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LONG-TERM UNEMPLOYMENT IN POLAND BETWEEN 2015 AND 2019

Abstract

Background: This article presents an attempt to capture trends in long-term unemployment, determine its structure and intensity regarding labour force groups, and identify factors that contributed to long-term unemployment in Poland between 2015 and 2019.
Research purpose: An economic, multifaceted analysis of long-term unemployment in Poland in the years of economic upturn from 2015 to 2019.
Methods: An empirical analysis using quarterly aggregate and individual data on unemployment sourced from LFS conducted from 2015 to 2019. Non-parametric and parametric methods (a logit model) were also used.
Conclusions: The highest probability of long-term unemployment compared with the base categories characterised people aged 45 or older, people with junior secondary, elementary or incomplete elementary education, the unemployed seeking jobs through labour offices, urban residents, and the residents of voivodeships other than the Mazowieckie voivodeship (excluding Lubelskie). The lowest risk of long-term unemployment compared with the base categories occurred among people aged up to 24 years, higher education graduates, and people with post-secondary and secondary education, married people, active-job seekers, and the residents of the Lubelskie voivodeship.

Keywords: unemployment, long-term unemployment, labour force groups.

JEL classification: J21, J64

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1. Introduction

In evaluating the effects of unemployment on the economy and society, not only does its size need to be considered but also the duration because its influence on both these spheres tends to increase with time. Long-term unemployment, i.e., exceeding 12 months, has a stronger negative impact on those affected by it and the country's economy.

The long-term term unemployed are faced with two main problems. Firstly, as unemployment benefits can only be drawn for a specific period, their financial situation substantially deteriorates after they cease to be eligible for them. Secondly, the passing months of occupational inactivity erode their human capital and employability, as well as making them feel excluded and worthless.[1]

From the macroeconomic perspective, long-term unemployment is more detrimental to the economy than transient unemployment because it hampers economic growth (mainly by reducing average productivity of labour), increases the national budget deficit (as expenditures expand and revenues shrink), weakens the negative relationship between unemployment and inflation (the long-term unemployed have a very limited role in easing wage pressures), and boosts the hysteresis effect of unemployment.[2] For all these reasons, the need to counteract long-term unemployment is widely acknowledged by the economic literature and frequently addressed in economic practice. A vital aspect of developing strategies against long-term unemployment is a better understanding of the phenomenon.

It has already been known since the time of Keynes that the level of unemployment is closely associated with the stage of the business cycle as it depends on labour demand, which shrinks during economic downturns, reducing aggregate demand for goods and thereby production. It is, therefore, quite natural that economists are especially interested in studying long-term unemployment in periods when the economy contracts. Therefore, much less is known about the behaviour of long-term unemployment during economic

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[1] **A. Spermann**, *How to fight long-term unemployment: Lessons from Germany*, IZA Journal of Labor Policy 2015/4 (1), pp. 4–25.

[2] **R. Layard**, **S. Nickell**, **R. Jackman**, *Unemployment: Macroeconomic Performance and the Labour Market*, Oxford University Press, Oxford 1991; **S. Machin**, **A. Manning**, *Long-term Unemployment in Europe*, in: **O. Ashenfelter**, **D. Card** (eds.), *Handbook of Labour Economics*, Vol. 3C, North Holland, Amsterdam 1999; **L. Ball**, *Hysteresis in Unemployment: Old and new evidence*, NBER Working Paper 2009/14818, National Bureau of Economic Research, Cambridge.

expansion, when the rates of productivity growth are relatively high, and total unemployment rates are fairly low.

This paper investigates long-term unemployment and its characteristics in Poland between 2015 and 2019. In particular, it focuses on identifying the trends, structure and intensity of long-term unemployment among various labour force groups and on determining the factors that make someone become long-term unemployed. The factors are identified by estimating logit model parameters and include demographic, social and economic characteristics of the unemployed, which are potentially associated with their probability of becoming long-term unemployed. The empirical basis of the analysis is individual and aggregate unemployment data collected during labour force surveys (LFS) carried out in the sample years. Poland's economic situation in the sample period was relatively favourable. The unemployment rate fell from 6.8% in 2015 to 2.6% in 2019, and the average annual GDP growth rate was around 4.4%; it was the lowest in 2016 (3.1%) and the highest in 2018 (5.4%).

The article is structured as follows. Section 2 provides an outline of empirical studies on long-term unemployment. Section 3 explains the data and research methodology, focusing on the analytical approach and methods. In section 4, the non-parametric analysis of long-term unemployment is presented, including its trends, structure and intensity among labour force groups. Section 5 contains the estimates obtained from the logit model, which show how particular characteristics of the unemployed relate to their probability of being long-term unemployed. Section 6 provides the main conclusions from the study.

2. Literature review

The question of long-term unemployment has been analysed in many economic studies, ranging from works that investigate the significance of the theoretical framing of long-term unemployment for the course of various economic processes[3] to empirical analyses exploring its trends, structure and determinants. The latter has attracted special interest from Polish researchers.

Kucharski and Kwiatkowski, who studied long-term unemployment in Poland from 1992 to 1999, looked at its changes and the factors that determine

[3] Of note here is the fundamental work by Layard, Nickell, and Jackman (1991), who concluded that long-term unemployment has a major effect on NAIRU (Non-Accelerating Inflation Rate of Unemployment) levels.

its intensity.[4] Using individual and aggregate LFS data collected between 1992 and 1999, they built logit models to estimate associations between an unemployed person's characteristics (e.g., gender, age, education, marital status, and the type of residence) and the probability of that person becoming long-term unemployed, employed or 'economically inactive'. Their study demonstrated that young adults who completed higher education and were married were the least likely to become long-term unemployed. The most at risk were women, people aged between 45 and 54, the residents of towns with populations under 20,000, and people with elementary and incomplete elementary education. Kucharski conducted a similar analysis of long-term unemployment using the 2008–2012 LFS data and estimated the logit model parameters with the LFS data from Q4 2010.[5]

Śliwicki used individual LFS data from Q4 2010 to determine microeconomic and macroeconomic factors that lead to long-term unemployment in Poland.[6] The probability of a person becoming long-term unemployed was estimated from the parameters of variables such as age, education, marital status, occupation, the voivodeship of residence, and the Polish Classification of Activities section. It was found to be the highest for people older than 45 years, people with junior secondary education, unemployed jobseekers registered with labour offices, and former office workers. In another study published in the same year, Śliwicki evaluated how macroeconomic factors (GDP, export, import, average wages, minimum wages, foreign direct investments and investments) contributed to long-term unemployment using quarterly data from 2000 to 2011 and a logit model and a causal model to estimate the parameters.[7]

Wojdyło-Preisner examined long-term unemployment in the city of Białystok based on data that characterised people registered as unemployed between 2000 and 2012 derived from the PSZ Syriusz database. The probability of long-term unemployment was assessed separately for men, women and all labour force participants by estimating logit models whose parameters included

[4] **L. Kucharski**, **E. Kwiatkowski**, *Bezrobocie długookresowe w Polsce w latach 1992–2000 – tendencje, struktura i determinanty*, in: **S. Krajewski**, **T. Tokarski** (eds.), *Wzrost gospodarczy, restrukturyzacja i bezrobocie w Polsce: ujęcie teoretyczne i praktyczne*, Wyd. Katedra Ekonomii UŁ, Łódź 2002, pp. 283–305.

[5] **L. Kucharski**, *Long-term Unemployment in Poland in 2008–2012 – Tendencies, Structure and Selected Determinants*, Olsztyn Economic Journal 2013/8 (4), pp. 347–359.

[6] **D. Śliwicki**, *Ekonometryczna analiza czynników bezrobocia długookresowego*, Oeconomia Copernicana 2013a/2, pp. 39–56.

[7] **D. Śliwicki**, *Wpływ głównych czynników makroekonomicznych na bezrobocie długookresowe*, Wiadomości Statystyczne 2013b/3 (622), pp. 1–12.

socio-economic characteristics, family circumstances, the quality of human capital, occupation, the knowledge of foreign languages, and occupational mobility of the unemployed. The study confirmed that women, people aged 50+, unmarried people, and people with disabilities were the most at risk of long-term unemployment.[8]

The most comprehensive analysis of long-term unemployment in Poland is probably contained in the extensive study edited by Bronk, Wiśniewski and Wojdyło-Preisner, which involves definitional, theoretical and methodological deliberations on long-term unemployment followed by in-depth empirical analyses.[9] The analyses were performed on two different sets of statistical data, one of which described individuals who registered as unemployed in 2010 in six counties purposefully selected from the Syriusz IT database and the other comprised data on unemployed people who were surveyed in those counties from 2010 to 2012. Factors that increase the probability of long-term unemployment were identified using logit models and classification trees. The logit model parameter estimates revealed an association between long-term unemployment and a person's socio-demographic characteristics, family circumstances, human capital (including the knowledge of foreign languages), occupational mobility, and the county of residence (urban or rural). The analysis of the survey data also aimed to assess the role of variables such as the type of household, the level of income, health status, and the availability of public transport services. It determined that the most at risk of long-term unemployment were women, the age group 50+, people with elementary and junior secondary education, people with few years of work experience, people with disabilities, people who did not speak foreign languages, and former office workers.

Maksim and Wojdyło-Preisner adopted a local perspective to study long-term unemployment in Poland. They selected six counties (the urban counties of Białystok, Włocławek, and Przemyśl, and the counties of Działdowo, Sierpc, and Krasnystaw) that represent six different types of local economy (modern, industrial, obsolete industrial, industrial-agricultural, agricultural-industrial, and traditional agricultural).[10] Based on a logit model's estimates of the

[8] **M. Wojdyło-Preisner**, *Determinanty długotrwałego bezrobocia na przykładzie miasta Białystok*, Optimum. Studia Ekonomiczne 2013/6 (66), pp. 136–147.

[9] **A. Bronk**, **Z. Wiśniewski**, **M. Wojdyło-Preisner** (eds.), *Ryzyko długotrwałego bezrobocia w Polsce. Diagnoza i metody zapobiegania*, Wyd. Ministerstwa Pracy i Polityki Społecznej oraz Centrum Rozwoju Zasobów Ludzkich, Warszawa 2014.

[10] **M. Maksim**, **M. Wojdyło-Preisner**, *Determinanty długotrwałego bezrobocia w Polsce – perspektywa lokalna*, Gospodarka Narodowa 2015/4 (278), pp. 117–136.

characteristics of the unemployed registered in the counties in 2010 obtained from the Syriusz database, they identified factors that potentially contributed to long-term unemployment. Some of them (gender, age, and the knowledge of foreign languages) proved to be universal in the sense that their role was similar in all types of the local economy; others (education, disability, occupational mobility) were associated with the character of the local economy.

Long term-unemployment has also been the subject of a number of international studies. Nesporova presented an extensive analysis of long-term unemployment in five European countries: Austria, Czechia, Germany, Poland and Slovakia.[11] The focus of the analysis was on factors such as skill and geographical mismatches, labour tax wedge, generosity of unemployment benefits, employment protection legislation and temporary employment contracts as the drivers of high and persistent long-term unemployment. Trends in the general rate of unemployment, the rate of long-term unemployment and the structure of unemployment by gender and age group were identified based on statistical data from the years 2000–2014. Data on long-term unemployment incidence by sex and age (shares in the per cent of unemployment disaggregated by sex and age) were used to assess the risk of long-term unemployment for each age group. For Poland, the study showed that women were more at risk of long-term unemployment than men, and that people aged 15–24 were less likely to be long-term unemployed than those aged between 55 and 64.

Lallukka et al. presented an interesting study on the determinants of long-term unemployment in the group of young adults in Finland derived from the 1987 Finnish Birth Cohort. Social, health-related and individual determinants were examined in terms of their association with long-term unemployment among young men and women.[12] The social determinants included poor school performance, marital status, early school leaving, criminal convictions, parental factors, and municipal unemployment rate. The probabilities of long-term unemployment were predicted from logistic regression models. They concluded that men were more likely to be long-term unemployed than women. The strongest predictors of long-term unemployment proved to be poor school performance and parents' divorces.

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[11] **A. Nesporova**, *Long-term unemployment in Central Europe: A review of its nature and determinants in five countries*, Employment Working Paper 2017/218, ILO, Geneva.

[12] **T. Lallukka**, **M. Kerkelä**, **T. Ristikari**, **M. Merikukka**, **H. Hiilamo**, **M. Virtanen**, **S. Øverland**, **M. Gissler**, **J.I. Halonen**, *Determinants of long-term unemployment in early adulthood: A Finnish birth cohort study*, SSM – Population Health 2019/8, pp. 1–12.

Arruda et al. investigated the determinants of the probability of Brazilian workers being unemployed longer than a year.[13] They examined factors that increase the risk of Brazilian workers remaining unemployed for over a year using data from the 2013 National Household Survey and a binary regression model. The explanatory variables included gender, age, household head, urban/rural area, education level and region. The study found that females, people aged between 45 and 65, illiterate people and those who were not household heads ran the highest risk of long-term unemployment.

3. Data and research methodology

The following analysis of long-term unemployment in Poland is based on statistical data collected during LFS that was run between 2015 and 2019 and published by Statistics Poland. Two types of data are used: aggregate and individual. The aggregate data are examined to identify long-term unemployment trends (section 4). The assessment of the labour market situation of different population groups in section 4 is performed by calculating each group's long-term unemployment rate (as a ratio between the number of people out of work more than 12 months and the number of the economically active). The individual data sourced from the LFS surveys are used in the econometric analysis (section 5).

TABLE 1: *The quarterly labour force structure in Poland according to LFS between 2015 and 2019 (%)*

Specification	Employed	Economically inactive	Unemployed	Long-term unemployed*
1	2	3	4	5
1Q 2015	46.9	48.6	4.5	47.0
2Q 2015	46.9	49.3	3.8	47.4
3Q 2015	47.5	49.0	3.6	41.9
4Q 2015	47.7	48.8	3.5	41.2
1Q 2016	47.8	48.6	3.6	32.7
2Q 2016	48.1	48.8	3.2	32.0

[13] **E.F. Arruda**, **D.B. Guimaraes**, **J. Castelar**, **P.U.C. Castelar**, *Determinants of Long-Term Unemployment in Brazil in 2013*, International Journal of Economics and Finance 2018/10/6, pp. 53–64.

TABLE 1 (cont.)

1	2	3	4	5
3Q 2016	48.2	48.7	3.1	30.5
4Q 2016	48.4	48.8	2.8	31.2
1Q 2017	48.5	48.7	2.8	26.9
2Q 2017	49.0	48.5	2.5	26.5
3Q 2017	49.1	48.5	2.4	26.5
4Q 2017	48.9	48.9	2.2	27.7
1Q 2018	48.8	49.1	2.1	25.9
2Q 2018	49.2	48.9	1.9	26.4
3Q 2018	49.3	48.8	1.9	22.5
4Q 2018	49.5	48.7	1.8	22.9
1Q 2019	48.4	49.8	1.8	24.5
2Q 2019	49.7	48.7	1.6	18.6
3Q 2019	49.3	49.1	1.6	17.9
4Q 2019	50.0	48.5	1.5	18.7

N o t e: * – % of all unemployed.
S o u r c e: LFS data, calculated by the authors.

Labour force surveys in Poland use a rotational approach and are run on a quarterly basis. The rotational approach involves each survey examining four randomly drawn sub-samples: two of those surveyed in the previous quarter and two new ones. Each sub-sample takes part in four surveys according to the 2 – (2) – 2 formula, i.e., two quarters on, two quarters off, and two quarters on again. Table 1 presents the labour force structure in each quarter between 2015 and 2019.

Because each individual in a sub-sample participated in four surveys, econometric analysis is only performed on the data from the survey when they were interviewed for the first time to avoid artificial enlargement of the sample size.

To estimate the probability of an unemployed person not having a job longer than 12 months, observations on all unemployed people were taken out from each quarterly survey and combined into a single sample.

The estimation procedure used a logit model, whose explained variable y_i was defined as follows:[14]

[14] **G.C. Chow**, *Ekonometria*, PWN, Warszawa 1995, p. 310; **A.C. Cameron**, **P.K. Triverdi**, *Microeconometrics*, *Methods and Applicants*, Cambridge University Press, New York 2005, p. 466.

$$y_i = \begin{cases} 1 - \text{long} - \text{term unemployed person} \\ 0 - \text{person unemployed for up to 12 months} \end{cases}$$

The logit model can be described using the following formula:[15]

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_K x_{ki} + \mu_i \tag{1}$$

where:

$\ln\left(\frac{p_i}{1-p_i}\right)$ – logit – logit,

p_i – the probability of variable y_i taking a value of 1 (then a given person will be long-term unemployed) determined from the log distribution's density function,

x_{ji} – the model's explanatory variables,

β_j – the model's structural parameters,

μ_i – the error term.

As the explanatory variables of the logit model, individual characteristics are used, such as a person's age, gender, education, marital status, the level of disability, the job-seeking method, the area of residence (rural/urban), and the region (voivodeship). The model's parameters being estimated are denoted as $\beta_0, \beta_1, ..., \beta_k$.

The probability of the explained variable y_i taking a value of 1 or 0 can be expressed using the following formula:[16]

$$p_i = \frac{\exp\left(x_i'\beta\right)}{1+\exp\left(x_i'\beta\right)} = \frac{1}{1+\exp\left(-x_i'\beta\right)} \tag{2}$$

[15] **M. Gruszczyński**, *Modele zmiennych jakościowych dwumianowych*, in: **M. Gruszczyński** (ed.), *Mikroekonometria. Metody i analizy danych indywidualnych*, wydanie II rozszerzone, Oficyna a Wolters Kluwer business, Warszawa 2012, p. 81; **G.C. Chow**, **G.C. Chow**, *Ekonometria*…

[16] **M. Gruszczyński**, *Modele zmiennych jakościowych dwumianowych*, in: **M. Gruszczyński** (ed.), *Mikroekonometria. Metody i analizy danych*…, p. 80.

Thus, the odds ratio is calculated as:[17]

$$\frac{p_i}{1-p_i} = \exp\left(x_i'\beta\right) = \exp(\beta_0 + \beta_1 X + \beta_2 X_{2i} + \cdots + \beta_K X_{ki}) \tag{3}$$

According to equation (3), an increase in the value of variable x_{ji} alters the odds ratio $\frac{p_i}{1-p_i}$ in such a way that the ratio increases when $\exp(\beta_j) > 1$ and decreases for $\exp(\beta_j) < 1$.

Equation (2) allows the marginal effect of a change in X_j (the socio-demographic characteristics of the studied population groups) on p_i (the probability of long-term unemployment) to be determined:

$$\frac{\partial p_i}{\partial X_{ji}} = \beta_j \frac{\exp\left(x_i'\beta\right)}{\left(1+\exp\left(x_i'\beta\right)\right)^2} = \beta_j p_i (1-p_i) \tag{4}$$

A positive β_j means that an increase (decrease) in the value of variable X_j increases (decreases) the probability of variable Y taking a value of 1 (indicating that a given person will be long-term unemployed), whereas a negative β_j denotes that a decrease (increase) in the value of X_j decreases (increases) that probability.

The quality of the logit model parameter estimates is assessed using McFadden's pseudo-R^2 test:[18]

$$R^2 = 1 - \frac{\ln(L_{fit})}{\ln(L_0)}, \tag{5}$$

where L_{fit} and L_0 are the values of the reliability function for a given model and the model with an intercept, respectively.

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[17] The expression $1 - p_i$ stands for the probability that a given person will not become long-term unemployed.

[18] The values of the test range from 0 to 1. The bigger the differences between $\ln(L_{fit})$ and $\ln(L_0)$, the more the explanatory variables contribute to the model. In practice, the test values tend to be close to 0.

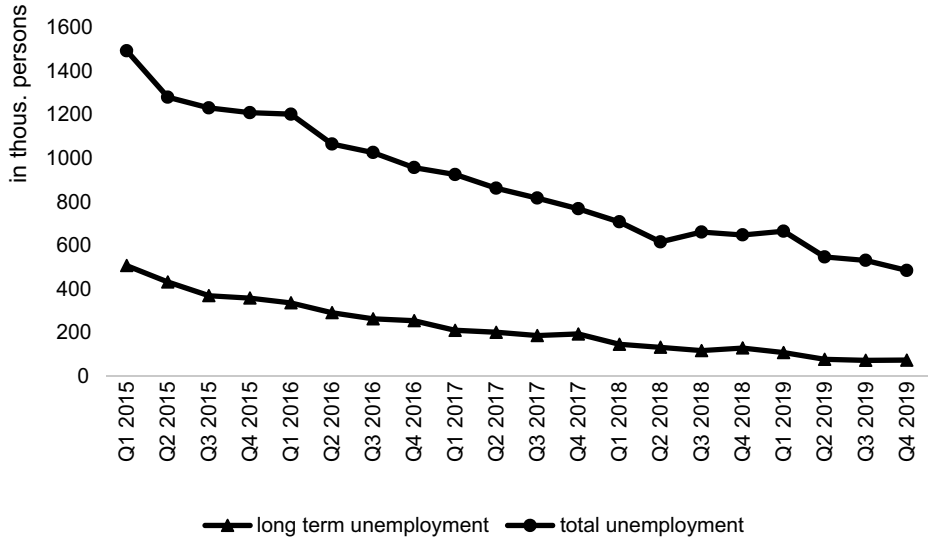
Equation (3) parameters were estimated in Stata software. The probability of long-term unemployment was determined assuming that a given person was unemployed.

As Poland's economic situation varied between 2015 and 2019, a decision was made to estimate the probability of a person being long-term unemployed for the whole sample period and for the years 2015 and 2019. The sample for the whole period contained 9,046 observations (including 3,092 for the long-term unemployed), the 2015 sample had 2,599 observations (of which 1,202 concerned the long-term unemployed), and the 2019 sample consisted of 1741 observations (317 for the long-term unemployed).

4. Tendencies in long-term unemployment

Before moving on to the analysis of logit model estimates, let us take a look at the general picture of long-term unemployment in Poland from 2015 to 2019 as arising from the non-parametric analysis, particularly at its scale, trends, and intensity among the main population groups, as well as at the groups' socio-demographic characteristics.

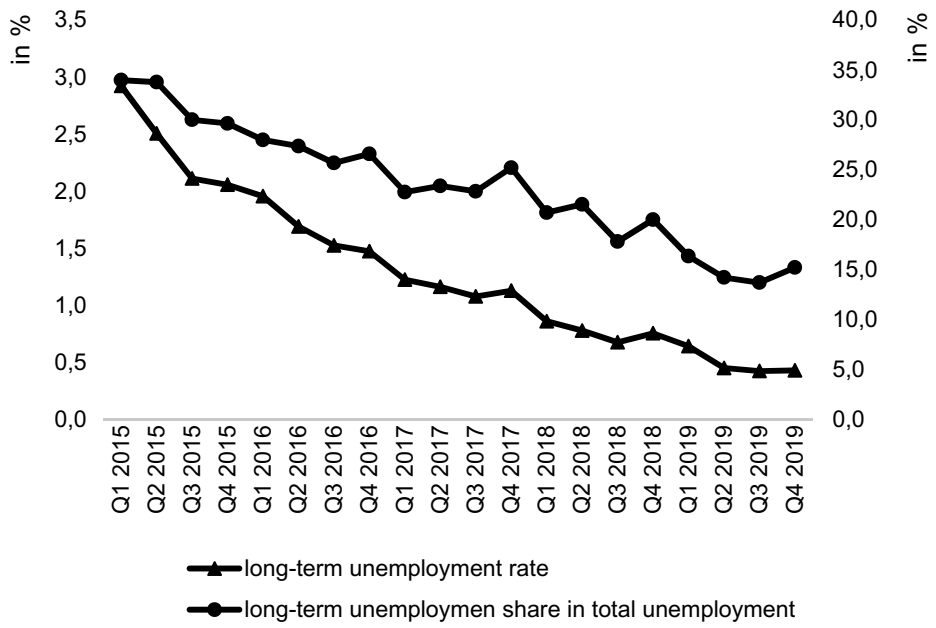
FIGURE 1: *Total unemployment and long-term unemployment in Poland, 2015–2019 (thousands)*



S o u r c e: labour force survey in Poland, various editions from 2015 to 2020, calculated by the authors.

Figure 1 compares the quarterly numbers of the long-term unemployed and all unemployed people in Poland in the sample years. The trend lines are downward sloping almost throughout the period, which is quite understandable given that Poland's economic situation in those years was good and steadily improving (the rate of unemployment declined between 2015 and 2019). As the number of the long-term unemployed decreased faster than the number of all unemployed (85% versus 67%), their share of total unemployment dropped in the sample years from 33.9% to 15% (see Figure 2). The intensity of long-term unemployment measured by its rate fell too, from 2.9% in Q1 2015 to 0.4% in Q4 2019 (see Figure 2).

FIGURE 2: *The long-term unemployment rate (left axis) and long-term unemployment's share in total unemployment (right axis) in Poland, 2015–2019 (%)*



S o u r c e: see Figure 1, calculated by the authors.

TABLE 2: *Structure of long term-unemployment* in Poland by labour force group, 2015–2919 (%)*

Labour force groups	2015	2016	2017	2018	2019
Gender:					
Male	55.1	55.2	58.7	57.1	54.5
Female	44.9	44.8	41.3	42.9	45.5
Age:					
Up to 24 years	14.7	14.1	13.2	10.3	9.6
25–44 years	49.4	51.2	45.7	52.7	51.9
45 years or older	35.4	34.4	40.6	36.2	35.9
Education:					
Higher	12.8	13.8	12.0	13.2	15.4
Post-secondary and secondary	34.9	33.7	32.5	30.6	33.8
Basic vocational	35.5	37.4	40.7	38.2	33.3
Lower-secondary, primary and incomplete primary	16.7	15.0	14.5	15.5	16.3
Place of residence:					
City/town	58.8	57.5	55.7	55.4	57.5
Rural area	41.2	42.5	44.3	44.6	42.5

N o t e: * – quarterly averages.
S o u r c e: see Figure 1, calculated by the authors.

The question about who long-term unemployed people are will be answered by referring to their characteristics such as gender, age, education, and the place of residence presented in Table 2. From the table, it follows that in all analysed years, men predominated among the long-term unemployed. Regarding the age of the long-term unemployed, most were in the age groups 25–44 years and 45 years and older; the percentage of young people aged up to 24 years was relatively small and decreased each year. People with higher education or primary education were relatively rarely affected by long-term unemployment, unlike those who had completed secondary, post-secondary or basic vocational education. This structure is quite similar to the structure of the general population in Poland. That said, it needs to be noted that the share of long-term unemployed people with higher education increased each year. Lastly, long-term unemployment was a bigger problem among the urban population than in rural areas.

As already mentioned, unemployment rates in Poland varied between 2015 and 2019. Let us see, therefore, what the structure of long-term unemployment was in both these years. According to the data in Table 2, the 2019 unemployment rate was significantly lower than in 2015, but the structure of long-term unemployment

by gender, age, education, and place residents was not very different. The only differences of note are a smaller share of young adults up to 24 years of age and a slightly larger share of people with higher education in 2019 compared with 2015.

TABLE 3: *Rates of long-term unemployment* in Poland by labour force group, 2015–2919 (%)*

Labour force groups	2015	2016	2017	2018	2019
Gender:					
Male	2.40	1.68	1.23	0.78	0.48
Female	2.40	1.65	1.08	0.75	0.53
Age:					
Up to 24 years	4.46	2.93	1.97	1.05	0.69
25–44 years	2.18	1.57	0.97	0.76	0.48
45 years or older	2.26	1.51	1.22	0.72	0.44
Education:					
Higher	0.96	0.70	0.41	0.29	0.21
Post-secondary and secondary	2.36	1.56	1.04	0.66	0.46
Basic vocational	3.27	2.45	1.86	1.20	0.71
Lower-secondary, primary and incomplete primary	6.22	4.22	3.05	2.32	1.54
Place of residence:					
City/town	2.33	1.58	1.07	0.70	0.46
Rural area	2.51	1.78	1.28	0.87	0.53

N o t e: * – quarterly averages.
S o u r c e: see Figure 1, calculated by the authors.

The labour force groups differed noticeably regarding long-term unemployment rates (see Table 3), with gender being the least differentiating factor. From 2016 until 2018, the long-term unemployment rate for men was considerably higher than for women, but in 2019 it was the other way round. Much bigger differences in long-term unemployment rates occurred between the age groups. In all analysed years, young people aged up to 24 years were the most at risk of long-term unemployment; in the case of the older age groups, 25–44 years and 45 years or older, the risk was comparable. A strong association was also found between the rate of long-term unemployment and the level of education. The rates of long-term unemployment were the highest in all sample years for people with incomplete primary education, primary education or junior secondary education, and the lowest for people with higher education. The finding that people with basic vocational education had a higher share of long-term unemployment than those with secondary or post-secondary education

surprisingly contrasts with the structure of job offers available. Lastly, the risk of long-term unemployment was higher in rural areas than in towns and cities, probably because rural populations are on average less educated, and fewer jobs are created in the countryside.

Comparing 2015 and 2019 shows that long-term unemployment rates decreased in all groups over the sample period, which should be attributed to the economic upturn. Interestingly, the relations between the studied groups' unemployment rates in 2019 and 2015 are similar. In both years, the highest rates of long-term unemployment were among people up to 24 years of age, people with elementary education, incomplete elementary or junior secondary education, and rural residents. Minor changes can only be seen in the rates for men and women: the former was higher in 2015 and the latter in 2019.

5. Results of econometric analysis

In this section, logit model 3 is estimated, and the results are presented in Tables 4–5. Table 4 shows the odds ratios of being long-term unemployed in Poland between 2015 and 2019 by labour force group. A ratio greater than 1 indicates that a given group is at a higher risk of long-term unemployment compared with the base category. For instance, the 25–44 years age group has an odds ratio of 2.433 (Table 4, column 2), meaning that its members are 143.3% more likely to become long-term unemployed than those comprising the base category. The data in Table 4 lead to the following observations.

In the years under consideration, age was the strongest risk factor for becoming long-term unemployed. People aged 45 years or older were 217.1% more likely not to be able to find a job within 12 months compared with the base age category (≤ 24 years).

The level of education also significantly determined the risk of long-term unemployment. The highest risk occurred for the least educated people and the lowest for higher education graduates, who were 49.3% less likely to be long-term unemployed than people with basic vocational education. People with lower-secondary education, primary education or incomplete primary education were 21.3% more at risk of long-term unemployment than the base category.

TABLE 4: *The odds ratios of becoming long-term unemployed in Poland, 2015–2019*

Specification	Odds ratio	z score
1	2	3
Constant	0.167	–13.06
Age (base category: people aged up to 24 years)		
25–44 years	2.433	12.13
45 years or older	3.171	13.51
Education (base category: people with basic vocational education)		
Higher	0.507	–9.00
Post–secondary and secondary	0.741	–5.29
Lower-secondary, primary and incomplete primary	1.213	2.29
Marital status (base category: single)		
Married	0.881	–2.13
Divorced)	0.987*	–0.13
Widower (widow)	0.802*	–1.29
Gender (base category: man)		
Females	0.960*	–0.83
Degree of disability (base category: people without disabilities)		
People with a certified disability	0.914*	–0.90
Job-seeking method		
People registered at the labour office	1.276	4.96
Active-job seekers	0.736	–5.42
Place of residence (base category: rural area)		
City/town	1.419	4.77
Voivodeship (base category: Mazowieckie)		
Dolnośląskie	0.981*	–0.13
Kujawsko-Pomorskie	1.339	2.42
Lubuskie	1.663	4.49
Lubelskie	0.711	–2.11
Łódzkie	1.564	3.49
Małopolskie	1.747	4.09
Opolskie	0.817*	–1.45
Podkarpackie	2.788	9.41

1	2	3
Podlaskie	2.218	6.19
Pomorskie	1.334	2.13
Śląskie	1.821	4.85
Świętokrzyskie	1.266	1.99
Warmińsko-Mazurskie	1.433	2.86
Wielkopolskie	2.925	7.75
Zachodniopomorskie	1.570	3.15

No. of observations: 9046 Log-likelihood: –5444.4231
Pseudo R^2: 0.0629
N o t e: * – statistically non-significant.[19]
S o u r c e: calculated by the authors based on LFS data from 2015 to 2019.

Regarding married people, their risk of becoming long-term unemployed was 10.9% higher than for single people. The probabilities of long-term unemployment estimated for the other marital status groups were not statistically significant.

Also not significant were the probability estimates calculated for women and people with a certified disability. In Poland, people with disabilities rarely engage in economic activity and usually opt for economic inactivity when faced with a risk of unemployment.

People seeking jobs through labour offices were 27.6% more likely to become long-term unemployed compared with those who explored other ways to find employment. In the case of active jobseekers,[20] the risk of long-term unemployment was lower by 26.4% compared with the base category.

A significant association was also found between the probability of long-term unemployment and a person's area of residence. In rural areas, it was 41.9% greater compared with towns and cities.

The region of residence also proved important. From 2015 to 2019, the unemployed living in the majority of Polish voivodeships, including Wielkopolskie, Podkarpackie, and Podlaskie, were more at risk of long-term unemployment than the unemployed residents of the Mazowieckie voivodeship.[21]

[19] The critical value of the statistics at the 0.05 significance level is 1.96.

[20] Active jobseekers are people who reported in the LFS to have recently registered with a private employment agency, placed or responded to a job offer, contacted employers, or used the intermediation of relatives and acquaintances**.**

[21] The capital of the voivodeship Mazowieckie is Warsaw.

An interesting exception is the Lubelskie voivodeship, where the risk of long-term unemployment was lower than in Mazowieckie, probably because of its predominantly agricultural character.

The estimates of the probability of a person being long-term unemployed in 2015 and 2019 in Table 5 lead to the following conclusions.

- In both 2015 and 2019, the risk of long-term unemployment was highest for people aged 45 or older. Compared with the base category, they were also the age group that was most likely to be long-term unemployed over the sample period.
- Higher education graduates were at the lowest risk of being unemployed longer than 12 months compared with the base category. In contrast, people with the lowest educational attainment were at the highest risk, both in 2015 and in all sample years. The 2019 risk estimate for this group was statistically not significant.
- In both 2015 and 2019, gender, the place of residence and a certified disability did not significantly contribute to the risk of falling into long-term unemployment.
- Only in 2019 were the unemployed registered with labour offices more at risk of seeking a job 12 months longer than the base category.
- The 2019 odds ratio estimates for most voivodeships were found to be statistically not significant. In the first and last years of the sample, the unemployed residents of Podkarpackie and Warmińsko-Mazurskie voivodeships were at the highest risk of long-term unemployment compared with the unemployed living in the Mazowieckie voivodeship.

TABLE 5: *The odds ratios of becoming long-term unemployed in Poland, 2015 and 2019*

Specification	2015		2019	
	Odds ratio	z score	Odds ratio	z score
1	2	3	4	5
Constant	0.298	–5.78	0.612	–7.35
Age (base category: people aged up to 24 years)				
25–44 years	2.673	7.61	2.216	3.44
45 years or older	3.024	7.26	3.931	5.22
Education (base category: people with basic vocational education)				
Higher	0.586	–3.78	0.685	–1.97
Post-secondary and secondary	0.911*	–0.91	0.836*	–1.04
Lower-secondary, primary and incomplete primary	1.326	2.23	1.335*	1.38

1	2	3	4	5
Marital status (base category: single people)				
Married	0.873*	–1.27	0.854*	–0.95
Divorced)	0.878*	–0.73	1.547*	1.84
Widower (widow)	0.614*	–1.69	0.425*	–1.30
Gender (base category: man)				
Females	0.999*	–0.01	0.895*	–0.79
Degree of disability (base category: people without disabilities)				
People with certified disability	0.947*	–0.30	0.585*	–1.85
Job-seeking method				
People registered with labour offices	1.012*	0.12	1.445	2.62
Active-job seekers	0.854*	–1.57	0.934*	–0.38
Place of residence (base category: rural area)				
City/town	0.996*	–0.05	0.909*	–0.67
Voivodeship (base category: Mazowieckie)				
Dolnośląskie	1.661	2.19	0.191	–2.18
Kujawsko-pomorskie	1.800	2.57	1.484*	1.21
Lubuskie	1.656	2.39	2.134	2.54
Lubelskie	0.811*	-0.75	0.556*	–1.12
Łódzkie	1.484*	1.78	1.473*	0.94
Małopolskie	1.598	2.04	1.455*	0.82
Opolskie	0.644*	–1.82	0.913*	–0.22
Podkarpackie	2.586	4.58	3.869	4.71
Podlaskie	2.559	3.86	1.646*	1.37
Pomorskie	1.413*	1.42	1.532*	1.14
Śląskie	1.823	2.73	2.309	2.32
Świętokrzyskie	1.187*	0.78	2.196	2.45
Warmińsko-mazurskie	2.099	3.20	3.050	3.06
Wielkopolskie	3.331	4.70	1.872*	1.59
Zachodniopomorskie	1.619*	1.79	1.590*	1.20
No. of observations	2599		1741	
Log likelihood	–1694.7996		–752.03627	
Pseudo R^2	0.0554		0.0897	

N o t e: * – statistically non-significant.[22]
S o u r c e: calculated by the authors based on 2015 and 2019 LFS data.

[22] The critical value of the statistics at 0.05 significance level is 1.96.

The probabilities of long-term unemployment estimated in this study are consistent with those presented in earlier works, according to which the most at risk of long-term unemployment in Poland were people aged 45 or older and people with low levels of education.[23]

6. Conclusions

The conclusions that can be drawn from the analysis are as follows. Both long-term unemployment and total unemployment showed strong downward trends in the analysed years. Long-term unemployment decreased faster, probably because of the growing number of long-term unemployed people moving to the category of "economically inactive" as a result of increased social transfers.

Among the long-term unemployed, men, young people up to 24 years of age, people with higher education, junior-secondary education or incomplete primary education, as well as rural residents, were the least frequent. The highest percentages of the long-term unemployed occurred among people aged 25–44 years, people with basic vocational education, women, and urban residents.

The highest rates of long-term unemployment characterised young people to 24 years of age and people with junior secondary education, primary education or incomplete primary education and the lowest in the older age groups (25–44 years and 45 years or older), as well as higher education graduates. Between men and women and between rural and urban residents, the rates of long-term unemployment were comparable.

The parametric analysis showed that people aged 45 years or older, people with junior-secondary education, primary education and incomplete primary education, jobseekers using labour offices, urban residents, and people living in voivodeships other than the base voivodeship of Mazowieckie were more at risk of long-term unemployment than their base categories.[24] People aged 25–44 years were also more likely to remain out of work longer than a year than people aged 24 years or younger.

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[23] **D. Śliwicki**, *Ekonometryczna analiza czynników bezrobocia długookresowego*, Oeconomia Copernicana 2013a/ 2, p. 55; **L. Kucharski**, *Long-term Unemployment in Poland in 2008–2012 – Tendencies, Structure and Selected Determinants*, Olsztyn Economic Journal 2013/8 (4), p. 358.

[24] The exception was the Lubelskie voivodeship where the probability of long-term unemployment was lower than in Mazowieckie.

The least likely to become long-term unemployed were higher education graduates, people with post-secondary education or secondary education, married people, active job seekers, and the residents of the Lubelskie voivodeship.

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BEZROBOCIE DŁUGOOKRESOWE W POLSCE W LATACH 2015–2019

Abstrakt

Przedmiot badań: W artykule podjęto próbę określenia tendencji bezrobocia długotrwałego, rozpoznania jego struktury i natężenia w przekroju grup siły roboczej oraz identyfikacji czynników determinujących bezrobocie długotrwałe w latach 2015–2019.
Cel badań: Celem opracowania jest ekonomiczna, wieloaspektowa analiza bezrobocia długotrwałego w Polsce w okresie dobrej koniunktury lat 2015–2019.
Metoda badawcza: W analizie empirycznej wykorzystano dane statystyczne o bezrobociu o charakterze agregatowym i jednostkowym (w ujęciu kwartalnym), pochodzące z badań aktywności ekonomicznej ludności (BAEL) z lat 2015–2019. W artykule wykorzystano metody nieparametryczne i parametryczne (model logitowy).
Wyniki: Największe prawdopodobieństwo bycia bezrobotnym długotrwale w porównaniu do kategorii bazowych miały osoby wieku 45 lat i więcej, z wykształceniem gimnazjalnym, podstawowym i niepełnym podstawowym, poszukujące pracy przez urzędy pracy, mieszkające w miastach, mieszkańcy innych województw niż woj. mazowieckiego (poza woj. lubelskim). W najmniejszym stopniu bezrobociem długotrwałym w porównaniu do kategorii bazowych były osoby w wieku do 24 lat, z wykształceniem wyższym, policealnym i średnim, zamężne (żonate), aktywnie poszukujące pracy, mieszkające w woj. lubelskim.

Słowa kluczowe: bezrobocie, bezrobocie długookresowe, grupy siły roboczej.