Comparative Economic Research. Central and Eastern Europe
Volume 27, Number 4, 2024
https://doi.org/10.18778/1508-2008.27.30

The Labour Market Situation of Population Groups in the Visegrád Countries

Łukasz Arendt https://orcid.org/0000-0002-0596-0196
Ph.D., Associate Professor, University of Lodz, Department of Economic Policy, Lodz, Poland
e-mail: lukasz.arendt@uni.lodz.pl

Leszek Kucharski https://orcid.org/0000-0002-4075-4283
Ph.D., Associate Professor, University of Lodz, Department of Economic Policy, Lodz, Poland
e-mail: leszek.kucharski@uni.lodz.pl

Iwona Kukulak-Dolata https://orcid.org/0000-0001-6294-3192
Ph.D., Assistant Professor, University of Lodz, Department of Economic Policy, Lodz, Poland
e-mail: iwona.kukulak@uni.lodz.pl

Anna Rutkowska https://orcid.org/0000-0001-8663-5207
University of Lodz, Department of Economic Policy, Lodz, Poland, e-mail: anna.rutkowska@uni.lodz.pl

Abstract

The paper presents the results of an analysis of selected population groups in the labour markets of the Visegrád Group (V4) countries (i.e., Czechia, Hungary, Poland and Slovakia) from 2015 to 2020. The study assesses the relative situation of these groups, taking into account the skill profiles of their members. Thus, we identify groups with the relatively best and worst employability prospects in the V4 labour markets. To this end, the parameters of a polynomial logit model (representing relative risk ratios for exiting employment or unemployment) are estimated.

The study reveals that in all V4 countries, tertiary graduates were in the best position in the labour markets. The highest-skilled professionals had the best chances of finding a job while being the least likely to become unemployed. The most uncertain labour market situation concerned people aged up to 24 years, the least-educated and low-skilled people, and people aged 55 years and older. This points to the need to provide support programmes targeted at these social groups, implemented within the public policies, i.e., labour market and educational policies, with special

Received: 12.10.2023. Verified: 14.02.2024. Accepted: 27.09.2024

emphasis on the adult learning system. The main contribution of the study is that it includes the task-content approach to analyse the employability prospects in the V4 labour markets.

Keywords: unemployment, employment, labour market situation of population groups

JEL: J21, J64

Introduction

The situation of people in the labour market varies with technological progress, demographic and migratory processes, phases and fluctuations in the economic cycle, and economic restructuring, which influence it with different intensities. This article presents the results of a study on the situation of selected labour force groups in the Visegrád Group (V4) countries (i.e., Czechia, Hungary, Poland and Slovakia) from 2015 to 2020, primarily to determine which of them fared best and worst, taking special account of their members' qualifications[1].

In order to assess the labour market position of particular groups, the parameters of a polynomial logit model (representing the relative risk ratios for exiting employment or unemployment) were estimated. For Czechia, Slovakia and Hungary, individual Labour Force Survey (LFS) data from 2015–2020 provided by Eurostat were used[2]. In the case of Poland, Eurostat's data did not have the four-digit codes for occupations and professions, preventing the identification of occupational groups based on the types of tasks they involve. Therefore, LFS individual data published by Statistics Poland (GUS) were used.

The article is structured as follows. Part 2 is a review of studies pertinent to the subject, and Part 3 presents the key indicators that characterise the V4 labour markets. Part 4 explains the polynomial logit model and the relative risk ratios for exiting employment or unemployment. In the final part, the conclusions from the research are summarised.

1 Based on the classification of occupations and professions, five groups of occupations were distinguished: non-routine cognitive personal (Group 1); non-routine cognitive analytical (Group 2); non-routine manual physical (Group 3); routine cognitive (Group 4); and routine manual (Group 5). The classification follows the one proposed by Acemoglu and Autor (2011).

2 The database was provided by Eurostat within the project "Technical change and polarisation of labour markets in the 'old' and 'new' EU Member States" conducted at the Faculty of Economics and Sociology, University of Lodz.

A review of the literature

Various research centres have long studied the labour market situation of population groups in the V4 countries. Most studies have been designed as literature reviews focused on selected labour market indicators or using the methods of descriptive statistics. More advanced statistical and econometric methods have been used relatively rarely, although recent years have seen an increase in the number of studies using them.

According to existing research, the V4 countries had considerably different levels of innovativeness and utilisation of human capital prior to becoming EU members. The most modern in that respect were the economies of Czechia and Hungary. The development of Poland's economy was primarily hindered by its obsolete structure (Gawrycka and Szymczak 2008).

Studies using the synthetic indicator of labour market development to explore V4 countries in the early years of their EU membership found that while the labour markets improved in all of them, they remained significantly different. The best situation (marking the greatest progress) occurred in Czechia and Slovakia. Compared with the other V4 countries, the labour market in Poland ranked relatively low, both in 2004 and 2008 (Gawrycka and Szymczak 2013), and its ranking did not change significantly in subsequent years. Czechia was an economic and labour market leader due to having the lowest and most stable unemployment rates, the lowest public debt and current account deficit levels, and the highest GDP per capita. Poland and Hungary lagged behind Czechia and Slovakia, even though Poland's economy developed at the fastest rate (Grabia 2014).

Studies of the V4 countries during the Great Recession showed that their unemployment rates increased while employment rates declined, leaving no doubt that their labour markets suffered from the crisis. From 2007 to 2009, the countries' macroeconomic indicators (employment, GDP, real wages, labour productivity, and time worked) showed procyclical tendencies. In Poland, employment and unemployment rates did not change significantly, mainly due to the GDP growth trend and cuts in real wages and working time. In the other four countries, however, changes in the indicators were more pronounced. Czechia and Slovakia experienced substantial decreases in employment related to slow GDP growth and substantial rises in real wages (Kwiatkowski 2011; 2014). Furuoka's (2014) analysis of the hysteresis of unemployment rates in the V4 countries concluded that employment and unemployment in Czechia and Slovakia were less affected by the adverse, long-term consequences of the 2007–2008 financial crisis and the euro crisis, as their labour markets were more dynamic and less vulnerable to external shocks. The Polish and Hungarian labour markets were less resilient, and the hysteresis effect in both countries suggested that they may have suffered more from long-term unemployment.

In the years following the Great Recession, from 2011 to 2013, the employment, unemployment, and economic activity trends in the V4 countries were partly reversed due to changes in the ratios between real wage growth and labour productivity growth, GDP growth, and labour market institutions (i.e., tax wedge, minimum wage, and the degree of legal employment protection) (see Kwiatkowski 2014). However, Zieliński (2015) observed that the crisis also increased the population's economic activity, directly contributing to higher levels of unemployment, especially among young people, but without affecting the labour market situation of women.

Although the labour markets of the V4 countries fared differently in 2015, all of them failed to achieve the target employment rate set out in the Europe 2020 Strategy. The most successful country was Czechia, where the employment rate increased the most in the years under consideration. Poland reported the greatest increase in the annual average rate of employment. Hungary and Slovakia had not seem likely to achieve and did not achieved the EU-recommended employment rate by 2020 (Zalewska and Świetlikowski 2017).

Studies spanning longer periods (from 2004, when they became EU members) have shown that unemployment trends were similar across the V4. From 2004 to 2016, unemployment rates fell in all countries (Miś 2019), following an irregular pattern: declines between 2001 and 2009 were followed by euro crisis-related increases that continued until 2013, when another series of decreases began. However, the V4 countries differed significantly regarding the course of the changes. The adjustment between the unemployment duration and unemployment rate was the shortest in Poland and Hungary, while in Slovakia, it was the longest. The strongest and weakest relationships between the unemployment duration and rate occurred in Poland and Slovakia, respectively (Dmytrów and Bieszk-Stolorz 2019). Szymańska (2017) stated that Slovakia's economic situation between 2004 and 2015 was particularly challenging because, in addition to its unemployment rate exceeding the EU average and being particularly high among young people, a considerable percentage of the population was long-term unemployed. In Poland, the period of being out of work and the share of long-term unemployment were the smallest among the V4 countries. Moreover, low unemployment benefits translated into low net replacement rates of in-work income (Szymańska 2017).

In 2019, Czechia was among the EU countries with the best labour market situation, confirmed by its economic activity and employment and unemployment rates. The Polish, Hungarian, and Slovak rates were closer to the EU average (Bieszk-Stolorz and Dmytrów 2020). However, as the years after 2010 showed, all V4 economies were more 'crisis-proof' than the 'old' EU members, and the fallout in 2012–2014 proved less hurtful for them. After 2012, the V4 unemployment rates, especially among young people, were lower than the EU–15, although the female economic activity rates remained smaller until 2019 (Ambroziak et al. 2021). Notwithstanding their improving economies, the countries

continued to struggle with labour problems, among which relatively high youth unemployment rates, substantial informal employment, and an undersupply of skilled workers were the most onerous (Onyusheva 2022).

More recently, research has focused on the impacts of the COVID–19 pandemic on the V4's labour markets. Zieliński (2022) concluded that they were buffered against economic cycle fluctuations by non-standard employment arrangements, which helped reduce the size of temporary and part-time employment and increase the scale of self-employment. The position of women in the labour market did not deteriorate following the pandemic, but the consequences were damaging for the young, people aged 55–64 years, and the lowest educated. In Hungary, Slovakia, and Czechia, the lowest educated were the most affected by declines in employment, and they showed the largest increases in unemployment.

Similar findings were reported by the team led by Kwiatkowski (2022). Their research showed that the pandemic initially reduced economic activity rates in all V4 countries and the number of people in employment, reversing previous trends. It also showed that in the 3rd quarter of 2020, both indicators started to rise again. The first six months of 2020 saw declines in the number of employees and unemployment rates across the V4, but in the 3rd quarter, they started to grow again. Unemployment trends between 2015 and 2022 were inverse to trends in the number of employees and employment rates. Before the pandemic, the numbers of unemployed people and unemployment rates were falling in the V4 countries. However, with the onset of COVID–19, both indicators started to rise, with their increases being somewhat small in Poland and quite noticeable in Hungary and Slovakia. Fast-growing average wages in Slovakia, Hungary, and Czechia in the 2nd quarter of 2020 (the first wave of COVID–19) implied the emergence of a "composition effect", i.e., a change in the structure of employment due to the loss of low-paid jobs. Another fast increase in average wages in the three countries took place in the 4th quarter of 2020 in relation to the second wave of the pandemic.

Analysis of the basic labour market indicators

The V4 countries occupy 533,600 km^2, which represents 12.6% of the EU–27 area. As of 2021, they were home to 62.7 million people, i.e., more than 14% of the population of the EU–27. Poland has the largest population (59%), followed by Czechia (16.8%), Hungary (15.5%), and Slovakia (8.7%) (Eurostat 2023a).

The V4 economies have relatively high industry shares of gross value added (exceeding the EU–27 average) and an agricultural sector comprising approximately 1.9 million of farms. They frequently compete with each other for foreign investments, and their

main trading partner is Germany (Ambroziak et al. 2021). As of 2020, their aggregate GDP per capita accounted for more than 70% of the GDP of the EU–15.

The measure used to gauge employment intensity is the rate of employment, which indicates what percentage of the working-age population is in work. The level is important for the economy because a higher value helps sustain economic growth in the long term. Figure 1 shows increasing employment rates from 2015 to 2019. An analysis of the fourth quarters shows that the EU–27 employment rate rose from 64.9% to 68.6%. The greatest increases in the employment rate were recorded by Hungary (by 5.5 percentage points) and Slovakia (5 p.p.). In 2015 Czechia was the only country where employment rate exceeded the EU average (70.8% vs 64.9%). In 2019, a higher employment rate than the EU average occurred also in Hungary (70.3%). The Polish and Slovak employment rates were below the EU average (68.5% in both cases). As a result of the economic downturn, employment rates decreased in 2020 in all V4 countries at a varying pace. Even so, the 2020 Czech, Hungarian, and Polish rates (74.3, 70.2, and 69.4%, respectively) were above the EU average of 67.8%, while the Slovak rate (67.8%) was equal to it. In 2021, the employment rates in all four countries rose above 70%, exceeding the EU average of 69.3%. The gap between the highest and lowest rates of employment decreased in the V4 countries, from 7.3 p.p. in 2015 to 4.5 p.p. in 2021. In 2021, the highest employment rate was noted in Czechia (75.3%) and the lowest in Slovakia (70.8%).

Joining the EU influenced the GDP growth rates and the economic structure of the V4 countries. Additionally, their agricultural sectors started to give way to developing services and efforts to sustain the industrial sector. This naturally involved changes in the number of employees and the occupational structure of the labour force.

Between 2015 and 2021, employment increased in all V4 countries, ranging from 7.1% in Hungary to 4.4% in Czechia. In the last year of that period, with 23,544,800 people in employment, the V4 accounted for 14.2% of total employment in the EU. Poland had the most economically active people (13,114,00), while Slovakia had the fewest (2,151,200), which reflected the countries' different demographic situations.

A comparison of the V4 countries in terms of employment structure and the major groups of occupations defined by the International Standard Classification of Occupations 2008 (ISCO–08) shows that in 2015, they were more different than in 2021 (Table 1). In 2015, 'professionals' constituted the largest occupational group in the labour markets of Poland and Hungary (21.3% and 15.5%, respectively); in Czechia and Slovakia, it was technicians and associate professionals (17.4%) and service and sales workers (18.3%). By 2021, 'professionals' had become the largest occupational group in all four labour markets. In the structure of employment, they accounted for 22.6% in Poland, 19.1% in Hungary, 18.0% in Czechia, and 15.1% in Slovakia; the EU–27 average was 21.4%. The proportion increased the most in Hungary (3.9 p.p.) and the least in Poland (1.3 p.p.), where

they were relatively the largest occupational group in each year of the sample, much larger than in the other V4 countries.

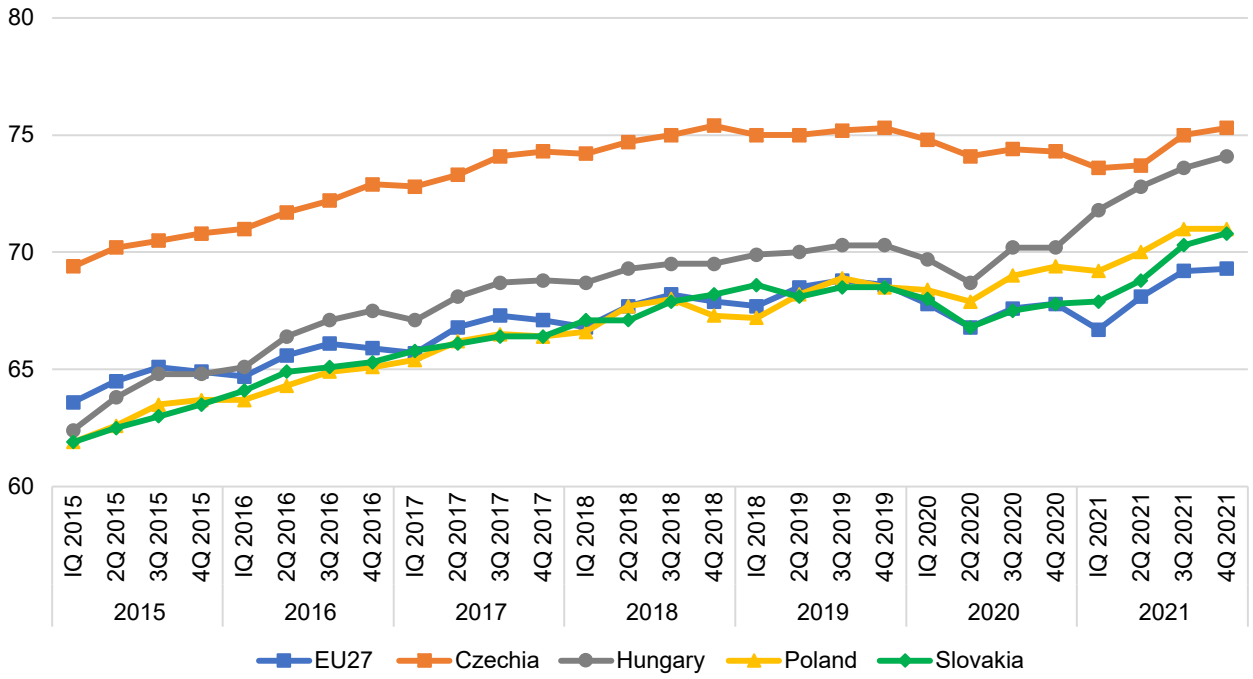

Figure 1. V4 countries' employment rates, 2015–2021 (%)

Source: own elaboration based on Eurostat 2023b.

The changes in the importance of particular occupational groups show that in expanding economies, human capital (knowledge and skills) embodied in the best-educated employees is increasingly appreciated, while the demand for low-skilled workers is declining. A confirmation of this observation is the change in employment shares of 'elementary occupations' and 'craft-related trades workers'. The 'elementary occupations' share of employment decreased the most in Slovakia (by 3.6 p.p., to 6.1% in 2021), but in Czechia, it consistently stayed at the same level of 6.4%. Hungary was the only country where it exceeded the EU average (9.8% vs 9.3%); in Czechia, Poland, and Slovakia, 'elementary occupations' accounted for 6.4%, 6.3%, and 6.1% of employment, respectively, and were below the EU-average.

Table 1. Employment structure in the V4 countries according to the International Classification of Occupations 2008 (ISCO–08) in 2015 and 2021 (%)

Specification	2015					2021				
	EU–27	Czechia	Hungary	Poland	Slovakia	EU–27	Czechia	Hungary	Poland	Slovakia
Managers	4.1	4.7	4.3	5.7	3.5	3.9	4.8	3.7	6.0	4.8
Professionals	17.8	15.0	15.2	21.3	11.6	21.4	18.0	19.1	22.6	15.1
Technicians and associate professionals	17.5	17.4	14.9	13.7	15.5	16.7	17.2	15.5	15.2	17.1
Clerical support workers	11.1	10.2	8.5	7.6	9.9	11.3	10.2	8.5	8.3	11.9
Service and sales workers	16.6	14.2	14.8	13.9	18.3	15.5	13.8	13.5	13.2	16.7
Skilled agricultural, forestry and fishery workers	1.0	0.8	1.3	0.5	0.7	0.9	0.7	1.5	0.5	0.6
Craft-related trades workers	12.0	15.1	14.7	16.2	13.6	11.3	13.4	13.5	14.6	12.1
Plant and machine operators and assemblers	8.6	15.8	14.2	11.6	16.6	8.2	15.2	14.5	11.6	14.8
Elementary occupations	10.4	6.4	11.6	8.2	9.7	9.3	6.4	9.8	6.3	6.1
Armed forces occupations	0.8	0.4	0.4	0.8	0.6	0.7	0.4	0.5	0.8	0.7
n/a	0.2	0.0	0.0	0.4	0.0	0.6	0.0	0.0	0.8	0.0

Source: own elaboration based on Eurostat 2023c.

The share of the 'craft-related trades workers' group also decreased between 2015 and 2021, but the changes were smaller (from 1.8 p.p. in Czechia to 1.2 p.p. in Hungary) and similar across the V4. In 2021, the group's share of employment exceeded the EU average of 11.3% in all four countries, reaching 13.4% in Czechia, 14.6% in Poland, 12.1% in Slovakia, and 13.5% in Hungary.

The share of 'clerical support workers' also increased in all four countries between 2015 and 2021, from 0.1 p.p. in Czechia to 2.1 p.p. in Slovakia. In 2021, it was estimated at 10.2% in Czechia, 8.5% in Hungary, 8.3% in Poland, and 11.9% in Slovakia (the EU average was 11.3%).

The changes in the structure of employment in all V4 countries imply that their labour markets were becoming more modern, which resulted in a greater demand for highly skilled and qualified personnel.

A good measure of the labour market situation is the rate of unemployment. According to Figure 2, Slovakia had the highest rate of unemployment, greater than the EU average until the 3rd quarter of 2016, across the study period. However, as the level steadily

fell in subsequent quarters, in the last quarter of 2021, it exceeded the EU average by only 0.1 p.p. In the other three countries, unemployment rates were well below the EU average. Czechia and Poland are among the EU countries with very low levels of unemployment (Kwiatkowski 2022).

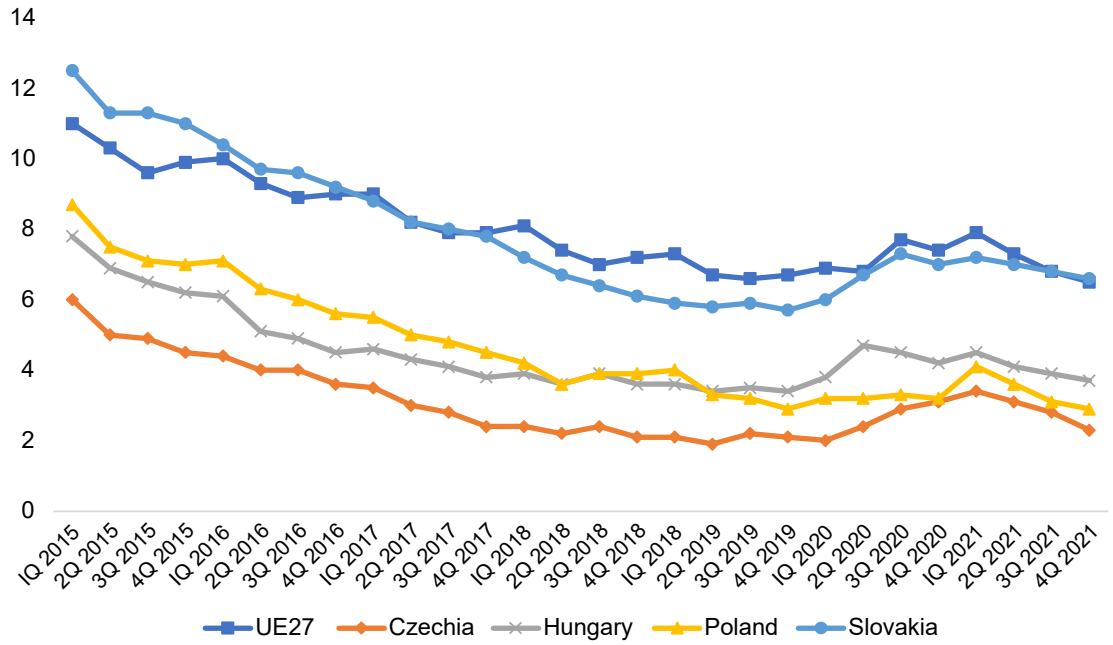

Figure 2. V4 countries' unemployment rates, 2015–2021 (quarterly data, %)

Source: own elaboration based on Eurostat 2023d.

It is notable that the gap between the V4 countries with the highest and lowest unemployment rates decreased from 6.5 p.p. in 2015 to 4.3 p.p. in 2021. This suggests that the V4 labour markets stabilised in that period and points to a relationship between the unemployment rate and fluctuations in the economic cycle, which collapsed in 2020 in the wake of the COVID–19 pandemic.

The model and results of econometric analysis

The econometric analysis sought to determine the labour market situations of population groups in the V4 countries from 2015 to 2020. Czechia, Slovakia, and Hungary were studied using LFS individual data from the sample years provided by Eurostat. As Eurostat's Polish data on occupations and professions did not have four-digit codes, LFS individual data from 2016–2020 released by Statistics Poland were used[3].

3 LFS individual data with four-digit codes were not available for Poland for 2015 and the first three quarters of 2016; therefore, annual data from 2017–2020 and the 4th quarter of 2016 were used.

In order to estimate the probabilities of individuals transitioning from one labour market state to another (unemployment, employment, and outside the labour force (economic inactivity)), a panel of annual observations was constructed. Transitions between labour market states in a given quarter were compared with transitions in the same quarter of the previous year.

The econometric analysis was performed using a polynomial logit model, which assessed the probability of transitions in discrete time. The probability of individual i experiencing event j (a transition from unemployment into employment or outside the labour force) can be described with the following formula (Chow 1995; Wiśniowski 2012; Cameron and Trivedi 2015):

$$P_{ij} = \frac{e^{\beta' z_{ji}}}{\sum_{k=1}^{J} e^{\beta' z_{ji}}}, \tag{1}$$

where: $i = 1, \ldots, J$; P_{ij} – the probability of transitioning, for instance, from unemployment to employment or economic inactivity; and z_{ji} – a vector containing explanatory variables that represent the labour market participants' characteristics (such as age, gender, level of education, place of residence, and occupational group), and a dummy variable, 'pandemic', which takes a value of 1 for 2020 and 0 for the other years.

Two variants of the polynomial logit model were used. Their parameters were estimated to determine: 1) the probability of an individual transitioning from employment to unemployment or economic inactivity and 2) the probability of an individual transitioning from unemployment to one of the other two labour market states. In both variants and for each V4 country, the same explanatory variables were used.

Table 2 contains the estimates of relative risk ratios[4] (RRR) for transitioning from employment to unemployment and outside the labour force. They were calculated taking into account the individuals' age, education, gender, place of residence, and occupational (task-content) group. Below, the conclusions drawn from the analysis of the estimates are presented.

A variable that significantly determined the probability of moving from employment to unemployment or economic inactivity was the person's age. In all four countries, 15–24-year-olds were the most likely of all age groups to lose their jobs compared with the base category. The risk of redundancy was the smallest for people in the oldest age

4 RRR values were interpreted as follows: a value greater than 1 meant that individuals in the occupational group under consideration were more likely to transition to another labour market state than those representing the base category; a value smaller than 1 indicated that the probability was lower. For the sake of illustration, the members of an occupational group with an RRR of 2.5 meant that they were 150% more likely to transition between labour market states compared with the base category.

group, who were also the most likely to move from employment to economic inactivity compared with the group 35–44 years. In Czechia, Poland, Slovakia and Hungary, the probability of 15–24-year-olds being terminated and unemployed was greater compared with the base category by 140.6%, 187.1%, 126.9%, and 136%, respectively.

In each country, the risk of unemployment compared with the base category was lowest for people aged 45–54 years. They were also the least likely to transition from employment to economic inactivity.

Educational attainment also significantly determined the labour market situation. In all four countries, tertiary graduates were the least at risk of unemployment, with the probability of unemployment being the lowest compared with the base category for tertiary graduates in Hungary (by 66.1%).

In Czechia and Slovakia, gender was also significantly related to the risk of redundancy and unemployment. In both countries, the risk was greater for women than for men, by 31.8% and 26%, respectively. At the same time, however, women in all four countries were more likely to transition from unemployment to economic inactivity.

Table 2. The estimates of relative risk ratios for transitioning from employment to unemployment and outside the labour force in the Visegrád Group countries, 2015–2020[5]

Explanatory variable	Czechia	Poland	Slovakia	Hungary
To employment				
Age (base category age 35–44)				
15–24	2.406*	2.871*	2.269*	2.360*
25–34	1.646*	1.628*	1.496*	1.487*
45–54	0.834*	0.733*	0.943*	0.838*
55 and more	0.924	0.565*	0.783*	0.645*
Education (base category: Less than primary, primary and lower secondary education (levels 0–2))				
Tertiary (levels 5–8)	0.303*	0.623*	0.299*	0.239*
Upper secondary and post-secondary non-tertiary education (levels 3–4)	0.325*	0.747*	0.373*	0.359*
Gender (base category: men)				
Women	1.318*	1.052	1.260*	1.027
Place of residence (base category: rural area)				
Urban area	1.318*	1.471*	1.046	0.980
Occupation (base category: non-routine manual)				

5 For Poland, from IV Q 2016 to 2020.

Explanatory variable	Czechia	Poland	Slovakia	Hungary
Non-routine analytic	0.391*	0.379*	0.505*	0.525*
Non-routine interactive	0.591*	0.468*	0.638*	0.736*
Routine cognitive	0.484*	0.597*	0.589*	0.523*
Routine manual	1.434*	0.968	1.060	1.439*
Pandemic (base category: years 2015–2019)				
Pandemic	1.256*	1.073*	1.371*	1.354*
To inactivity				
Age (base category age 35–44)				
15–24	2.621*	2.544*	2.151*	2.515*
25–34	3.281*	1.509*	2.201*	2.126*
45–54	0.576*	0.856*	0.571*	0.686*
55 and more	8.888*	5.918*	6.787*	4.138*
Education (base category: Less than primary, primary and lower secondary education (levels 0–2))				
Tertiary (levels 5–8)	0.585*	0.695*	0.654*	0.444*
Upper secondary and post-secondary non-tertiary education (levels 3–4)	0.591*	0.905*	0.485*	0.489*
Gender (base category: men)				
Women	2.010*	2.000*	1.387*	2.384*
Place of residence (base category: rural area)				
Urban area	0.892*	1.324*	0.886*	0.767*
Occupation (base category: non-routine manual)				
Non-routine analytic	0.763*	0.585*	0.184*	0.814*
Non-routine interactive	0.747*	0.603*	0.183*	0.766*
Routine cognitive	0.877	0.773*	0.254*	0.669*
Routine manual	1.237*	0.841*	0.361*	0.984
Pandemic (base category: years 2015–2019)				
Pandemic	1.005	1.029	1.093*	1.411*
Number of observations	104,932	463,343	209,478	529,755
Log-likelihood	– 23,246.4	– 86,786.6	– 46,203.9	– 122,191.2
Pseudo R^2	0.1	0.08	0.09	0.08

* Significant at up to 5%.
Source: own elaboration based on Eurostat LFS microdata provided by EUROSTAT and Statistics Poland within the project "Technical change and polarisation of labour markets in the 'old' and 'new' EU Member States" conducted at the Faculty of Economics and Sociology, University of Lodz.

According to the RRR estimates, place of residence significantly influenced the probability of transitioning from employment to unemployment in Czechia and Poland. In Poland, the risk of redundancy and unemployment was 47.1% higher for towns and cities than for rural areas. Urban residents in Czechia, Slovakia, and Hungary were less at risk of moving from employment to economic inactivity. The lower probability of employed urban residents in Poland moving to economic inactivity can be explained by the reinstatement of the previous retirement ages on 1 October 2017.

In all V4 countries, the risk of redundancy was significantly related to the task content of jobs. People in non-routine analytic and non-routine interactive jobs were less threatened by job loss than those comprising the base category. The least at risk of unemployment were the best-qualified employees (in non-routine analytic jobs). This is because the demand for their services increases as the technological revolution moves forward, and when employers must reduce their workforce in periods of economic downturn, they shed the lowest-skilled workers first.

In Poland and Slovakia, workers doing manual routine jobs were less at risk of transitioning to unemployment than the lowest-skilled workers. Only in Czechia were they more exposed to the risk of unemployment than the base category.

The members of the three occupational groups were also the least likely to transition from employment to economic inactivity.

The crisis triggered by COVID–19 significantly changed the risk of becoming unemployed in all V4 countries. In 2020, it increased the most compared with the pre-pandemic years in Slovakia and Hungary, and the least in Poland. Slovakia and Hungary were also where the pandemic statistically significantly increased the probability of transitioning from employment to economic inactivity in 2020.

The estimates of relative risk ratios for transitioning from unemployment to employment and economic inactivity in the V4 countries are summarised below (Table 3).

Table 3. The estimates of relative risk ratios for transitioning from unemployment into employment and outside the labour force in the Visegrád Group countries, 2015–2020[6]

Explanatory variable	Czechia	Poland	Slovakia	Hungary
To employment				
Age (base category age 35–44)				
15–24	3.004*	1.209*	2.043*	1.542*
25–34	1.633	1.093*	1.313*	1.118*

6 For Poland, from IV Q 2016 to 2020.

Explanatory variable	Czechia	Poland	Slovakia	Hungary
45–54	0.743*	0.818*	0.821*	0.869*
55 and more	0.402*	0.641*	0.669*	0.722*
Education (base category: Less than primary, primary and lower secondary education (levels 0–2))				
Tertiary (levels 5–8)	4.241*	1.170*	2.425*	1.981*
Upper secondary and post-secondary non-tertiary education (levels 3–4)	2.977*	1.158*	0.806*	1.228*
Gender (base category: men)				
Women	1.183*	0.961	1.226*	1.239*
Place of residence (base category: rural area)				
Urban area	0.885	0.976	0.984	0.582*
Occupation (base category: non-routine manual)				
Non-routine analytic	3.869*	1.411*	6.760*	2.922*
Non-routine interactive	4.630*	2.083*	7.088*	5.201*
Routine cognitive	6.280*	2.206*	9.242*	5.751*
Routine manual	5.064*	1.930*	13.762*	6.119*
Pandemic (base category: years 2015–2019)				
Pandemic	1.008	1.002	0.748*	0.905*
To inactivity				
Age (base category age 35–44)				
15–24	1.155	0.695*	1.206*	0.965
25–34	1.013	0.815*	0.915	0.894*
45–54	0.937	1.228*	1.216*	1.178*
55 and more	2.372*	2.634*	2.637*	2.462*
Education (base category: Less than primary, primary and lower secondary education (levels 0–2))				
Tertiary (levels 5–8)	0.669*	0.723*	0.761*	0.535*
Upper secondary and post-secondary non-tertiary education (levels 3–4)	0.867*	0.906*	0.655*	0.708*
Gender (base category: men)				
Women	0.931*	1.679*	1.377*	1.283*
Place of residence (base category: rural area)				
Urban area	1.047	0.894*	1.036	0.655*
Occupation (base category: non-routine manual)				
Non-routine analytic	0.538	1.010	0.781	0.646*
Non-routine interactive	0.607**	0.839*	0.859	0.620*

Explanatory variable	Czechia	Poland	Slovakia	Hungary
Routine cognitive	0.504*	0.917	1.196	0.791*
Routine manual	0.486*	0.758*	0.707*	0.613*
Pandemic (base category: years 2015–2019)				
Pandemic	1.320**	1.266*	1.640*	1.471*
Number of observations	4384	31493	30017	50790
Log-likelihood	–4,031.8	–31,809.5	26,840.3	–50,151.2
Pseudo R^2	0.13	0.06	0.14	0.09

*, ** Significant up to 5% and 10%.
Source: own elaboration based on Eurostat LFS microdata provided by EUROSTAT and Statistics Poland within the project "Technical change and polarisation of labour markets in the 'old' and 'new' EU Member States" conducted at the Faculty of Economics and Sociology, University of Lodz.

The labour market situation of V4 residents was also significantly determined by their age. Compared with the base category, unemployed 15–24 year olds (the most mobile age group on the labour market) had the best prospects of all age groups to find employment. By contrast, unemployed people aged 55 years and over were the least likely to be re-employed and the most likely to leave the labour force.

The significance of the level of education for the re-employment prospects of unemployed individuals in the V4 countries was ascertained. Tertiary graduates were more likely to find a job than people with the lowest educational attainment, which shows that although higher education does not shield individuals from unemployment, it considerably increases their chances for re-employment. Tertiary graduates in Poland, Hungary, and Czechia were also less likely to transition from unemployment to economic inactivity, meaning that even failed job searches do not make them consider transitioning to economic inactivity.

Unemployed Czech, Slovak, and Hungarian women were more likely to exit unemployment and find employment than unemployed men. The RRR estimates for Poland were statistically not significant.

Hungary proved to be the only country where the place of residence was significant for the probability of exiting unemployment into employment. The unemployed living in Hungary's towns and cities were 41.8% less likely to find a job than unemployed rural residents. At the same time, the urban unemployed in Poland and Hungary were less likely to transition from unemployment to economic inactivity.

In all four countries, the level of qualifications was significantly associated with the probability of unemployed people finding new jobs. Interestingly, relatively high chances

to shift from unemployment to employment were recorded for individuals performing routine cognitive jobs. This points to the still high demand for such candidates in these countries, which may be linked to offshoring: V4 countries are perceived as good locations for Business Processes Outsourcing (BPO) centres, in which routine cognitive tasks dominate (Arendt et al. 2023).

The COVID–19 pandemic reduced unemployed people's chances to return to the workforce in Slovakia and Hungary. However, it increased the probability of transitioning from unemployment to economic inactivity in all four countries as the economic crisis paused recruitment.

Conclusions

This study assessed the labour market situation of selected social groups in the Visegrád Group countries by analysing the likelihood of transitioning between employment, unemployment and economic inactivity, and thus people's employability potential. The findings point to many similarities across the V4 countries. Firstly, it was revealed that educational attainment is a significant driver of an individual's situation in the labour market, i.e., tertiary graduates were the most likely to transition from unemployment to employment and the least likely to lose their jobs compared with the least-educated people. Of all V4 countries, the labour market position of tertiary graduates was the most favourable in Czechia.

Secondly, being under 24 years of age was associated with the most uncertain position in the labour market. This age group faced the highest risk of redundancy compared with people aged 35–44 years, which confirms that the youth are still a disadvantaged group in the V4 labour markets. The COVID–19 pandemic exacerbated this unfavourable situation. A relatively difficult labour market situation across the four countries was also faced by people aged 55 years and over. They were less at risk of unemployment than the 35–44-year-old group, although they had poorer prospects of transitioning from unemployment into employment. This qualifies them as a stagnant segment of labour markets in the V4 countries. In each country, the oldest age group was the most likely to exit employment or unemployment and transition to economic inactivity. This points to the need for targeted support for these two age groups to enhance their employability prospects.

Thirdly, COVID–19 increased the probability of transitioning from employment to unemployment across the group of countries. However, Slovakia and Hungary were the only countries where the likelihood of exiting unemployment into employment was lower than in the pre-pandemic years.

Analysing the situation in the labour market by task-content of jobs is the value added of this study, as to the best of our knowledge, no such analysis has yet been conducted.

This approach is important, considering the dynamic changes in digitalisation and automation, which pose new challenges to both employers and employees, leading to shifts in the required skills mix. The study showed that individuals who perform non-routine analytical jobs had the best prospects of finding a job and were the least threatened by redundancy and unemployment compared with those who perform non-routine manual jobs. This clearly indicates that the technical change in V4 countries largely follows a pattern that is characteristic of more developed economies, where individuals who perform non-routine analytical and interactive tasks are less at risk of losing their jobs than people who perform other tasks (especially routine manual).

The labour markets in the V4 countries still offer relatively good prospects for individuals who perform routine cognitive tasks. However, this may change due to an increase in relative wages in the V4, leading to shifts in labour demand and, thus, a deterioration of the employability prospects of this group of individuals.

References

Acemoglu, D., Autor, D. (2011), *Skills, Tasks and Technologies: Implications for Employment and Earnings*, [in:] D. Card, O. Ashenfelter (eds.), *Handbook of Labor Economics*, Vol. 4 (B), Elsevier, San Diego, pp. 1043–1171, https://doi.org/10.1016/S0169-7218(11)02410-5

Ambroziak, Ł., Chojna, J., Gniadek, J., Juszczak, A., Miniszewski, M., Strzelecki, J., Szpor, A., Śliwowski, P., Święcicki, I., Wąsiński, M. (2021), *Grupa Wyszehradzka – 30 lat transformacji, integracji i rozwoju*, Polski Instytut Ekonomiczny, Warszawa.

Arendt, L., Gałecka-Burdziak, E., Núñez, F., Pater, R., Usabiaga, C. (2023), *Skills requirements across task-content groups in Poland: What online job offers tell us*, "Technological Forecasting and Social Change", 187, 122245, https://doi.org/10.1016/j.techfore.2022.122245

Bieszk-Stolorz, B., Dmytrów, K. (2020), *Influence of Accession of the Visegrad Group Countries to the EU on the Situation in Their Labor Markets*, "Sustainability", 12, 6694, https://doi.org/10.3390/su12166694

Cameron, A.C., Trivedi, P.K. (2015), *Microeconometrics. Methods and Applications*, Cambridge University Press, New York.

Chow, G.C. (1995), *Ekonometria*, Państwowe Wydawnictwo Naukowe, Warszawa.

Dmytrów, K., Bieszk-Stolorz, B. (2019), *Mutual relationships between the unemployment rate and the unemployment duration in the Visegrad Group countries in years 2001–2017*, "Equilibrium. Quarterly Journal of Economics and Economic Policy", 14 (1), pp. 129–148, https://doi.org/10.24136/eq.2019.006

Eurostat (2023a), *Population by broad age group, CENS_21AG*, https://ec.europa.eu/eurostat/databrowser/view/CENS_21AG/default/table?lang=en (accessed: 8.09.2023).

Eurostat (2023b), *Employment rates by sex, age and citizenship (%), LFSQ_ERGAN*, https://ec.europa.eu/eurostat/databrowser/view/LFSQ_ERGAN__custom_3522253/default/table?lang=en (accessed: 8.09.2023).

Eurostat (2023c), *Employees by sex, age and occupation (1 000), LFSA_EEGAIS*, https://ec.europa.eu/eurostat/databrowser/view/LFSA_EEGAIS__custom_6642083/default/table?lang=en (accessed: 8.09.2023).

Eurostat (2023d), *Unemployment rates by sex, age and citizenship (%), LFSQ_URGAN*, https://ec.europa.eu/eurostat/databrowser/view/LFSQ_URGAN__custom_3523122/default/table?lang=en (accessed: 8.09.2023).

Furuoka, F. (2014), *Hysteresis Effect on Unemployment: Evidence from the Visegrad Countries*, "Ekonomický časopis", 62 (2), pp. 185–198.

Gawrycka, M., Szymczak, A. (2008), *Wybrane aspekty rynku pracy w krajach Grupy Wyszehradzkiej po przystąpieniu do UE*, "Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu", 21, pp. 115–126.

Gawrycka, M., Szymczak, A. (2013), *Zróżnicowanie rynków pracy na przykładzie krajów grupy Wyszehradzkiej*, "Studia Ekonomiczne", 160, pp. 73–82.

Grabia, T. (2014), *Sytuacja gospodarcza w krajach Grupy Wyszehradzkiej – analiza porównawcza*, "Gospodarka w Praktyce i Teorii", 2 (35), pp. 35–47, https://doi.org/10.18778/1429-3730.35.03

Kwiatkowski, E. (2011), *Recent Labour Market Trends in the Visegrad Group Countries*, "Comparative Economic Research. Central and Eastern Europe", 14 (2), pp. 25–40, https://doi.org/10.2478/v10103-011-0009-z

Kwiatkowski, E. (2014), *Zmiany na rynkach pracy i ich determinanty w krajach Grupy Wyszehradzkiej w latach 2004–2013*, "Studia i Prace Wydziału Nauk Ekonomicznych i Zarządzania", 35 (2), pp. 371–393.

Kwiatkowski, E. (ed.) (2022), *Pandemia Covid–19 a zmiany na rynku pracy. Polska na tle innych krajów Grupy Wyszehradzkiej*, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa.

LFS microdata: dataset provided by EUROSTAT and Statistics Poland within the project "Technical change and polarisation of labour markets in the 'old' and 'new' EU Member States" conducted at the Faculty of Economics and Sociology, University of Lodz.

Miś, L. (2019), *Problemy społeczne Grupy Wyszehradzkiej*, Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków.

Onyusheva, I. (2022), *Labour Market Issues in V4 Countries*, "Pressburg Economic Review", 2 (1), pp. 37–42.

Szymańska, A. (2017), *The Labour Market in the Visegrad Group Countries – Selected Aspects*, "Olsztyn Economic Journal", 12 (3), pp. 289–306, https://doi.org/10.31648/oej.2812

Wiśniowski, A. (2012), *Modele zmiennych wielomianowych nieuporządkowanych*, [in:] M. Gruszczyński (red.), *Mikroekonometria. Modele i metody analizy danych indywidualnych*, Oficyna a Wolters Kluwer business, Warszawa, pp. 185–224.

Zalewska, M.E., Świetlikowski, P. (2017), *Ocena szans realizacji głównych celów strategii Europa 2020 w krajach Grupy,* "Zeszyty Naukowe Politechniki Śląskie, Organizacja i Zarządzanie", 104, pp. 367–378.

Zieliński, M. (2015), *Unemployment and Labor Market Policy in Visegrad Group Countries*, "Equilibrium. Quarterly Journal of Economics and Economic Policy", 10 (3), pp. 185–201.

Zieliński, M. (2022), *The Effect of the COVID–19 Pandemic on the Labor Markets of the Visegrad Countries*, "Sustainability", 14, 7386, https://doi.org/10.3390/su14127386

Sytuacja na rynku pracy grup ludności w krajach Grupy Wyszehradzkiej

W artykule przedstawiono wyniki analizy sytuacji wybranych grup ludności na rynkach pracy krajów Grupy Wyszehradzkiej (V4) w latach 2015–2020. Badanie pozwala na określenie względnej sytuacji tych grup, z uwzględnieniem profili kwalifikacyjnych pracowników. Innymi słowy, w badaniu identyfikowane są grupy o relatywnie najlepszych i najgorszych perspektywach zatrudnienia na rynkach pracy V4. W tym celu oszacowano parametry wielomianowego modelu logitowego (reprezentującego względne współczynniki ryzyka odpływu z zatrudnienia oraz z bezrobocia). Z przeprowadzonych analiz wynika, że we wszystkich krajach V4 najlepszą pozycję na rynku pracy mieli absolwenci szkół wyższych. Największe szanse na znalezienie pracy mieli specjaliści o najwyższych kwalifikacjach i w najmniejszym stopniu byli zagrożeni jej utratą. Najbardziej niepewna sytuacja na rynku pracy dotyczyła osób w wieku do 24 lat, osób najsłabiej wykształconych i o niskich kwalifikacjach oraz osób w wieku 55 lat i więcej. Wskazuje to na potrzebę zapewnienia programów wsparcia skierowanych do tych grup społecznych, realizowanych w ramach polityk publicznych – polityki rynku pracy i edukacji, ze szczególnym uwzględnieniem systemu uczenia się dorosłych. Główną wartością dodaną badania jest uwzględnienie podejścia zadaniowego w analizie perspektyw zatrudnienia na rynkach pracy Grupy Wyszehradzkiej.

Słowa kluczowe: bezrobocie, zatrudnienie, sytuacja grup ludności na rynku pracy