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Article

Long-term unemployment in Poland in the years 1995-2007

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Eugeniusz Kwiatkowski, Leszek Kucharski

Long-term unemployment in Poland in the years 1995-2007

Abstract

This study analyses trends in the long-term unemployment in Poland, as well as its structure and macroeconomic importance for both equilibrium unemployment and the efficacy of anti-inflationary policy. It combines a theoretical part with discussion based on the statistics on the Polish economy for recent years.

As shown by the theoretical analysis, long-term unemployment weakly eases wage pressure exerted by workers, so a larger percentage of the long-term unemployed lifts equilibrium unemployment to a higher level and makes anti-inflationary policy less effective.

The empirical analyses of the Polish economy indicate that the duration of unemployment is a factor that significantly shapes the probability of finding a job. The hypothesis that the rates of worker flows from the stock of unemployment to the stock of employment are much lower in the case of the long-term unemployed persons than for the short-term unemployed has been corroborated.

The statistical data on the Polish economy show that the country's long-term unemployment is relatively large. To curb the negative macroeconomic impacts of this type of unemployment, its scale needs to be reduced. It is also necessary to increase the rate of long-term unemployed workers using the active labour market programmes.

1. Introduction

An important feature of the stock of unemployment is its duration, especially in analyses of unemployment impacts. A relatively large number of persons entering the stock of unemployment and staying there for a relatively short period can give rise to the same level of unemployment as a comparatively limited number of persons losing jobs for a long time. In the latter case, we deal with a stagnant stock of unemployment, where a relatively small group of persons remains jobless for quite long periods. This case, involving the existence of a relatively large number of the long-term unemployed (i.e. persons who are jobless longer than 12 months), generates a range of significant macroeconomic consequences. Being able to recognize them has an important practical meaning, especially for improving the efficacy of policies aimed at fighting unemployment and inflation.

This paper discusses long-term unemployment in Poland. In particular, it focuses on its trends, structure and macroeconomic impacts, as well as highlighting equilibrium unemployment and the efficacy of anti-inflationary policy. Its content refers to the hypothesis according to which reduced long-term unemployment not only improves the labour market situation without amplifying inflationary pressure, but also makes macroeconomic policy more effective in fighting inflation. The presented discussion is partly theoretical and partly uses the statistical data on the Polish economy for recent years. Special attention is paid to the statistics derived from labour force surveys conducted in Poland in the years 1995-2007.

The remainder of the paper has been structured as follows. Part 2 is a theoretical presentation of the role of long-term unemployment as a factor determining equilibrium unemployment and the effectiveness of anti-inflationary policy. Part 3 analyses the trends and structure of long-term unemployment in Poland. Part 4 examines the relationships between the duration of unemployment and individual's odds of finding a job as observed in the Polish economy. Part 5 deals with the relationship that linked long-term unemployment and equilibrium unemployment in the Polish economy in the years 1993-2005. Part 6 refers to the possibility of reducing long-term unemployment by involving workers in the active labour market programmes. In this context, the probability estimates of becoming long-term unemployed and a trainee are compared against individuals' demographic, social and economic features. Part 7 provides a summation and conclusions.

2. The macroeconomic aspect of long-term unemployment

When we analyse the macroeconomic significance of long-term unemployment, the overall effects of unemployment are worth highlighting. Because of its various and far-reaching consequences, unemployment has been in the centre of economic, social and political debates for long years. These consequences have their economic and social dimensions, but particularly sociological and psychological dimensions. Considering the economic effects of unemployment, it is worth stressing that:

- unemployment translates into output loss, because of underutilised labour force and depreciating human capital in the period of occupational inactivity,
- unemployment impairs the economic situation of the unemployed themselves and their families, because unemployment is a period of declining income,
- unemployment is detrimental to the condition of the national budget, unemployment increases potential workers' rivalry for jobs, boosting the motivation for seeking educational opportunities and investing in human capital,
- because unemployment determines the impact of wage pressures, it plays a significant role in shaping the dynamism of inflationary processes and the effectiveness of anti-inflationary policy (Kwiatkowski, 2002, pp. 78-86).

The structure of unemployment and particularly the proportion of long-term unemployment are crucial to all the consequences it generates. Firstly, as far as unemployment effect on lower output is concerned, we must stress that a higher percentage of the long-term unemployed workers makes output losses bigger, because such workers lose a large portion of their human capital. Secondly, the longer duration of unemployment, the more detrimental it becomes to the economic situation of the unemployed and their families, because the time-limited entitlement to drawing unemployment benefits lowers the compensation ratio for the entire period of unemployment. Thirdly, the national budget suffers more severely when the rate of long-term unemployment goes up; its higher values both decrease budget revenues and increase budget expenditures (allocated to finance occupational activation and social aid). Fourthly, the influence of long-term unemployment on the competition for jobs (either positive or negative) is largely determined by factors such as the scale of human capital depreciation among the long-term unemployed, the decline in

their reservation wage, amounts spent on education and improvement of qualifications. Because the long-term unemployed persons lose a considerable portion of their human capital (depreciation), their growing share in total unemployment can adversely affect the competition for jobs. Fifthly, long-term unemployment is important as a factor affecting inflation and the effectiveness of anti-inflationary policy. Because the mechanism underlying this influence is rather complex, let us consider the last point more in-depth.

From equilibrium unemployment theory¹ it follows that actual unemployment falling below the level of equilibrium unemployment accelerates inflationary processes in the economy; on the other hand, if actual unemployment grows in excess of equilibrium unemployment, then the inflationary processes slow down. This suggests that appropriately restrictive macroeconomic policy (and especially monetary policy), implying the emergence of actual unemployment surplus over equilibrium unemployment, is necessary to reduce inflation. However, the same relationships allow drawing another conclusion, that anti-inflationary policy could be made more effective (as measured by inflation decline) with the same degree of restrictiveness, if the level of equilibrium unemployment were lower. In these circumstances, we need to ask the questions about factors determining the level of equilibrium unemployment and the ways in which long-term unemployment affects its evolution.

The NAIRU theory explains that the level of equilibrium unemployment is at the point where the realistic wages, i.e. wages affordable for the potential of the economy (mainly determined by labour productivity), meet the targeted wages. The latter are shaped by several factors, such as the rate of unemployment, the share of long-term unemployment in total unemployment, the generosity of the system paying unemployment benefits, the power of the trade unions, the intensity of searching for jobs and the size of structural gaps separating labour supply and labour demand (Kwiatkowski, 2002, pp. 149-152).

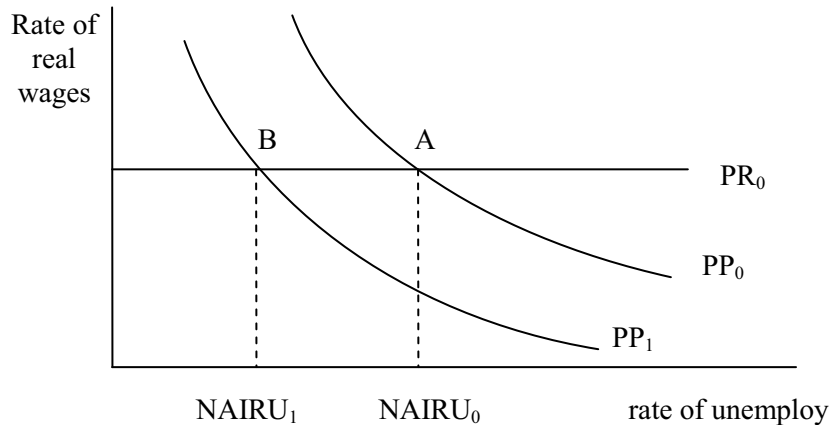
The search for the level of equilibrium unemployment is illustrated in graph 1, where the straight line PR_0 stands for the existing level of realistic wages and the curve line PP_0 shows the targeted real wages as a diminishing function of the rate of unemployment. The latter curve is plotted *ceteris paribus*, i.e. assuming that all other determinants of the targeted wages are stable, including the level of long-term unemployment. The NAIRU equilibrium

¹ That is the theory of the natural rate of unemployment proposed by M. Friedman and E. S. Phelps and the NAIRU theory developed by R. Layard, S. Nickell and R. Jackman. The theories are discussed more broadly in Kwiatkowski, 2002, pp. 140-154.

unemployment is given at the intersection of the realistic wages PR_0 and the targeted wages PP_0 (point A).

A change in the size of long-term unemployment affects the size of equilibrium unemployment, mainly by influencing the targeted real wages. The mainspring of this mechanism is depreciating human capital of persons remaining jobless for a longer period. Having lower levels of qualifications and skills, these unemployed are less likely to find jobs, as indicated by theory of job search. It is unrealistic to assume that their reservation wage will be sufficiently reduced, to more than compensate for the depreciation of human capital. Another factor diminishing the long-term unemployed persons' chances of finding jobs is the attitude of employers recruiting workers. They frequently take longer periods of unemployment as a negative screening criterion. This approach affects the job-seeking activity of the long-term unemployed persons. Discouraged by a lengthy and futile quest for jobs, they frequently continue their efforts with less commitment (Layard, Nickell, Jackman, 1991, pp. 236-238). As a result, they can hardly compete with the economically active persons and the short-term unemployed for jobs. For this reason, the long-term unemployed persons weakly ease the pressure on wage increases exerted by the economically active part of population.

A changing size of long-term unemployment can be graphically illustrated as a shift of the curve representing the targeted real wages PP_0 (see chart 1). When long-term unemployment goes up or down, the curve moves, respectively, rightward or leftward. According to chart 1, a decline in long-term unemployment – the curve of the targeted real wages shifts then to PP_1 – makes equilibrium unemployment drop to the $NAIRU_1$ level. This drop means that a surplus of actual unemployment over equilibrium unemployment – this surplus is necessary under the NAIRU theory to bring inflation down – is achievable with a lower level of total unemployment. Then inflation can be reduced at a lower social cost, i.e. unemployment. Further, a drop in equilibrium unemployment also means that with a given degree of macroeconomic policy restrictiveness we can have larger reduction in inflation, thus making anti-inflationary policy more effective.

Chart 1. Determinants of the NAIRU equilibrium unemployment

Source: the own elaboration.

The new Keynesian economics emphasises the impact of fluctuations in the overall economic activity (including fluctuations in the total demand for commodities) on equilibrium unemployment, which is transmitted via the mechanism of hysteresis. According to this approach, the NAIRU equilibrium unemployment depends not only on the existing level of real factors affecting equilibrium unemployment, but also on the levels of actual unemployment observed in the previous periods. It follows from the concept of hysteresis that a short-lived economic recovery cannot make up the effects of deep recession overnight. Considering the aforementioned role of long-term unemployment, an improving economic cycle does not necessarily have to entail a fast decline in unemployment. Depreciated human capital of the long-term unemployed workers and consequently their lower skills do not allow them to find new jobs quickly (Kwiatkowski (2002), pp. 153).

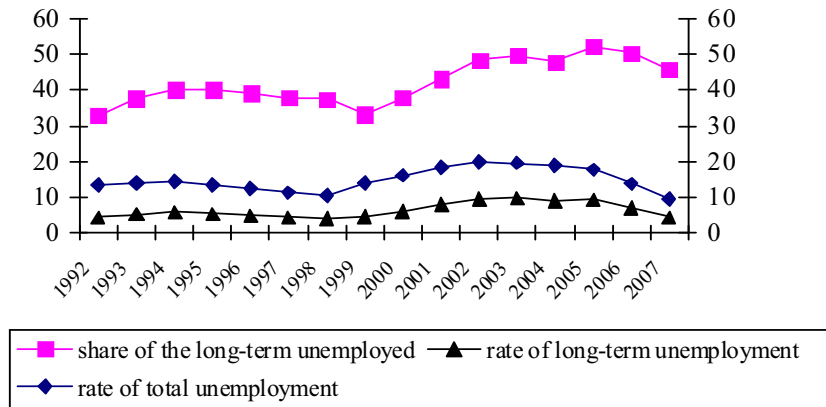
3. The trends and structure of long-term unemployment

The question arises whether the main findings on the role of long-term unemployment derived from the above theory are true for the economic circumstances in Poland. It is particularly important to ask whether the assumption that the long-term unemployed workers weakly reduce the pressure

on wage increases, unlike the short-term unemployed workers, is a correct one. Before the question can be answered, let us look at the trends and structure of long-term unemployment in Poland.

Graph 1 illustrates the rates of total unemployment and long-term unemployment, as well as the shares of long-term unemployment between 1992 and 2007. According to the graph, the changes in the rate of long-term unemployment, observed in the investigated period, actually corresponded to the changes in the rate of total unemployment. Only in the last years, the rate of long-term unemployment was falling more slowly than the rate of total unemployment. As a result, the share of long-term unemployment in total unemployment, growing throughout the period in question, began to shrink from 2006 (the share was the highest in 2005 – 52.2%), falling to 45% in the year 2007.

Graph 1. The rates of total unemployment and long-term unemployment, and the share of the long term unemployed in total unemployment, years 1992-2007 (%)



Source: websites www.stat.gov.pl and www.psz.praca.gov.pl, and Poland's Labour Force Survey, quarters I-IV, 2007, GUS, Warsaw.

The similarity of trends shown by the rates of total unemployment and long-term unemployment seems to suggest the operation of hysteresis mechanisms related to the depreciation of human capital. It is worth noting that after a period in which the share of long-term unemployment was relatively stable (1993-1998), its rate increased dramatically between 1999 and 2005.

The data in table 1 characterise the structure of the long-term unemployed persons, which helps establish their profiles. Comparing these unemployed with

the structure of the short-term unemployed (to six months), we can identify the distinctive features of the long-term unemployed. According to the data, most long-term unemployed persons can be found in older age groups (45-54 years), while younger persons predominate among the short-term unemployed. Regarding the level of education, most long-term unemployed persons have basic vocational education, elementary education and secondary vocational education. Characteristically, persons with basic vocational education are the most numerous also among the short-term unemployed, but their share in this type unemployment is significantly smaller than in long-term unemployment.

Another interesting finding is that persons with tertiary education represent a relatively large proportion of the short-term unemployed, but they become long-term unemployed relatively rarely.

Table 1. The structure of the long-term and short-term unemployed according to selected characteristics, 4th qr. 2007 (%)

| Specification | Share in total unemployment to 6 months | Share in total unemployment exceeding 12 months |
|---|---|---|
| Sex: | | |
| Males | 49.5 | 49.4 |
| Females | 50.5 | 50.6 |
| Place of residence: | | |
| Towns | 63.9 | 67.5 |
| Rural areas | 36.1 | 32.5 |
| Age: | | |
| 15-19 years | 4.7 | — |
| 20-24 | 28.4 | 15.6 |
| 25-29 | 20.7 | 14.1 |
| 30-34 | 10.8 | 15.1 |
| 35-44 | 14.0 | 17.5 |
| 45-54 | 15.0 | 28.3 |
| 55-74 | 6.4 | 8.8 |
| Level of education: | | |
| Tertiary | 16.6 | 7.2 |
| Post secondary | 4.0 | 4.2 |
| Secondary vocational | 24.9 | 19.9 |
| Secondary general | 12.0 | 11.2 |
| Basic vocational | 32.1 | 38.4 |
| Junior secondary, primary and incomplete primary | 10.4 | 19.1 |
| Type of completed education: | | |
| Teaching and pedagogy | 2.6 | 1.6 |
| Humanities, linguistics and the arts | 2.5 | - |
| Social sciences, economics and law | 12.6 | 10.9 |
| Exact sciences, mathematics and informatics | 4.9 | 2.9 |
| Engineering, manufacturing processes and building | 34.0 | 34.4 |
| Agriculture and veterinary science | 3.3 | 5.0 |
| Health and welfare | 3.0 | - |
| Services | 14.5 | 13.8 |
| General curricula | 22.6 | 30.2 |
| Unknown | - | - |
| Duration of employment in the last workplace | | |
| to 1 year | 59.4 | 40.4 |
| 2 – 5 years | 23.3 | 29.9 |
| 6 – 9 years | 5.2 | 8.3 |
| 10 years or more | 12.1 | 21.3 |

Source: Poland's Labour Force Survey, IV qt. 2007, GUS, Warsaw 2008.

The data on the types of unemployed persons' completed education offer some interesting conclusions. A large part of the long-term unemployed graduated from majors related to engineering, building, manufacturing processes and general courses, whereas relatively few of them completed humanities, pedagogy, exact sciences, mathematics and informatics. Characteristically, the educational structure of the short-term unemployed resembles the structure of the long-term unemployed. It can therefore be concluded that the type of completed education has basically no effect on the duration of unemployment.

Comparing the structures of short-term unemployment and long-term unemployment with respect to the duration of employment in the last workplace we clearly see that the number of years worked similarly affects both these structures. In both cases, the majority are persons who worked relatively short periods (especially to 1 year). Therefore, the more experienced workers have better chances of getting jobs.

4. The duration of unemployment and the odds of finding a job

Let us now ponder on the question if the Polish economy data confirm the hypothesis that long-term unemployment can ease wage pressures.

Given the diversity of factors that can determine wage changes, a direct measurement of the influence exerted by long-term unemployment on wage pressures is extremely difficult or even impossible. In this situation, the significance of long-term unemployment will be verified by comparing employment odds for persons remaining jobless to 6 months and those unemployed longer than 12 months.

The likelihood of unemployed persons' finding jobs can be estimated by means of outflow rates for persons moving from unemployment to employment. The aggregate rate of outflow from unemployment to employment (bz) is given as a ratio of persons who moved from unemployment to employment in the period in question (BZ) to the stock of unemployment in the initial period (B). This can be written as:

$$bz = \frac{BZ}{B} \cdot 100\% \quad (1)$$

The outflow rates can also be calculated for groups of unemployed workers distinguished by sex, age, education or period of unemployment. For instance, in the case of males remaining jobless to 6 months (bz_{mk}), the outflow rate from unemployment to employment can be calculated as a percentage ratio

of the flow of such males who joined the stock of employment (BZ_{mk}) in the period in question to their stock in the initial period (B_{mk}), which can be written as follows:

$$bz_{mk} = \frac{BZ_{mk}}{B_{mk}} \cdot 100\% \quad (2)$$

The outflow rates from unemployment to employment can be calculated analogously for other groups of unemployed persons. Interestingly, the presented outflow rates can be interpreted as the probability that particular groups of the unemployed persons will find jobs.

Table 2. The average outflow rates from unemployment to employment for the groups of short-term and long-term unemployed persons in Poland in 2005 (%)

| Groups of unemployed persons | Outflow rates for persons unemployed to 6 months | Outflow rates for persons unemployed over 12 months |
|--|--|---|
| Total | 14.75 | 6.85 |
| Females | 11.98 | 5.78 |
| Males | 17.08 | 8.00 |
| Urban areas | 14.19 | 6.68 |
| Rural areas | 15.52 | 7.11 |
| Aged to 24 years | 13.11 | 8.77 |
| Aged 25-39 years | 16.99 | 7.52 |
| Aged 40-54 years | 13.46 | 5.44 |
| Aged 55 years and older | 15.28 | 6.24 |
| Tertiary education | 25.73 | 6.19 |
| Post secondary and secondary vocational education | 13.84 | 8.02 |
| Secondary general education | 10.66 | 4.64 |
| Basic vocational education | 14.37 | 7.80 |
| Junior secondary, primary and incomplete primary education | 12.91 | 4.60 |
| Reservation wage to 1000 Zł | 11.85 | 5.40 |
| Reservation wage 1000-2000 Zł | 15.63 | 8.07 |
| Reservation wage above 2000 Zł | 18.33 | 10.37 |

Source: 2005 LFS individual data; authors' calculations.

Table 2 presents the rates of worker outflows from unemployment to employment calculated using individual data derived from the labour force survey conducted in Poland in 2005. The rates were calculated for the selected groups of unemployed persons divided into short-term unemployment (to 6 months) and long-term unemployment. The numbers should be viewed as averaged indicators for the year 2005, as we used the arithmetic averages of three rates of outflows, i.e. outflows taking place between the quarters I-II, II-III, and III-IV.

Table 2 offers several important conclusions. Firstly, the total rate of outflow from unemployment to employment is much higher for persons remaining jobless to 6 months than for the long-term unemployed. This confirms the earlier hypothesis that the jobless persons' odds of finding employment are the smaller, the longer the period out of work. Secondly, the above regularity indicating a connection between the rate of outflow from unemployment to employment, on one hand, and duration of unemployment, on the other, concerns not only the entire population of unemployed persons, but also their smaller groups distinguished based on criteria such as sex, place of residence, age, education or reservation wage. Thirdly, the distinguished groups of the long-term unemployed have significantly different employment odds. Among the long-term unemployed, females are less likely to find jobs than males, urban residents than rural population, older persons than younger persons, and less educated persons than those with higher levels of education. Fourthly, the rates of outflows from unemployment to employment allow identifying groups of persons at greatest risk of long-term unemployment. These groups include females, persons aged 40 years and older, persons with primary, junior secondary, incomplete primary and secondary general education.

Outflow rates estimated vis-à-vis the reservation wage level provide rather surprising outcomes. On one hand, outflow rates from unemployment to employment were invariably lower for the long-term unemployed than the short-term unemployed, which is consistent with our earlier theory. On the other hand, though, it is quite surprising that the rates were higher for groups of persons receiving higher reservation wage. A likely explanation of this fact is that higher reservation wage is usually paid to persons with higher education and higher qualifications, which may improve their employment odds. It is also worth noting that the estimates of the outflow rates for this group of persons can be biased, because its size is relatively small.

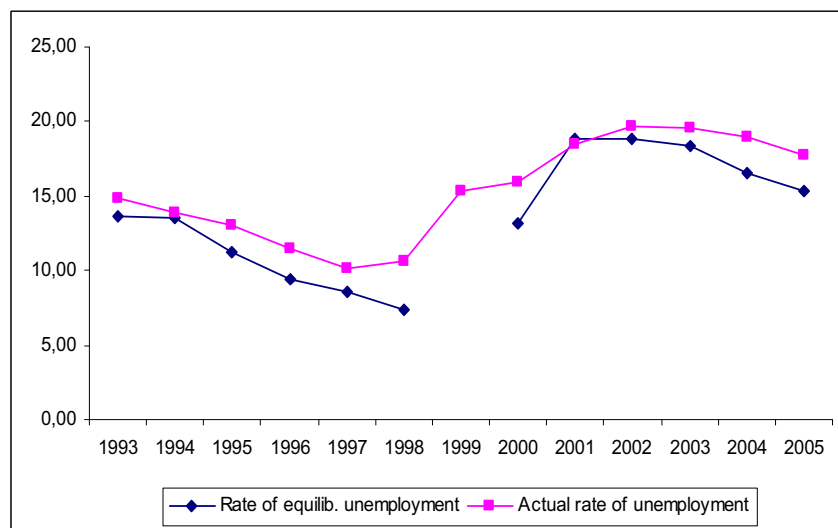
The above estimates of the outflow rates from unemployment to employment indicate that extending period of unemployment does reduce the likelihood of finding a job in Poland. It is therefore reasonable to assume that the long-term unemployed cannot compete for jobs against the employed and

short-term unemployed persons as equally suitable applicants. This brings us to the conclusion that the long-term unemployed probably ease the pressure on wage increases much less effectively than the short-term unemployed do. A large proportion of long-term unemployment is likely to set equilibrium unemployment at a higher level.

5. Long-term unemployment and equilibrium unemployment

Let us analyse now the relationship linking long-term unemployment and equilibrium unemployment. It has already been stressed that, according to economic theory, a growing number of the long-term unemployed can increase equilibrium unemployment, because long-term unemployment does not help ease wage pressures.

Chart 2. The actual rate of unemployment and the rate of equilibrium unemployment in Poland, years 1993 – 2005



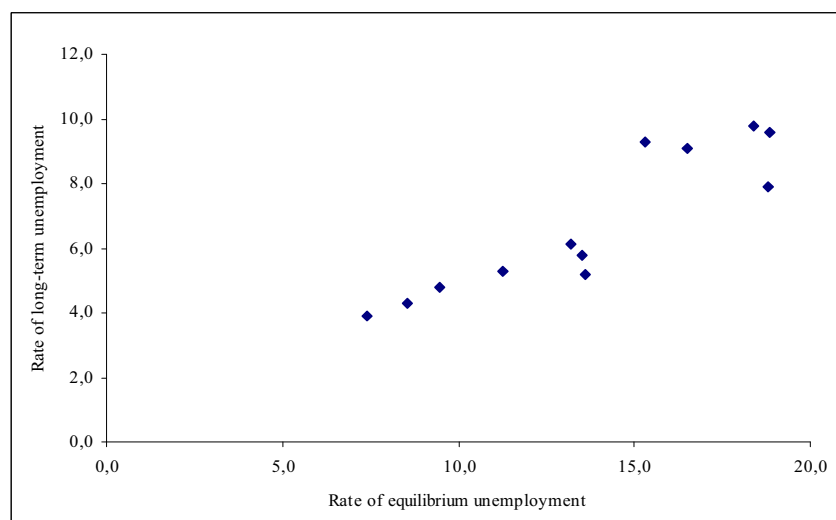
Source: LFS individual data for the years 1993-2005 and various editions of Poland's Labour Force Surveys from the years 1995-2007, authors' calculations.

Let us first analyse the relations linking the actual rate of unemployment and the rate of equilibrium unemployment. The data on the level of equilibrium unemployment as presented in this paper were estimated using the flow method,

explained in the book by M. Socha and U. Sztanderska (Socha, Sztanderska, 2000, p. 152).

The rates of equilibrium unemployment were calculated as the arithmetic averages of the quarterly rates of equilibrium unemployment.

Chart 3. Long-term unemployment and equilibrium unemployment in Poland, years 1993-2005



Source: see chart 2, authors' calculations.

From chart 2 it follows that between 1993 and 2005 the actual rate of unemployment and the rate of equilibrium unemployment moved in the same direction². Both the rates were dropping in the years 1993-1998, with the actual rate of unemployment being larger than the rate of equilibrium unemployment. This seems to suggest that macroeconomic policy implemented from 1993 to 1998 was overly restrictive.

In the period 2000-2003, the slackening business cycle substantially increased unemployment in Poland. Equilibrium unemployment also grew considerably in that period. The actual rate of unemployment exceeded the level of equilibrium unemployment in the years 2000 and 2002, which can be deemed another indication of too restrictive macroeconomic policy, although in 2002 the

² Because the labour force surveys were interrupted in 1999, the data on the level of equilibrium unemployment in that year are not available.

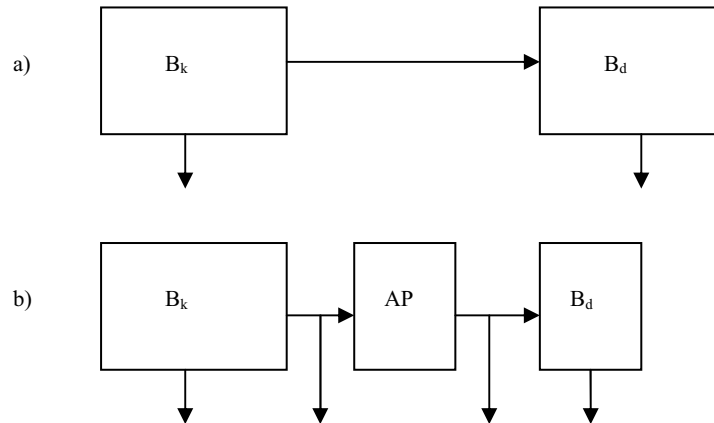
two rates were not significantly different. Also in the period 2003-2005, the actual rate of unemployment was larger than the rate of equilibrium unemployment.

The relationship between the rates of long-term unemployment and the rates of equilibrium unemployment is illustrated by chart 3. According to this chart, in the investigated period the level of equilibrium unemployment and the rate of long-term unemployment were correlated strongly and positively. Two groupings of points can be seen on the chart. One of them (closer to the origin of coordinates) refers to the first years of the transitional period, when relatively low rates of long-term unemployment co-existed with relatively low rates of equilibrium unemployment. The other group of points shows the years 2000 - 2005, when higher rates of long-term unemployment were accompanied by higher levels of equilibrium unemployment. Chart 3 confirms the earlier formulated hypothesis that the rates of long-term unemployment and equilibrium unemployment are interrelated.

6. Long-term unemployment and the take-up of active labour market programmes

The above discussion indicates that the recommendable line of action should reduce the size of long-term unemployment. There are a number of measures that can be instrumental in attaining this goal. One of the basic approaches improves employability by involving the unemployed in the active labour market programmes, particularly training and temporary employment schemes. The effect of the active programmes used by the unemployed on long-term unemployment can be illustrated graphically (see graph 2).

Graph 2. Participation in the active labour market programmes and long-term unemployment



Source: the own elaboration.

Graph 2 presents one case (a) where all jobless workers leaving short-term unemployment (B_k) are assumed to join the stock of long-term unemployment (B_d). By contrast, in the other case (b), the short-term unemployed participate in the active labour market programmes (AP) for some time. Owing to this participation and improved employability, some of the participants take steady jobs. This makes the stock of long-term unemployment (B_d) shrink.

The numbers of unemployed persons taking advantage of the active programmes have been relatively low in Poland so far. In 2006, slightly more than 600,000 unemployed persons accepted such programmes (intervention works, public works, training, job clubs and job placement services), i.e. only ca 26% of all the unemployed. Although the long-term unemployed used the programmes too, they constituted only 19% of all long-term unemployed persons (see: *Bezrobotni pozostający bez pracy powyżej 12 miesięcy. Analiza zmian w latach 1993-2006*, 2007). These numbers suggest that the active labour market programmes should cover a much larger proportion of the unemployed persons, including the long-term unemployed.

It is important for the active labour market programmes to be correctly targeted. In particular, such programmes should cover persons at greatest risk of unemployment, including its long-term variant. In this context, let us explore whether the programmes in Poland were suitably targeted, and especially, whether their coverage of the long-term unemployed was satisfactory.

To find the answers, let us estimate the odds ratio of becoming a long-term unemployed person and of becoming a trainee against a range of selected characteristics of individuals surveyed in 2006 (data on individuals' participation in other active labour market programmes are not available). The econometric analysis uses data on individuals derived from labour force surveys conducted in Poland. In both models, the sample comprised 12,825 individuals.

A so-called logit model was applied to analyse factors determining the odds of becoming a long-term unemployed person and a trainee. The unemployed population was broken down into two categories: the long-term unemployed, i.e. persons remaining jobless longer than 12 months (these were assigned the value of 1) and persons unemployed to 12 months (their value was 0). The second estimated model distinguished between persons who accepted training provided by labour offices and others.

Let us consider the likelihood of an event that an individual with characteristics x_i will remain jobless for a period exceeding 12 months (or will be admitted to a training course in the second model). This likelihood can be represented by equation (3) (Chow G. C., 1995, p. 310):

$$P_1(x_i) = P_{1i} = \frac{e^{\beta'x_i}}{e^{\beta'x_i} + 1} \quad (3)$$

where:

x_i – the vector of explanatory variables,

β – the vector of the logit function parameters.

The vector of the explanatory variables stands for the demographic, social and economic characteristics of the investigated individuals, such as age, educational attainment, sex, marital status, place of residence, reservation wage level and the period of searching for a job. The authors chose the variables based on their theoretical knowledge of factors increasing the risk of becoming a long-term jobless person.

Transforming equation (3), we obtain:

$$\ln \frac{P_{1i}}{1 - P_{1i}} = \beta'x_i \quad (4)$$

To generate the function describing sample reliability, we introduce a dummy variable $f_{1i} = 1$ for the i -th individual being a long-term unemployed

person or equal 0, if unemployed shorter than 12 months³. The reliability function for an n-element sample is given by equation (5):

$$L = \prod_{i=1}^n P_{li}^{f_{li}} (1 - P_{li})^{1-f_{li}} \quad (5)$$

The unknown structural parameters (β) of the logit model are estimated using the maximum likelihood method (MLM). Our analyses were performed using the software package Stata 6.0.

Table 3 presents the estimated odds ratios of becoming a long-term unemployed person by labour force segment in Poland in 2006. An odds ratio higher than 1 means that a given group is at higher risk of such an event than the base category members are. For instance, an estimate of 0.457 for persons under 24 years of age (column 2, table 3) indicates that the odds for such persons of becoming long-term unemployed were smaller by 54.3% compared with persons in the base category. In all tables in this section, the shaded estimates are statistically insignificant at the significance level of 0.05.

³ The digit of 1 used in the second model means that a given individual accepted labour office training, while 0 stands for non-participation.

Table 3. Odds ratios of becoming a long-term unemployed person estimated for Poland in 2006

| Specification | Odds ratio | t-Student |
|--|------------|-----------|
| Age (base category: persons aged 35-44 years) | | |
| To 24 years | 0.457 | -12.66 |
| 25 - 34 years | 0.848 | -2.98 |
| 45 - 54 years | 1.180 | 3.01 |
| 55 and older | 1.029 | 0.32 |
| Education (base category: persons with basic vocational education) | | |
| Tertiary | 0.484 | -9.44 |
| Post-secondary and secondary vocational | 0.783 | -5.20 |
| Secondary general | 0.798 | -3.42 |
| Junior secondary, primary and incomplete primary education | 1.099 | 1.81 |
| Level of reservation wage | | |
| To 1000 Zł | 1.190 | 4.40 |
| 1001-1600 Zł | 1.025 | 0.32 |
| 2001 Zł and more | 0.798 | -1.55 |
| Marital status (base category: unmarried male or female) | | |
| Married persons | 0.927 | -1.74 |
| Sex | | |
| Males | 0.843 | -4.45 |
| Class of locality (base category: rural area) | | |
| Towns | 1.048 | 1.26 |

No. of observations: 12,825

Log likelihood: - 8,580.8

Source: calculated by the authors based on LFS data, 2006.

An analysis of the data in table 3 offers the following conclusions. In the period in question, persons under 35 years of age were less likely to become long-term unemployed than persons in the base category were. On the other hand, persons older than in the base category (46-54 years) were more threatened by long-term unemployment. Therefore, the active labour market programmes should give more attention to this group. Because older persons retire early, Poland has the „youngest” old-age pensioners in the EU. The odds ratio estimated for population aged 55 years and older was not statistically significant. These persons are still entitled to early retirement.

The risk of long-term unemployment was the lowest among individuals with tertiary education. Similarly, persons with post-secondary, secondary vocational and secondary general education were less threatened by long-term unemployment than persons having basic vocational education. The odds ratio estimated for the group of persons with junior secondary, primary and incomplete primary education was not statistically significant (at the assumed significance level, i.e. 0.05). It became statistically significant at the significance level of 0.07. In other words, better education translates into lower risk of being absorbed by long-term unemployment.

Long-term unemployment is a problem for females. The local labour markets confirm the findings of the nationwide investigations (Wojdyło-Preisner, 2008, p. 213). In the analysed period, males' odds of becoming long-term unemployed were lower by 15.7%.

Table 3 additionally reveals that persons earning the lowest level of reservation wage were the most vulnerable to long-term unemployment. This situation seems to be caused by the fact that the level of this wage is closely correlated with workers' qualifications and years of service. Wages expected by people with the lowest qualifications are usually smaller.

Well-targeted active labour market programmes are important for decreasing the size of unemployment. Because of limited budget resources, the active programmes should help the risk groups, and particularly persons at greatest risk of long-term unemployment.

Table 4. Estimated odds ratios of being trained in Poland in 2006

| Specification | Odds ratio | t-Student |
|--|------------|-----------|
| Age (base category: persons aged 35-44 years) | | |
| To 24 years | 0.778 | -0.54 |
| 25 - 34 years | 0.952 | -0.13 |
| 45 - 54 years | 0.859 | -0.39 |
| 55 years and older | 0.343 | -1.03 |
| Education (base category: persons with basic vocational education) | | |
| Tertiary | 1.332 | 0.62 |
| Post-secondary and secondary vocational | 1.619 | 1.55 |
| Secondary general | 0.978 | -0.05 |
| Junior secondary, primary and incomplete primary education | 0.118 | -2.08 |
| Job-seeking period (base category: 7-12 months) | | |
| To 6 months | 1.286 | 0.74 |
| 13 months and longer | 0.529 | -1.74 |
| Marital status (base category: single) | | |
| Married persons | 1.488 | 1.20 |
| Sex | | |
| Males | 0.640 | -1.58 |
| Class of locality (base category: rural area) | | |
| Towns | 0.591 | -1.76 |

No. of observations: 12,825

Log likelihood: - 8,580.8

Source: authors' calculations based on the LFS data, 2006.

Table 4 contains estimated odds ratios of being trained by the Polish labour offices in 2006. In this model, the odds of being accepted for training are related to individuals' age, education, job-seeking period, sex, marital status, as well as place of residence.

The data in table 4 allow formulating the following conclusions. Only one of the distinguished variables is statistically significant (at the significance level of 0.05). The odds for persons with junior secondary, primary and incomplete primary education of participating in training were lower by 88.2% vis-à-vis persons comprising the base category (with basic vocational education). Because the first group is at greatest risk of long-term unemployment, neglecting their

training needs is a mistake. Naturally, the uneducated persons do not qualify for all types of training, but they can be referred to vocational preparatory courses.

The parameter estimate for persons remaining jobless longer than 12 months was not statistically significant at the assumed level of significance, i.e. 0.05. Yet, the relatively high value of the t-Student statistics allows us to assume that the labour offices did not perceive the long-term unemployed as their first choice, when referring their clients to training. In spite of the reluctance to take training on the part of the long-term unemployed, the labour offices should encourage them to accept this option, even if their being trained does not guarantee that they will get jobs afterwards.

7. Conclusion

The presented analyses underline the macroeconomic importance of long-term unemployment, especially as a factor determining equilibrium unemployment and the efficacy of anti-inflationary policy. The still high percentage of the long-term unemployed largely contributes to the persistent, relatively strong pressure on wage increases. Wages outgrowing employers' financial potential can put a brake on Poland's economic growth.

From the theoretical analysis it follows that long-term unemployment weakly eases workers' pressure on wage increases, thus a larger percentage of the long-term unemployed raises the level of equilibrium unemployment and blunts the efficacy of anti-inflationary policy.

As shown by the empirical analysis of the Polish economy, the duration of unemployment significantly affects the odds of finding a job. The longer period of unemployment, the lower likelihood of moving from unemployment to employment.

The econometric analysis shows that persons aged 35-54 years with basic vocational education or no education at all, females and unemployed workers with the lowest level of reservation wage were the most vulnerable to long-term unemployment. This analysis also reveals that the persons at greatest risk of long-term unemployment did not attract special attention from the labour offices recruiting future trainees. This calls for making training available to a larger proportion of the long-term unemployed.

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