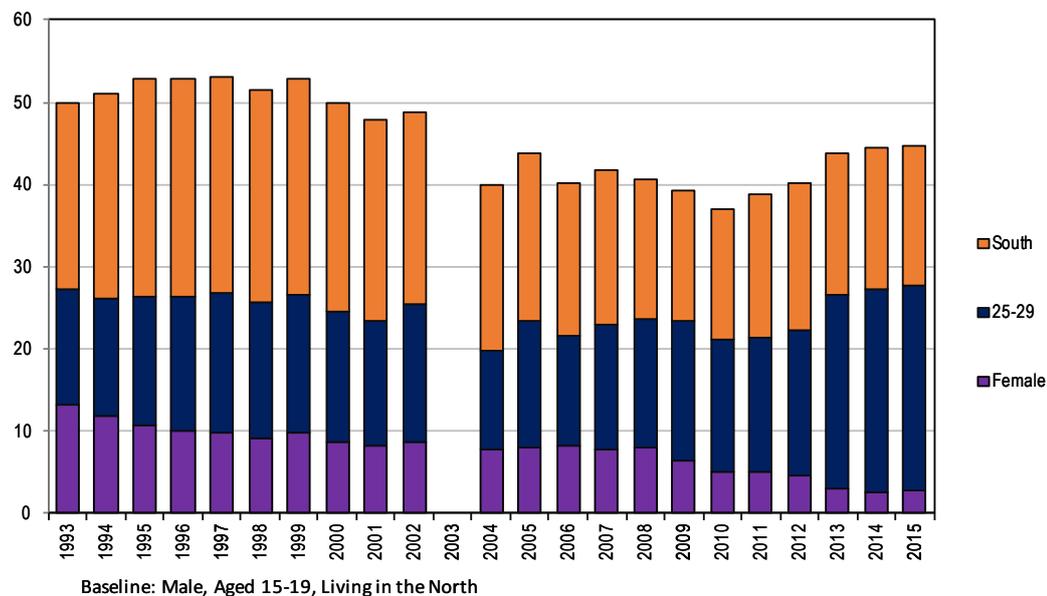
We estimate, year by year, the following linear probability model:

$$NEET_i = \alpha + \beta_1 female_i + \beta_2 age20_24_i + \beta_3 age25_29_i + \beta_4 center_i + \beta_5 south_i + \varepsilon_i$$

Again both dependent and explanatory variable are dummies taking value 1 if the individual belongs to the relative category and zero otherwise. The

results can be interpreted in an analogous way to the unemployment regression.

Figure 2.16. Gap in the probability of being NEET: from the most to the least advantaged, 1993-2015



The graph highlights that the gap in the probability of being NEET is on average large - ranging from almost 52 percent to more than 37 percent - presents a downward trend over the longer term, but is not significantly exacerbated by the economic downturn. Of course, this does not imply that the absolute probabilities of becoming NEET for the least and the most disadvantaged profiles have not increased, only that inequality has remained close to stable. The overall narrowing trend is mainly driven by a decrease in the additional probability of being NEET associated with being a woman. The regional component, the South factor, also declines slightly. At the same time, the age factor markedly increases during the recession, compensating in part the longer-term decrease in the other two components. Regarding the years of the crisis, these outcomes are consistent with the results in *Figure 2.9*. Both genders experience an increase in the NEET rate from 2011 to 2015. However, the rise in the NEET rate for males is larger. The same is true for macro areas, with the rise in the NEET rate during the crisis being larger in the North than in the South,

thus partially closing the gap. By contrast, the gap significantly rises across age categories.

The overall picture is that of a country that has been characterized historically by divergent performances among its demographic groups. During the last decade of the 20th century, the situation was quite stable: a less-skilled female, aged 20-24 and living in the South - what we have defined to be the type of individual at greatest disadvantage in term of unemployment outcomes - had a probability of being unemployed that was around 50 percentage points higher than that of a highly skilled male, in his prime and living in the North - our most advantaged individual. Bearing in mind that caution is needed when comparing numbers from the two different surveys, one can see that the situation notably improved in the early 2000s: the overall additional probability for the most disadvantaged individual kept on decreasing until 2007 when it reached 25.4 percentage points. With the crisis, however, inequalities grew steeply again, peaking in 2015 at 50.3 percentage points, that is, 25 percentage points more than in 2007.

2.4 Key facts

- Inequalities in terms of employment outcomes are largely present across age groups, different regions and education groups, and to a minor extent across gender. Young people, Southern regions and less-educated individuals suffer more from spells of unemployment than other individuals do. The most alarming data is the high share of young individuals and people living in the South in long-term unemployment.
- The unemployment rate is an important indicator of problems relating to the labor market, but it severely understates those problems, as many individuals are discouraged from looking for work or face involuntary part-time work.
- The crisis enlarged disparities between the most disadvantaged demographic groups and the other groups. Individuals living in the South, young and less-educated individuals saw their situation disproportionately aggravated compared to other categories. The only exception was gender, because the crisis reduced inequality between males and females. Overall, older individuals emerge as the most advantaged age group, at least in term of employment outcomes. This is true when looking at their current state, the effect that the crisis had on their labor market performance and their longer-term situation.
- The high incidence of long-term unemployment that disproportionately affected the youth, is peculiar to the Italian labor market, compared to other OECD and Euro area countries. The sharp increase in both the overall long-term unemployment rate and the youth long-term unemployment rate caused by the crisis are also specific to Italy.

These findings call for policies that specifically target young individuals, and among them those aged 20 to 30, who have dropped out of the labor force or are experiencing long spells of unemployment. Among the youth, unemployment is not the only problem as involuntary part-time or discouragement are also important features. The focus that Italian policymakers have recently placed on older groups of workers may be in part misplaced. Addressing regional disparities in labor market outcomes is a long-standing issue and, without doubt, a difficult one. The fact that in the long-run some of those disparities tend to decrease offers some hope that well designed policies could accelerate this trend and eventually overcome medium term shocks such as the last economic crisis in 2007.

2.5 Appendix: the data

Throughout our analysis, we relied on the Italian Labor Force Survey (“Rilevazione Continua sulle Forze di Lavoro” - RCFL in brief), collected by the Italian Statistics Institute (ISTAT). The aim of this survey is to “obtain information about working status, job searching and general attitudes towards the labor market of the Italian working-age population (ISTAT. *Nota Metodologica dell’Indagine*)”. The Italian RCFL is a large survey representative of the Italian population. Each quarterly cross-sectional dataset contains around 150.000-155.000 individuals. The survey adopts a rotational sampling design, whereby the sample units - the households to which each individual belongs - are included for 2 consecutive quarters, excluded in the following 2 and re-included for 2 more quarters. The data is available from the first quarter of 1993 to the second quarter of 2015.

We define long-term unemployment as a spell of more than 6 months, which is consistent with the US definition of long-term unemployment, but distinct from the one used by the OECD.

We disaggregate the analysis by demographic characteristics. We base the age classification on the “constructed variables” in the last section of the Labor Force Questionnaire. Specifically, we use the CLETAD and CLETAQ variables to create age classes of either 10-year or 5-year lengths. To define our macro-areas, we divide the national territory into 3 regions: North, Centre, and South (including the Islands). We construct 3 educational categories: individuals who obtained at most a middle-school qualification, an upper secondary school qualification and at least a college degree. Finally, we exploit the structure of the questionnaire to build aggregates of interest, such as the NEET rate.

To outline the current “profile” of the Italian labor force by demographics, we average quarterly data from the third quarter of 2012 to the second quarter of 2015, which is the most recent quarter available. We thus use around 1.800.000 recent observations to develop a static comparison across demographic groups. To study the effects of the crisis years, we use data from the first quarter of 2007 - the year that the financial crisis started - to the second quarter of 2015 - the latest quarter available. To develop the longer-term analysis, we use all of the data that is available, from 1993 to 2015.

3. Comments

In this chapter we report on some of the views expressed during the Policy Workshop on “*Unemployment and skill mismatch in the Italian labor market*” organized by IGIER-Bocconi in partnership with J.P.Morgan at the Exhibition Hall of the Bocconi University on October 27, 2016.

Reported summaries and quotes relate to the keynote speech of Tommaso Nannicini (Undersecretary of State to the Italian Prime Minister) and to the discussion “Unemployment and active labor market policies”, moderated by

Fabiano Schivardi (Bocconi professor, De Benedetti Chair for Entrepreneurship) with the participation of Paolo Sestito (Head of Service Economic Structure of the Bank of Italy) and Maurizio Del Conte (Bocconi University and National Agency for Active Labor Market Policies - ANPAL).

The round table discussion followed the presentation of the study “Labor market inequalities across Italian demographic groups: a focus on the youth and the long-term unemployed”, included in Chapter II of this report.

Summary of the keynote speech of Tommaso Nannicini (Undersecretary of State to the Italian Prime Minister)

What are main policy objectives of the Italian Jobs Act?

“The Jobs Act does not aim to create jobs “out of nowhere”, but was introduced to achieve a number of specific objectives. First, the Jobs Act aims to regulate the job market in order to foster a structural adjustment of our economy. More specifically, in Italy we need to reallocate capital and labor from less productive sectors towards more productive ones. Obviously, it is not enough to change the “rules of the game” in the labor market to foster this process, which requires several policy tools as well as creative entrepreneurship. However, the lack of proper regulation of the labor market may hinder such structural adjustment. Therefore, the first goal of the Jobs Act is the introduction of a set of dynamic rules to foster such structural adjustment, while at the same time decreasing its costs. Second, the Jobs Act aims to improve the link between employment trends and the economic cycle, in order to reduce the fear of hiring with open-ended contracts when expectations change and the economy begins to grow again. The idea is to encourage permanent contracts also at the beginning of an economic upturn, when growth is still fragile and the probability of hiring people with temporary contracts is greater. Thus, one can say that reducing the labor market dualism is the second goal of the Jobs Act. Finally, the third goal is to support those who suffer most of the costs of adjustment. This can be done by ad hoc actions to protect the weakest segments of the labor market. If those who bear the burden of adjustment are not protected, then there is a risk of social exclusion that in the end may prevent change. Overall, one may say that the employment protection system is moving from traditional protection of jobs to protection of workers.”

“The Jobs Act defined more clearly the boundary between employed work and self-employment. In particular, it reformed the so-called “lavoro para-subordinato”

(para-subordinate atypical employment) and introduced a new distinguishing criterion for self-employment by adding the requirement of etero-organizzazione (hetero-organization) to that of etero-direzione (hetero-management). In other words, the circumstances characterizing employment has become more inclusive while, at the same time, real self-employment has become easier to identify.”

“On top of the new “contratto a tutele crescenti” (contract with increasing protection), better definition of self-employment and new protection mechanisms for self-employed workers, other instruments have been introduced to strengthen the protections of workers, such as reform of the social security net. The Jobs Act allocated more than 2 billion Euros to increasing the coverage of unemployment benefits. For instance, currently 97% of permanent contracts and 87% of fixed-term ones are covered by the NASPI, while previously there were larger “holes” in the social safety net. The coverage of the Wage Guarantee Fund (Cassa Integrazione Guadagni) is wider as well. The idea was to bring this tool back to its original purpose, i.e. providing organizational flexibility to companies in financial distress without jeopardizing the possibility of actually re-activating the employment relationships of workers who have been laid off or put on short-time work. Furthermore, the Jobs Act has given a new direction to the development of active labor market policies, based on competition between the private sector and the public sector. The purpose is to provide those who may unfortunately lose their jobs in this more dynamic labor market with quick and efficient active labor market services. Despite some delays due to an excess of bureaucracy, it is hoped that the new agency for active labor market policies (ANPAL) will be able to promote the development of this quasi-market of employment services and implement the new assegno di ricollocazione (placement allowance).”

Why has the reform changed the regulation of permanent contracts?

“The need to focus on permanent contracts is due to the fact that, over the last twenty years, labor market reforms only improved the so-called flexibility “at the margin”. In other words, they did not change the rules for permanent contracts, but instead enhanced labor market flexibility through non-standard contracts. This approach led to a marked segmentation and ultimately to the development of a dual labor market, comprising protected and non-protected workers. The Jobs Act aims to reverse this trend: the flexibility is not “at the margin” anymore, but goes to the heart of standard contractual relationships. With the reform, the standard open-ended contract becomes more flexible, but at the same time it retains an important set of protections which are both formal and substantial (e.g. the possibility of getting a loan, higher incentives for employers to invest in human capital, etc.), despite the fact that now separation costs are lower and increase only with tenure. Protection increases with tenure for two reasons: first, the quality of the match between demand and supply can only be evaluated over time and, second, it is only fair to protect the investment in human capital made by someone who has been working in a given firm for a long time.”

Why was the “contratto a tutele crescenti” introduced together with a contribution exemption?

“The social security contribution exemption introduced together with the “contratto a tutele crescenti” (contract with increasing protection) has indeed been the subject of much controversy. This exemption was conceived as an incentive for permanent hiring as well as a stimulus measure. Originally it was available to everyone. Today it remains available for curricular internships and for people below 29 years of age in difficult situations.”

Are the results achieved by the Jobs Act satisfactory?

“Some of the most relevant indicators are not available yet. This is the case for those related to the impact of the reform on the organizational processes of firms, productivity dynamics and human capital investments within and outside companies. However, aggregated statistics related to the last year and a half show that open-ended contracts have recently become the main way to enter the labor market. While it is still early to observe any effect on the stock of contracts, flows into employment have already changed.”

“Between January 2015 and August 2016 we observed a decrease of 76.000 units among the self-employed. This is not necessarily bad news. It could be the result of the Jobs Act’s original purpose of reducing bogus self-employed workers and collaborations: In fact, the Jobs Act better defined the difference between employment and self-employment. The result of this legislative change may be the inclusion of many situations of fictitious self-employment into the area of dependent employment. However, it is too early to say whether the decline of 76.000 self-employed workers is actually due to the achievement of such an objective. It could also be caused by the negative economic trend that self-employed professionals are experiencing in the aftermath of the crisis.”

“The Jobs Act is clearly a reform in which the government decided to invest a lot of “political capital”. In such circumstances, one can pursue an initiative that preserves its original rationale, without incurring the many compromises that typically occur in politics. Such initial advantage, however, may turn out to be rather detrimental after the reform is approved. Indeed, if the reform becomes a flagship initiative (abroad or in national media), then the public debate enters a vicious circle in which every small economic adjustment is considered to be the final verdict on the reform’s failure or success. In this scenario, the future of the reform does not depend on the fit between the means and the ultimate goals, nor on the reasonably achievable results, but only on the volatility of the economic cycle. It is like training for a marathon and being forced to run 100 meters instead. Similarly, the Jobs Act was conceived for other goals, but is now evaluated according to its ability to create jobs in six months’ time.”

Summary of the discussion “Unemployment and active labor market policies”, moderated by Fabiano Schivardi (Bocconi University)

The results from the study, in line with other research, clearly show that young people suffered most during the crisis. Part of the responsibility lies with the dual labor market. Can the reform of employment contracts introduced by the Jobs Act change the current scenario?

Paolo Sestito (Bank of Italy):

“The significant impact on young individuals was predictable. A crisis naturally has negative consequences for those who are just entering the labor market. In the Italian framework, the dual system exacerbated the crisis’ effects on the youth. Many fixed-term contracts expired, primarily damaging young individuals. The real issue concerning youth is to understand what can be done to foster growth and reduce dualism.”

“In a study in collaboration with Eliana Viviano we tried to evaluate the effects of subsidies on open-ended employment, compared to effect of the new contractual rules. The study found a reduced impact of the contratto a tutele crescenti (contract with increasing protection) on full-time employment, whereas subsidies had a major effect. Nevertheless, the study singled out a structural change related to the hiring behavior of firms. Interestingly, the new contractual rules could have decreased their reluctance to hire unknown workers with full-time contracts.”

“Changes in contractual rules have a minor role among the policies in favor of youth employment: the policies to boost growth are much more fundamental.”

Maurizio del Conte (Bocconi University and ANPAL):

“The results presented in the study originated within a system that maximized the protection of employment (i.e. a system whose objective was the stability of employment relationships), also in comparison with other countries. Yet, the crisis greatly affected both the level of inequality and the level of employment. Thus, we should understand what went wrong in our system of employment protection.”

“Most of the debate about the regulation of the Italian labor market centers around two positions: those supporting strong employment protection (for instance, the debate about Article 18) in contrast to those supporting a reduction of exit constraints. The Jobs Act does not adopt any of these arguments: firms are not free to dismiss workers, but at the same time employment protection is not maximized. In fact, the Jobs Act adjusts employment rules by keeping a high degree of protection, while reducing the psychological impact of hiring permanent workers (for instance, by removing the reinstatement provision). After all, the level of employment protection of a worker with a contratto a tutele crescenti and 7-8 years of tenure does not differ much from that of a worker with an old open-ended contract (the old contratto a tempo indeterminato).”

“The Jobs Act represents a paradigm shift in the field of active labor market poli-

cies, which are new to the Italian scenario. It is the first attempt in Italy at introducing a national system of measures, aimed at accompanying unemployed people towards new jobs. I think that adjustments in the employment protection system together with the implementation of active labor market policies might have a significant impact in reducing inequalities, especially during recovery periods.”

Traditionally Italy has favored passive labor market policies (i.e. income support for the unemployed), while today we are trying to move towards active policies aimed at the reintegration of unemployed workers. Are we facing a paradigm shift in labor market policies, from passive to active ones?

Paolo Sestito (Bank of Italy):

“One must be cautious in interpreting recent reforms as the passage from passive labor market policies to active ones. Recent reforms, starting with the Fornero reform in 2012, mainly expanded and consolidated the coverage of passive policies. In Italy expenditure on passive labor market policies was low, and the protection system did not guarantee universal coverage. Furthermore, expenditure concentrated on the restructuring processes of firms. This system generated some negative consequences as it induced a “freeze” in the restructuring processes of companies in financial difficulty, since they could exploit wage support schemes such as the Wage Guarantee Fund (Cassa Integrazione Guadagni) and Mobility Funds (Mobilità e Mobilità lunga) for long periods. The first important step in the reform process has been the transformation of the protection system into a universal one, strengthening the compatibility and the automatism of different instruments. For instance, the generosity of unemployment benefits is now proportional to the amount of contributions paid, and benefits have a fixed duration. In other words, recent reforms improved both the equity and efficiency of the system. Nowadays there is a tendency to overlook the impact of those reforms, probably because many actors, who lost their former lobbyist power due to these reforms, usually complain about them.”

“Until now, active policies have been relegated to experimental or local experiences, and they have often been characterized by marked inefficiencies. Of course immediate results are unrealistic: the reform process will be long and is still partly uncertain.”

Concerning the mode of implementation of active policies, the reform plans to assign an “employability score” to each unemployed person. In principle, such a score should take into account the difficulty of re-entering employment and hence determine the amount of the so-called *assegno di ricollocamento* (placement allowance) to be spent in employment agencies. How will the “score” be computed?

Paolo Sestito (Bank of Italy):

“Regarding the implementation of active labor market policies, it is important to adopt an experimental approach. The reform involves the profiling of unemployed workers, in order to determine their degree of employability. Based on their “employability score” they will be entitled to receive the “*assegno di ricollocamento*” (place-

3. Comments

ment allowance), the amount of which will vary depending on the individual's chances of finding employment. Administrative data will be fundamental for the implementation of the reform, but at the same time data manipulation issues could arise. An experimental approach and the possibility of adaptation throughout the implementation process will be crucial to identifying the best organization model.”

Maurizio del Conte (Bocconi University and ANPAL):

“Both the profiling of workers and the mixed private-public system should be evaluated using a randomized trial, to obtain an objective evaluation of the ability of the system to actually accompany unemployed individuals toward employment. Unfortunately, the idea of carrying out a randomized trial has encountered little consensus and has been harshly criticized in newspapers, where expressions such as “reinsertion at random” and “lottery of active policies” have been used. However, it will be important to stick to the idea of carrying out an impact evaluation with sound scientific methods in order to really understand the consequences of the reform.”

“Concerning the profiling of unemployed workers, we will focus on the individual probability of re-hiring, based on an algorithm which will take into account about thirty indicators (such as age, area of residence, profession, gender, etc.). However, I am sure that the profiling system will be progressively adapted in the future, since the implementation process is starting from zero.”

“The reform aims to create a mixed public-private system, where public employment centers will interact with private employment agencies. Private agencies will receive the placement allowance to support unemployed workers in training activities and job search. How will the relationship between public and private employment services be structured?”

Paolo Sestito (Bank of Italy):

“The public-private relationship in employment services is not new to the Italian context. Basically there are currently two regional models: the one implemented in Lombardy and the one implemented in Emilia-Romagna. However, I think that the new national system should avoid segmentation, limit ideological and local influences, and focus instead on the difficulty of developing this quasi-market. In particular, it will be crucial to develop an information system that is able to track workers even after reinsertion, in order to evaluate the quality of the matching between jobs and candidates.”

Maurizio del Conte (Bocconi University and ANPAL):

“The choice of a mixed public-private system of employment services is mainly due to the low development of Italian public employment centers, while private employment agencies already have national coverage. Many organizational models coexist today in Italy at a regional level, regarding both the matching and the training of workers. In this field, we want to adopt a pragmatic approach in order to single out the most effective solution for each specific geographical context.”





4. Skill mismatch and labor shortages in the Italian labor market

The potential mismatch between the skills and qualifications of the workforce and the needs of employers is a recurrent issue in the public debate of many countries, including Italy. On the one hand it is often argued that, especially in the wake of the great recession and the consequent downturn of labor demand, skilled workers have become more and more willing to accept jobs for which they are excessively qualified. Media reports about university graduates working at call centers have become topical. At the same time, employers often complain that they have difficulties finding adequately trained workers and that this is an important impediment to growth and innovation.

Unfortunately, shedding light on the issue of labor market mismatch is not an easy task. The very definition of labor market mismatch is nebulous and the same term is often used to indicate a variety of different concepts. In its more general meaning, skill mismatch is defined as the discrepancy between the skills of the workforce (the supply of skills) and the requirements for the available jobs in the economy (the demand for skills) at a given time and place. The exact nature of such discrepancy, however, can be very different across definitions (as discussed in *Box 1* below).

The objective of this study is to use the best available data and a clear and sound definition to describe the phenomenon of labor market mismatch in Italy. We adopt a micro definition of skill mismatch, which can be applied to any single job-worker pair. It is therefore a notion that applies exclusively to employed workers. More specifically, a mismatch arises when a worker possesses a level of skills that is either higher or lower than the one required for the job. In order to estimate empirically this definition of skill mismatch, we use the PIAAC data, a recent OECD survey on adult skills (notably literacy and numeracy skills), which allows

us to investigate skill mismatch comparably across countries. Since both in Italy and in other PIAAC countries the overlap between numeracy and literacy proficiency is substantial, most of our results refer to numeracy skills.

In addition, we complement our analysis of employed workers with information on potential hiring difficulties associated with current vacant jobs. In particular, we look at indicators of the existence of labor shortages in Italy and we investigate the relationship between salaries and the hiring difficulties reported by employers. To this end, we use the Excelsior database, an Italian survey sponsored by the Italian Association of the Chambers of Commerce that provides forecasts on the demand for labor from employers and on the incidence of hard-to-fill vacancies.

Although the focus of this chapter remains on Italy, whenever possible we compare the results with other OECD countries. Our findings highlight that the overall level of skill mismatch in Italy, although not excessively different from that of other OECD countries, results from the combination of a relatively low demand for skills from Italian employers and a relatively unskilled workforce. In particular, by looking at the skill requirements of Italian jobs, we show that labor demand in Italy is less skill intensive than in other countries, across firms of all sizes. The low demand for skills from Italian employers is associated with the high level of over-skilling among university graduates (STEM graduates in particular), as well as for the faster deterioration of the skills of Italian workers relative to other countries. Under-skilling and hiring difficulties in Italy seem to be particularly prominent in skilled blue-collar occupations. Italy is also characterized by a large geographical variation in the level of workers' skills and in the incidence of skill mismatch, with southern regions largely lagging behind the rest of the country.

Box 1: Understanding labor market mismatch

In its most general meaning, skill mismatch may be defined as the discrepancy between the skills of the workforce (the supply of skills) and the requirements for the available jobs in the economy (the demand for skills) at a given time and place. The exact nature of such discrepancy, however, can be very different across definitions.

According to the micro definition adopted in this work, skill mismatch is a feature of the single job-worker pair, and therefore refers to employed workers only. More specifically, workers are over-skilled when they possess a level of skills that is higher than that required for their jobs, and under-skilled when they possess a level of skills that is lower than that required for their jobs. If one considers educational attainments rather than actual skills, then one

speaks of qualification mismatch.

A rich strand of studies adopts a more macro concept of mismatch. In this literature, aggregate mismatch is defined as the existence of alternative allocations of workers, often meaning both employed and non-employed workers, to jobs, both filled and vacant, that could improve productivity (or employment) compared to the existing equilibrium.

Finally, a labor shortage is a specific type of aggregate mismatch. It is the discrepancy between the characteristics of available vacancies and those of unemployed workers in a specific occupation, industry or geographical area. In particular, a labor shortage arises when the number of vacancies exceeds the number of qualified candidates.

4.1 The Survey of Adult Skills in Italy

The main data source used in this chapter is the OECD Survey of Adult Skills. The first wave of the survey was carried out in 24 countries in 2011-2012, as a part of the OECD's Programme for the International Assessment of Adult Skills (PIAAC). The survey is implemented by interviewing representative samples of adults aged 16 to 65 and is expressly designed to provide internationally comparable results. After answering a background questionnaire, respondents are asked to complete an assessment exercise aimed at measuring their skills in three domains: literacy, numeracy and problem solving. The resulting proficiency scores range from 0 to 500 in each domain. The survey also collects information on how intensively and how frequently a variety of skills are used at work. The average sample size of the first wave of the PIAAC survey was of about 6900 people per country. The sample size for Italy was of 4621 people. Italy did not take part in the assessment of problem solving abilities (together with a few other countries), hence we only have information on literacy and numeracy skills.

The focus of the analysis of this chapter is on employees, as skill mismatch is intended to be a feature of existing worker-job matches. Thus, our results do not cover self-employed workers, unemployed or inactive people. More specifically, we work on a sample of 1.876 Italian employees from the Italian PIAAC data, who are systematically compared to employees from the remaining PIAAC countries (a sample of 76.546 observations, covering 21 OECD countries).

When the results of the PIAAC survey for Italy were first published in 2013 (Di Francesco, 2013; OECD 2013), the disappointing performance of the Italian adult population became immediately evident. Numeracy and literacy scores of the Italian working age population were among the lowest of OECD participating countries. Our results on Italian employees confirm these findings. In *Figure 4.1*, we present some descriptive evidence on the numeracy skills of Italian and PIAAC employees. Mean numeracy scores are lower in Italy compared to other PIAAC countries, across

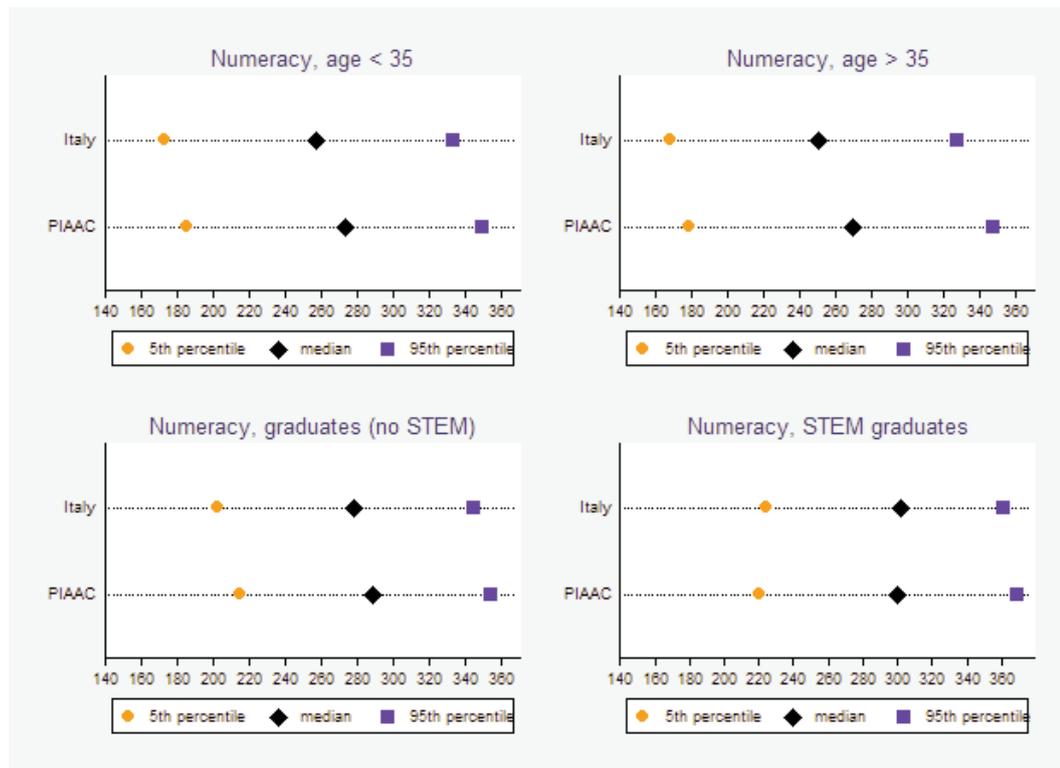
all age groups. The negative performance of young cohorts in particular suggests that in Italy the schooling system does not provide Italian workers with the same proficiency as in the other countries. Also Italian graduate workers have, on average, comparatively lower proficiency scores, with the notable exception of STEM graduates, who seem to be more in line with their foreign counterparts. Italy also shows great geographical variability in mean proficiency scores, with North East and Center regions being close to the PIAAC averages, while southern regions largely lag behind (Figure 4.2). Moreover, as can be seen in Figure 4.2, the gap in mean numeracy scores across regions

widens among young workers. Thus, geographical heterogeneity in proficiency scores is likely to increase in the future.

4.2 Qualification versus skill mismatch

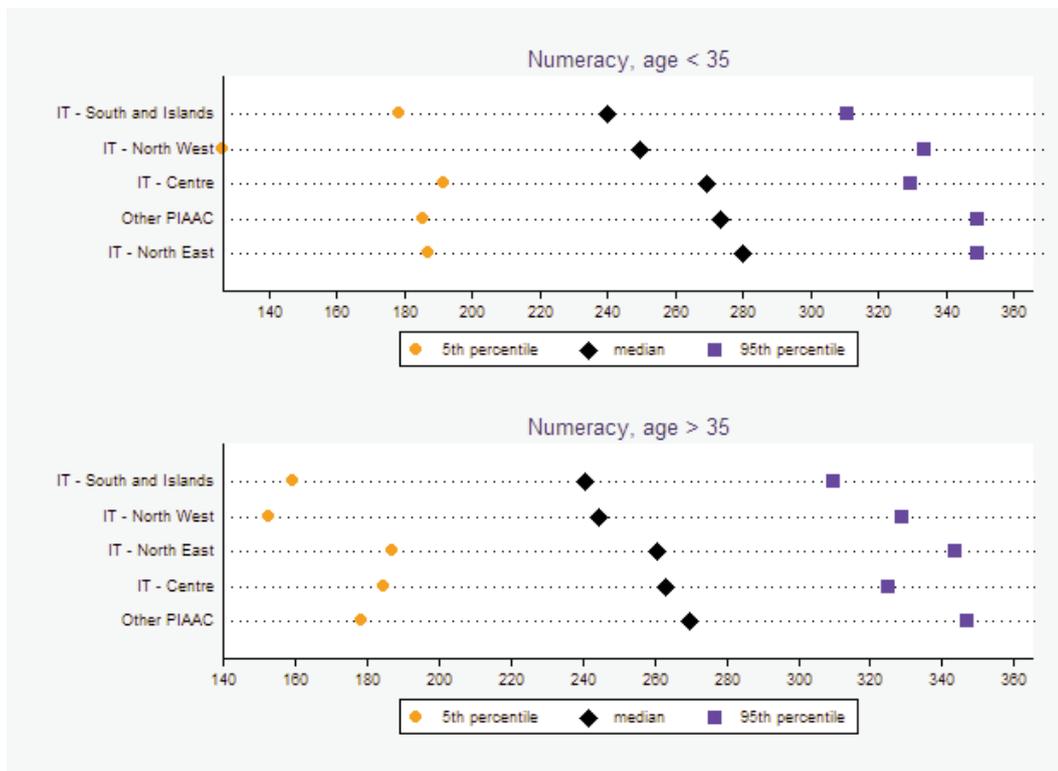
The most common way of investigating mismatch empirically has been to compare the qualifications of workers with the qualifications needed for their jobs. This information is available in many surveys where interviewed workers are asked both about their educational qualifications and about the qualifications that would be needed to be hired to do their jobs (the

Figure 4.1 – Employees proficiency scores in numeracy



Source: OECD-PIAAC data

Figure 4.2. – Employees proficiency scores in numeracy across Italian regions



Source: OECD-PIAAC data

exact formulation of these questions may vary across surveys). Workers would be classified as over-qualified when possessing qualifications above the level required for their jobs, under-qualified in the opposite situation and well-matched when the two coincide. The problem with this definition is that skills and competences are accumulated, and potentially deteriorate, also outside the school environment. Hence, one’s formal qualifications do not necessarily correspond to actual competences.

The recent PIAAC survey allows us to compute a measure of skill mismatch based on actual skills rather than on formal qualifications. The assessment

exercise administered to the survey respondents is key in this respect, as it produces skill proficiency measures for each participant in the survey. According to a methodology officially adopted by the OECD (Pellizzari and Fichen, 2017), skill mismatch is then computed on the basis of the features of the single job-worker pair and it measures whether the skills possessed by the worker correspond to the skills required by the job. A worker whose skills are below the level required by the job is classified as under-skilled, a worker whose skills are above those required by the job is classified as over-skilled. Further details on this methodology are provided in *Box 2*.

Box 2: The OECD measure of skill mismatch

The measure of skill mismatch used in this study is the one officially adopted by the OECD in the context of the PIAAC programme (Pellizzari and Fichen, 2017). More specifically, skill mismatch is computed as follows.

- The PIAAC sample is restricted to employees holding only one job.
- Jobs are defined separately for each country on the basis of 2-digit ISCO occupational codes. Due to a small sample size, whenever possible occupations with less than 50 observations are recoded according to their 1-digit code (9% of the sample). After that, occupations with fewer than 50 observations are dropped (3% of the sample).
- Workers who self-report being well-matched are then identified. These workers do not feel they “have the skills to cope with more demanding duties than those they are required to perform in their current job” and at the same time they do not feel they “need further training in order to cope well

with their present duties”.

- For each available skill domain and country, the minimum and maximum skill requirements for each occupation are defined as the minimum and the maximum test scores of the self-reported well-matched workers in that specific occupation..
- Finally, for each skill domain and country, workers are classified as being over-skilled if their test score is higher than the maximum requirement for their occupation (that is the maximum score of the self-reported well-matched workers) and under-skilled if their test score is lower than the minimum requirement for their occupation. All workers between the minimum and maximum are classified as well-matched.

One key advantage of this methodology is that it makes limited use of self-reported information, partially overcoming the problem of defining the skill requirements of jobs based on a survey of workers and subjective evaluations.

Now that information on both skills and qualifications is available within the same data source, the two measures of mismatch can be compared directly. Interestingly, available evidence from PIAAC data points to the fact that qualification and skill mismatch in reality measure two rather different phenomena. *Table 4.1*, for example, compares skill mismatch and qualification mismatch in Italy. Skill mismatch is computed according to the OECD methodology (*Box 2*) and focuses in particular on numeracy skills. Qualification mismatch refers to workers whose formal educational attainments are either higher or lower than those usually required for their job. The table shows that almost 80% of those who are under-qualified are in fact well-matched in terms of skills. Among the over-qualified about 78% are well-matched on skills, while

only 17% of them are actually over-skilled. The overlap between the two types of mismatch seems to be quite limited.

The discrepancy between the two measures arises for different reasons. First of all, the investment in education may be successful to a greater or lesser extent depending on the individuals. For example, some people may go to university but end up learning just enough to get their qualifications and substantially less than their most successful colleagues. Additionally, skills are learned on the job and tend to deteriorate during un-demanding jobs or periods of under-employment. As a result, those, presumably the most skilled, who manage to get the best jobs can accumulate more skills over their careers and the gap between good and bad workers widens over time.

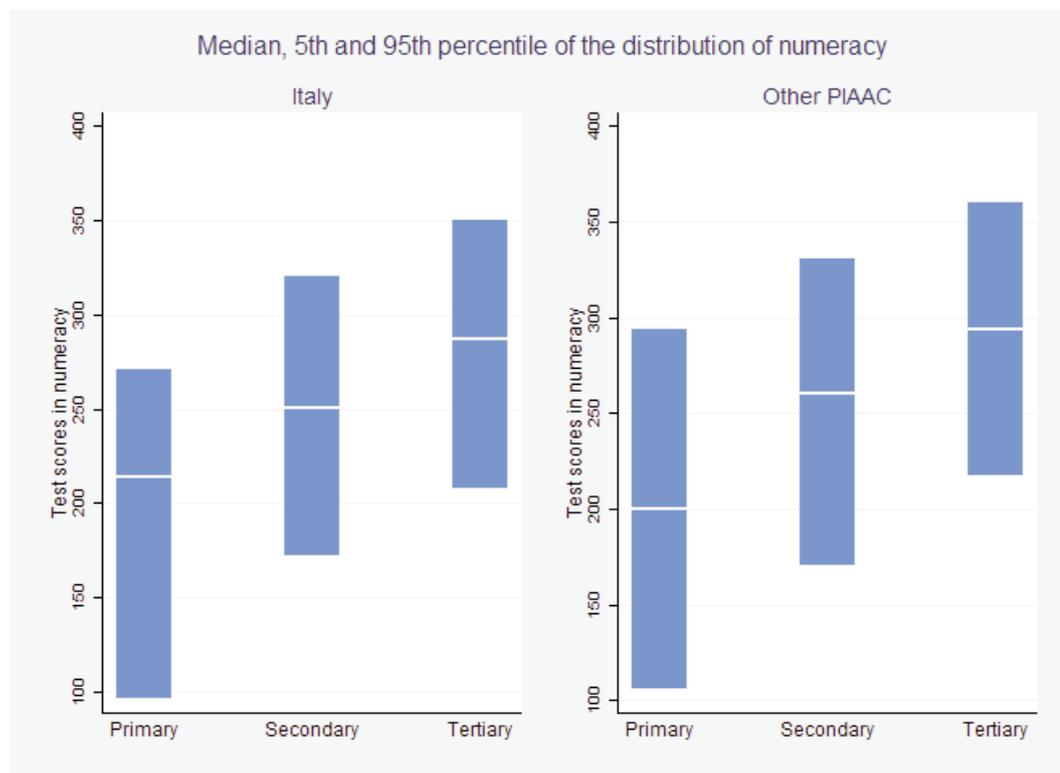
4. Skill mismatch and labor shortages in the Italian labor market

Table 4.1. – Qualification and skill mismatch (in numeracy) in Italy

Qualification mismatch (self-reported)	Skill mismatch (tested)			Total
	under-skilled	matched	over-skilled	
underqualified	10%	79%	11%	100%
matched	9%	76%	15%	100%
overqualified	5%	78%	17%	100%
Total	9%	77%	14%	100%

Source: OECD-PIAAC data

Figure 4.3. – Distribution of skills by qualification level



Source: OECD-PIAAC data

Figure 4.3 plots the distribution of numeracy skills by formal qualification in Italy and other PIAAC countries, and shows a large heterogeneity of skills within qualification groups. It is true that in all countries the median skill level increases with the level of qualification, however the overlaps in the level of skills of people with different qualifications are large. For example, the best high school graduates perform largely above the median of university graduates. The worst university graduates have proficiency levels close to the median of workers with primary education. In Italy, proficiency levels overlap even more than in other countries (median values of the three qualification levels are closer). Thus, Italian qualifications are, on average, less informative about workers' actual skills than in PIAAC countries.

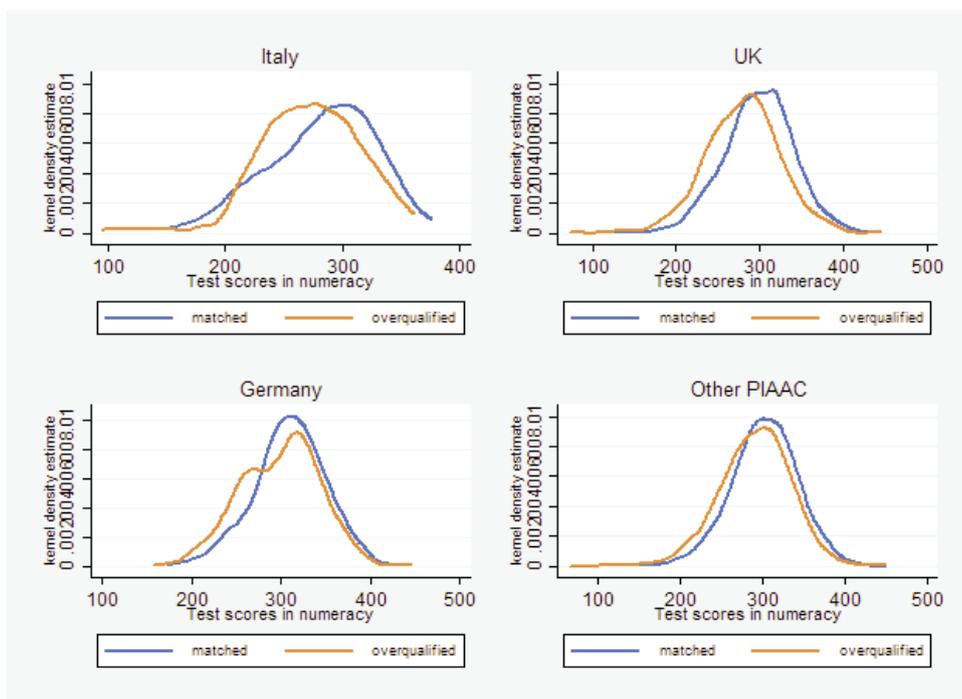
Another way to look at the discrepancy between qualifications and skills is presented in *Figure 4.4*, which focuses exclusively on university graduates. The graphs plot the distribution of numeracy in different countries for those who have the right qualifications for their jobs and those who are over-qualified. On average, the distribution of skills of over-qualified graduates is slightly shifted to the left and therefore the level of skills of over-qualified graduates is poorer, on average, than that of well-matched graduates. As *Figure 4.4* shows, in Italy this discrepancy between the two distributions is more pronounced than in other countries. One possible explanation for the difference between the two distributions is that skills tend to deteriorate faster in less demanding jobs, where graduates are more likely to be over-qualified. Another explanation could be that employers are able to discriminate between good and bad graduates, and therefore people with poorer skills end up in jobs where they are over-qualified but probably well-matched in terms of skills. In this second case, mismatched graduates would be over-qualified for a good reason: they have poorer skills to start with.

Both explanations can apply to the Italian case. The Italian economy is still concentrated in traditional sectors and characterized by a large number of small firms, many operating with relatively un-innovative technologies. Therefore, the probability of graduates being employed in un-demanding jobs is higher than in other countries. Alternatively, the Italian educational system may be producing formal qualifications that are not a particularly good indication of actual skills, as seems confirmed by the greater heterogeneity of test scores across Italian graduates compared to other countries (Italy has the more dispersed distribution of *Figure 4.4*). If that is the case, Italian employers may choose to hire graduates with poorer skills in jobs where they appear over-qualified but are well-matched in terms of skills.

Figure 4.5 gives some insights into which of the two mechanisms tend to prevail in Italy across different groups of workers. The first two graphs compare the distribution of numeracy skills for younger and older graduates, both well-matched and over-qualified. The graph on the top right seems to confirm the idea that skills deteriorate faster among over-qualified workers, as the shift to the left is very pronounced among older workers, who presumably have longer working careers. However, a discrepancy between well-matched and over-qualified graduates also exists among workers of younger cohorts. In that case, the discrepancy between the two distributions is probably due to over-qualified graduates whose formal qualifications are a poor reflection of their actual skills. Young STEM graduates are an exception in this respect, since the skill distribution of well-matched and over-qualified STEM graduates seems to overlap. For this category of graduates, qualification mismatch is probably driven more by a lack of a demand for their skills than by issues related to the quality of their qualifications.

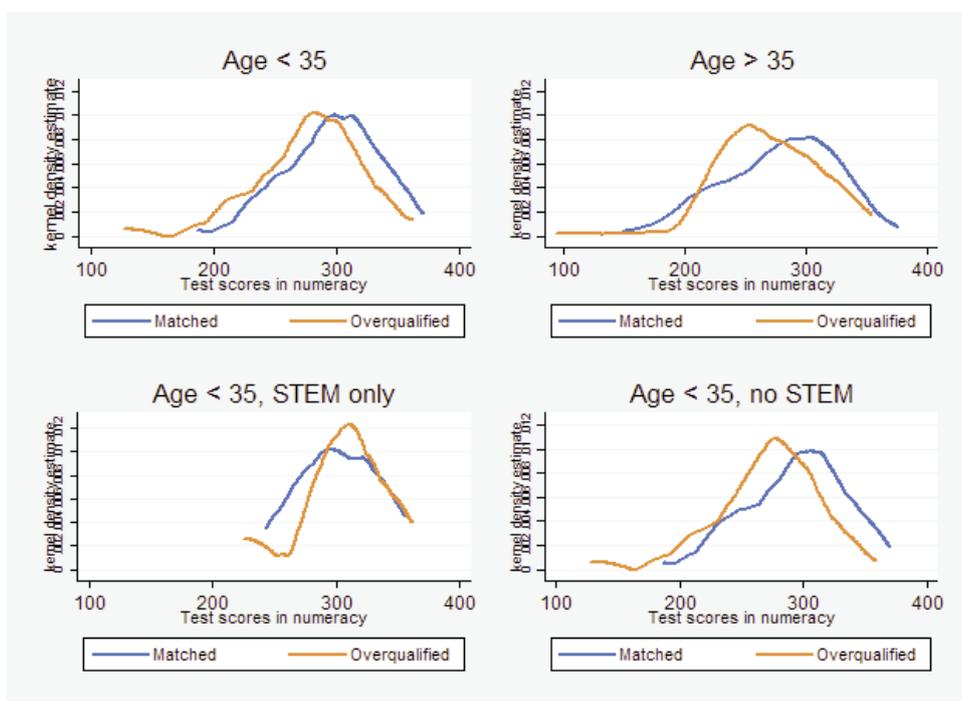
4. Skill mismatch and labor shortages in the Italian labor market

Figure 4.4. – The numeracy skills of over-qualified and well-matched university graduates



Source: OECD-PIAAC data

Figure 4.5. – Over-qualified and well-matched university graduates in Italy, by age and field of study



Source: OECD-PIAAC data

To sum up, measuring mismatch based on formal educational qualifications can be misleading, since schooling has heterogeneous effects across individuals, and skills develop and become obsolete outside the school environment. A measure of mismatch based on skills is certainly a better indicator of a worker’s true ability. Of course, this does not mean that the presence of qualification mismatch is not an issue. We should of course be careful about university graduates working in the call centers because apparently these individuals are not reaping the returns of the costly investment they have made. However, the problem relates more to the functioning of the education system than to the efficiency of the labor market in matching the right worker to the right job. In fact, in Italy a comparison between skills and qualification mismatch highlights that in Italy formal qualifications are less informative about the actual skills of workers than in other countries.

4.3 The incidence of skill mismatch in Italy

Our results show that for numeracy, on average, in Italy 77% of employees are well-matched, about 9% are under-skilled and 14% are over-skilled. Italy has a slightly smaller fraction of over-skilled workers and hence a higher fraction of workers who are well-matched in their jobs compared to the PIAAC weighted average (where over-skilled workers are about 17%). When weighted for the population of each country, the average level of under-skilling in PIAAC countries is 9%, the same as in Italy. However, if we look at the ranking of PIAAC countries (*Figure 4.6*), Italy clearly belongs to the group of countries with the highest levels of under-skilling.

Italy is also a country with large geographical differences. As can be seen in *Figure 4.7*, the overall level

of skill mismatch varies widely across regions. In particular, over-skilling is higher in the North East (20%), while overall mismatch is lower in the South.

Both in Italy and in the other PIAAC countries the overlap between numeracy and literacy mismatch is substantial (87% of the workers in Italy and 90% of workers in other PIAAC countries who are well-matched in numeracy are also well-matched in literacy). For that reason, and for the sake of simplicity, we mainly focus on numeracy skills, while the results for literacy are reported in the Appendix (*Table 4.5*, *Figure 4.13* and *Figure 4.14*).

Table 4.2 describes the incidence of skill mismatch in numeracy by the socio-demographic characteristics of the workers and by the features of their jobs. According to our results, both in Italy and elsewhere men are more mismatched than women. In Italy, total skill mismatch for men is 10 percentage points higher than for women. Perhaps due to their weaker labor market attachment, women seem to select jobs that better fit their skills. Presumably, when they are severely under- or over-skilled they tend to be inactive or unemployed more frequently than men. Mismatch also varies widely across age groups, with a higher incidence of over-skilling among younger workers. Not surprisingly, workers with primary education are more likely to be under-skilled, while university graduates are more likely to be over-skilled. In particular, in Italy the incidence of over-skilling is as high as 29% among STEM graduates, more than twice the national average. Both in literacy and numeracy, foreign workers show levels of under-skilling that are substantially higher than native workers, while they are less likely to be over-skilled. The gap between native and foreign workers is more pronounced in Italy than in other PIAAC countries, most likely as a result of the relatively low skill composition of the migrant workforce in Italy.

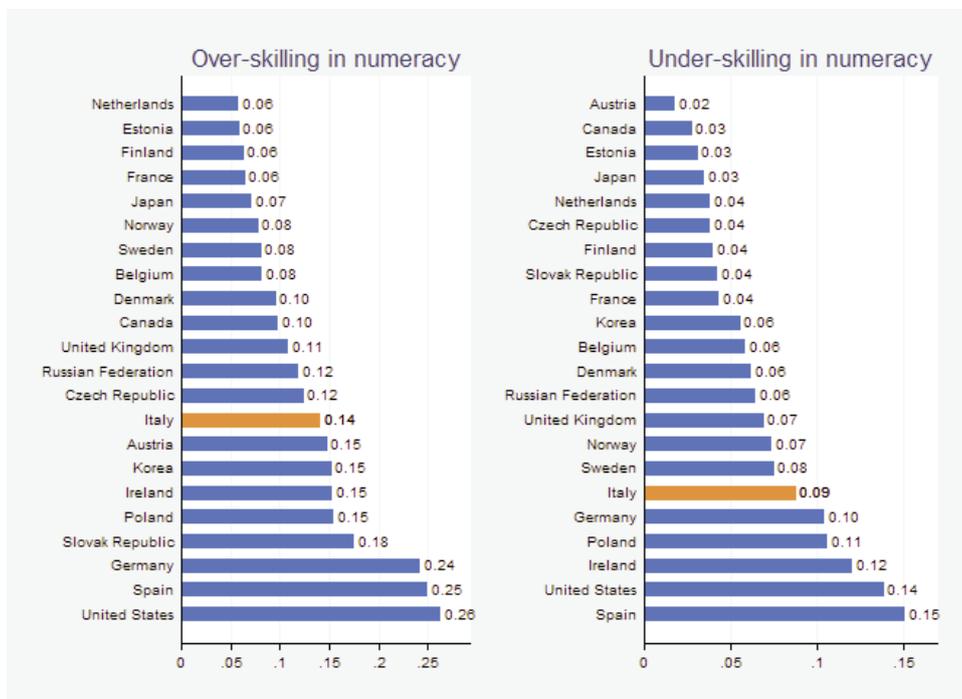
4. Skill mismatch and labor shortages in the Italian labor market

Table 4.2. - Skill mismatch in numeracy by worker and job characteristics

Characteristics (self-reported)	under-skilled (%)		over-skilled (%)	
	Italy	Other PIAAC	Italy	Other PIAAC
Sex				
Men	10,3	8,0	16,7	20,2
Woman	7,0	9,5	10,9	13,1
Education				
Primary	20,5	22,8	0,0	5,7
Secondary	9,3	9,6	13,7	14,4
Tertiary	3,7	6,8	19,5	20,4
Graduates				
STEM graduates	1,1	7,1	29,3	27,8
Others	4,6	6,7	16,4	17,0
Migrant (first generation)				
Natives	7,8	7,8	14,6	17,4
Foreign	18,9	17,7	8,9	12,0
Age				
young < 30	11,9	8,3	16,4	20,5
prime-age	7,4	8,2	15,8	16,7
older > 49	10,2	10,1	7,9	13,6
Firm size				
1-10 workers	10,6	9,3	9,6	15,1
11-50 workers	8,8	8,3	16,4	16,3
51-250 workers	6,2	8,0	16,1	15,5
>250 workers	7,3	9,3	19,2	20,8
Type of occupation				
White collar, high-skills	5,5	8,6	19,2	19,8
White collar, low-skills	9,3	8,5	9,9	14,2
Blue collar, high-skills	22,7	5,7	7,9	15,6
Blue collar, low-skills	4,6	11,7	15,9	14,5
Type of contract				
Permanent	8,4	6,5	15,8	12,9
Temporary	7,7	6,9	8,2	12,3
Total	8,8	8,7	14,1	16,8

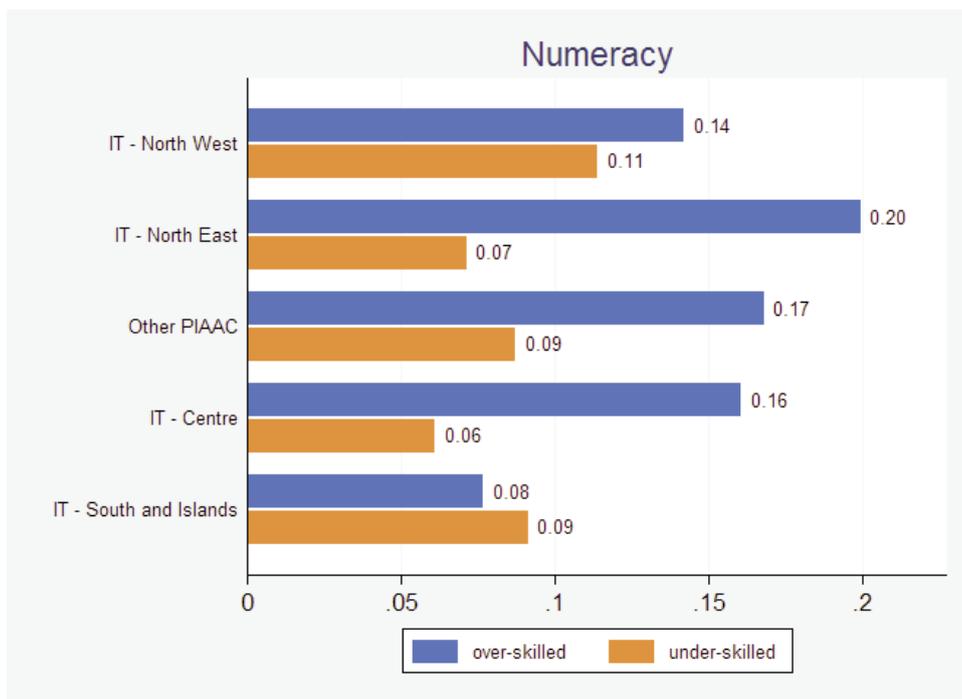
Source: OECD-PIAAC data

Figure 4.6. - Skill mismatch in numeracy across PIAAC countries



Source: OECD-PIAAC data

Figure 4.7. – Skill mismatch in numeracy across Italian regions



Source: OECD-PIAAC data

Rather different degrees of mismatch emerge across occupations. In particular, under-skilling is higher among highly skilled blue-collar workers (22,7% in Italy, 5,7% in PIAAC countries). In Italy, unlike other PIAAC countries, the incidence of skill mismatch varies depending on the type of contract, presumably due to the strong labor market duality (that is a segregated labor market where permanent workers benefit from high employment protection, while most of the burden of adjustment is borne by temporary workers). Over-skilling is as high as 15.8% among workers with permanent contracts, while it is only 8.2% among temporary workers. Temporary workers typically experience higher separation rates and receive less training than permanent ones. These phenomena may have an impact on the efficiency of matching between temporary workers and firms, and influence their skill development, thus explaining the lower level of over-skilling among them.

4.4 Demand or supply?

How should we interpret the results on the incidence of skill mismatch in Italy? Is the misallocation of skills in Italy a more serious problem than in other PIAAC countries? It is hard to draw definitive conclusions from this descriptive evidence. First of all, one must acknowledge that a certain degree of mismatch is likely to be structural, especially for young workers who need some time to experiment with the labor market and to find the right job for them. Secondly, and more importantly, the level of skill mismatch is the result of structural features of the economy, such as the quality of its human capital and the demand for skills from employers. In other words, the overall level of skill mismatch observed in each country is the result of the complex interplay between labor supply and labor demand factors.

4.4.1 The demand side

Looking at the demand side, we know that the Italian economy is typically concentrated in sectors with relatively low technological and innovative capacity and is characterized by a large number of small firms. Therefore, labor demand is likely to be less skills intensive than in other countries. This is confirmed in *Figure 4.8*, which plots the minimum and maximum skill requirements of seven different occupational groups⁵. According to our methodology, workers with proficiency levels between these two thresholds would be classified as well-matched. Therefore, these minimum and maximum skill requirements can be interpreted as indirect measures of the skill requirements associated with the jobs.

As can be seen in the top panel of *Figure 4.8*, almost all white collar occupations in Italy have minimum skill requirements below those of other PIAAC countries. The gap is wider for highly skilled white collar occupations such as professionals (business and administration professionals, teaching professionals, science and engineering professionals, etc.). Similar conclusions can be drawn by looking at maximum skill requirements. In Italy they are mostly below those of other PIAAC countries, thus confirming the idea of a lower demand for skills from Italian employers across the entire spectrum of jobs corresponding to a specific occupation. Against this background, skilled blue collar occupations represent an exception. For this group, that currently accounts for about 14% of Italian dependent employment, minimum skill requirements in Italy are higher than abroad. These jobs are probably concentrated in those manufacturing sectors that have been able to keep up with the process of technological innovation and now represent the excellence of Italian exporting firms.

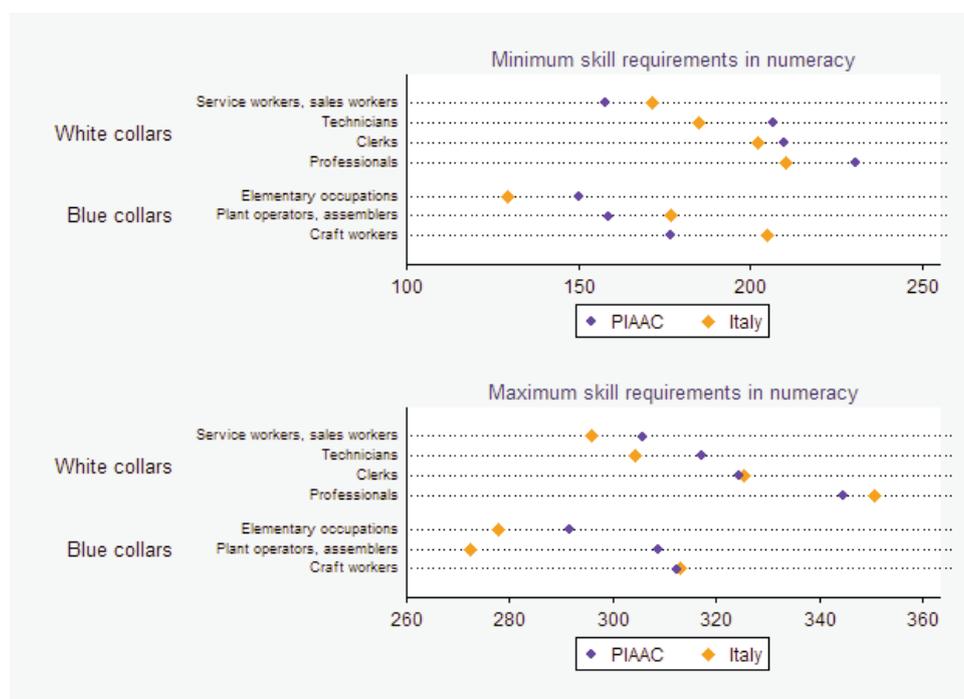
⁵ More precisely, *Figure 4.8* reports the average value of minimum and maximum skill requirements by 1-digit occupational groups.

Otherwise, the concentration of employment in small firms (about 39% of Italian employees, compared to 22% of other PIAAC countries) explains why labor demand is generally less skills intensive in Italy. This is indeed what we observe in *Figure 4.9*, in which the minimum and maximum skill requirements are particularly low for businesses with less than 10 employees. Small firms often do not have the resources to keep up with technological progress and to invest in research and development. In fact, the inability to innovate is often the very reason why a company does not grow and remains small. Hence, it is not surprising to find that skill requirements correlate negatively with firm size. Moreover, small employers may find it difficult to train their employees for highly skilled positions. It is well-documented that employer-sponsored training is less frequent in small firms, mainly because small

employers are not able to cover the fixed costs of workforce training, whereas large companies can recoup such costs more easily by spreading them over a large number of employees.

In Italy, however, the weak demand for skills also seems to extend to large firms. In *Figure 4.9* we see that in Italy the skill requirements of very large firms (with more than 250 employees) are not so different from those of medium-size firms (between 10-50 employees), contrary to what we observe in other PIAAC countries, where skill requirements steadily increase with firm size. As a consequence, the largest gap in minimum skill requirements between Italy and PIAAC countries is registered among large firms, confirming the idea of a productive system that is lagging behind in term of skill demand across all sizes of business.

Figure 4.8. – Minimum and maximum skill requirements of jobs



Source: OECD-PIAAC data

Figure 4.9. – Minimum and maximum skill requirements of jobs by firm size



Source: OECD-PIAAC data

What are the consequences for skill mismatch of the low demand for skills from Italian employers? If the skill requirements of Italian jobs are relatively modest compared to other countries, then skilled workers in Italy are more likely to be employed in jobs where their skills are not exploited to their full potential.

This interpretation is supported by the breakdown of the skill mismatch indicator by worker education (Table 4.2). Over-skilling in numeracy is greater among university graduates (19.5% compared to 13.7% among high-school graduates) and reaches a stunning 29.3% among university graduates in STEM subjects (Science, Technology, Engineering and Mathematics).

At the same time, since skills also accumulate and deplete on the job, they tend to deteriorate faster in

economies where un-demanding jobs are widespread and workers’ skills are rarely challenged. From this perspective, with mean proficiency scores significantly below the average of the other OECD countries (Di Francesco 2013; OECD, 2013), the disappointing performance of the Italian workforce overall, could be attributed at least in part to a faster depletion of their skills due to the nature of their jobs.

It is worth noting that over-skilling is not necessarily a bad phenomenon when it remains within reasonable limits. Way too often the public discourse on mismatch tends to overlook the fact that the skill requirements of jobs are themselves the result of a process of technological innovation, in which workers’ skills are crucial ingredients. In other words, the skill requirements of tomorrow’s jobs are created by today’s workers and their skills. From this perspec-

tive, over-skilling indicates that some workers are employed in jobs where their skills are not exploited to their full potential, but at the same time, it indicates that the economy has the potential to improve its technological capacity and upgrade the requirements of its jobs. Such potential is particularly relevant in a country like Italy, where the skill requirements of existing jobs are substantially lower than those observed in other countries.

The comparison between northern and southern regions in Italy may help to clarify the relevance of this point. Even though the South has the lowest level of skill mismatch of all Italian regions (as shown in *Figure 4.7*), this is likely to be the result of a vicious circle where a low demand for skills from employers meets a relatively unskilled workforce. On the contrary, over-skilling is particularly high in northern regions as a result of a higher supply of highly skilled labor. Although a high share of highly skilled workers in northern regions have competencies that are partly redundant with respect to the current demand for skills, they could trigger a much needed upgrading of future jobs.

4.4.2 The supply side

It is important to emphasize that the observed level of skill mismatch is also a function of the initial quality of the human capital in the economy. As we have seen in the previous paragraphs, the PIAAC results for Italy clearly suggest that the schooling system does not provide Italian workers with the same proficiency as other countries.

Supply problems become particularly evident when looking at the level of under-skilling in Italy. In fact, whereas a certain degree of over-skilling might be interpreted positively, under-skilling is more clearly a

problem. Under-skilling signals that workers have difficulties dealing with the basic tasks in their jobs and, unless their ability to carry out those tasks is improved by some form of learning, it is likely that they will remain under-skilled in the future, as the job requirements will upgrade due to technical progress.

As already noted, Italy is among the PIAAC countries with the highest levels of under-skilling, despite the relatively low skill requirements of existing jobs. From a policy perspective, dealing with high levels of under-skilling calls for educational and training policies aimed at improving the quality of human capital. Whether such policies should be provided by the general school system, vocational education, or formal on-the-job training is a hotly debated issue. However, our results show that under-skilling in Italy is particularly prominent in skilled blue-collar occupations (building workers, metal and machinery workers, and food processing, wood working, garment and other craft workers⁶), where it reaches 23% of Italian employees, compared to a PIAAC average of only 6% (*Table 4.2*). In contrast to elementary and routine occupations in the manufacturing sector, these are the types of manufacturing jobs that might resist the forces of globalization, and even gain importance in the economies of the advanced world. For this particular group of occupations, an investment in educational policies aimed at developing high-quality vocational education could alleviate tensions in this specific segment of the labor market. To this aim, Italy could benefit from the experience of other European countries with strong vocational education systems (such as Germany, Austria and Switzerland) or from recent small-scale experiments carried out in Italy in the field of tertiary vocational education (such as the experience of the Istituti Tecnici Superiori, which were introduced in 2008).

⁶ This group of occupations includes ISCO 2-digits codes 71 (building and related trades workers, excluding electricians), 72 (metal, machinery and related trades workers), 74 (electrical and electronic trades workers) and 75 (food processing, wood working, garment and other craft and related trades workers).

4. Skill mismatch and labor shortages in the Italian labor market

Table 4.3. – Descriptive statistics on hard-to-fill vacancies in Italy in 2015

Characteristics	Hard-to-fill vacancies %	Number of vacancies	
<i>Sector</i>			
Industry	16%	112650	23%
Construction	7%	58190	12%
Trade	9%	84690	17%
Turism	10%	49090	10%
Other services	12%	195800	39%
Total	12%	500420	100%
<i>Area</i>			
North-West	13%	161180	32%
North-Est	14%	121400	24%
Centre	11%	98970	20%
South and Islands	9%	118890	24%
Total	12%	500440	100%
<i>Firm size</i>			
1 - 9 employees	11%	172940	35%
10 - 49 employees	11%	92020	18%
>= 50 employees	13%	235460	47%
Total	12%	500420	100%
<i>Type of contract</i>			
Permanent	12%	249260	50%
Non permanent	12%	251180	50%
Total	12%	500440	100%

Source: Excelsior data (2015)

Table 4.4. – Top 10 hard-to-fill occupations in Italy in 2015

% hard-to-fill vacancies	Occupation	Share of total vacancies
37,2%	(1) Specialists in mathematics, informatics, physics and natural sciences	1,9%
30,4%	(2) Engineers, architects and similar professions	1,8%
27,2%	(3) Specialists in life sciences	0,3%
26,2%	(4) Directors and managers of large companies	0,3%
23,7%	(5) Health specialists	0,1%
22,5%	(6) Specialists in humanities, social, artistic and managerial professions	1,9%
22,2%	(7) Technical occupations in the health sector	1,9%
20,1%	(8) Technical occupations in science, engineering and manufacturing	4,9%
19,6%	(9) Craftsmen and skilled workers in food, wood, textiles, leather industry	2,6%
19,1%	(10) Craftsmen and skilled workers in mechanical engineering and electronics	4,7%
22,9%	Total top 10 hard-to-fill occupations	20,3%
12,0%	Total occupations	100,0%

Source: Excelsior data (2015)

4.5 The incidence of hard-to-fill vacancies in Italy

Another dimension of mismatch that is often discussed in the policy area is the difficulty encountered by employers when looking for appropriate candidates for a vacant job. These so-called “hard-to-fill” vacancies are often interpreted as signals of skill shortages and of a lack of adequate skills in the labor market. Our previous analysis suggests that the current workforce seems to possess the necessary skills for the existing jobs. However, such analysis cannot capture potential hiring difficulties associated with vacant jobs or even vacancies that are not opened due to skill shortages. Hence, it is interesting to investigate the hiring behavior of employers and the difficulties they report in their search for the right employees.

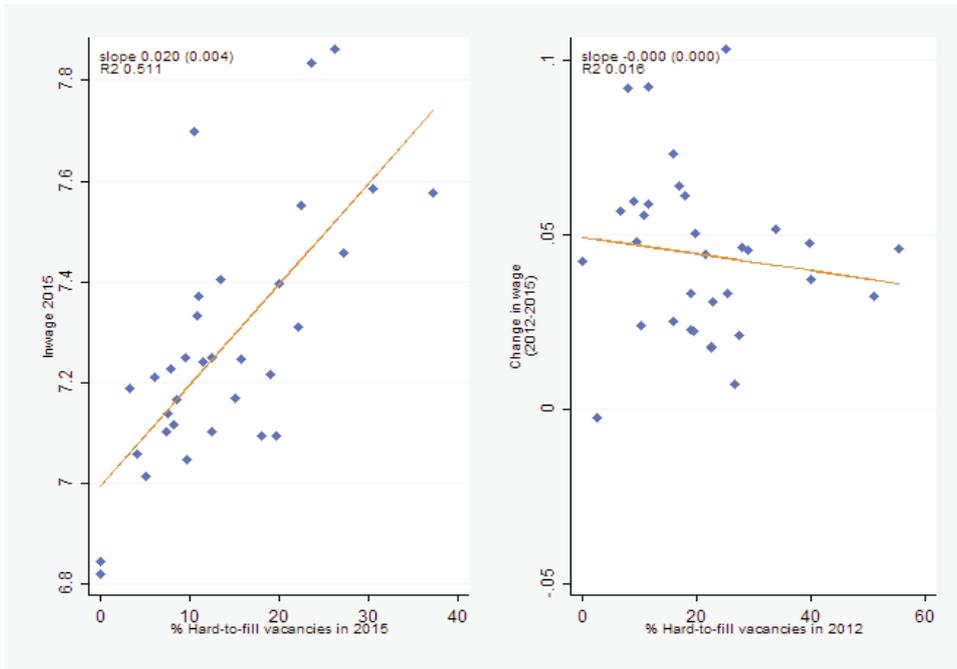
Information on hard-to-fill vacancies can be obtained from surveys of employers who are asked about their unfilled jobs and their expectations about how difficult it will be to fill them. In Italy, this type of data is provided by the Excelsior survey, which collects detailed information on expected recruitment by Italian employers. The survey is carried out every year over a sample of 100,000 private firms, corresponding to about 8% of the total number of Italian firms with at least one employee.

The Excelsior data provide detailed information about the demand for labor by Italian employers, as well as its distribution across provinces and sectors. Part of the information is gathered from administrative archives (notably, the Business Register) covering key characteristics of firms, such as economic activity, number of employees, location, and legal form. A questionnaire carried out at the firm level provides specific information about the job profiles that each firm expects to recruit for during the year (and, if no hiring is expected, the reasons for this).

According to the 2015 Excelsior survey, Italian employers report that on average 12% of their vacancies are hard-to-fill, many concentrated in the industrial sector (where 16% of the firms experience hard-to-fill vacancies). If we consider the top 10 occupations with the highest share of hard-to-fill vacancies (*Table 4.3*), we can see that more than half of them are highly skilled technical jobs, such as technical occupations in science, engineering and manufacturing; craftsmen and skilled workers in mechanical, engineering, electronics; craftsmen and skilled workers in the food, wood, textiles and leather industries. Finally, also top management positions and occupations in the health sectors are reported to be particularly hard-to-fill.

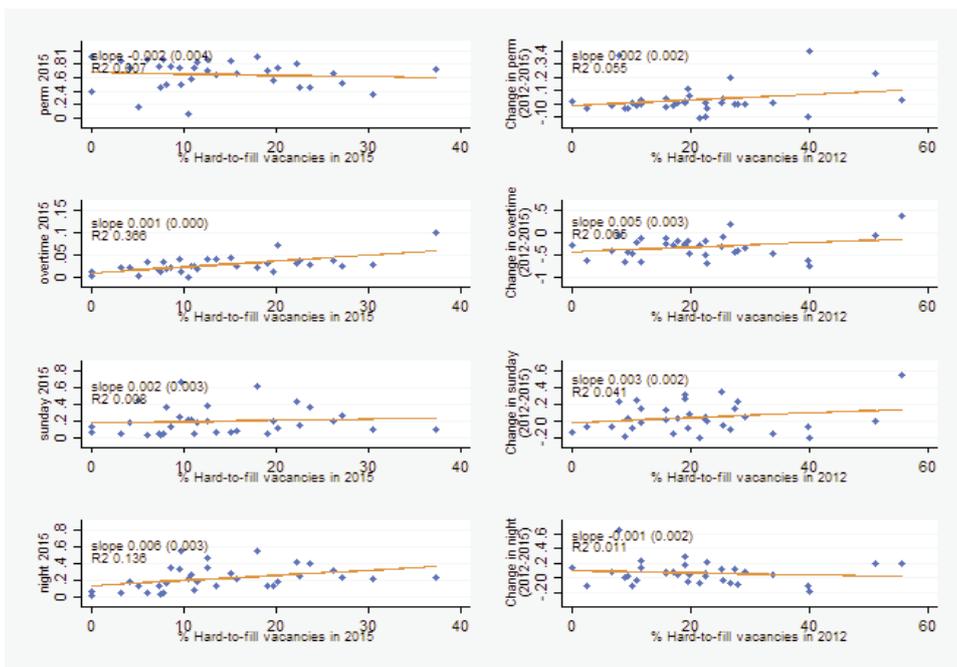
4. Skill mismatch and labor shortages in the Italian labor market

Figure 4.10. – Hard-to-fill vacancies and wages



Source: LFS (Q1-2012 and Q1-2015) and Excelsior data (2012 and 2015)

Figure 4.11. – Hard-to-fill vacancies and working conditions



Source: Authors' elaboration based on LFS (Q1-2012 and Q1-2015) and Excelsior data (2012 and 2015)

Note: On the vertical axis, "perm" refers to the share of workers with permanent contracts; "overtime" refers to the share of people working overtime; "Sunday" refers to the share of people working on Sunday; "night" refers to the share of people working at night (shifts from 8pm to 5am).

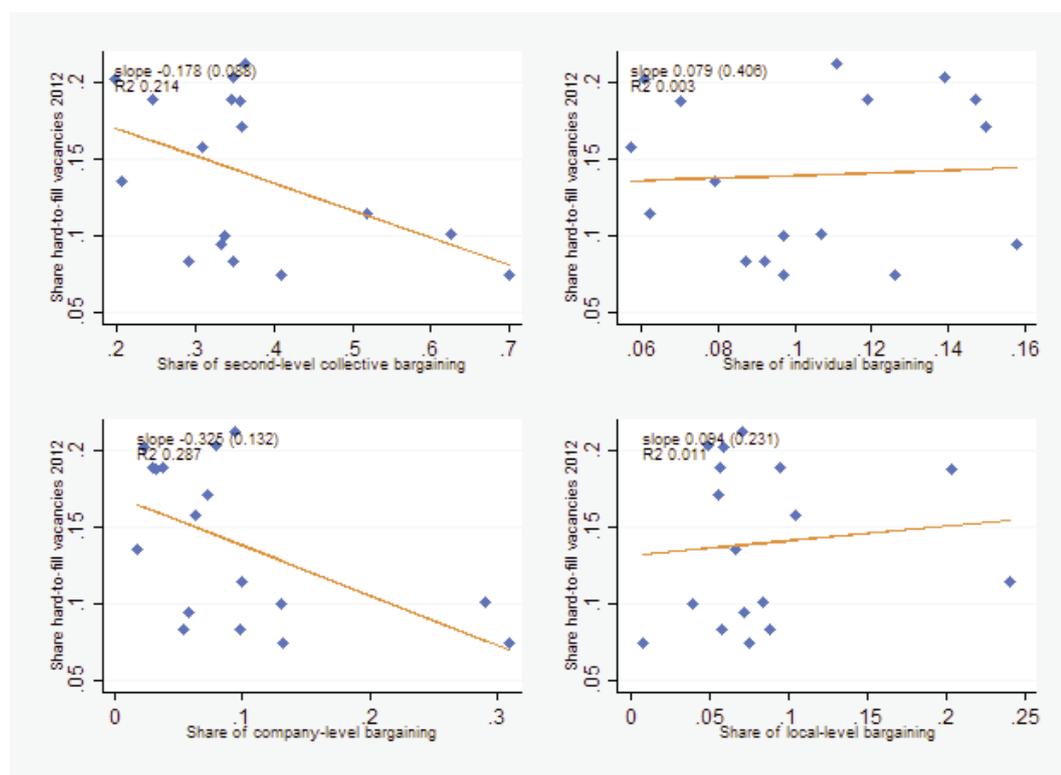
4.6 Hard to find or hard to pay for?

Employers can use various strategies to deal with the problem of hard-to-fill vacancies and to increase the attractiveness of a particular job for suitable candidates. One obvious strategy is to improve the working conditions and, particularly, the salary. *Figure 4.10* (left panel) shows that on average the occupations where hard-to-fill vacancies are higher are the ones paying higher salaries. This is not surprising since the most demanding jobs are presumably the ones that are harder to fill. What is perhaps more surprising is the right-hand panel of *Figure 4.10*, which replaces the average salary with the growth in the average salary between 2012 and 2015, and replaces the current (2015) percentage of hard-to-fill vacancies with the one reported in 2012. The figure shows that the occupations in which hiring was dif-

ficult in 2012 were not the ones where average salaries increased the most between 2012 and 2015: in fact the relationship is negative, but very weak (it does not reach the conventional levels of statistical significance). In other words, it seems that employers in recent years have not responded to hiring difficulties by making the jobs more attractive to potential candidates, for example, by increasing salaries.

The salary is an important element of the job package but other working conditions also matter. Indeed hard-to-fill occupations seem to be characterized by a strong incidence of undesirable working conditions, such as overtime and night shifts (*Figure 4.11*, left panel). At the same time, there do not seem to have been significant changes in the conditions for these types of jobs (*Figure 4.11*, right panel).

Figure 4.12. – Hard-to-fill vacancies and second-level collective bargaining by sector (year 2012)



Source: Excelsior data (2012) and Istat-Cnel survey (2012)

One possible reason for this rigidity in working conditions is perhaps the rather centralized system of collective bargaining that makes it difficult for employers to adjust wages and other non-pecuniary features of jobs to attract more and better job candidates. In the Italian system of collective bargaining, working conditions are typically negotiated in national collective agreements, often at industry level, rather than at local or company level. Centralized bargaining covers remuneration conditions, but also a range of non-pecuniary issues such as working hours and work organization. In Italy, decentralized bargaining still covers a minority of workers (according to Istat, second-level collective bargaining currently covers around 32% of employers with at least 10 employees). Therefore, it may be difficult for employers to change the working conditions only for the most needed job profiles, as it would involve a deviation from national collective agreements covering all workers within the same firm. *Figure 4.12* confirms the idea that greater flexibility in adapting working conditions is indeed accompanied by a lower incidence of hard-to-fill vacancies. Hiring difficulties seem to be less present in sectors where second-level collective bargaining is more widespread, in particular at company level (*Figure 4.12*, left graphs).

To sum up, Italian employers do seem to face difficulties hiring appropriate candidates. Still, there is a reason why some jobs are harder to fill, which is that they appear to be characterized by undesirable working conditions. However, despite reported difficulties recruitment strategies do not seem to have exploited the potential for improving working conditions in order to attract more and better candidates. The rather centralized system of collective bargaining might impede adjustment to pecuniary and non-pecuniary features of the jobs.

4.7 Key messages

On skills supply in Italy:

- According to PIAAC data, numeracy and literacy skills of Italian employees are among the lowest of OECD countries, across all age groups and all qualification levels (the only exception being STEM graduates). Italy is also characterized by a large geographical variation in proficiency scores, with southern regions largely lagging behind the rest of the country.
- The Italian educational system may be producing formal qualifications that are less informative of the actual skills of workers than in other PIAAC countries. This may partly explain the incidence of over-qualification among young graduate workers: Italian employers may choose to hire graduates with poorer skills in jobs where they appear over-qualified but in reality are well-matched in terms of skills.

On skills demand and hiring difficulties of Italian employers:

- The Italian economy is typically concentrated in traditional sectors with relatively low technological and innovative capacity and is characterized by a large number of small firms (39% of Italian employees work in small firms, against a PIAAC average of 22%). Looking at the skill requirements of Italian jobs, we see that labor demand in Italy is indeed less skills intensive than in other countries, especially among highly skilled white collar occupations. Skill requirements are particularly low in small businesses, although the Italian productive system seems to have a low demand for skills across all sizes of business.

- Italian employers do face some hiring difficulties. However, the salaries and working conditions of the most difficult jobs to fill do not seem to have improved in recent times. The centralized system of collective bargaining might be an impediment to adjusting salaries and working conditions to attract more and better candidates. Increasing the coverage of decentralized bargaining may be helpful in adapting working conditions to local needs, as hiring difficulties seem to be less pronounced in sectors where second-level collective bargaining is more widespread, in particular at a company level.
- Skilled blue collar occupations represent an exception among Italian occupations: for this specific group of jobs, minimum skill requirements in Italy are higher than in other PIAAC countries. In addition, highly skilled technical jobs are among the occupations with the highest share of hard-to-fill vacancies.

On skill mismatch in Italy:

- Labor market mismatch has been investigated mostly in terms of qualification mismatch, which can be misleading when the interest is in the actual skills of workers. PIAAC data allows us to compute a measure of skill mismatch based on an assessment of actual skills rather than on formal qualifications.
- In Italy, 14% of employees are over-skilled (against a PIAAC weighted average of 17%) while 9% are under-skilled (equal to the PIAAC weighed average). The overall level of skill mismatch varies widely across Italian regions. Over-skilling is higher in the North East (20%), while overall mismatch is lower in the South. The overall level of skill mismatch in Italy, although not excessively different from the OECD average, is the result of a vicious circle where a relatively low demand for skills from employers meets a relatively unskilled workforce.
- The low demand for skills from Italian employers may be responsible for the high level of over-skilling among university graduates (STEM graduates in particular), as well as for the faster deterioration of their skills. Although some workers are employed in jobs where their skills are not exploited to their full potential, over-skilled workers may represent the potential of the Italian economy to innovate and upgrade its job requirements in the future.
- In Italy, the incidence of over-skilling also varies depending on the type of contract (it is as high as 16% among permanent workers, while is only 8% among temporary workers), presumably due to the strong labor market duality.
- Under-skilling in Italy is particularly prominent in skilled blue-collar occupations, where it reaches 23% of employees (against Italian and PIAAC averages of 9% and 6% respectively). With respect to this specific group, Italian employers are probably experiencing hiring difficulties, resulting in above-the-average levels of hard-to-fill vacancies and under-skilling among already employed workers. High quality vocational training might alleviate tensions in this specific segment of the labor market.

4.8 Appendix

To sum up, Italian employers do seem to face difficulties hiring appropriate candidates. Still, there is a reason why some jobs are harder to fill, which is that they appear to be characterized by undesirable working conditions. However, despite reported dif-

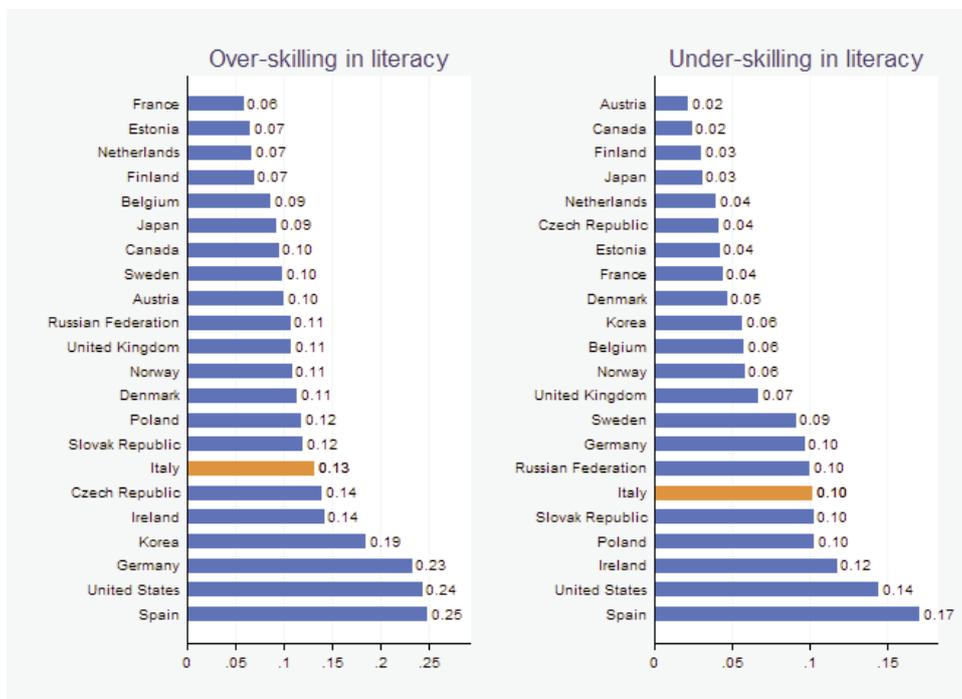
ficulties recruitment strategies do not seem to have exploited the potential for improving working conditions in order to attract more and better candidates. The rather centralized system of collective bargaining might impede adjustment to pecuniary and non-pecuniary features of the jobs.

Table 4.5. – Skill mismatch in literacy by worker and job characteristics

Characteristics (self-reported)	under-skilled (%)		over-skilled (%)	
	Italy	Other PIAAC	Italy	Other PIAAC
Sex				
Men	11,3	9,5	13,6	18,6
Woman	8,8	9,0	12,8	13,8
Education				
Primary	21,8	21,3	6,9	6,2
Secondary	9,9	10,0	11,8	13,6
Tertiary	8,7	7,6	21,2	20,2
Graduates				
STEM graduates	8,5	8,4	31,1	25,7
Others	8,8	7,2	18,0	17,6
Migrant (first generation)				
Natives	8,4	8,3	13,7	17,0
Foreign	26,4	18,5	7,2	10,1
Age				
young < 30	12,9	7,5	13,2	20,9
prime-age	9,3	9,0	15,4	16,3
older > 49	10,8	11,2	7,4	12,1
Firm size				
1-10 workers	12,8	9,7	7,4	15,4
11-50 workers	8,8	9,1	16,1	16,0
51-250 workers	6,8	8,4	18,4	14,1
>250 workers	10,0	9,5	16,3	20,0
Type of occupation				
White collar, high-skills	8,0	9,5	23,6	19,0
White collar, low-skills	9,1	8,9	7,1	13,2
Blue collar, high-skills	17,7	6,3	4,8	20,4
Blue collar, low-skills	10,1	11,1	11,6	12,0
Type of contract				
Permanent	9,7	7,0	14,7	12,9
Temporary	12,2	7,6	7,6	12,9
Total	10,2	9,2	13,2	16,3

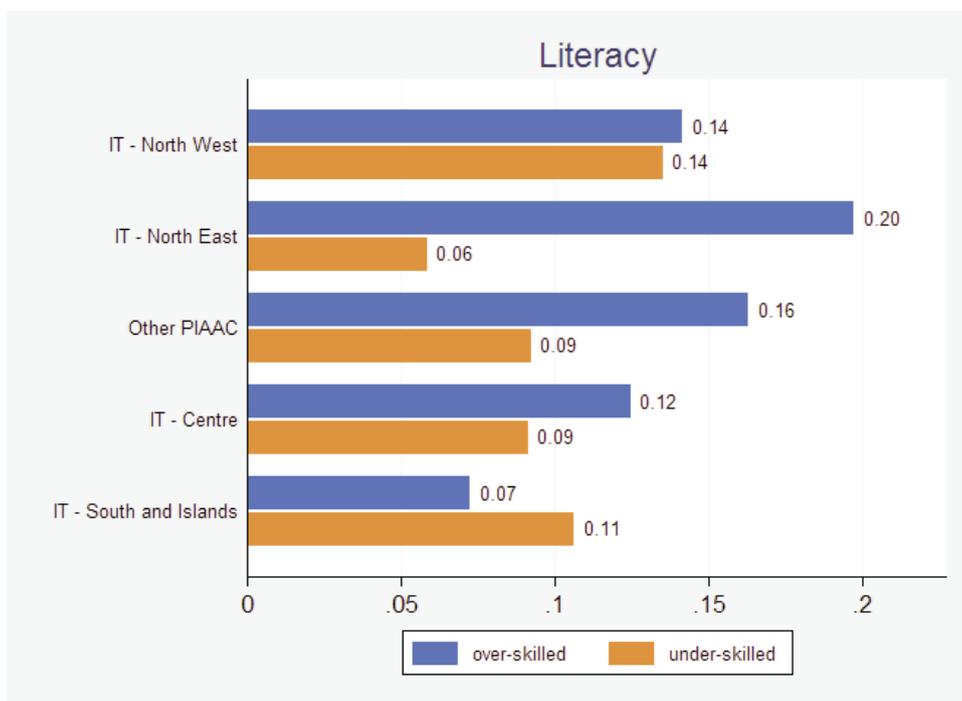
Source: OECD-PIAAC data

Figure 4.13. – Skill mismatch in literacy across PIAAC countries



Source: OECD-PIAAC data

Figure 4.14. - Skill mismatch in literacy across Italian regions



Source: OECD-PIAAC data

5. Comments

In this chapter we report some of the views expressed during the Policy Workshop on “Unemployment and skill mismatch in the Italian labor market” organized by IGIER-Bocconi in partnership with J.P.Morgan Chase Foundation at the Exhibition Hall of the Bocconi University on October 27, 2016.

The reported summaries and quotes relate to the round table discussion “Skill Mismatch, education and training policies”, moderated by Dario Di Vico

(Corriere della Sera) with the participation of Gustavo Bracco (Human Resources Senior Adviser Pirelli), Andrea Gavosto, Director of the Fondazione Giovanni Agnelli, Glenda Quintini (Senior Economist at OECD) and Monica Poggio (President of ITS Mechatronics Lombardia).

The round table discussion followed the presentation of the study “Skill mismatch and labor shortages in the Italian labor market”, included in Chapter 4 of this report.

Is skill mismatch in Italy more a supply or a demand problem?

Andrea Gavosto (Director of Fondazione Giovanni Agnelli):

“It is important to address whether the skill mismatch is related to the production system or to the education system. From the point of view of the demand for skills, the production system is increasingly reducing manual and repetitive tasks thanks to technological progress. Employers will be increasingly looking for creativity and analytical skills. From the point of view of the supply of skills, the main problem of the Italian education and training system concerns the teaching method. We know that in our system, both at school and university, lessons are mainly teacher led. This traditional approach, however, does not allow students to develop some key skills, such as creativity or interpersonal skills (e.g. communicating and working in groups).”

“In order to solve some of the problems affecting the supply of skills in Italy, it will be necessary to reorganize the Italian training system for adult workers over their entire working life, by providing periods in which workers not only marginally update their competences, but also learn the skills needed for new occupations.”

Gustavo Bracco (Human Resources Senior Adviser of Pirelli):

“Firms, when hiring new personnel, look both at what people know and at what people can do. With respect to knowledge, this is shown in a recent study carried out by the Fondazione Giovanni Agnelli in partnership with AIDP (Associazione Italiana per la Direzione del Personale) based on the answers of 300 HR managers. It found that when making their hiring decisions, companies strongly rely on about fifteen Italian universities or university programs that provide adequate education, and with whom they have a well-established relationship of cooperation. With respect to actual skills, the same research highlights that recently graduated employees appear to be lacking in soft skills.”

“In order to develop the skills that are lacking and to promote a better matching between candidates and firm needs, Pirelli has set up an internal two-year program for recently graduated employees. Obviously, the main aim of the program is to enhance employee skills according to internal necessities. Nonetheless, significant effort is devoted to the development of soft skills. A lot of attention is then put on the so-called “orienteering lab”, in order to guide workers towards those job positions that better match their competencies and soft skills.”

Glenda Quintini (OECD Senior Economist):

“I think that the education system must be the starting point. We cannot provide all young individuals with programs to enhance their employability or to offer re-training. Moreover, besides having enough resources, the programs are also needed. The Youth Guarantee required an “activation system” to be already in place. However, not every country has one, especially those with high youth unemployment rates. Nowadays, thanks to the establishment of ANPAL (Agenzia Nazionale per le Politiche Attive del Lavoro) we may have more instruments to set up the programs necessary for the Youth Guarantee to operate.”

“In Italy there are problems both on the skill supply side and on the skill demand side. On the supply side, the study highlights a remarkable heterogeneity in terms of skills among the over-qualified. For some of these workers, there is indeed a problem concerning their education. However, the research does not specify their field of study. Most young people are not aware of which education programs are in high demand and are therefore associated with better employment opportunities. On the demand side, Italy has a production system that is characterized by a high share of small and medium-sized companies, which are usually identified as a major cause of skill mismatch problems. However, in Italy underutilization of skills occurs irrespective of business size. It is a general issue, which does not exclusively affect small companies.

Which aspects of the study do you find less convincing?

Andrea Gavosto (Director of Fondazione Giovanni Agnelli):

“First, the study analyzes the set of mathematical and logical skills of the entire population between 16 and 65 years old, despite the fact that skills tend to develop across generations and over time. It would be better to examine specific age groups, for instance up to 35 years of age. Second, I think that measuring only mathematical skills is a limitation. Indeed, several studies show that, despite being core competences, they represent only a subset of the skills required on the job. Recent literature is more likely to consider skills to be the set of abilities that are required to cope with a given job. In particular, three different skill categories are typically identified: first, manual and repetitive skills; second, analytical and creative skills; third, interpersonal skills. Therefore, identifying over-skilling or under-skilling by looking only at mathematical competences may be misleading. For instance, some STEM graduates who are classified, according to the study, as over-qualified based on their

mathematical skills, may actually be well-matched, as they may lack other key skills, such as public speaking and team working abilities.”

What were the consequences of the economic crisis on the workforce within companies?

Dario Di Vico (Journalist, Corriere della Sera)

“The economic crisis has considerably changed firms. Companies are becoming increasingly “horizontal”. There was a reduction not only of manual and repetitive jobs, but also of several managerial positions. In recent years, several multinational firms have acquired Italian companies. In these cases, they often valued the production processes, while deciding to merge managerial functions at the top of the organization.”

It is often argued that Italy lacks tertiary vocational education. Where do we stand in this field? Should Italy expand programs that provide school-work experience, which currently only exist in small-scale pilot projects?

Monica Poggio (President of the ITS Lombardia Meccatronica and HR Director):

“In Italy there is a “third way” within the education and training system, beyond that of the high school diploma and the university degree, which is often neglected. I am referring to the Istituti Tecnici Superiori (Higher Technical Institutes). Although they were introduced in Italy almost ten years ago (in 2007-2008), they still have relatively few students. At the moment, in Italy there are about 4,000 ITS graduates, and slightly more than 5,000 students. There are 86 ITSs (of which 18 are located in Lombardy) focusing on various fields, such as chemistry, mechatronics, tourism and the green economy. Their distinctive element is the strong structural link with firms. Out of more than 1,600 ITS partners, almost 40 percent are firms or associations of firms. Furthermore, during the two-year training program, 30 percent of lesson time is carried out in firms; finally, over half of the teachers come from the business world and participate in designing the school curriculum.”

“Confindustria data show that Italy lacks technicians. In this framework, ITSs represent a valid answer to the need for technical training, especially in a manufacturing country like Italy. It is obvious that you cannot simply import the German dual model in a different country. However, it may be useful to borrow the most interesting elements from it, especially in light of the fact that in other countries with dual systems (such as Germany, Switzerland or France), youth employment is markedly lower than in Italy. For instance, ITSs in the field of mechatronics (or, alternatively, automation) answer a specific employment need of the manufacturing sector (13 percent of technical profiles required in the manufacturing sector fall within the field of mechatronics). The ITS “third way”, therefore, represents a specific answer in order to achieve better matches and to train people in a way that is consistent with the skills needs of firms.”

Italian employers do not seem to use the wage lever (or other working conditions such as working hours arrangements or the type of contract) to attract workers for occupations that face many hard-to-fill vacancies. Why?

Dario Di Vico (Journalist, Corriere della Sera)

“According to the results presented in the study, Italian companies do not extensively use wage incentives to attract workers to vacant jobs that are hard to fill. In my opinion, this behavior is related to the role played by unions. For instance, if a company cannot hire welders, it cannot pay them more than the amounts established by collective agreements. The reason for this is that unions would immediately ask for higher compensation for all other employees. Therefore, this type of behavior would become a source of conflict rather than an opportunity.”

Italian companies, when compared to those abroad (e.g. in Germany), appear to be investing less in training. Why is it not convenient for Italian employers to invest in training? What measures would reverse this pattern?

Andrea Gavosto (Director of Fondazione Giovanni Agnelli):

“It is true that, from an international perspective, the Italian productive system devotes a small amount of resources to training. However, I think that the kind of generalist education provided at school and university is more fundamental, while it is not always the case for professional training. Furthermore, training programs should be evaluated on the basis of their quality, rather than on the basis of the number of hours of training. Only in a limited number of circumstances do we know undoubtedly that training policies are useful. This is the case, for instance, for companies that are undergoing restructuring, where it is fundamental to teach new skills to redundant workers. In other cases, the outcome of these actions is uncertain. Moreover, since education is a cumulative process, it is difficult to train individuals who did not acquire basic skills at school or university. Knowledge development is a process where each well- step that is done well helps with the next step.”

“I think that in Italy the main issue is the school and university system and therefore policies should first intervene in this field. On the one hand, there is a problem concerning teaching content (in Italy a division going back to Benedetto Croce between abstract and practical subjects or, in other words, between knowledge and know-how, is still common). On the other hand, there is a problem related to teaching methods (generally lessons are teacher led, but we know that other methods such as teamwork exist). Finally, educational guidance is essential at the end of both the lower secondary school and the upper secondary school. Only after achieving some improvements on these issues, can we intervene in the area of training.”

Glenda Quintini (OECD Senior Economist):

“Company size can be a barrier to investment in training. A small company not only has to finance the training program, but also has to set it up and to look for local providers. However, there are some international examples of local groups of small firms that were able to organize collective training programs. These are the so-called group training organizations, which have successfully operated in the United Kingdom, Australia and other countries.”

How can we achieve a better match between demand and supply of skills?

Glenda Quintini (OECD Senior Economist):

“There is a need for a better communication between demand and supply of skills. Specifically, does the education system provide young people with information about the needs of employers? Is the curriculum of different training programs updated according to the specific needs of employers (especially at local level)?”

“A study carried out by the OECD highlights that those organizations adopting managerial styles that give autonomy to workers, focus on team working, and aim at involving workers in the business dynamics, are those that are exploiting individual skills optimally. I think that Italian companies should rely more on this approach since it can be effective for all business sizes.”

Gustavo Bracco (Human Resources Senior Adviser of Pirelli):

“In theory, a more precise definition of the most requested skills would be useful. In practice, however, this is quite hard to achieve. In a recent survey carried out by AIDP (the Italian association for human resource management) in partnership with Bocconi and AICA (the Italian association for Information Technology and Computing), among the answers to the question: “What is the role of the HR manager in a future dominated by technology?”, we find the following answers at the top of the ranking: “Expert in change management” and “Development of continuous learning”. On the contrary, options like “Unions relationship management” and “workforce optimization” seem to be less important.”

“Within a company disconnected activities are short-lived, irrespective of their focus (training, interoperability, talent or career development). Coordination between different initiatives is essential, also in order to encourage the self-empowerment of workers. For this reason, Pirelli is implementing a project called Growithus in order to signal the opportunities for growth within the company. In this project, employees get to know the list of existing functions within the company, job opportunities that are created all over the world, and available training courses. Out of 100 job openings that Pirelli fills through internal voluntary reallocation by a system of job posting, more than 50% are inter-functional transitions and they are usually very successful.”

J O E



6. Conclusions

The performance of the Italian economy over the last twenty years has been extremely disappointing. The situation has further deteriorated during the great recession. And even now, during the recovery phase, Italy is still growing less than any other industrialized country. This evidence suggests that some structural feature is at the root of this long-standing stagnation and decline.

This report has focused on the labor market, both in terms of the effects and of the potential causes of this performance. In the first chapter, we supplied a detailed description of the evolution of the Italian labor market over the last two decades, with a focus on the recent recession years. The key result is that, against an overall very negative performance, the workers that suffered the most were the weakest components of the labor force. The unemployment rate for younger workers reached the record figure of 40% in 2015. Other categories that suffered disproportionately were the less-educated and those living in the South. This implies that the crisis, in addition to dramatic aggregate consequences, had strong negative redistributive effects, that need to be addressed by policy.

The implication of these findings is clear: labor market policies should target explicitly the demographic group that has borne a disproportionate burden in the crisis: younger individuals, particularly those with less education and living in the South. The discussion that followed the presentation of the report stressed that some important steps were made toward the transformation of the Italian protection system into a more universal one. What still needs to be implemented is the part of the labor market reform related to active labor market policies, the design of which represents the key challenge in the near future.

The second chapter focused on one potential cause of the poor performance of the labor market and, as a consequence, of the economy as a whole: skill mismatch. Using data from the PIAAC-OECD survey, we showed that the high level of skill mismatch in the Italian labor market has both a labor demand and a labor supply component. On the labor supply side, the survey shows that numeracy and literacy skills of Italian employees are among the lowest of the OECD countries. This calls into question the capacity of the school system to endow Italian workers with the skills required by the labor market. However, the analysis also points to shortages on the skill demand side. Due to its specialization in traditional, low-tech sectors and to the predominance of SMEs, labor demand in Italy is less skills intensive than in other countries. Moreover, the centralized system of collective bargaining might be an impediment to adjusting salaries and working conditions to attract more and better candidates. Increasing the coverage of decentralized bargaining may be helpful in adapting working conditions to local needs.

Matching tasks to skills is a key ingredient of firm performance. In the competitive framework in which the Italian economy operates, workers' skills are a primary source of competitiveness. It is therefore important to determine the costs in terms of productivity losses of skill mismatch, and the causes of such mismatch. The results presented in this report set the stage for what we plan to investigate next within the Bocconi-JPM New Skills at Work Project. We will distinguish between labor demand and labor supply shortages. On the labor demand side, we will consider potential constraints external to the firm that might impact the quality of the skills mix, such as labor market regulation and globalization. We will also study factors that lie within the firm that may condition the capacity to select and employ the proper skills mix. Specifically, we will consider the characteristics of Italian entrepreneurs and the managerial practices adopted in firms.

In terms of labor supply, in order to understand how to tailor the supply of skills to the needs of the Italian economy, we will focus on different segments of the Italian population: students, young workers, older workers, and unemployed people. Clearly, the problem of reducing the skill mismatch calls for different measures depending on age. We plan to analyze the problems related to the supply of skills for both younger and older workers, looking at age-specific policy solutions.

The ultimate goal of this project is to offer policy suggestions to improve the match between labor supply and demand. In fact, as stated by one of our distinguished guests, the regulation of the labor market is not a once and for all operation, but rather, it needs to keep up with a continuously changing economic landscape. To improve the functioning of the labor market we need to constantly monitor its performance and identify the new challenges that it faces, and to offer policy suggestions based on solid and rigorous economic analysis. Our ambition in this project is to contribute to this process.

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