

WORK POLARISATION VERSUS WORKFORCE EDUCATION: ANALYSIS AT EUROPEAN UNION LEVEL

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Abstract

This scientific endeavor, the issue of work polarisation according to the education level in the EU's Member States is addressed. The theoretical aspect of the problem is reflected in this scientific endeavor through the scientists' contributions concerned with this field. Thus, several opinions and arguments are presented regarding the work polarisation, by highlighting education and lifelong learning on this phenomenon. In the paper, the work polarization depending on the education level is achieved according to the International Standards Classification of Occupations developed by the International Labor Organization.

Methodologically, the work polarization in the European Union was analyzed based on statistical data provided by EUROSTAT, as well as provisions of the European Centre for the Development of Vocational Training.

Key words: *work; job; professional skills; qualification level; occupations.*

JEL Classification: *J21, J23, J31.*

1. Introduction

In the context of the knowledge-based economy, changes are taking place rapidly in all fields of activity, including the labor market in general, and employment in particular. The work polarisation is influenced by structural developments in all sectors of activity of the economy which, in turn, have led to new trends in employment, requiring innovative professional knowledge and skills. The re-technology and robotization processes of various economic activities have led to the disappearance of jobs that required a low level of professional skills and, also, to the creation of novelty jobs, with knowledge and professional skills, necessary for current and future requirements. The rapid development of information technologies in recent years will lead, in the future, to an even greater polarisation of the labor market, depending on the professional skills of the workforce. The Coronavirus 19 pandemic, which affected countries worldwide, led to the onset of a global economic crisis, while highlighting the discrepancy between the demand and supply of professional skills. During the Coronavirus 19 pandemic, more than ever, the value of digital skills was observed, when a large part of the activities began to be carried out remotely. Thus, the Coronavirus 19 pandemic highlighted many benefits of digital work and learning. That is one of the reasons why the European Commission has reiterated its commitment to "help boost competitiveness and technological sovereignty" by investing in infrastructure and digital skills [16].

The demand for digital skills is growing, and its coverage depends on the education system in each country that has succeeded to adapt educational policies to cover the deficit, both quantitatively and qualitatively, on the labor market. To cover the digital skills gap, some EU's Member States have resorted to "importing" labor force from outside the European Union.

For a long time, primary and secondary education were a reality for most countries that provided the labor force needed for the labor market. The development of the knowledge based-economy has imposed an orientation of efforts towards higher education. These efforts have been reinforced by growing activity, which suggests that the impact of investment in education and training for the national economic growth is positive and significant, although it remains difficult to quantify. Recognizing that higher education is crucial for economic development and job creation,

the European Union has set itself the target that at least 40% of young people aged 30 to 34 to have a job qualification, following the graduation of a higher education institution by 2020. At the same time, the European Commission notes that 11 countries in the Community have exceeded that target for 2020 [16].

According to the European Center for the Development of Vocational Training (CEDEFOP), one of five European citizens has reading and writing problems, and an even greater number of people do not have sufficiently well-developed mathematical and digital skills [16]. A significant share of immigrants and asylum seekers do not possess basic skills and have a poor knowledge of the language of the host country, so they are at high risk of unemployment, poverty and social exclusion. A significant number of people in the EU cannot find a job because they do not have the right skills or they are in positions that do not match the qualifications they have obtained. Indeed, 30% of graduates hold jobs that do not require a university qualification. Meanwhile, 40% of employers cannot find people with the right skills to fill vacancies and too few have training and skills needed to set up their own business or finding new opportunities [17].

Analyzing the literature, we find that there are several criteria that can be taken into account in the work polarisation such as: technological changes focused on specific professional skills, increasing education level, trade liberalization, developing of the service sector, employer preferences, state policies, organizational changes etc. Given the wide range of criteria that can lead to work and jobs polarisation, in this scientific endeavor, the work polarisation in terms of educational level and professional skills is addressed.

2. Literature review

The continuous increase in labor demand for certain tasks, the performing of which requires a high qualification level, as well as its reduction among the workforce performing simple or less complex tasks have led to skills mismatches, including in EU's Member States. This effect can be partially offset by improved economic conditions, as well as a higher educational level and human resources participation in the labor market. This highlights the scale of the challenge of promoting supply alignment with the demand for professional skills in a growing economy. In the absence of an adequate supply response, labor market trends lead to skills mismatches, especially during recessions and economic crises.

In this context, the existence of inaccuracies between the demand for professional skills required by employers, on the one hand, and the professional skills provided by human resources, on the other hand, has been the research subject for a multitude of researchers.

Jobs polarisation is defined as a relative increase in jobs at both extremes of the wage distribution (lower and upper) compared to those with average wages (with average skill level). This phenomenon is well documented in countries with developed economies [1]. A large part of the literature is focused on the causes of this phenomenon, highlighting technological developments and globalization as the main factors in reducing the occupations share with average wages (medium level qualifications). Much of the literature is focused on the causes of this phenomenon, highlighting the technological developments and globalization as the main factors of the decrease in the share of occupations with average wages (medium level qualifications). However, less is known about its consequences, and more specifically about its impact on human resources with inappropriate professional skills. New technologies can replace human resources employed in jobs that consist of routine tasks, easily automated. In return, new jobs can be created, the holders of which will perform creative tasks, focused on solving the problems for which cognitive skills are needed. As machine learning and artificial intelligence advance in many sectors of the economy, an increasing number of employees may be involuntarily forced to move from declining employment (focused on routine tasks involving professional skills of medium level), to growing ones (which are characterized by a

high or low level of cognitive skills). The literature addressing the issue of educational expansion suggests that, with the general expansion of education, the demand for lower-skilled employees is declining. As low-skilled people become a minority, they are perceived as less and less useful for the labor market. At the same time, if graduation represents a signal for the performance and learning ability of applicants, its lack acts as a failure.

Goos and Manning were among the first to show the link between job polarisation and technological change. They argued that the reduction in intermediate occupations in the UK labor market is due to the large number of "routine" tasks that need to be performed and are easier to automate, as they can be performed according to a precise set of standard instructions [8].

In addition to technological changes, international trade and the relocation of production allow the replacement of routine manufacturing processes in the country with imports, as a result of the transfer of routine activities to countries with lower labor costs [4]. Both the international trade and the relocation of production processes have shifted domestic labor demand, by increasing the number of less routine occupations (occupations that require high qualification) in recent decades. Given that these two mega-trends complement and reinforce each other, it is difficult to clarify the unilateral effects of technological change and international trade on job polarisation.

Globally, all EU's Member States have experienced job polarisation in the last two decades. Compared to the period up to the 2008 economic crisis, the share of employed people with medium-level professional skills and average wages is decreasing in all EU's Member States. However, it should be noted that the degree of decrease is different from one country to another.

The countries in southern and central Europe that have experienced a late shift in employment, from agriculture and industry to the services sector, increasing polarisation at national level would have taken place due to job relocations both between and within sectors. It is expected that this change will affect both demand and supply of skills: kinds of tasks performed at the workplace and types of professions and occupations required in the labor market.

Professional skills mismatch refers to the gap between demand and supply of skills in the labor market, in which professional abilities and knowledge required by employers are different from those offered by employees, in general, or jobseekers, in particular. The professional skills mismatch has a large meaning and can refer to:

- the economy as a whole, expressed through macroeconomic skills mismatch;
- the organizations level, expressed through the weakness of skills with which they face when hiring the vacancies;
- the job level, expressed by the gap between the professional skills of the employee and those necessary for the job.

While the skills shortages refer to the situation where employers fail to cover vacancies due to lack of suitably qualified candidates, skills mismatch at the job refers to the degree to which employees of organizations have a higher or lower qualification or are poorly connected to those required by the job [5]. The economy of any country records some professional skills mismatches as a result of short-term imbalances in the labor market [12]. But when mismatches become structural and persistent, these can have considerable economic and social repercussions, requiring appropriate solutions for the structural policy of the labor market.

Professional skills mismatch remains high in the EU's Member States. Currently, more than 60 million adults in the EU do not have the necessary skills in: literacy, math and digital field. At the same time, digital technologies are increasingly used in the workplace of EU's Member States. Today, most jobs require basic digital skills. In 2017, almost half of the EU population (43%) had basic or lower basic digital skills, recording a slight improvement compared to 2015. However, 38% of employers reported that the lack of digital skills had an impact on their performance, particularly through loss of productivity. In 2019, each EU's Member State has received a recommendation regarding professional skills, of which 12 countries have explicitly stated their relevance to the labor market, as well as the professional skills mismatch (Belgium, Bulgaria, Croatia, Estonia, France,

Ireland, Netherlands, Poland, Portugal, Romania, Slovenia and Spain) [16]. This highlights the scale of the challenge concerning the adjustment of supply to the demand for skills within EU. The concept of mismatch at work captures the discrepancies between the skills or qualifications acquired by people employed in a job and the skills or qualifications required for that job. Ideally, workplace mismatch should look at the gaps between an employee's professional skills and those required for his profession.

Since, it is difficult to operationalize and measure the skills, so far all indicators have focused on education, either in terms of years of training (vertical mismatch on the job) or in the field of education (horizontal mismatch on the job).

Overqualification is an indicator of the mismatch of vertical skills, which determines the number of employees with medium and high qualifications for which their level of qualification exceeds the requirements of the job, as part of total employment. In 2015, the International Labor Organization (ILO) proposed that jobs, classified at levels 1-3 of the International Standard Classification of Occupations (ISCO), require highly qualified employees, jobs at levels 4-8 of the ISCO require employees with a medium level of qualification, and elementary jobs (ISCO level 9) do not require employees to have a qualification. As a result, an employee with a medium level of qualification will be considered overqualified if he / she will hold a job at level 9 according to ISCO, and another - as an under-qualifier, if he / she will have a job at ISCO level 1-3. An employee with a low level of qualification will be considered unqualified if he / she holds a job at ISCO levels 1-8. So, overqualification is not only determined by the probability that a highly or medium-skilled employee will be over-qualified, but also by the share of highly and medium-skilled employees in the total number of jobs.

In addition, there are horizontal professional skills mismatches that show the discrepancy between the person's professional qualification and the position that she/he holds. Although most indicators of job mismatch have focused on the vertical dimension, Garcia-Espejo and Ibáñez consider horizontal skills mismatches as an important complement to vertical skills mismatches, as overqualification and underqualification do not take into account the educational field and, generally, heterogeneity between people with the same level of qualification [14]. The professional skills mismatch depending on the educational field become relevant, because “inappropriate” people:

- may be frustrated by the impossibility of hiring according to the professional qualification;
- may generate economic losses for companies due to low efficiency and / or additional costs for acquiring job-specific professional skills.

3. Applied methodology

In order to carry out this scientific approach, with reference to the work and jobs polarization in the European Union depending on the education level and professional skills, we used data provided by EUROSTAT, obtained through the Labor Force Survey, applied in all Member States. Also, it was taken into account the ISCO developed by the ILO, which groups the workforce into three categories:

- highly qualified people - correspond to levels 5-8 according to International Standard Classification of Education (ISCED);
- people with average qualification - correspond to levels 3-4 according to ISCED;
- unqualified persons - correspond to levels 1-2 according to ISCED.

Given the rapidity with which professional skills are changing in the knowledge-based economy, the process of continuing vocational training is imminent in order to maintain the current level of the workforce qualification or even to obtain a higher level of qualification. In this regard, continuing professional training should become a concern for, on the one hand, governmental

institutions and organizations' management and, on the other hand, for people of working age, whether these people are employed or seeking employment.

At the same time, the organization management must be aware that, by investing in vocational training programs for its employees, it provides the skills framework, necessary at a given time, to cope with the competitive environment in which it operates. Also, employees should be aware of the need to develop new professional skills in order to be considered useful and avoid the risk of dismissal, if their skills do not match to the organization needs. Figure 1 shows the workforce participation rate in vocational training programs in the last 4 months, according to the labor force survey applied in the EU's Member States.

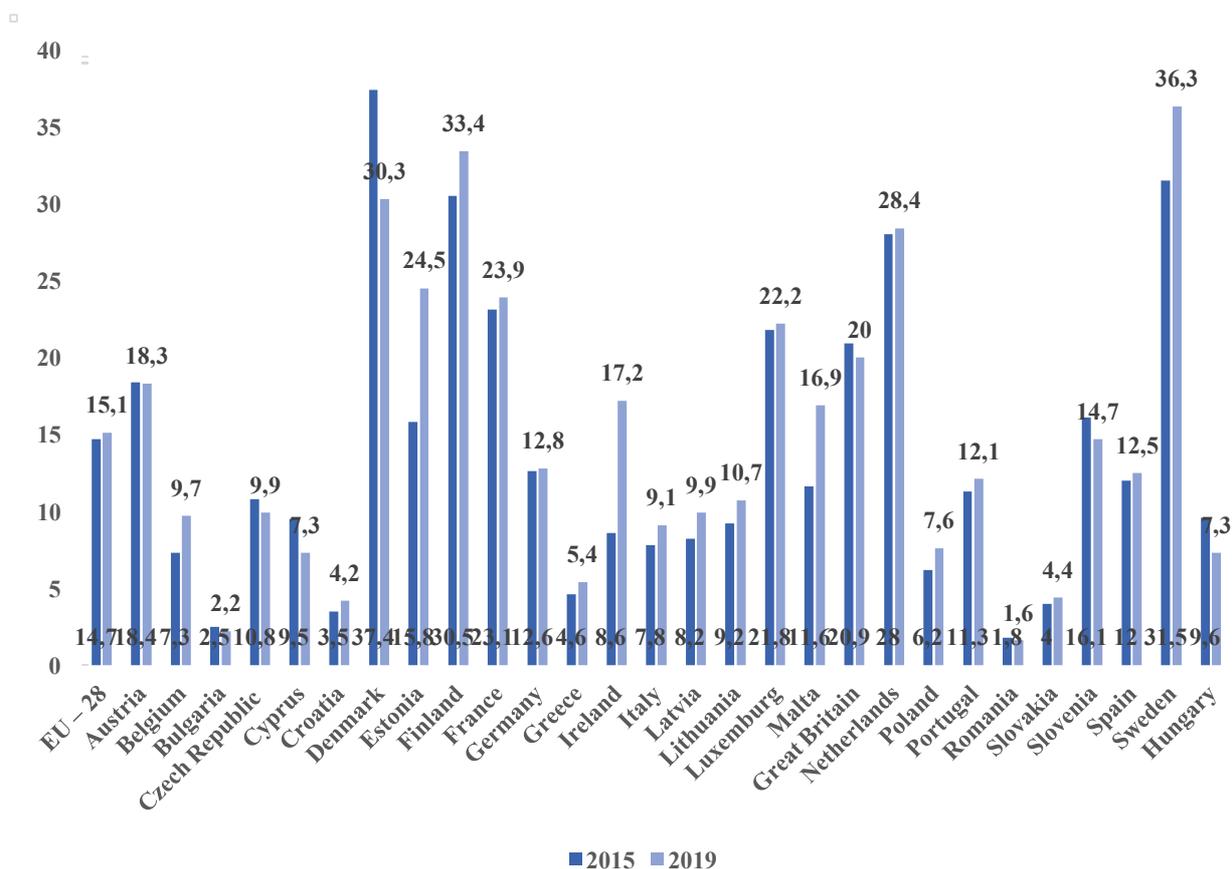


Figure 1. Workforce participation rate in vocational training programs in the last 4 months in the EU's Member States

Source: Elaborated by the author on the basis of the EUROSTAT data.

As it can be inferred from Figure 1, the workforce participation rate in vocational training programs at the European Union level, in the analyzed period, increased insignificantly - from 14.7% in 2015 to 15.1% in 2019. The workforce participation rate in vocational training programs has increased in most EU's Member States, with the exception of Bulgaria, Czech Republic, Denmark, United Kingdom, Romania, Slovenia and Hungary. The highest workforce participation rate in vocational training is found among the northern countries. In 2019, it reached 36.3% - in Sweden, 33.4% - in Finland and 30.3% - in Denmark. Even though in 2019 the workforce participation rate in vocational training programs decreased by almost 7 percentage points, in 2019 compared to 2015, it still remains at a fairly high level.

If Figure 1 shows the share of workforce participation in vocational training programs, in general, in Tables 1 and 2 it is presented by workforce categories, according to the ISCO.

Table no. 1. Highly qualified workforce participation rate for the period 2015-2019

Countries	2015			2019		
	Managers	Professionals	Technicians and associate professionals	Managers	Professionals	Technicians and associate professionals
EU – 28	17,2	21,7	17,6	17,5	22,3	17,8
Austria	19,9	31,7	22,0	19,8	31,7	20,7
Belgium	9,5	11,3	8,4	12,4	14,5	9,4
Bulgaria	;	2,6	6,1	2,7	3,4	4,2
Czech Republic	14,9	19,1	14,6	13,9	16,3	12,7
Cyprus	11,0	18,9	12,0	7,7	13,0	9,0
Croatia	5,3	6,2	4,0	;	8,5	5,9
Denmark	36,0	42,0	36,4	27,3	33,3	28,3
Estonia	22,0	28,1	20,9	32,3	38,9	28,5
Finland	41,1	39,1	34,9	41,7	42,5	37,2
France	28,9	34,5	26,6	30,3	36,3	26,4
Germany	9,9	15,7	15,1	9,8	16,1	15,4
Greece	9,7	8,5	5,5	;	7,1	6,6
Ireland	6,1	9,0	6,6	14,6	20,7	15,4
Italy	13,2	15,6	11,6	15,0	17,1	13,4
Latvia	12,0	16,1	9,4	13,3	20,3	12,8
Lithuania	10,2	14,3	14,4	13,6	16,6	14,7
Luxemburg	20,1	28,6	22,8	21,2	29,5	22,2
Malta	17,4	17,7	14,1	20,9	28,8	17,7
Great Britain	17,4	25,8	21,0	16,2	24,3	19,9
Netherlands	22,8	31,3	28,0	21,5	30,1	27,5
Poland	7,3	10,3	7,4	10,2	13,8	9,2
Portugal	19,2	22,1	13,7	20,7	23,1	14,0
Romania	;	3,2	3,0	;	2,5	2,5
Slovakia	8,0	7,2	5,0	6,8	7,0	6,1
Slovenia	18,1	24,7	16,8	19,2	23,2	16,5
Spain	15,5	22,4	15,0	16,6	22,0	16,0
Sweden	33,9	40,3	31,9	37,2	45,3	36,4
Hungary	13,6	15,3	11,9	19,6	11,9	10,4

Source: Elaborated by the author on the basis of the EUROSTAT data.

According to Table 1, the participation rate of highly qualified people in vocational training programs in the European Union has increased insignificantly for all three categories of workforce: managers, specialists and technicians. At the same time, we find that the highest participation rate in vocational training for this workforce category is in the northern countries - Sweden, Finland and Denmark, followed by the Netherlands and France. Although in 2019 the participation rate of highly qualified people decreased significantly in Denmark, compared to 2015, it remains at a fairly high level, compared to other EU's Member States. In the period under review, a substantial increase of participation rate in vocational training programs was recorded in Estonia. It increased by over 10 percentage points for managers and specialists, and in the case of technicians - by over 7 percentage points.

Regarding the participation rate in the professional training of employees with medium qualification level, it is presented in Table 2. According to ISCO, the category of people with medium qualification level includes: clerical support workers, service and sale workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, plant and machine operators and assemblers.

Table no. 2. Participation rate of people with medium-level qualifications in vocational training programs during 2015-2019

Countries	2015					2020				
	Clerical support workers	Service and sale workers	Skilled agricultural, forestry and fishery workers	Craft and related trades workers	Plant and machine operators and assemblers	Clerical support workers	Service and sale workers	Skilled agricultural, forestry and fishery workers	Craft and related trades workers	Plant and machine operators and assemblers
EU – 28	14,4	16,0	10,3	8,3	6,2	14,2	16,2	10,2	8,5	6,3
Austria	16,7	18,0	11,6	12,1	8,1	17,6	17,1	12,8	11,3	6,5
Belgium	5,7	7,3	;	4,6	3,8	6,7	12,5	;	5,2	4,0
Bulgaria	4,4	3,2	;	;	;	4,4	2,5	;	1,1	;
Czech Republic	12,5	9,0	4,1	5,7	5,7	11,0	9,7	5,4	4,9	5,8
Cyprus	10,2	9,4	;	3,0	;	8,2	8,5	;	2,2	;
Croatia	5,2	3,1	;	1,4	5,7	4,1	3,7	;	0,8	5,8
Denmark	40,5	44,2	29,6	28,0	17,2	34,6	34,8	28,6	25,3	15,8
Estonia	15,8	16,1	;	5,8	4,9	22,2	29,9	;	10,0	8,0
Finland	28,8	29,8	21,8	14,7	16,1	32,2	32,3	24,0	16,9	18,7
France	24,0	20,9	16,0	14,2	12,3	25,1	21,2	16,4	14,1	12,7
Germany	13,5	13,7	12,9	11,3	4,5	12,5	14,4	10,5	11,0	4,9
Greece	3,4	4,8	;	1,9	1,5	6,3	6,8	;	2,6	2,0
Ireland	7,2	14,6	;	5,8	3,3	16,1	21,5	;	14,0	7,0
Italy	8,3	6,7	2,1	3,7	4,1	10,0	7,7	3,5	4,7	4,0
Latvia	7,8	7,8	;	3,5	3,0	11,9	8,2	;	3,8	2,7
Lithuania	9,1	9,5	;	4,8	3,4	10,2	12,0	;	3,7	3,4
Luxemburg	18,3	21,1	;	14,1	9,7	17,8	18,2	;	13,3	9,9
Malta	10,5	9,9	;	3,7	3,3	18,1	13,5	;	6,8	6,4
Great Britain	18,5	26,1	11,9	13,9	8,9	16,7	24,6	14,3	16,1	9,1
Netherlands	21,1	35,3	23,5	18,4	18,2	21,4	37,5	19,3	20,8	19,5
Poland	7,5	6,9	;	2,2	2,5	8,1	7,4	;	2,6	2,8
Portugal	10,7	10,3	;	4,8	4,9	10,5	11,4	;	4,9	4,6
Romania	2,0	1,6	;	1,0	1,1	2,1	1,1	;	1,1	1,7
Slovakia	4,7	3,8	;	2,3	2,7	4,7	3,9	;	2,7	3,1
Slovenia	16,7	19,1	;	6,5	6,0	14,2	15,8	;	6,6	5,7
Spain	12,9	11,4	5,2	5,4	5,2	13,3	12,6	3,9	5,8	5,7
Sweden	32,8	32,5	22,0	15,9	16,8	35,9	36,3	29,2	18,9	19,0
Hungary	10,0	7,9	;	5,9	7,1	7,8	6,3	;	4,2	5,1

Source: Elaborated by the author on the basis of the EUROSTAT data.

Analyzing the information from the Table 2, regarding the workforce participation rate with a medium qualification level in vocational training programs, we observe that, practically, the same trends are maintained as in the case of people with a high qualification level. Similarly, we find that the participation of people with medium-level qualifications in vocational training programs is less than that of people with high qualifications, with some exceptions. For example, in Germany, the participation rate of people with a medium level of qualification is higher than that of managers. The fact that in the case of skilled workers in agriculture and forestry it is not given information of all EU's Member States (less than 50%), shows that the rate of their participation in vocational training is enough low and irrelevant for the analysis.

4. Conclusions

The development of science and technology has led to significant changes in the employment structure. As production processes are re-engineered and robotized, there have been changes in the structure of occupations and jobs, by reducing jobs that involve manual and routine activities. The modernization and innovation of production processes have a certain effect on the jobs polarisation, due to the positive impact on highly qualified jobs. Likewise, the innovation of production processes leads to a decrease in polarisation, following the elimination of jobs whose tasks are performed manually.

The research results show that the employed population share in the services sector has increased, which has led to an obvious jobs polarisation. This changed the spectrum of professional skills the economy of a country needs in a given period of time, increasing, in particular, the number of jobs involving higher qualification levels. In developed countries, the relocation of production processes has a direct impact on the job polarisation by reducing occupations with medium qualification level according to ISCO.

In the circumstances of the knowledge-based economy, professional skills are changing even more rapidly, which makes both employers and employees to be concerned with the development of professional skills vertically and their diversification horizontally. The lifelong learning system has and is being developed to cover the shortage of professional skills recorded at some time, in a country.

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