RATIONALE BEHIND THE BOOK

The Worth of Skills.
Structural Innovation, Knowledge Organization and Jobs Shifts
in Different Stages of Globalization

Our book studies of the effects on labour markets and skill trade of two main sources of structural change in contemporary economies. First, innovation progressively turned out to be structural. Second, jobs are transforming themselves in their very nature, spatial location and time dimension. While, on the one side, jobs are undergoing a process of de-structuring, innovation is becoming a permanent practice. Meanwhile, the speed of transformation has become so fast to induce ever-changing expectations in all the agents involved.

Both sources of change are strictly linked to the transformation in the organization and use of knowledge taking place in the framework of markets globalization and diffusion of the so called 'fourth industrial revolution'. Furthermore, since globalization went through different stages and it is still shifting, this transformation is yet in progress.

Structural changes are deeply transforming both the supply of and the demand for skills needed to stay competitive in the labour markets. The pace of innovation is accelerating exponentially leading to the prediction of composite, even if uncertain, scenarios crucial for the adoption of appropriate strategies and policies.

The aim of our book is to describe the main sources of structural change and their impact on the evolution of labour markets and the future trends of professional skills. In particular, we will focus on the fundamental importance of high skills for sustainable development.

Different reasons explain this choice. First, it goes without saying that today the labour force is increasingly composed of workers with upper secondary and tertiary education. Second, while in the past, labour markets and skill provision were mainly conceived as domestic issues, nowadays the globalization and regional integration brought about the formation of supranational settings for their operation and therefore they are related to different levels of government. Furthermore, the international migration of highly educated individuals became an increasingly widespread phenomenon that goes beyond the traditional outflows of human capital from developing to developed countries, usually designed as "brain drain". Globally, in the past decade the rate of migration increased by 70% to reach 27 million in 2010-11, while about 30% of all migrants in the OECD area were highly educated (OECD, 2013). Although most of this surge refers to transfers from low-income to high income countries, the number of highly educated emigrants from high-income OECD countries has also increased. Overall, in 2013 young migrants arriving from high-income countries as adults accounted for 23% in the OECD and 36% in the EU (OECD, 2014).

Notably, across Europe, migrants are increasingly young and highly educated. At the European level, 63% of intra-EU movers in 2009-13 were aged 15-34, while this age category only accounted for around 34% of the labour force in the EU. These cohorts of migrants are actually distinguished by a high share of graduates. The proportion of highly educated among recent intra-EU movers has raised from 27% in 2004-2008 to 41 % in 2009-2013 (European Union, 2014).

The effect of structural change is affecting mostly high skilled jobs. In order to match with fast and structural innovation, new skills will have to be acquired by people and it should be a concern for public institutions and firms to create a delivering system for new knowledge.

The first part of the book deals with the baseline of this evolution, looking at the main driving forces behind the structural changes experienced in the different phases of globalization. The study will try to identify for each phase the principal changes taking place in the nature of investment, innovation and global supply chains. Structural innovation is affecting heavily labour markets. Three are its main distinguishing features: (i) it can be helpful in modifying both the economic structure and the institutional architecture; (ii) it can be capable to influence both production and consumption activities; (c) it takes place continuously, also independently from explicit choices by producers and consumers with positive but also negative impacts.

Attention is paid particularly to the globalization of markets which led to the implementation of different business strategies in order to take advantage of fundamental shocks. In fact, different countries reacted according to their capabilities. For instance, countries of the global North (such as the US or Germany) implemented policies intended to stem the offshoring process. On the other hand, emerging powers (like China or Poland) tried to attract the assembly line offshored by big corporations.

The analysis of the structural adjustments through innovation needed to keep up with competitiveness, will be conducted under a macro and meso-economic perspective. This will allow us to give a wide overview on the main changes that are taking place. The study will be concentrated upon technological, economic, demographic, environmental and institutional transformations, envisaged both in a private and social perspective, which are driving the change at the beginning of the XXIst century. Afterward, the analysis will focus on the labour market and how the overall shifts, discussed previously, are going to affect both labour demand and supply.

Furthermore, structural innovation enabled the evolution of business models and pushed for the creation of new ones. Feedbacks from and happiness of customers is crucial in order to create products suitable for the markets. This fact is one of the most distinguishing features of the "chain-link model" where feedbacks have the function of linking innovation to R&D. This exchange can enrich the supply value chain thanks to the contribution of R&D that may result as an activity enhancement influencing the whole creation process of a product or a service. The improvement

may affect not only the primary activities (like marketing and sales), but also the support activities (such as human resources management).

The second part of the book is focused on the future contradictions and strife caused by structural innovation in markets for high skill workers. High skill jobs are the most affected by structural innovation. In fact, most of the new working positions opened by new technologies require a high level of skill in order to be properly filled. The new working positions created by cutting-edge technologies may require a completely new knowledge base and a distinctive demand for labour. On the other side, the supply of skilled labour can grow at a completely different pace. Therefore, innovation can lead to a shortage of key roles due to insufficient time to grow new skills. For instance, this occurrence is observed in regions where the numbers of data scientists are limited relative to their demand. This has various consequences for the labour markets including increasing the average wage for the role and systematic "poaching" among firms.

However, workers in innovative sectors will need to quickly adapt to the tasks transformations required within their jobs. Then in the firms' perspective, worker reskilling is a tool of increasing importance. For example, lifelong learning is increasingly adopted during the workers' lifecycle in order to face the importance of recurrent training and the acquisition of new skills. Hence adaptability to radical changes looks more attainable by people reaching higher levels of education in the employers' perspective. In fact, nowadays employers tend to require a higher and a broader level of competences from the workers, due to the synergy between automation and globalization generating a very competitive economic and social environment (Carnevale *et* al., 2018).

Our book will analyse graduates' condition in the labour markets, considering different influencing variables such as globalisation and underemployment. According to OECD (2016) mismatch among graduates is affecting about 15% of workers in Europe and the USA and this problem is amplified by the erosion of middle-skills positions. Even if the mismatch/underemployment issue has to be explored more carefully, this situation increases the chance for a high skill worker to be employed in a low skill job. However, it is also possible that technological change may alter this trend. Data science algorithms may have the potential to improve jobs allocations by facilitating the matching between demand and supply sides thanks to a more accurate analysis of the skills required for the job and the one actually achieved by the worker.

Technological change is also increasing automation, which has been a destroyer of jobs in the labour markets for centuries. The debate upon the fourth industrial revolutions' impact on the economy shows strong contrasts between researchers. The techno-pessimist side claims that

automation will not have a significant impact on the labour markets. Gordon (2016) is the best-known scholar that supports this side of the debate. His opinion is that even with the ongoing innovative activities their economic impact will be modest (Crafts and Mills, 2017). On the other hand, the techno-optimist state that automation will bring a large impact to markets in the coming decades. Brynjolffson and McAfee (2014) support the idea that this revolution will be the most important one since the first industrial revolution and how the world will witness an unprecedented rate of technological advance (Crafts and Mills, 2017). In either case, the supply and the demand side for labour are changing in the depth, shaping around the technological advance and the new business models. Innovation is constantly modifying the boundaries between demand and supply of labour markets, changing tasks and skills within the job. Branches like healthcare are rapidly expanding, while sectors like agriculture, are declining in terms of employment. An accurate analysis of tasks performed in a job may increase the understanding of which kind of skills are more intensive in automation, outlining which abilities will be more valuable.

The new scenarios are highlighting the importance of multidimensional inequality, participation and the psychological dimension. These topics may encompass an added value in revitalizing future scenarios otherwise too passive and flat. For instance, wage inequality is still growing with the reshaping of labour markets led by automation. A blue-collar worker has constantly increased his productivity in the past 50 years, but his salary per hour is growing at a much slower pace, giving to the owners most of the benefits brought about by innovation (Ford, 2015). Another focal point is the creation/destruction of the very job place. Computerisation already took over middle-skill and middle-wage jobs. The low skilled jobs are the next that risks to be automated, this risk is higher in Southern Europe countries (Green and Henseke, 2017). On the other hand, the high skill jobs trends look to be complementary to automation and leading to higher wages due to increased productivity (Robert et al., 2017). Furthermore, subsets of firms are beginning to support ethic missions that give importance to environmental and social sustainability or, like the CEOs' "Business Roundtable", are committed to upholding the highest standards of corporate governance in the USA. This sense of purpose or mission deriving from the "ethical" engagement is becoming more important in firms' real milieus. Also thanks to the new technologies, the commitment to ethical missions may directly affect the perception of customers. The real engagement in these activities can be diverse depending on which layer of business is the one who promotes them. Those arguments may represent a starting point for a reappraisal of the issue of quality in future workplaces, considering the production and social fragmentation effects and the stance of firms and corporations that cannot give anymore for granted the availability of public and social goods formerly provided by public administrations.