

**LONG-TERM UNEMPLOYMENT IN POLAND  
IN 2008–2012 – TENDENCIES, STRUCTURE  
AND SELECTED DETERMINANTS**

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Key words: unemployment, long-term unemployed, logit model.

Abstract

This study presents the structure and tendencies in long-term unemployment in Poland in the years 2008–2012. This study identifies the groups of people with an increased risk of long-term unemployment.

The analyses produced the following conclusions. The groups with the highest risk of long-term unemployment include: singles, people aged of 55 and above and people with a low level of education. Young people with university and general secondary education faced the lowest risk of long-term unemployment.

**BEZROBOCIE DŁGOOKRESOWE W POLSCE W LATACH 2008–2012 –  
TENDENCJE, STRUKTURA I WYBRANE DETERMINANTY**

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Słowa kluczowe: bezrobocie, bezrobocie długookresowe, model logitowy.

Abstrakt

Celem opracowania jest przedstawienie tendencji i struktury bezrobocia długookresowego w Polsce w latach 2008–2012. Podjęto również próbę odpowiedzi na pytanie, które grupy ludności są w największym stopniu zagrożone bezrobociem długookresowym.

Z przeprowadzonych analiz wynikają następujące wnioski. W największym stopniu zagrożone bezrobociem długookresowym w analizowanym okresie były osoby stanu wolnego, w wieku 55 lat i więcej, legitymujące się niskim poziomem wykształcenia. Najmniejsze prawdopodobieństwo bycia bezrobotnymi długookresowo miały osoby młode z wykształceniem wyższym i średnim ogólnokształcącym.

## Introduction

According to Keynesian theory, an economic downturn results in a decrease in production output, a decrease in the employment rate and an increase in the unemployment rate. In a prolonged downturn period, some of the unemployed become long-term unemployed.

For the past few years, the global economy has been struggling with the greatest economic crisis since the Great Depression. The effects of the crisis have also been felt in Poland. The GDP growth rate may still be positive, but it is much lower than it used to be. The economic slowdown in Poland has resulted in an increase in the unemployment rate, including long-term unemployment.

The aim of this study is to present the trends and structure of long-term unemployment in Poland in the years 2008–2012. It also identifies the population groups with the highest risk of long-term unemployment.

The statistical analyses conducted in the paper are based on a non-parametric method and on a parametric method. The latter method consists in using a logit model.

## The effect of long-term unemployment on the economy

Long-term unemployment has a number of negative consequences, both for the unemployed and for the entire economy. Extended periods of unemployment exacerbate the economic situation of the unemployed and their families.

An increase in the long-term unemployment rate also decreases the human capital of the unemployed. According to the theory of human capital, the resources of human capital (like financial capital) can increase and can be depreciated. Human capital can increase provided sufficiently high financial outlays are made for raising the level of education, training and qualifications improvement (cf. KWIATKOWSKI 2002, p. 209, BLAUG 1995, p. 303–305). Human capital can be decreased by a long period of unemployment. With prolonged unemployment periods, the unemployed lose some of their professional skills and experience. This reduces their chances of returning to the labour market.

The effect of human capital loss on the hysteresis of unemployment can be presented in the following manner. In a negative supply shock or a negative demand shock some of the employed lose their jobs. An economic downturn also reduces the chances of the unemployed or of the professionally inactive to find a job. Moreover, technological advancement results in a decrease in the human capital of people without work. Staying out of work for longer periods

leads to deterioration of the human capital of the long-term unemployed. This, in turn, reduces their chance to find a job. An economic upturn does not necessarily result in a decrease in the unemployment rate. A low level of qualifications and professional skills of the unemployed may prevent them from finding a job.

This especially applies to those who are long-term unemployed. The percentage of those affected by long-term unemployment increases in a time of crisis. Extension of the period of unemployment accelerates the process of depreciation of human capital. This considerably reduces the chances of the unemployed to find a job. For employers, those unemployed for a long time are not perfect substitutes for those unemployed only for a short time. Such actions of employers also affect the behaviour of the long-term unemployed. A futile job hunt may be a cause of apathy and decrease the intensity of job-searching, which will intensify the effect of unemployment hysteresis (cf. KWIATKOWSKI 2002, p. 214).

According to the NAIRU theory, the level of long-term unemployment affects the level of equilibrium unemployment. The NAIRU unemployment rate can be changed by factors which affect the level of realistic and demanded real wages. The level of realistic real wages (i.e. the wages which correspond to the capabilities of the economy) depends mainly on work productivity. An increase in work productivity makes it possible to raise wages without precipitating inflation processes. An increase in the realistic real wages, with the assumption of *ceteris paribus*, results in a decrease in the NAIRU.

In turn, the level of demanded real wages depends on: labour market situation (i.e. the unemployment rate), the generosity of the unemployment allowance system, the level of protection of labour conditions, the strength of trade unions in wage negotiations, the insider's position, lack of structural fit between labour supply and demand and the long-term unemployment rate (cf. LAYARD et al. 2005, p. 13–48, KWIATKOWSKI 2002, p. 150).

An increase in the percentage of the long-term unemployed in the total unemployment results in an increase in the level of demanded real wages which, in turn, results in an increase in the NAIRU. As has been said before, since the long-term unemployed lose part of their professional qualifications and skills they cannot successfully compete with the employed or the short-term unemployed to get a job. As a consequence, the higher the long-term unemployment rate is, the higher the wage demands will be, which results in an increase in the NAIRU.

An increase in the wage pressure affects the NAIRU by the following mechanism (see Fig. 1). The *W* line denotes the demanded real wages, whereas the *P* line is the price curve (the realistic real wages). The intersection of those curves determines the NAIRU (marked in the figure as  $u^*$ ).

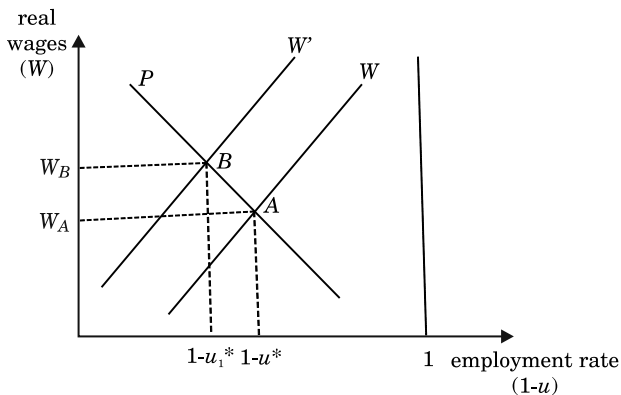


Fig. 1. The effect of an increase in wage pressure on NAIURU

Source: prepared by the author based on: LAYARD et al., 2005, p. 383.

Let us assume that initially the labour market was in the equilibrium state at point A. At that point, the equilibrium employment rate was  $(1-u^*)$ . An increase in the wage pressure (as a consequence of the percentage of the long-term unemployed) shifts the (demanded) wage curve left to the  $W'$  position. As a result of the adaptation processes, the economy shifts to another labour market equilibrium point – B, with a lower equilibrium unemployment rate  $(1-u_1^*)$ , and, consequently, a higher level of NAIURU ( $u_1^*$ ).

### Changing trends and the structure of long-term unemployment

Let us now analyse the changing tendencies in the long-term unemployment. Figure 2 presents data on the number of the long-term unemployed<sup>1</sup> and the total number of the unemployed in the years 2008–2012. It leads one to the following conclusions. Both quantities changed in the same direction during the period under analysis. Only in 2008 did both of them decrease. From Q1 onwards, the total unemployment and the long-term unemployment increased (with certain fluctuations). In Q4 2008, the number of the long-term unemployed reached the lowest level, while it reached the highest level in Q4 2012 (the number of the long-term unemployed increased during that period by 104.9%). Therefore, one can claim that the economic downturn in Poland has brought about a considerable increase in the long-term unemployment rate.

<sup>1</sup> Long-term unemployment that is lasting more than twelve months.

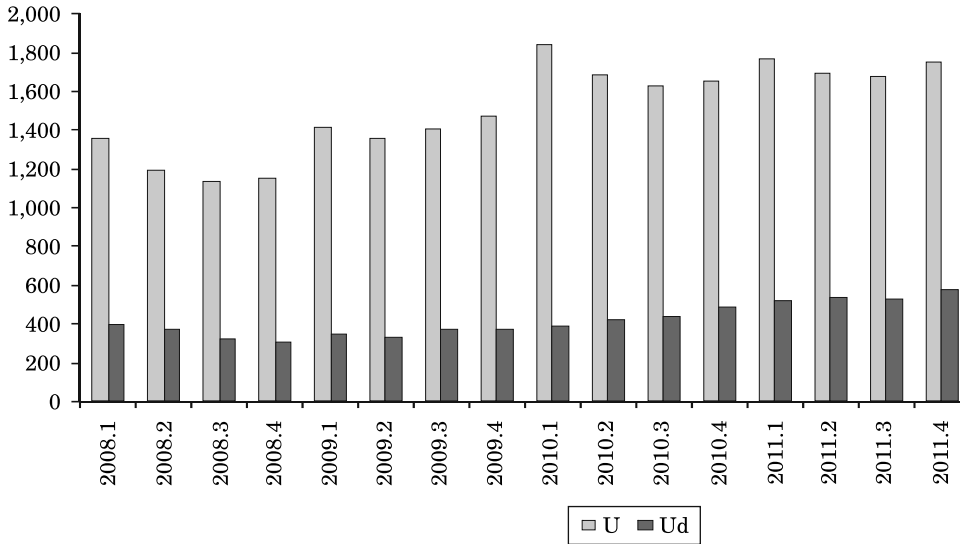


Fig. 2. The total number of the unemployed (U) and long-term unemployed (Ud) in Poland during the period between Q1 2008 and Q4 2012 [per thousand people]  
 Source: Economic activity of the population of Poland, various editions between 2008 and 2013, GUS, Warsaw.

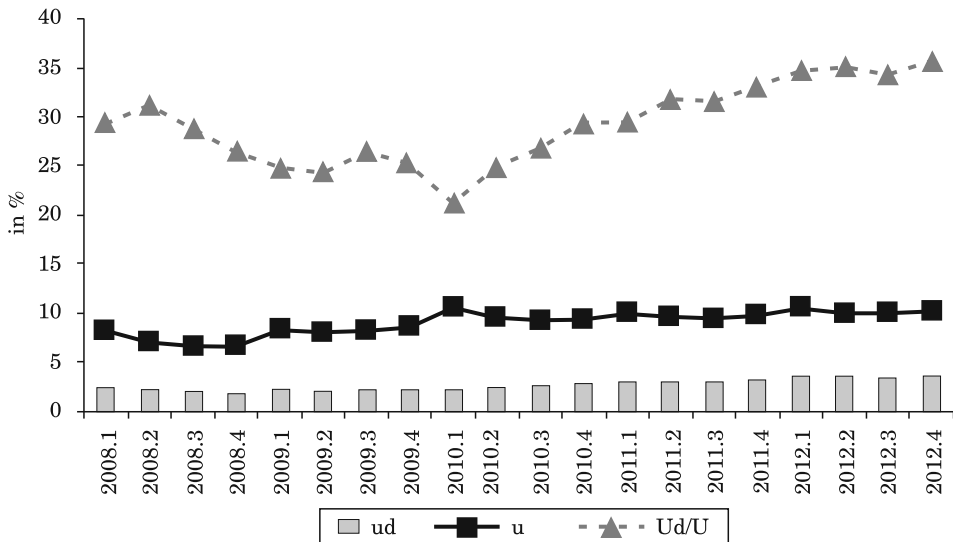


Fig. 3. The total unemployment rate (u), the long-term unemployment rate (ud) and the percentage of the long-term unemployed in the total unemployment (Ud/U) in Poland during the period 2008–2012  
 Source: as for figure 2.

Figure 3 presents quarterly data on the unemployment rates, long-term unemployment rates<sup>2</sup> and the percentage of long-term unemployment in total unemployment. From Q1 2009 onwards, both the total unemployment rate and the long-term unemployment rate grew (with certain seasonal fluctuations). The long-term unemployment rate grew from 1.9% in Q4 2008 to 3.6% in Q4 2012. As diagram 2 shows, the percentage of the long-term unemployed in the total unemployment decreased until Q4 2009. Beginning with Q1 2010, a strong increasing tendency of the long-term unemployed percentage in the total unemployment was observed. At the end of the period, the long-term unemployed accounted for 35.7% of all the unemployed.

The highest percentage of the long-term unemployed in the total unemployment in 2009 was observed in the provinces: Świętokrzyskie, Podkarpackie and Lubelskie (see Table 1). These are provinces where a large portion of the population is employed in agriculture and where the service sector is poorly developed. The lowest percentage of long-term unemployed in the same year was recorded in the following provinces: Wielkopolskie, Pomorskie and

Table 1  
The percentage of the long-term unemployed in the total unemployment by province in Poland in the years 2009–2012 [%]

Province	2009	2012	Increase
Poland	26.9	35.6	8.7
Łódzkie	25.7	36.5	10.9
Mazowieckie	32.3	39.4	7.1
Małopolskie	27.1	35.1	8.0
Śląskie	21.1	31.2	10.0
Lubelskie	34.1	41.4	7.3
Podkarpackie	34.2	42.9	8.7
Podlaskie	27.2	40.6	13.5
Świętokrzyskie	35.1	37.2	2.1
Lubuskie	21.4	28.1	6.7
Wielkopolskie	19.8	29.3	9.5
Zachodniopomorskie	23.7	34.5	10.7
Dolnośląskie	23.3	32.2	8.9
Opolskie	20.6	31.6	11.0
Kujawsko-Pomorskie	29.5	37.7	8.1
Pomorskie	19.9	31.1	11.2
Warmińsko-Mazurskie	26.7	34.7	8.0

Source: Registered unemployment in Poland, various editions from the years 2009–2013.

<sup>2</sup> The long-term unemployment rate is the ratio of the long-term unemployed to the total workforce.

Table 2

The structure of the long-term unemployed by sex in Poland in 2008–2012 [%]

Item	2008	2009	2010	2011	2012
Total	100.0	100.0	100.0	100.0	100.0
Men	46.5	48.0	52.2	49.6	50.1
Women	53.5	52.0	47.8	50.4	49.9

Source: as for figure 2, calculations by the authors.

Opolskie. The provinces of Wielkopolskie and Pomorskie are among the best-developed in Poland, whereas for the province of Opolskie, its location on the German border is an important factor.

The table 1 shows that the percentage of the long-term unemployed grew in all provinces in the years 2009–2012. The largest increase in the long-term unemployment during the period under study was observed in the following provinces: Podlaskie, Pomorskie and Opolskie. On the other hand, the lowest increase in the percentage of the long-term unemployed in the total unemployment was recorded in the provinces: Świętokrzyskie, Lubuskie and Lubelskie. Despite the largest increase in the percentage of the long-term unemployed during the analysed period, the provinces: Wielkopolskie, Pomorskie and Opolskie also recorded the lowest percentage of the long-term unemployed in 2012. Moreover, the provinces of Podkarpackie and Lubelskie remained regions with the highest percentage of the long-term unemployed in 2012.

Tables 2–6 present data on the structure of the long-term unemployed by selected social and demographic features. The structure of the unemployment was determined from annual average data from BAEL.

Table 2 indicates that during the analysed period, the structure of the long-term unemployed changed. In the period of 2008–2009 and in 2011, women accounted for the majority of the long-term unemployed. In the other years, men were a majority of the long-term unemployed.

An analysis of the structure of the long-term unemployed indicates the following conclusions (see Table 3). In 2008, the highest percentage of the long-term unemployed were people aged 45 to 55 years, whereas in 2012, those were people aged 25–34. It is a cause for concern that this percentage of the unemployed remained high in the group during the entire period. People at the age of 55 and above accounted for the smallest percent of the long-term unemployed in 2008–2012. The low proportion of the group in the long-term unemployment is a consequence of the fact that the professional activity of the people in this age group is low. If they lose a job, people in this age group do not have much chance to find a new one.

Table 3

The structure of the long-term unemployed by age in Poland in 2008–2012 [%]

Age	2008	2009	2010	2011	2012
Total	100.0	100.0	100.0	100.0	100.0
Under 24	16.0	16.2	14.4	16.1	17.1
25–34	27.1	27.0	29.0	28.7	28.7
35–44	20.9	20.1	19.7	20.4	20.5
45–55	27.7	27.5	25.7	24.0	21.5
55 and more	8.3	9.2	11.2	10.8	12.2

Source: as for figure 2, calculations by the author.

Table 4

Structure of the long-term unemployed by education in Poland in 2008–2012 [%]

Education	2008	2009	2010	2011	2012
Total	100.0	100.0	100.0	100.0	100.0
University	7.5	10.2	9.2	12.1	12.6
Post-secondary	3.9	4.2	3.5	3.4	4.0
Secondary vocational	21.2	20.1	23.1	21.7	19.2
Secondary general	9.4	10.3	10.1	10.5	11.6
Vocational	38.1	35.5	37.2	34.9	35.6
Junior high, primary, incomplete primary	19.9	19.7	16.9	17.4	17.0

Source: as for figure 2, calculations by the author.

The data on the structure of the long-term unemployed by education indicate that people with post-secondary education accounted for the smallest portion of the long-term unemployed. As university education is becoming increasingly common, post-secondary education enjoys less and less popularity among secondary school graduates. People with university and general secondary education accounted for a small percent of the long-term unemployed. However, although the portion of the people with general secondary education increased by 1% between 2008 and 2012, the proportion of the long-term unemployed increased by 2.2% during that time, which is a sign that the university education system should be better adapted to the labour market needs.

It is noteworthy that people with vocational and secondary vocational education dominated among the long-term unemployed in all the years under study. These two groups accounted for more than half of all the long-term unemployed.



Table 5  
Structure of the long-term unemployed by the education profile in Poland in 2008–2012 [%]

Item	2008	2009	2010	2011	2012
Total	100.0	100.0	100.0	100.0	100.0
Teachers' education and pedagogy	1.6	1.6	1.5	2.2	2.6
Humanities, linguistics and art	1.9	2.4	1.8	1.9	1.3
Social sciences: economics and law	11.1	14.0	14.1	16.2	15.7
Science: mathematics and computer science	2.9	2.2	3.2	2.6	2.3
Engineering, production processes and construction	33.0	34.1	40.5	36.6	36.2
Agriculture and veterinary medicine	5.5	4.8	4.6	4.3	3.9
Healthcare and welfare	1.4	1.9	1.1	1.2	1.7
Services	13.6	9.4	6.3	7.2	7.9
General syllabus	29.0	29.6	26.9	27.8	28.4

Source: as for figure 2, calculations by the author.

Table 5 indicates that people who graduated from schools teaching engineering, production processes, construction and general syllabuses accounted for the greatest portion of the long-term unemployed in all the years under study. The proportion of the long-term unemployed who graduated from economics or law faculties increased throughout the entire period. This indicates that the labour market was saturated. People who graduated from schools teaching health care and welfare accounted for the smallest portion of the long-term unemployed. There was a decreasing tendency (with fluctuations) in the percent of the long-term unemployed qualified in service-related provisions.

## The econometric model and its estimates

In order to estimate the probability of being unemployed for a long time, the unemployed population was divided into two categories: long-term unemployed – people staying out of work for more than 12 months (they were assigned the value of 1) and the unemployed staying out of work for less than 12 months (they were assigned the value of 0).

The probability that an individual with a feature  $x_i$  will remain out of work for more than 12 months can be expressed by the following formula (see CHOW 1995, p. 310):

$$P_1(x_i) = P_{1i} = \frac{e^{\beta'x_i}}{e^{\beta'x_i} + 1} \quad (1)$$

where:

$x_i$  – vector of explaining variables,

$\beta$  – vector of the structural parameters of the logit function.

The vector of explaining variables covers demographic, social and economic features of the individuals under study: age, education, sex, marital status, place of residence, threshold wage and the period of seeking a job. The variables were chosen based on the theoretical knowledge about the factors which increase the risk of being unemployed for a long time.

After a transformation, the formula (1) will have the following form:

$$\ln \frac{P_{1i}}{1 - P_{1i}} = \beta'x_i \quad (2)$$

In order to formulate a function to describe the reliability of a sample, let us introduce an artificial variable:  $f_{1i}$  equal to 1, when the  $i$ -th individual is unemployed for a long time, and equal to 0 when the individual is unemployed for less than 12 months. The reliability function for a  $n$ -element sample is described by the equation (3):

$$L = \prod_{i=1}^n P_{1i}^{f_{1i}} (1 - P_{1i})^{1 - f_{1i}} \quad (3)$$

The unknown structural parameters ( $\beta$ ) of the logit model are estimated by the highest reliability method. Our analyses employed the Stata program.

Table 6 presents estimates of odds ratio for remaining unemployed for a long time in selected groups of workforce in Poland in 2010. The value of an odds ratio higher than 1 means that the probability of remaining unemployed for a long time for a group is higher compared to the base category. For example, the estimated value of 0.393 for people aged under 24 (column 2 in table 6) means that for those people, the probability of them remaining unemployed for a long time will be lower by 60.7 compared to individuals in the base category (i.e. people aged 35–44). The shaded estimate values in all the tables are insignificant at the level of significance of 0.05.

Table 6  
Estimates of the odds ratio of being long-term unemployed in Poland in Q4 2010

Item	Odds ratio	<i>t</i> -Student statistics
Age (base category: people aged 35 to 44)		
Under 24	0.393	-7.88
25–34	<b>0.901</b>	<b>-1.00</b>
45–54	1.585	4.47
55 and more	1.616	3.79
Education (base category: people with the vocational education)		
University	0.606	-4.01
Post-secondary and vocational secondary	<b>0.924</b>	<b>-0.90</b>
General secondary	0.711	-2.80
Junior high, primary and incomplete primary	<b>1.141</b>	<b>1.33</b>
Marital status (base category: single)		
Married	0.857	-2.01
Sex		
Male	1.014	0.21
Type of place of residence (base category: village)		
Town	<b>0.938</b>	<b>-0.92</b>

Number of observations: 4,188

Log likelihood: - 2,582.59

Sources: authors' calculations based on individual data from BAEL, Q4 2010.

Table 6 shows that young people (under 24 years old) were threatened with long-term unemployment to the least extent compared to the base category. Young people are the most mobile on the labour market, therefore they are not as threatened with long-term unemployment as other people<sup>3</sup>.

For people at the age of 45–54, the probability of becoming unemployed for a long time was 58.5% higher than the base category. In turn, the odds of people at the age of 55 and more remaining out of work for a long time were 61.6% higher compared to the base category. Labour offices need to focus more on the oldest unemployed people as targets of activation programs.

Among all the categories of education, people with university education were the least threatened with long-term unemployment compared with vocational education. The probability of the former remaining unemployed for a long time was lower by 39.4% compared to the base category. Moreover, people with general secondary education were less threatened with being long-term unemployed than those with vocational education. The majority of

<sup>3</sup> Similar findings were obtained by E. Kwiatkowski and L. Kucharski in 2006 (see Kwiatkowski, Kucharski, 2009).

people with general secondary education usually decide to go to university, hence the risk of long-term unemployment is lower.

Among the groups for whom the probability of long-term unemployment is lower than for the base category are married people. Having to provide for their families makes them seek jobs more actively and accept even unattractive job offers.

## Conclusions

These analyses indicate the following conclusions.

First, long-term unemployment is an important factor for the macroeconomy. An increase in the percentage of the long-term unemployed leads to an increase in the unemployment equilibrium and an increase in the wage pressure in the economy. As they lose part of their qualifications, the long-term unemployed have less chance of finding a job.

Second, an economic downturn in Poland has resulted in an increase in the long-term unemployment. The number of the long-term unemployment increased more than twofold in the years 2009–2012.

Third, categories of people with the lowest percent in the group of the long-term unemployed included: people under 25 and over 55, with post-secondary, general secondary and university education, qualified in healthcare and welfare-related jobs. It is noteworthy that the percentage of the long-term unemployed with university education has increased.

Fourth, people at the ages of 25–34 and 45–55 with vocational education, whose education is associated with engineering, production processes, construction and general syllabuses accounted for the highest percentage of the long-term unemployed.

Fifth, econometric analyses show that people aged 55 and above and 45–55 were the most threatened with long-term unemployment. Groups most threatened with long-term unemployment also include people with vocational education and singles. Groups which were the least threatened with long-term unemployment included people under 24, with university and general secondary education.

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