

# Transitions from unemployment in Poland: a multinomial logit analysis\*

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## Abstract

This paper includes the multinomial logit analysis based on the individual Polish LFS data stretched over the 1997-2004 period. It's main goal is to scrutinize the determinants of outflows from unemployment at the time when the two shocks have affected the Polish economy and labor market. It focuses mainly on the supply-side factors influencing probabilities of transitions out of unemployment including personal characteristics and unemployment benefits. Special attention is devoted to the analyzes of the impact of search behavior and labor market policies on finding job chances.

JEL classification: J2, J64, H31

Key words: Labor dynamics, transition economies, labor market institutions, job search, multinomial logit

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# 1 Introduction

Unemployment rate in Poland is the highest one in European Union and also among New Member States, as it levels at about 18 percentage points. It was not the case in 1998 when Poland in this respect was very similar to European average. In fact the unemployment rate almost doubled between the mid 1998 and mid 2003 following two separate shocks. The first one - clearly the Russian crisis - has struck all of the Polish neighbors causing the similar pattern of changes, however only Poland faced 1.5 years later the significant economic slowdown. Moreover, as the changes on the labor market of Central and Eastern Europe countries in the 90s could be attributed to the economic transformation and were connected to reallocation of the labor force between public and private sector (Konings, Lehmann and Schaffer (1996), Boeri, Flinn (1997), Boeri, Terrell (2002)), we find that the protracted increase of unemployment in Poland should be treated as the result of slow absorption of the adverse shocks (Bukowski et al., 2005).

As implied by the search theory (McCall, 1970), the unemployment rate can be analysed in terms of an inflow rate and an average duration of unemployment. In the companion paper (Bukowski, Lewandowski, 2005) we have focused on the transitions out of employment in Poland which allows us to presume that in fact the prolonged deterioration on the labor market in Poland is rather due to increased persistence of unemployment. Therefore in this paper we try to look for the factors that determine the relative situation of various groups of unemployed on the labor market. We focus on determinants of their chances to find a job but also look for the incentives to leave the labor market. Such emphasis is triggered by the fact that, concurrently to soaring unemployment, Poland experienced decreasing participation. Our explanation of the broad patterns is in line with Ljunqvist and Sargent (1998) conjecture how shocks and institutions shape workers' incentives to labor supply: random shocks end jobs and reduce workers' human capital, and public institutions potentially influence job search by subsidizing leisure.

However, we recognize heterogeneity of workers and conduct our analysis on the micro level. Our goal is to understand the influence that the worsening on the labor market exerted for the relative positions of individuals with different personal and household characteristics. We also take into account job experience and try to control for state-dependence by distinguishing unemployed on the basis of length of their unemployment spell. Special attention was devoted to the role of individual search strategies and active labor market policies, as factors that potentially (as it is widely discussed in literature) can improve not only the individual prospects of the unemployed but also situation on the aggregate level.

The paper proceeds as follows. In section 2, we describe the data and we report gross flows at the aggregate level for different groups of workers. In section 3, we present the variables used in econometric analysis and interpretation of its outcomes. In sections 4-6, we discuss the results obtained in various models. We conclude in section 7.

## 2 Transitions out of employment - descriptive statistics

The data used in the analysis originate from the Polish Labor Force Survey (BAEL) carried out between 1997 & 2004. In this paper we classify individuals as employed, unemployed and inactive, according to the methodology adopted by Polish Statistical Office (GUS) which is consistent with the one applied by Eurostat and ILO. We are analysing one-year transitions and to our knowledge this is the first such analysis conducted for Poland. Focusing on one-year transitions enables us to control for seasonal fluctuations. We excluded from our sample men aged 65 or more and women aged more than 60, i.e. above statutory retirement age in Poland, so we are left with 15181 individuals in the sample. The more detailed description of the data can be found in Appendix.

Frequencies of the transitions from unemployment have changed substantially during the period. The share of individuals repeatedly unemployed has increased from about 50 per cent in period 1997/1998 to 71.4 per cent in 2001/2002 and then declined slightly to 67.0 per cent in 2003/2004 which we find still high.<sup>1</sup> Concurrently, the proportion of individuals finding employment has dropped from 33.5 per cent in the sample 1997/1998 to the lowest level of 16.7 per cent in 2001/2002.<sup>2</sup> The intensification of the persistence of unemployment after 2000 was sustained and the average length of the unemployment spell has been continuously increasing. A modest recovery on the labor market has followed later, reflected in the outflow to employment rising to 19.3 per cent in the first two quarters of 2003/2004.

The decrease in the transition to inactivity has occurred parallel to higher unemployment recurrence and lower outflow to employment. It was stable around 16 per cent till 2000/2001, then dropped to 12 per cent in the sample 2001/2002 and 2002/2003 to rise by near 2 percentage points in 2003/2004. Such change was due to the more intensive transitions to unemployment, resulting in the increase of the number of young and prime-age unemployed. Thus, the decrease of the flows to inactivity should not be treated as the prove of its lesser importance. Nevertheless, the evolution in time of transitions from employment to inactivity is similar (Bukowski, Lewandowski, 2005). The reduction in the proportion of people leaving the labor market was probably partly due to the limited possibilities to do so, namely to tightening the eligibility conditions for applying for disability benefits<sup>3</sup> and on the other hand, the increase of the number of newly granted pre-retirement assistance and benefits has triggered direct outflow from employment to inactivity hence the decline of the transitions to inactivity is relatively higher in case of unemployed. Indeed, the participation decreased immediately after the shock among individuals aged 50-64 (Bukowski et al., 2005).

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<sup>1</sup>For example, one-year transitions out of unemployment in Great Britain in the period 1990-2000 were almost equally distributed among all states (Schmitt, Wadsworth, 2002). In Estonia, Latvia and Lithuania, the share of repeatedly unemployed was significantly lower than in Poland, even in the aftermath of the adverse shock and was in period 1999/2000 equal respectively to 65.2, 48.3 and 46.6 per cent (OECD, 2003).

<sup>2</sup>Such transitions were similar in the Baltic countries before the shock but later were much less frequent in Poland (OECD, 2003).

<sup>3</sup>Such reform was introduced in 1997 but its consequences become visible around 1999-2000.

Consequently we find changes in time of frequencies of transitions in case of outflows from unemployment as more eminent than from employment<sup>4</sup> which indicates that the stabilization of unemployment was due to increase in structural unemployment on the high level. The proportions of unemployed finding a job, remaining unemployed and leaving the labor market were equal to respectively 32.3, 51.2 and 16.5 per cent in the sample 1997/1998 whereas they were on average equal to 19.5, 66.8 and 13.8 per cent from 2000 on. Therefore, we suppose that the nature of the unemployment (its frictional or structural character) probably have changed and factors determining the transitions out of it may differ before and after the adverse shock to greater extent than in case of employment.

Table 1: Transitions from unemployment

Destination state	1997/1998	1998/1999	2000/2001	2001/2002	2002/2003	2003/2004
Employment	33.5	27.1	21.2	16.7	20.2	19.3
Unemployment	49.9	56.8	62.4	71.4	67.8	67.0
Inactivity	16.6	16.1	16.4	11.9	12.0	13.7

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

## 2.1 Transitions out of unemployment and personal characteristics

With respect to gender differences we find the proportion of women among unemployed steadily decreasing from 53.4 per cent in 1997 to 46.4 per cent in first half of 2003 which is mainly due to the stronger increase in the number of the unemployed men. Unemployment rate among women has remained higher, but the gender gap has decreased.<sup>5</sup> Average persistence of unemployment calculated on the whole sample is higher in case of females, but comparing the transition frequencies by year of the survey, we find that women were by 5 percentage points more likely to remain unemployed in 1997/1998, but from 2000 on women exhibit persistence of unemployment lower by at least 1 percentage point (Table 2), so the increase of average persistence was due to the substantial increase among men.

In 1997/1998 unemployed of both sexes were more likely to find job than to become inactive. Later, only a small minority of unemployed men has been moving to inactivity - this outflow was smaller than the 50 per cent of the outflow to employment. Among women both outflows were rather of the same magnitude, the one to inactivity has been a little bit more frequent. This indicates that the inactivity is strictly connected to gender and to institutional incentives, because comparing the transitions to inactivity we see that most of newly inactive move there directly from employment (see also Bukowski, Lewandowski (2005).)

<sup>4</sup>Not presented here. For further information see Bukowski, Lewandowski (2005).

<sup>5</sup>The participation rate among males was higher by 13.0 percentage points in 1998 and by 10.6 percentage point in 2004, the employment rate among males was higher by 13.8 percentage point in 1998 and by 12.1 percentage point in 2004. On the other hand, the unemployment rate was higher among females by 3.3 percentage point in 1998 and by 1.5 percentage point in 2004 (own calculation based on BAEL).

Individuals younger than 35 years have constituted more than 50 per cent of unemployed during the period, but the age structure of the unemployed has changed slightly as it became more flat (Table 2) and the average age of unemployed in the sample has been slightly increasing every consequent year. Two clear patterns emerge. The proportion of unemployed finding a job decreases with age, whereas the proportion moving to inactivity increases. The percentage of individuals staying in unemployment rises with age, unemployed aged 35-44 - these people exhibit by far the highest persistence of unemployment regardless of the time span considered. The persistence is lowest among individuals aged 55-64, but as the actual retirement age in Poland is by 4-5 years lower than the statutory retirement age,<sup>6</sup> people aged 55-64 facing the risk of losing a job or being unemployed are very likely to move into inactivity, cause they are uncertain to find a job. As individuals older than 55 constitute very small share of unemployed, we will focus at the moment on younger cohorts.

Table 2: Transitions from unemployment by gender and age

	Share in the sample	Employment	Unemployment	Inactivity
Pooled data 1997-2004				
Men	49.1	26.2	62.7	11.1
Women	50.9	19.8	62.5	17.7
Age group 15-24	27.4	27.4	61.0	11.6
Age group 25-34	25.0	25.7	62.7	11.6
Age group 35-44	25.2	22.1	65.0	12.9
Age group 45-54	19.1	16.0	64.0	20.0
Age group 55-64	3.3	8.1	50.7	41.2
Total	100.0	22.9	62.6	14.5
Pooled data 2000-2004				
Men	49.9	22.1	67.3	10.6
Women	50.1	16.9	66.2	16.9
Age group 15-24	27.3	22.7	66.1	11.2
Age group 25-34	25.7	22.8	66.0	11.2
Age group 35-44	23.9	18.5	69.7	11.8
Age group 45-54	20.0	13.5	67.4	19.1
Age group 55-64	3.1	7.0	53.8	39.2
Total	100.0	19.4	66.8	13.8

Notes: Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

Unemployed aged 15-24 exhibit the highest outflow to employment, the lowest to inactivity and they are less likely to stay in unemployment than unemployed aged 25-55. Young workers experience the highest job turnover and presumably their frictional unemployment rate is higher

<sup>6</sup>This is confirmed by estimates by OECD and as well as by Polish authorities (Bukowski et al., 2005).

than among older cohorts. However, their relative advantage when the transitions to employment are concerned all but disappears when we study the transitions from 2000 on, because the difference between them and age group 25-34 has disappeared. Besides this change, the prospects of the individuals have worsened in rather flat way, all of them experiencing proportionally lower transitions to employment and also to inactivity parallel to higher unemployment persistence.

We suppose that the youngest group was more affected by the adverse shock because of the lower average education level and experience.<sup>7</sup> However, its consequences were more temporary in case of young workers. Older workers were more likely to remain unemployed but young individuals have increased their education spells and postponed entering the labor market. On the other hand, young and unskilled workers may have faced substantial risk of persistent unemployment (Bukowski et al., 2005).

Concerning the education level attained, it comes by no surprise that the most numerous group of unemployed consists of people with vocational education who constitute the second numerous group in working age population (Table 20 in Appendix). It is consistent with the highest transitions from employment to unemployment experienced by this group. As presented in Table 3, individuals with less than secondary education made up to nearly 2/3 of unemployed. From 2000 on, the share of unemployed with primary education has slightly decreased which was offset by the increase of the share of individuals with secondary or post-secondary education level attained but the same occurred in the general population in working age as the average level of education is higher in younger cohorts, so these characteristics interact with each other (Tables 16 and 17 in Appendix).

We find the education level determining the out-of-unemployment transitions, because the transitions to employment decrease strongly and the persistence of unemployment increases as the education level declines. For example, the percentage of unemployed with tertiary education finding a job is almost two times higher than among those with vocational education. The persistence of unemployment is nearly the same among unemployed with less than secondary education, but the ones with primary education are much more likely to leave the labor market which is also in line with highest transitions to inactivity experienced by this group among all employed. Thus, the low skilled individuals are mainly leaving the labor market, even if they initially move from employment into unemployment. However, age differences exert here strong influence.

The transitions calculated from 2000 (not shown in the Table 3) indicate that the shock affected particularly unemployed with vocational, secondary and post-secondary education - the persistence of unemployment among them is by 5 percentage points higher than if calculated on the whole sample. Furthermore, the parallel decrease in the proportion of individuals finding a job was the most sizeable in case of these educational groups. The rise of the percentage

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<sup>7</sup>Indeed, as stressed by Farber (1998), one of the central facts describing worker mobility is that the probability of job ending declines with tenure thus also with experience.

Table 3: Shares in the stock of employed and transitions for different education levels attained

Education level attained	at-	Percentage of unemployed	Employment	Unemployment	Inactivity
Tertiary		3.3	39.7	47.5	12.8
Secondary & post secondary		32.5	25.3	59.6	15.1
Vocational		42.4	23.2	64.3	12.6
Primary or less		21.8	16.0	66.3	17.7
Total		100.0	22.9	62.6	14.5

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

of unemployed repeatedly declaring unemployment was equal to 1.7 percentage point in case of people with tertiary education and to 3.2 percentage points in case of unemployed with primary or lower education level attained. Individuals with tertiary education represent very small percentage of the stock of unemployed and they have cope with the tougher labor market much better than the rest of unemployed, so the changes in transition patterns are almost negligible among them. In case of people with primary education, the rise in persistence of unemployment was almost completely balanced by the decrease in the outflow to employment, as the transitions to inactivity have not changed. The outflow to inactivity has decreased regardless of the education level, as it was also in case of gender. It seem that comparing to the late 90s, the situation of people with secondary or post-secondary education has deteriorated - their share in the stock of unemployed increased and the transition patterns have also worsened. To lesser extent it also happened in case of individuals with vocational education.

## 2.2 Transitions out of unemployment by sources of income

The institutional arrangements determining eligibility conditions and generosity of various welfare transfers, like unemployment benefits, disability benefits and early pensions, influence the labor supply decision of individuals, and play important role in Poland as was argued number of authors (Boeri, Terrell, 2002), (Góra, 2003), (Boni, Golinowska, 2004), (Bukowski et al., 2005). Such decisions are undertaken within the household. Because of the nature of the survey, the only way we can control for these effects is to check how the sources of income of individual's household influence transition frequencies. Here we investigate the structure of the unemployed with respect to main source of household's income and also how groups distinguished on such basis differ concerning transitions (Table 4). The structure of the stock of unemployed with respect to main source of household's income and the transition frequencies for the corresponding groups have virtually remained constant through time, or to be more precise, have changed accordingly.

Majority of unemployed lives in households receiving income from employment, but their

share is by 20 percentage points lower than in case of the employed. It is similar in case of self-employment. Individuals whose household is living out of pensions and unemployment benefits are strongly overrepresented when compared with employed - the difference equals nearly 19 percentage points. Moreover, the share of individuals receiving income from different sources is equal to 13.4 per cent and it was almost negligible among employed. To some extent it is reasonable - if the individual does not work and is not eligible for pension, disability or unemployment benefit, he or she must have some other source of income, be them other social security benefits transfers from family members or work in underground economy. Regardless of the concrete source, he or she may be less likely to find employment which is confirmed by the transition patterns - the outflow to employment among individuals living of pensions or different sources of income is much lower than among those living of any types of employment. People with different source of income have also the highest persistence of unemployment which indicates that some of them may probably work in underground economy. The highest transitions to employment were recorded among unemployed living of the unemployment benefit and two thirds of them were receiving the benefit personally. Their high outflows to employment are spurious because receiving benefit indicates short unemployment spell which increases the probability of finding a job.

Table 4: Shares in the stock of unemployed and transitions for different main sources of income

Main source of household's income	Percentage of unemployed	Employment	Unemployment	Inactivity
Employment	45.2	24.6	62.4	14.0
Self-employment	4.5	27.0	56.4	16.6
Agriculture farm	3.3	37.4	53.0	9.6
Pension or benefit	26.8	19.3	64.0	16.7
Unemployment benefit	6.8	33.4	55.6	11.0
Different source of income	13.4	17.1	68.8	14.1
Total	100.0	22.9	62.6	14.5

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

### 2.3 Transitions out of unemployment - unemployment benefit eligibility and length of the spell out of work

In general, unemployment benefits in Poland have been granted during the period considered to unemployed who were employed or self-employed for at least 180 days within 12 months before the registration at the work office. From 1997 on, the benefit is being paid for 6 months in low unemployment regions (unemployment rate less than national average), 12 months in

regions where unemployment rate is higher than national average<sup>8</sup> and 18 months in high-unemployment regions (unemployment rate at least equal to twice the national average) for individual with at least 20 year of work experience.

Table 5: Percentages of unemployed receiving unemployment benefit and average length of out-of-work spells

	Percentage of unemployed receiving unemployment benefit	Percentage of unemployed receiving unemployment benefit among individuals not working for at most 1 year	Average length of the not working spell of benefit recipient (in months)	Average length of the not working spell (in months)
1997/1998	28.5	55.1	12.5	28.3
1998/1999	17.0	33.4	11.3	27.7
2000/2001	16.9	37.7	11.5	31.4
2001/2002	15.6	35.7	11.4	30.6
2002/2003	13.6	33.2	11.3	30.7
2003/2004	12.3	31.0	9.8	32.6

Notes: Men aged 15-64 and women aged 15-59. Averages calculated on the subsamples consisting of individuals with out-of-employment spells shorter than 10 years.

Source: Own calculations based on BAEL.

The share of the unemployment benefit recipients has declined significantly during the period, as is indicated by data in Table 5. We also present the average spells out of employment<sup>9</sup> for beneficiaries and for all unemployed in the subsample consisting of individuals unemployed not working up to 10 years,<sup>10</sup> and share of the unemployed receiving unemployment benefits

<sup>8</sup>From 1st May 2004 benefits are paid for 12 months in regions where unemployment rate is higher than 125 per cent of national average, but this reform does not apply to the individuals in our sample.

<sup>9</sup>Because of the nature of the survey, there is no direct information about the duration of the unemployment, but individuals state the date of losing the last job, provided they have ever worked. deterioration of the human capital. Furthermore, employers treat unemployment spell as the signal of low productivity. Therefore, using the information available, we constructed the variable which to some extent quantifies the time the individual has no job. It was calculated as the length of the period between moment when the survey was conducted and moment when the last job was lost, in case of individuals who have ever worked, and as the length of the period between moment of the survey and the moment of completing education if the individual has not ever worked. Thus, this variable approximates the duration of the spell without work. Of course it does not exactly match the length of unemployment spell. Some individuals may not have answered the survey sincerely that means that they do not treat very short employment spells as breaks in unemployment, so they have declared the date when the last "serious" job was lost. Moreover, 211 of 15181 individual in the sample did not answer the question. On the other hand, such definition of the variable does not distinguish between unemployment and inactivity, but we find this type of bias as useful, because it is the total time out of employment what matters here.

<sup>10</sup>Unemployed not working for at least 10 years constitute 10 per cent of all unemployed and 1 per cent of benefit recipients in our sample. The fact that there exist such beneficiaries indicates that the survey was not

among unemployed not working up to 1 year. The corresponding decline in the frequency of beneficiaries among all unemployed is due to the increase in stock of unemployed who are not eligible to benefit because of the long unemployment spell and also to the higher inflow of unemployed not fulfilling reciprocity criteria (especially young) which has contributed to the decrease of beneficiaries among all unemployed not working up to 1 year.

Table 6: Transitions out of unemployment for individuals not working up to 1 year

	Destination state	1997/ 1998	1998/ 1999	2000/ 2001	2001/ 2002	2002/ 2003	2003/ 2004
Unemployed, out of employment up to 1 year	Employment	45.3	34.4	31.3	24.8	30.6	31.3
	Unemployment	44.0	54.0	58.5	66.0	61.0	59.0
	Inactivity	10.7	11.6	10.2	9.2	8.4	9.7
Benefit recipients, out of employment up to 1 year	Employment	45.2	39.4	34.4	31.7	36.1	43.1
	Unemployment	45.1	49.0	59.4	62.9	57.3	49.3
	Inactivity	9.7	11.5	6.2	5.4	6.6	7.6

Notes: Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

Because the transitions to employment are much higher among unemployment beneficiaries than among all of the unemployed, we have to take into account the differences in the unemployment spells. Therefore in Table 6 we present transitions for individuals with out-of-employment spell up to 1 year. The data point out that the unemployment benefits seem to increase the transitions to unemployment stronger as their availability becomes relatively more limited. In particular, in 1997/1998 there was virtually no difference between all of the unemployed not working for 1 year or less and benefit recipients among them, but the divergence arose later and has ever-increased, so the transitions to employment were by few percentage points higher among beneficiaries. It is worth noting that the structure of the beneficiaries with respect to gender, age and education level attained has not substantially changed, as men, individual aged 25-44 and with vocational education constituted the most overrepresented groups among benefit recipients (Tables 18 and 19 in Appendix). Moreover, the intensification of the outflow to employment among beneficiaries was mainly due to such change among men, whereas the proportion of the men among beneficiaries has been rising parallel to its increase among all unemployed. As the structure of such subgroups<sup>11</sup> with respect to education level attained and age has not changed visibly, and the increase of the difference of the outflow to employment between benefit recipients and individuals not eligible was recorded for men aged 25-54, we guess that beneficiaries were probably more likely to find employment. Nevertheless, this finding applies mainly to unemployed with vocational education level. On the other hand, we guess that as the unemployment remained high, the eligibility criteria may have distinguished

conducted carefully.

<sup>11</sup>Men and women receiving benefits or not eligible, out of work for up to 1 year.

the unemployed with respect to their attachment to labour market which is an unobservable characteristic.

To illustrate the crucial role played by the length of out-of-work spell, we have classified the unemployed into 8 groups that are of comparable class frequencies and so that transitions within groups are homogenous. Thus, the intervals increase with spell and they are: up to 6, 6-12, 12-24, 24-36, 36-48, 48-72, 72-100, more than 100 months. In line with human capital deterioration argument, transitions to employment decrease with the length of the of out-of-employment spell whereas transitions to inactivity increase. The persistence of unemployment rises with the length of spell till it reaches its maximum for the group remaining 36-48 months without employment and then remains stable. The detailed transition frequencies are presented in Table 7.

Table 7: Shares in total unemployment and transitions from unemployment by length (in months) of out-of-employment spell

	Up to 6	6-12	12-24	24-36	36-48	48-72	72-100	Over 100	Total
Share in the stock of unemployed	18.8	14.5	17.4	11.2	7.6	10.6	7.5	12.4	100.0
Employment	35.8	31.1	25.5	20.4	16.9	14.7	13.5	9.4	22.9
Unemployment	55.5	57.9	62.4	64.8	68.1	67.1	67.5	67.6	62.6
Inactivity	8.7	11.0	12.1	14.8	15.0	18.1	19.0	23.0	14.5

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

## 2.4 Transition out of unemployment and search behaviour

The economic theory stresses the importance of the search intensity for the probability of finding a job, especially within the search theory (Burdett, Mortensen, 1978), (Pissarides, 2000). On the empirical basis, job intermediation and job broking belong to one of the most effective labour market policies (Martin, 2000), (OECD, 2005). Using the main method of search as the approximation of search effort, we put the unemployed into 4 categories. The overwhelming majority rests on labor market offices which is rather passive way of looking for job. We distinguish also unemployed who search on their own,<sup>12</sup> who depend on advertisements and who rest on personal connections. Unfortunately, 245 individuals did not give information about undertaken search activities. The decomposition of the stock of unemployed by search method and corresponding transitions are presented in Table 8. Two thirds of unemployed rests on labor market offices and they experience the highest unemployment persistence, as well as the lowest outflows to inactivity. This is probably due to the fact that registration at the

<sup>12</sup>They search directly by visiting employers, use job counseling and intermediation agencies or try to set up their own company.

labor market office provides access to public health insurance,<sup>13</sup> so 70 per cent of unemployed surveyed in 1997/1998 and 1998/1999 and 75 per cent of those surveyed between 2000 and 2004 were registered. We presume that some of unregistered individuals may work in the shadow economy, but some of them can also consider leaving the labor market voluntarily, hence they are not interested in registering.

Table 8: Shares in the stock of unemployed and transitions by search methods used

Search method	Share in the stock of unemployed	Employment	Unemployment	Inactivity
Labor market office	67.0	22.9	64.8	12.3
Individual	14.2	26.5	57.5	16.0
Advertisements	10.1	19.2	61.1	19.7
Personal contacts	7.0	18.9	57.4	23.7
No answer	1.6	22.8	62.6	14.6
Total	100.0	22.9	62.6	14.5

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

The registered unemployed have to stay in touch with the labor market offices, so we presume that resting on labor market office indicates that they are not undertaking any additional search activities. As the financial constraints placed on labor market offices reduced their ability to finance active labor market policy measures, especially after the adverse shock, we find that job counseling and intermediation offered by labor market offices is very limited and in fact inefficient (Bukowski et al., 2005), (Góra, 2005). The persistence of unemployment in case of labor market offices customers may to some extent result from institutional incentives to be registered. Probably, some of these individuals should be treated as inactive. On the other hand, about 7 per cent of unregistered individuals rest on labor market offices, 30 per cent search on their own, 27 per cent focuses on advertisements and 20 per cent on personal contacts. The unregistered unemployed have lower persistence of unemployment than the registered ones, they exhibit transitions to employment lower by 3 percentage points and, which is the most important difference, they are twice as likely to leave the labour market (the outflow to inactivity equal to 22.3 per cent). Above regularities can to some extent bias the transitions calculated for groups distinguished on the basis of search method.

Unemployed searching on their own or relying on personal contacts exhibit the lowest levels of unemployment persistence, as 57.5 per cent of them remain unemployed. however, there is considerable difference in the structure of outflow between them: individuals searching on their own are the ones most likely to find employment. Unemployed relying on personal contacts are the ones most likely to become inactive and the least likely to find a job, the corresponding transition frequencies being equal to 23.7 per cent and 18.9 per cent. The implied inefficiency

<sup>13</sup>From 2004 on it no longer so.

of such way of search contradicts the opinion widely held in Poland that personal contacts and acquaintances increase the chances of finding employment. To the contrary, such behavior may indicate low devotion to search and may be chosen by individuals with low level of human capital and skills. Focusing on advertisements has not been an efficient way of search, as is implied by relatively low outflow to employment and high persistence of unemployment. Therefore, we infer that advertisements reduce the demand-supply mismatches on the labor market to rather limited extent.

## **2.5 Transition out of unemployment by the sector of economy where individual worked**

In the companion paper (Bukowski, Lewandowski, 2005) we have shown that the transitions out of employment differ among sectors of economy, even if we control for their interactions with personal characteristics. Job which can be acquired by the unemployed is largely dependent from the previous one, especially in Poland where the life-long learning is very limited and restructuring of the industries contributed to the reduction of employment in certain branches (Boni, Golinowska, 2004), (Bukowski et al., 2005). Moreover, it is easier to find a job in the sector experiencing increase in demand for labor and the limited cross-sectional mobility of workers amplifies these differences. On the other hand, some sectors like services or construction are characterized by more intensive job turnover.<sup>14</sup> As also stressed in OECD (2005), displaced workers in EU countries are more likely to become long-term unemployed or to leave the labour market than in US but on the other hand the percentages of displaced workers finding job in the same sector is in both economic areas very similar and in fact is highest in case of manufacturing. In case of Poland the emphasis was mainly put on the reallocation of the labour force between public and private sector during transition (Konings, Lehmann and Schaffer (1996), (Boeri, Flinn, 1997), (Boeri, Terrell, 2002). In this paper we focus rather choose rather different perspective and focus on the influence exerted by the 1999 adverse shock on different sectors of economy. Therefore, we try to capture these effects by distinguishing the unemployed on the basis of the sector where the last job was held. Of course, some of them have never worked and unfortunately some of those who have worked, had not stated in which sector it was.

Individuals who did not state the sector where the previous job was held, but declared that they had worked before, exhibit very low transitions to employment, only slightly higher than the half of the average frequency. As on the other hand they exhibit disproportional high transitions to inactivity, this may bias the sectoral differences. In particular, we presume that only a negligible minority of them has worked in public administration, education & health care or business services, because they are mostly low educated and older than 35 years. Almost two thirds of them are women which also contributes to outflows to inactivity. We infer that the

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<sup>14</sup>The stylized fact for 13 EU countries found by Gomez-Salvador, Messina and Vallanti (2004) is that that job reallocation and job creation in construction and service sectors are higher than in industry but job destruction is lower.

labor market attachment of these individuals may be very low, so they probably experienced in the past many spells out of work and may also work in underground economy. Therefore they do not give the details of their last job held. Hence, we have to treat the following results as preliminary and with caution.

Table 9: Shares in total unemployment and transitions from unemployment by sector of the economy where the previous job was held

Sector	Share in the stock of unemployed	Employment	Unemployment	Inactivity
Pooled data 1997-2004				
Agriculture	4.4	23.8	61.1	15.1
Industry	19.2	25.5	60.1	13.5
Coal mining	1.5	18.3	64.3	17.4
Power engineering	2.7	25.8	61.4	12.8
Construction	8.1	26.7	63.4	9.9
Services	18	27.8	60.3	11.9
Business services	2.9	23.6	58.6	17.8
Public administration, edu- cation & health care	6.6	21.4	62.2	16.4
Never worked	21.8	22.6	63.5	13.9
No answer	14.8	12.1	67.2	20.7
Total	100.0	22.9	62.6	14.5
Pooled data 2000-2004				
Agriculture	3.6	21.5	64.4	14.1
Industry	18.3	22.1	65.6	12.3
Coal mining	1.7	17.8	67.0	15.1
Power engineering	3.4	24.1	63.1	12.7
Construction	7.1	20.8	69.6	9.6
Services	16.3	24.4	65.4	10.3
Business services	3.2	21.5	60.9	17.6
Public administration, edu- cation & health care	6.0	18.6	66.1	15.3
Never worked	22.7	18.8	67.7	13.5
No answer	17.8	11.4	69.3	19.3
Total	100.0	19.4	66.8	13.8

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points.  
Source: Own calculations based on BAEL.

As data in Table 9 indicate, industry and services are by large the most numerous sectors in the sample which is in line with outflows from employment to unemployment being in these

sectors higher than the average. Nevertheless, once unemployed, former services' employees are more likely to find employment than former industrial workers. The third group among unemployed are the former construction's workers who had by large the highest outflow from employment to unemployment among all groups distinguished on sectoral basis (Bukowski, Lewandowski, 2005). In the whole sample, construction exhibits also the highest transitions back to employment which indicates that workers in this sector experienced multitude of short employment and unemployment spells, connected to high seasonality of work in this sector and its vulnerability to demand fluctuations. In the period 2000-2004 their share declined, as well as the transitions to employment which illustrates the prolonged contraction in the level of activity and output in this sector.

There are differences between services and business services, since business services exhibit the highest transitions to inactivity and their share among unemployed is higher in the subsample than in the whole sample. It is also true in the case of power engineering and coal mining. The higher outflows to inactivity reported for former employees of business services, public administration, education & health care and agriculture may also be explained by the fact that these unemployed are much older than the other. The lowest transitions to employment were recorded for former coal-mining employees which indicate that the attempts to restructure the branch have not equipped them with skills needed to cope with unemployment. Compared to another sectors, higher percentage of unemployed coal-miners remain unemployed which is connected to their relatively young age.

### 3 Interpretation of the outcomes of the model and description of the variables used

Multinomial logit model of the labour market transitions makes it possible to estimate the influence of individual factors on the probabilities of transitions on the labour market. In order to estimate the influence of the characteristics identical for each of the possible alternatives, i.e. individual characteristics, The probabilities of occurrence of each of possible transitions are normalised with respect to one of the them, usually the one occurring most frequently in the given sample. It allows us to estimate the influence of the characteristics identical for each of the possible alternatives, i.e. individual characteristics. In this case, the most frequent outcome is remaining in employment, hence the probability of transition from employment to any of the other states  $j$  ( $j \in \{E, I\}$ ) is expressed as:

$$P_{Uj} = \frac{\exp(X_i' \beta^j)}{1 + \exp(X_i' \beta^E) \exp(X_i' \beta^I)} \quad (1)$$

In such model, the marginal effect of the change of the specific variable  $x_k$  depends on the values of other explanatory variables. The marginal effect of  $x_k$  on the probability of entering, say, state 1 is equal to:

$$\partial P_1 / \partial x_k = P_1 \left( \beta_k^1 - \sum_{j=1}^3 P_j \beta_k^j \right), \quad (2)$$

but because for  $j \in \{E, I\}$ :

$$\ln \left[ \frac{P_{Uj}}{P_{UU}} \right] = X_i' \beta^j \quad (3)$$

the estimated parameter related to given explanatory variable in the equation expressing the probability of a given transition shows how the probability in question changes as compared to the probability of remaining in the initial state. Consequently, to assess the influence of a given variable on the probability of occurrence of a given outcome of the explained variable, one has to calculate a so called Relative Risk Ratio (RRR)<sup>15</sup> which indicates by how many percent does the probability of occurrence of a given outcome change if the explanatory variable changes by a unity. So when interpreting the obtained estimates one has to remember that they express how the given variables influences the probability of leaving employment for a certain destination state relative to the probability of no outflow.

We distinguish between 3 labor market statuses: employment, unemployment and inactivity. The intention is to answer the question whether a particular group of people is relatively more likely to end up in a particular destination state in one-year time between interviews. Therefore in the initial formulation of the model, we have used the following explanatory variables:

- gender (males are the reference group),
- marital status (married are the reference group),

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<sup>15</sup>RRR is simply equal to Euler's constant to the power equivalent to the estimated parameter's value.

- a set of age groups indicators (age 25-34 is the reference group),
- a set of education level indicators (secondary or post-secondary education level attained is the reference group),
- a set of dummy variables controlling for the size of the dwelling place (city with 20-50 thousand inhabitants is the reference group),
- a set of dummy variables controlling for the length or out-of-employment spell (12-24 months being the reference group),
- a set of indicators of the main source of income of the individual's household (employment and self-employment being the reference group),
- a set of time-specific effects indicators (panel 2000/2001 is the reference group),
- unemployment rate computed as the one-year average unemployment rate in every state district at the quarter when the individual entered the survey.

Gender, age and education point to substantial differences between individuals with regard to labor supply decisions, level of human capital and the evolution of the labor market indicators. They are also confirmed by the transition statistics presented earlier. We can interpret them as the supply-side factors. We include length of out-of-employment spell on the basis of human capital deterioration argument - as the length of spell out of employment increases the individual probably becomes less attached to labour market and the mismatch between skills of the unemployed and demand-side arises. The indicators for the size of the dwelling place are partly supply and partly demand side factors. Cities of different size may exhibit different level of infrastructure and the response to the adverse shock may differ among them because of higher diversity of jobs offered in large cities, so we control for these differences by explicitly including a set of dummy variables in our model.

The labour supply decisions are made within the household, so especially in case of unemployed it is crucial to control for all sources of income. As theory emphasizes, any kind of subsidy to leisure should have adverse effect on labour supply which in this context means that it should influence the willingness to take up (resume) working. Thus we include the main source of income of the household as the explanatory variable.<sup>16</sup>

We also control for time-specific effect in order to capture institutional factors and additional variance in the transitions between given years which may be important because of the adverse shock. To control for the differences between regions and also changes in the overall situation on the labor market, we have include unemployment rate. It was calculated for every region - defined as state district - and for every quarter of the survey as the average unemployment in last year in given region.

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<sup>16</sup>The nature of the survey makes it impossible to determine the structure of the household's income with respect to work, social security benefits and transfers.

Multinomial logit model is estimated by the maximum likelihood estimation (MLE) method. Estimation was done with Stata 8.0 package. The data were not weighted.<sup>17</sup>

## 4 Personal characteristics and length of out-of-employment spell

Although we suppose that in order to isolate the impact of personal characteristics we have to control for length of out-of-employment spell, in the first model we do not include these spells, because it would require excluding from the sample 211 individuals whose characteristics and transitions are distinct from those for which such information is available. In subsection 4.1 we present the outcomes of such model (Table 10, columns 2 & 3), then we control for the length of out-of-employment spell and compare the results.

Because the transitions out of unemployment differ in time, we estimated our models also using the subsample consisting of individuals interviewed between 2000 and 2004, so we excluded 4078 observation. The primary model is then labeled model 2. As expected, the estimates changed, some of the explanatory variables significant in the model estimated on the whole sample lose their relevance when the subsample is used and the null hypothesis of stability of the estimates in the Hausman test was rejected at 1 per cent significance level. Our simple model is nested in all which will be presented in following sections and such conclusion will hold for every pair of these models.

### 4.1 Influence of gender, marital status age and education level attained

The outcomes from initial models 1 and 2 confirm our findings based on transition frequencies discussed earlier. Women are significantly more likely to become inactive than to find employment - these results are robust in both samples considered, although in the subsample gender plays more powerful role in determining the probability of transition to inactivity and less powerful in case of employment. It confirms that the adverse shock has affected men relatively stronger in terms of persistence of unemployment so the relative risk ratio of transition to employment has converged, but the one of transition to inactivity has diverged as unemployed women were moving there much more often. This difference is connected to sectoral differences and length of unemployment, so we expect the influence of gender to change when we account for these factors.

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<sup>17</sup>In some of the literature, the data weighted by sample weights are used (see for example D'Addio, Rosholm (2004)). Because the data in BAEL are weighted on the basis of the city/countryside structure of the population and then on the basis of age (within 5-year cohorts) and gender, we find that this weighting procedure is not independent from the labour market status of the individual, especially in case of the unemployed. Therefore we decided to use unweighted data. In fact, reestimating the model on the weighted data changes the parameters only marginally without influencing the quantitative findings.

Not married unemployed have probabilities of both outflows reduced by more than 20 per cent which means higher persistence of unemployment. These results are significant at 1 per cent level and will turn out robust to changes in the size of the sample and to inclusion of other explanatory variables. The highest succession of unemployment is confirmed by gross transitions for married and single unemployed, but single individuals exhibit outflows to employment higher by 0.5 percentage point. The RRR significantly lower than 1 is then explained by the fact that single unemployed are very young - 52 per cent of them are younger than 25 years and 75 per cent are younger than 35 years. It is worth noting that RRR of the transition out of the labour force is larger (in absolute terms) in the pooled sample which points out that the adverse shock struck those who were married (and older) for relatively longer time than young and single (see below).

We have stressed the importance of age in explaining the outcomes obtained for marital status, because we find it as highly significant determinant of the transition probabilities. Considering the outflow to employment, all age groups dummies are significant at 1 per cent level. Individuals aged 15-24 are by 26 per cent more likely to find employment and by 20 per cent more likely to become inactive than the reference group aged 25-34. They are the only group with both transitions modified in the same way, namely increased. Nevertheless, in the period 2000-2004 this difference has been reduced and the relative risk ratio of transition to employment is significant only at 10 per cent level. This is in line with changes presented in subsection 2.1. The differences between remaining age groups are stable across the samples used. Individuals aged 35-44 are by 18 per cent less likely to find employment whereas there are no differences with respect to inactivity. The older unemployed are significantly more likely to become inactive than to find employment, which is parallel to the influence of age on the transitions out of employment (Bukowski, Lewandowski, 2005). However, as the average duration of out-of-employment spell and the risk of long-term unemployment increase with age, we expect these results to be revised when controlled for this explanatory variable.

As the persistence of unemployment decreases and transitions to employment increase with education level attained, it comes by no surprise that all education dummies significantly influence the likelihood of outflow to employment, whereby the difference is the highest for unemployed with tertiary education, who have probability of finding a job by 141 per cent higher than members of the reference group with secondary or post-secondary education. The probability of transition to employment decreases by almost 25 percentage points with every level of education below secondary. However, education is not significant determinant of the transitions to inactivity, as age exerts here the most important influence. In the subsample (model 2) consisting of individuals interviewed 2000-2004 when the labor market conditions were much tougher than in 1997 and 1998, the influence of education is slightly smaller in case of lower than secondary education and higher in case of tertiary education. This demonstrates that the prospects of finding employment has converged among individuals who do not have tertiary education. To some extent it also signals that the incremental value of the every subsequent

level of education is highest for tertiary education.

Moreover, as education significantly determines odds of transitions out of employment which have been decreasing with education level attained (Bukowski, Lewandowski, 2005), we infer that it plays significant role in determining flows within economically active individuals, but when the decision to leave the labor market is considered, although it diversifies working individuals but not unemployed - for them age is the most important determinant of the flow out labour force. That signifies that institutional incentives trigger such decisions (Góra, 2003), (Bukowski et al., 2005). Odds of transition to employment increase with education level, so the higher the education, the lower the average spell out of employment. Thus, controlling for the length of these spells may reshape these outcomes.

We also notice that the only significant indicator of the size of the dwelling place is dummy variable for cities with more than 100000 inhabitants - it significantly increases probability of the transition to inactivity, although in the subsample such effect is much weaker and is significant only at 10 per cent level. We find it clearly connected to the higher age of the unemployed in large cities.

## 4.2 Influence of sources of income

If the main source of household's income comes from self-employment, the persistence of unemployment is reduced and outflows to employment and unemployment are increased with respectively 10 per cent and 5 per cent significance, compared with the reference group which receives income from employment. It is in line with gross transitions and coincides with transitions out of employment (Bukowski, Lewandowski, 2005). Since these outcomes are robust across all the models considered, we think that the unobservable heterogeneity - individuals living in entenerpreneurs' households are more mobile and flexible on the labor market, their devotion to work may be higher - and possibility to work in self-owned company (even part-time) are the most important factors standing behind the significance of this variable. In the subsample, this variable is no longer significant which reveals that when the labor market conditions have worsened, the differences between self-employment and employment with respect to transitions have shrunk, both among unemployed and employed (see also Bukowski, Lewandowski, 2005).

Probability of transition to employment is significantly higher for unemployed living of agriculture farm and unemployment benefit. These results are robust to changes in the size of the sample and specification of the models. In case of agriculture farm, overwhelming majority of unemployed - 60 per cent - is younger than 25 years of age, most of them are men and eventually the disguise unemployment in agriculture also may play important role. Individuals living of unemployment benefit are characterized by shorter unemployment spells which is mainly responsible for their high transitions to employment. Moreover, their flows to employment may be partially triggered by the need to regain eligibility for unemployment benefit.

If pension or disability benefit is the main source of household's income is or if it comes

from different sources, the probability of finding employment is reduced, but only with low significance and these outcomes disappear in model 2 estimated on the subsample. Although pensions increase the probability of transition to inactivity by 20 per cent at 1 per cent significance level in the whole sample, they are insignificant in the subsample. On the other hand, such variable allows us to control only for the main source of income and in fact unemployed eligible to pre-retirement benefits or early pensions may live in households with working members. Therefore we find the high significance of age group dummies as the appropriate variable reflecting the possibilities to quit economic activity by older workers.

### 4.3 Unemployment rate and time dummies

To control for the differences between regions and also changes in the overall situation on the labor market, we have include time dummies and unemployment rate. It was calculated for every region - defined as state district (voivodeship) - and for every quarter of the survey as the average unemployment in last year in given region. As expected, the higher the unemployment rate, the lower the probability of finding a job, although this outcome is stronger in the whole sample which indicates that the negative influence of unemployment rate is mainly due to its lower values before the shock, when transitions to employment were considerably higher. The differences among regions which are captured by the unemployment rate are also important, but to lesser extent, because in the subsample these unemployment rates were much more stable in time.

We have chosen the sample 2000/2001 as the reference group, because transitions then were similar to those calculated for the pooled sample. 1997/1998 probabilities of both outflows were significantly higher, with the one to employment increased by 83 per cent and to inactivity by 20 per cent. Because we only have first quarter 1998 in our sample, the significance of 1998/1999 dummy has to be treated as preliminary. Nevertheless, it is completely reasonable that transitions to employment were then more likely than in 2000/2001.<sup>18</sup> The likelihood of persistence of unemployment in 2001/2002 was significantly higher than in 2000/2001 which is in line with presented descriptive statistics (Table 1). Later, the probability of finding employment was not significantly different from the reference period which suggest the increasing persistence of unemployment on the macro level. On the other hand, the outflows to inactivity were less likely from 2001 on which is due to the transitions to inactivity in 2000/2001 being on the levels prevailing in late 90s.<sup>19</sup> The increase in gross transitions to inactivity in 2003/2004, comparing to 2001/2 and 2002/3 is confirmed by the econometric model.

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<sup>18</sup>This outcome may be different if it was possible to include the whole year 1998 in the analysis, because the unemployment in Poland soared in 1999, so unemployed interviewed in 1998 and 1999 may have experienced lower probability of finding employment than those interviewed only in first quarters of these years.

<sup>19</sup>It is worth noting that the increase of the number of inactive between 2000 and 2002 was due to young, who lengthened their education spells.

Table 10: Multinomial logit models for transitions out of unemployment - personal characteristics as explanatory variables

	Model 1: Pooled data 1997-2004		Model 2: Pooled data 2000-2004	
	Employment	Inactivity	Employment	Inactivity
Female	0.62***	1.66***	0.66***	1.71***
Single	0.72***	0.75***	0.73***	0.79***
Age 15-24	1.26***	1.20**	1.15*	1.16***
Age 35-44	0.82***	0.98	0.82***	0.95
Age 45-54	0.64***	1.64***	0.62***	1.66***
Age 55-64	0.33***	4.32***	0.36***	4.68***
Tertiary education	2.41***	1.02	2.49***	1.12
Vocational education	0.76***	0.90*	0.73***	0.90
Primary or less education	0.53***	1.04	0.58***	1.06
City over 100000	1.04	1.29***	0.98	1.21*
Countryside	1.11	1.05	1.09	1.11
MSoI – self-employment	1.27**	1.30**	1.13	1.17
MSoI – agricultural farm	1.78***	1.03	1.93***	0.96
MSoI – pension	0.91*	1.20***	0.95	1.12
MSoI – unemployment benefit	1.69***	0.88	1.89***	0.85
MSoI – other	0.87**	1.00	0.89	0.98
Unemployment rate	0.98***	1.00	0.98**	0.99
Year 1997/1998	1.83***	1.20**	-	-
Year 1998/1999	1.35***	0.99	-	-
Year 2001/2002	0.71***	0.63***	0.71***	0.63***
Year 2002/2003	0.93	0.66***	0.92	0.65***
Year 2003/2004	0.90	0.79***	0.89	0.78***
Number of observations		15181		11103
Pseudo $R^2$		0.0578		0.0447
Pseudo-likelihood		-13028.0		-9135.4

Notes: MSoI - main source of income. Women aged 15-59 and men aged 15-64. Reference category: male, between 25 and 34, secondary or post-secondary education, married, living in a town with 20000-50000 inhabitants, main source of household's income is from employment, year 2000/2001. (\*), (\*\*), (\*\*\*) denotes significance at 10, 5 and 1 per cent level respectively. Relative risk ratio shows how the probability of observing  $Y = 1$  changes when  $X$  changes from 0 to 1. Standard errors computed with the Huber/White/sandwich robust variance estimates.

Source: Own calculations based on BAEL.

#### 4.4 Controlling for length of out-of-employment spell

The preceding models 1 and 2 give the intuition how personal characteristics have influenced the probabilities of transitions out of unemployment and confirm the essential role played by the human capital. We have argued that importance of the length of out-of-employment spell may also be crucial, particularly in determining the odds of finding a job. It may also influence the decision to leave the labor market. As the unemployment spell increases, the individual is getting older and discouraged in the search effort, so he/she is more likely to become inactive. Nevertheless, such decision depends on the availability of receiving income from other sources.

We control for the length of out-of-employment spell using the variable described in subsection 2.3, so we have to exclude from our sample 211 individuals who didn't give the required information. In order to capture the influence of length of out-of-employment spell, we have used a set of dummy variables with the reference group composed of individuals not working for 12-24 months. Unfortunately, because the individuals are interviewed only for 2 consecutive years, it is impossible to check how long their unemployment spell really would be. Nevertheless, in multinomial logit setting we are interested on the relative differences between individuals with out-of-employment spells of various duration, so we can interpret the obtained relative risk ratios parallel as all the other dummy variables. Inclusion of these variables has increased the explanatory power of the model, as the null hypothesis in likelihood-ratio test was rejected at 1 per cent significance level. The outcomes for the model estimated on the whole sample and on the subsample (labelled 3 & 4) are presented in Table 11, columns 2 & 3. First we discuss how the relevance of personal characteristics has changed with inclusion of dummies for the duration of out-of-employment spell. Then we look at the differences with respect to length of period out of work experienced by the unemployed distinguished on the basis of crucial individual characteristics which allows us to discuss the influence of the spell indicators.

#### 4.5 Influence of personal characteristics

As we have mentioned in subsection 4.2, the changes in relative risk ratios reflecting the influence of main sources of income are rather small. None of them has changed their importance. More interesting are interactions between spell in question and personal characteristics. As expected, the influence of gender and education level has decreased. Females exhibit 29 per cent reduction in the probability of transition to employment and 57 per cent increment in the probability of transition to inactivity which in both cases is lower by 9 percentage points comparing to preceding model. This is due to longer out-of-employment spells experienced by women, illustrated by the data in Table 12. The median unemployed female has remained two and a half year without job at the time of the interview which is by 10 months longer than the median unemployed male. This difference may to some extent reflect different intensity of job turnover between sectors clustering women and men. This is in line with the fact that women

Table 11: Multinomial logit models for transitions out of unemployment - personal characteristics and length of out-of-employment spell as explanatory variables

	Model 3: Pooled data 1997-2004		Model 4: Pooled data 2000-2004	
	Employment	Inactivity	Employment	Inactivity
Female	0.71***	1.57***	0.77***	1.61***
Single	0.72***	0.75***	0.73***	0.79***
Age 15-24	1.13**	1.32***	1.02	1.29***
Age 35-44	0.85**	0.97	0.86**	0.94
Age 45-54	0.68***	1.66***	0.65***	1.67***
Age 55-64	0.39***	4.15***	0.43***	4.45***
Tertiary education	2.00***	1.13	2.03***	1.26
Vocational education	0.79***	0.89*	0.77***	0.88*
Primary or less education	0.60***	0.96	0.69***	0.96
City over 100000	1.02	1.27***	0.96	1.23**
Countryside	1.13*	1.05	1.12	1.10
MSoI – self-employment	1.27**	1.26**	1.17	1.13
MSoI – agricultural farm	1.81***	1.03	2.00***	0.94
MSoI – pension	0.95*	1.19***	1.01	1.11
MSoI – unemployment benefit	1.43***	0.96	1.57***	0.95
MSoI – other	0.91**	0.98	0.94	0.97
Up to 6 months	1.46***	0.86**	1.48***	0.83*
6-12 months	1.28***	0.99	1.22**	1.02
24-36 months	0.83**	1.23**	0.83**	1.25*
36-48 months	0.70***	1.04	0.62***	1.07
48-72 months	0.59***	1.32***	0.56***	1.34***
72-100 months	0.57***	1.31***	0.53***	1.21
More than 100 months	0.47***	1.62***	0.39***	1.56***
Unemployment rate	0.97***	1.00	0.98**	0.99
Year 1997/1998	1.77***	1.27***	-	-
Year 1998/1999	1.25**	1.03	-	-
Year 2001/2002	0.71***	0.64***	0.71***	0.64***
Year 2002/2003	0.97	0.66***	0.95	0.66***
Year 2003/2004	0.95	0.79***	0.93	0.79***
Number of observations	14970		10987	
Pseudo $R^2$	0.0737		0.0623	
Pseudo-likelihood	-12607.2		-8853.9	

Notes: MSoI - main source of income. Women aged 15-59 and men aged 15-64. Reference category: male, between 25 and 34, secondary or post-secondary education, married, living in a town with 20000-50000 inhabitants, main source of household's income is from employment, individual not working for 13-24 months, year 2000/2001. (\*), (\*\*), (\*\*\*) denotes significance at 10, 5 and 1 per cent level respectively. Relative risk ratio shows how the probability of observing  $Y = 1$  changes when  $X$  changes from 0 to 1. Standard errors computed with the Huber/White/sandwich robust variance estimates.

work less in the lifecycle perspective.<sup>20</sup>

Because the average duration of out-of-employment spells increases with age, the influence of age dummies is smaller in case of transitions to employment, but higher in case of inactivity. The differences in relative risk ratios implied by models 1 and 3 are highest for age 15-24 dummy and equal to 12 percentage points in both transitions. As the age increases, the changes in relative risk ratios shrink. We draw a conclusion that higher transitions to employment experienced by young unemployed are connected to shorter interruptions in employment in comparison to those experienced usually by the reference group, but nevertheless age differences remain significant. On the other hand, the intensity of outflow to inactivity is even more age-specific.

Model 4 - estimated on the subsample - points to no differences in probability of transition to employment between individuals aged 15-24 and 25-34, whereas the probability of outflow to inactivity among young is higher by 29 per cent. It is in line with descriptive statistics presented in subsection 2.1. The changes in relative risk ratios connected with gender and remaining age groups are parallel to those in the whole sample and described earlier.

Table 12: Structure of gender and education groups by the length of out-of-employment spell, average and mode length of out-of-employment spell (in months) for individuals without work up to 10 years

Out-of-employment spell (in months)	Men	Women	Primary education	Vocational education	Secondary or post-secondary education	Tertiary education
0-6	22.4	15.3	14.3	18.8	20.2	35.0
6-12	15.4	13.7	10.0	14.8	16.8	18.1
12-24	18.9	16.1	14.2	18.4	18.1	19.9
24-36	12.1	10.3	10.0	11.9	11.2	9.1
36-48	7.4	7.9	8.1	7.7	7.6	4.2
48-72	9.6	11.5	13.5	10.3	9.4	5.5
72-100	6.4	8.5	10.9	6.8	6.5	3.5
More than 100	7.8	16.8	19.0	11.3	10.2	4.7
Total	100.0	100.0	100.0	100.0	100.0	100.0
Mode	19.0	29.0	38.0	22.0	20.0	11.0
Average	22.2	33.8	38.1	29.7	27.9	18.0

Notes: Pooled data 1997-2004. Individuals out of employment for up to 10 years. Men aged 15-64 and women aged 15-59. In percentage points.

Source: Own calculations based on BAEL.

Controlling for the length of out-of-employment spell has reduced the influence of education dummies, although their significance has not changed. We expect that education level is one of the main determinants of the duration of spells, but nevertheless even when we control for the length of spell, education level significantly diversifies odds of finding job. To illustrate how

<sup>20</sup>Although we have to bear in mind that labor supply of women in Poland is relatively higher than that of men in comparison with UE15.

different degrees of persistence of unemployment exhibited by various education group manifest themselves in length of out-of-employment spells, we present in Table 12 the decomposition of education groups by duration of these spells. Such structures, along with modes and averages, clearly stress the importance of education level attained in determining the prospects of unemployed. Interestingly, the differences between unemployed with vocational and secondary or post-secondary education are rather small, especially when compared with primary education and on the other hand with tertiary education.

#### 4.6 Influence of length of out-of-employment spell

As is presented in Table 7, the transitions to employment decrease and to inactivity increase with duration of out-of-employment spell. The outcomes of the models 3 & 4 confirm these relationships. All of the dummy variables for the duration of the spell are significant at 1 per cent level in model 3, except for the 24-36 months dummy variable which is significant at 5 per cent level. The relative risk ratios imply that the unemployed being out of work up to six months has the probability of finding employment by 46 per cent higher than the individual not working for 12-24 months. Every subsequent group we distinguish faces lower odds of finding employment but the incremental loss of the probability in question declines which means that the chances of finding employment are reduced at the declining pace as the individual remains unemployed and switches to next interval we have defined. However, lengthening of spell deteriorates the chances of finding employment regardless of the education level attained.

On the other hand, these indicators are to much lesser extent influencing transitions to inactivity, in particular there are no differences between individuals not working for 6-12 and 12-24 months. Thus, it seems that the outflow to inactivity accelerates after second year spent out of employment. Unemployed not working up to 6 months have the probability of transition to inactivity significantly reduced at 5 per cent level. Looking at the remaining groups, we find individuals not working for 24-36 and 48 or more months significantly more likely to become inactive and spurious insignificance of the 36-48 dummy.

Hence, the increase in transitions to inactivity, recorded for individuals with longer out-of-employment spells and presented in Table 7, is rather due to the increase of average age of members of each consecutive group and to the fact that individuals with higher level of human capital find jobs in first months of unemployment which is in particularly valid for 6-12 and 12-24 months groups. Moreover, the sectoral differences may play important role. We also have to remember that we do not track individual experience during unemployment, so membership in certain group does not mean that the individual has changed its labor market status after given spell of unemployment, but only that the person does not have job for such period.

Outcomes from the model 4 estimated on the subsample containing observations from the year 2000 on (Table 11 columns 4 & 5) suggest that the importance of duration of the spell for transition to employment has increased, as all of the dummies are significant at 1 per cent level and the relative risk ratios imply stronger differences between groups. As the share of

long-term unemployed has increased and the average spell out-of-employment has also risen, the situation of individuals not working for a long time has deteriorated which seems to confirm the prolonged stagnation on the labour market and is line with the human capital deterioration argument as well. With respect to inactivity, we find even smaller importance of these dummies which indicates that as the transitions to inactivity declined, they become more dependent on age than on the other explanatory variables.

## 5 Search behavior and labor market policy

Human capital seems to play substantial role in determining the likelihood of finding employment whereas transitions to inactivity are predominantly dependent on age and gender. Furthermore, the length of the out-of-employment spell significantly influences the odds of finding employment. Nevertheless, we guess that it should be also modified by the activities undertaken by the unemployed. Attending trainings may increase the human capital and skills so we include such variable in the model.<sup>21</sup> Moreover, unemployed should be offered measures of labor market policy, especially active labor market policy (ALMP). Actually, the scope of ALMP in Poland is rather limited as these policies encompass only a small percentage of unemployed and the expenditures are substantially lower than in EU15 countries (Bukowski et al., 2005). The overwhelming majority of labor market expenditures is spend on passive policy, not only on unemployment benefits but also on pre-retirement assistance and benefits.<sup>22</sup> Low outlays on ALMP may have probably contributed to the decline in the number of unemployed taking part in ALMP programs which might had especially detrimental effect as this decrease occurred concurrently to worsening the labor market conditions and increasing the need for active measures. Unfortunately, the data required to evaluate thoroughly the effectiveness of labor market policy are unavailable.<sup>23</sup>

Despite of human capital, the unobservable heterogeneity in attitude towards work also may influence the odds of finding employment. Using BAEL we are able only to control for the method of search stated by the individual. Unfortunately, in some cases the answer was not given, so we have to exclude 245 observations from our sample, 65 of which are also in the subsample consisting of individuals interviewed from 2000 on. In subsection 2.4 we have

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<sup>21</sup>Training dummy equals 1 if the individual has attended a training within 3 months before one of 3 interviews he undertook within one year. Unfortunately, from 2001 on the questionnaire was changed and the period within which the training had to be attended to be valid was reduced to 4 weeks. This resulted in rapid decrease in the number of unemployed declaring they had attended a training. Nevertheless, only 366 individuals in the whole sample attended a training.

<sup>22</sup>In fact the spending on pre-retirement assistance and benefits has been exceeding the spending on unemployment benefits from 2002 on.

<sup>23</sup>The individuals taking part in ALMP are not track after the program is finished and there is no information about their personal characteristics so it is impossible to assess the efficiency of ALMP not only on the individual level (by comparing the probability of finding employment before and after the participation) but also on the macro level (by accounting for dead-weight loss, substitution and displacement effects).

presented the decomposition of the sample by search method. Because two thirds of unemployed relied on labor market offices, we treat them as the reference group. We also control for the fact that someone is not registered by labor market office.

We have included these explanatory variables in all of the models presented earlier. This has not changed the significance of personal characteristics and on the other hand, if these variables were included in the model before indicators of the length of out-of-employment spells were added, the significance of these new variables was the same. In every case, the nested model had lower explanatory power than the one encompassing it, as the null hypothesis in the likelihood-ratio test was rejected with 1 per cent significance. Therefore, we present only the most comprehensive model, the outcomes for models labeled 5 & 6 are shown in Table 13. First we discuss the outcomes obtained for search methods and indicators of labor market offices' activities and then we will examine how the inclusion of these variables has modified the importance of the factors, which we have already accounted for - personal characteristics and length of out-of-employment spell. All of the results are robust to changes in the sample size which indicates that relative differences between various activities undertaken by unemployed have not changed.

Table 13: Multinomial logit models for transitions out of unemployment - personal characteristics, length of out-of-employment spell and search activity as explanatory variables

	Model 5:		Model 6:	
	Pooled data 1997-2004		Pooled data 2000-2004	
	Employment	Inactivity	Employment	Inactivity
Female	0.72***	1.62***	0.79***	1.68***
Single	0.73***	0.77***	0.74***	0.80***
Age 15-24	1.17**	1.31***	1.06	1.29***
Age 35-44	0.85***	1.01	0.84**	0.96
Age 45-54	0.67***	1.67***	0.64***	1.68***
Age 55-64	0.37***	3.65***	0.44***	3.75***
Tertiary education	2.07***	1.05	2.10***	1.19
Vocational education	0.78***	0.89*	0.76***	0.89
Primary or less education	0.61***	0.99	0.69***	0.99
City over 100000	1.05	1.19*	0.99	1.16
Countryside	1.11	1.05	1.09	1.11
MSoI – self-employment	1.27**	1.27**	1.17	1.11
MSoI – agricultural farm	1.81***	1.06	1.96***	0.98
MSoI – pension	0.96	1.19***	1.02	1.11
MSoI – unemployment benefit	1.26***	1.11	1.34***	1.08
MSoI – other	0.95	1.04	0.98	1.02
Up to 6 months	1.33***	0.82**	1.38***	0.77**
6-12 months	1.18**	1.01	1.15	1.03
24-36 months	0.85**	1.19*	0.86	1.25*
36-48 months	0.70***	1.05	0.65***	1.03
48-72 months	0.63***	1.24**	0.59***	1.34**
72-100 months	0.60***	1.22*	0.57***	1.16
More than 100 months	0.50***	1.41***	0.42***	1.41***
Individual search	1.31***	1.07	1.36***	1.03
Advertisements	0.90	1.06	0.90	1.00
Personal contacts	1.06	1.26**	1.14	1.30**

Training	2.76***	1.12	4.14***	1.56*
Unregistered	1.03	1.71***	0.94	1.87***
Benefit recipient	1.46***	0.95	1.47***	0.98
Unemployment rate	0.97***	1.00	0.98**	1.00
Year 1997/1998	1.65***	1.30***	-	-
Year 1998/1999	1.19*	1.05	-	-
Year 2001/2002	0.72***	0.65***	0.72***	0.65***
Year 2002/2003	0.98	0.65***	0.96	0.65***
Year 2003/2004	0.97	0.78***	0.95	0.79***
Number of observations		14736		10921
Pseudo $R^2$		0.0835		0.0752
Pseudo-likelihood		-12244.6		-8669.5

Notes: MSoI - main source of income. Women aged 15-59 and men aged 15-64. Reference category: male, between 25 and 34, secondary or post-secondary education, married, living in a town with 20000-50000 inhabitants, main source of household's income is from employment, individual not working for 13-24 months, search by PES, registered, not eligible to benefit, year 2000/2001. (\*), (\*\*), (\*\*\*) denotes significance at 10, 5 and 1 per cent level respectively. Relative risk ratio shows how the probability of observing  $Y = 1$  changes when  $X$  changes from 0 to 1. Standard errors computed with the Huber/White/sandwich robust variance estimates.

Source: Own calculations based on BAEL.

## 5.1 Influence of search methods and labor market offices activities

Individuals relying in their search effort on the labor market office constitute the reference group. We have argued in subsection 2.4 that these individuals exhibit the highest persistence of unemployment and rather high outflows to employment. Although searching by advertisements, chosen by less than 10 per cent of individuals, resulted in lower transitions to employment and higher transitions to inactivity, it is found insignificant in the multinomial logit setting. Because among unemployed aged 55-64 it was relatively much more popular than among all other age groups, it may explain the rather high outflows to inactivity connected with this method of search. On the other hand, searching by advertisements was also relatively more popular among unemployed with tertiary education but even within this group, the ones who were relying on advertisements exhibited transitions to inactivity considerably higher (more than two times) and transitions to employment lower than the ones using other search methods. It seems that this method of search is chosen by individual eager to leave the labor market, although it is insignificant in the model.

As indicated by the data in Table 13, individual search significantly increase the probability of finding employment. On the other hand relying on personal contacts makes unemployed more likely to become inactive. We also conjecture that there is substantial self-selection concerning the methods of search which is not only stemming from unobservable differences in the

attachment to labor market - as is probably is in case of advertisements - but also from institutional incentives - as in case of relying on labor market offices. The fact that only individual activities increase the probability of finding employment and also the fact that two thirds of unemployed relies on labor market offices (which dispose over very limited financial means for job counselling and intermediation) stresses the importance to develop job intermediation services in Poland. The lack of these services may cause unemployed to search by advertisements and even rest on personal contacts which seems not to increase their prospects of finding job.

Only a tiny minority of unemployed has attended training which may bias the estimates upwards. On the basis of models 5 & 6 we find the relative probability of starting to work significantly increased for these individual. The implied increment in likelihood of finding job is equal to 176 per cent in the whole sample and 314 per cent in the subsample. These results are in line with findings by Kluve et al. (2001).<sup>24</sup> However, individuals attending trainings are already well educated - 62 per cent of them have at least secondary and 6 per cent tertiary education level attained. They are also relatively young and exhibit short out-of-employment spells. Thus we conjecture that there is substantial creaming and resulting dead-weight losses taking place, as the ones who attend trainings are already the ones with better prospects on the labor market. Unfortunately, because of the lack of the data needed to evaluate the effectiveness of active labor market policy, we treat the above statement as preliminary.<sup>25</sup>

We interpret the positive influence of unemployment benefit on probability of finding employment with similar caution. Although we control for the length of out-of-employment spell, we find the outcome for the role of unemployment benefit rather spurious due to potential collinearity. Namely, 75 per cent of benefit recipients are out of work for 12 or less months whereas among unemployed not receiving benefit the respective share is 25 per cent. Moreover, we are unable to assess if the high transitions to employment among benefit recipients are resulting in stable employment or if they indicate attempts to regain the eligibility to benefit. Hence, we treat the results for unemployment benefit as preliminary, although the data presented in Table 6 in subsection 2.3 suggest that as the share of benefit recipients has been decreasing - even among unemployed not working up to 1 year - the higher transitions to employment among recipients have been becoming more visible.<sup>26</sup>

The unregistered unemployed are significantly more likely to become inactive - the increase in the probability in question equals 71 per cent in the whole sample (model 5) and 87 per cent in the subsample (model 6). This outcome confirms that the some of unregistered unemployed

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<sup>24</sup>Also O'Leary (1997) has found positive influence of trainings on the probability of finding employment and wages in 1990-1997 period but on other hand Puhani (1998) shows that participation in trainings is not significant in determining the chances of finding employment.

<sup>25</sup>Because of the lack of data from labor market offices it is rather impossible to assess the scale of creaming connected to trainings and to answer the question if it is deliberately conducted by labor market offices and triggered by the institutional and financial incentives inherent in the institutional structure of these offices.

<sup>26</sup>Because the benefits are paid to much lower fraction of unemployed and eligibility period has been reduced, our findings cannot be directly compared to findings by Puhani (1996) or Adamchik (1999) who on the basis of hazard functions showed that unemployment benefit eligibility reduces the probability of leaving unemployment.

ponder quitting voluntary the labor market, so this variable may also approximate the attitude towards work. On the other hand, some of unregistered are permanently out-of-employment. The higher average, mode and variance of the length of not working spell among unregistered ones is in line with this conjecture.

## **5.2 Changes in the influence of personal characteristics and duration of out-of-employment spell**

In general, the significance of personal characteristics has not changed comparing to the models 3 & 4 presented in Table 11. The relative risk ratios of finding employment with respect to young age and tertiary education level have increased in the whole sample and the influence of tertiary education has also increased in the subsample. It is due to the inclusion of the unemployment benefit dummy because only 2 per cent of benefit recipients have tertiary education and only 21 per cent of benefit recipients are younger than 25 years of age. Hence, higher transitions experienced by these individuals are to higher extent explained by their age and education.

Concerning transitions to inactivity, living in city with more than 100000 inhabitants no longer significantly increases the probability of becoming inactive. This change results from the inclusion of “unregistered” dummy that increases the probability of leaving the labor market. The unregistered unemployed constitute one third of all unemployed in large cities, on the other hand inhabitants of large cities amount to 25 per cent of all unemployed and to 36 per cent of all unregistered unemployed. Thus, the significance of large cities dummy in the preceding models 1 to 4 was due to this clustering of unregistered individuals.

The significance of indicators of the duration of out-of-employment spell has not changed in comparison to model 3 in the model 5 estimated on the whole sample. When the subsample is used, the significance of 6-12 and 12-24 months dummies disappears in model 6. Furthermore, the relative risk ratios connected to duration of spell have converged slightly to 1 which means that the differences stemming from various duration of the spell have been reduced. These change is completely triggered by the inclusion of “unemployment benefit” and “unregistered” dummy, as both of them strongly interact with the duration of the spell. Of course the search behavior differs between individuals with experiencing different time spent out of employment. Unemployed up to 6 months to highest degree focus on individual search and also on advertisements, whereas 64 per cent of them rely on labor market offices - which is the lowest share among all of groups distinguished. Labor market office is the most important method of search among individuals not working for 6-12 months and as the spell increases, the percentage of unemployed using this method declines slightly. Advertisements are rather uniformly popular among all groups. Relying on personal contacts becomes more important as the spell increases which indicates that this method is chosen by individuals who are probably discouraged by the inefficiency or other methods, probably used earlier. At the same time, it confirms that relying on acquaintances signals low level of human capital and its substantial

deterioration. Nevertheless, controlling solely for search methods does not change the influence of the out-of-employment spell.

## 6 Sectoral influence

We have argued in subsection 2.5 that sector where the previous job was held may to some extent influence the chances of finding employment, especially if some sectors experience severe contraction of output and workers are not perfectly mobile between jobs and sectors. In fact, in the analysis of transitions out of employment (Bukowski, Lewandowski, 2005) we have found significant differences between sectors, as agriculture, power engineering and public administration, health care & education exhibited significantly higher job stability comparing to industry. It was similar in case of services, although the significance and influence were smaller. Moreover, coal mining was characterized by significantly lower outflows to unemployment, the reverse being true for construction. Therefore we try to assess, if the sectoral differences persist among unemployed. Unfortunately, the nature of the study makes our analysis preliminary, as about 15 per cent of interviewed did not give the required information. Hence, we excluded another 2210 observations from our sample which consists now of 12526 individuals. We have also estimated the model on the subsample from 2000 on (it required excluding 1955 observations so we are left with 8966). The respective models are labeled as models 7 & 8. Controlling for sectors increases the explaining power of the model, as the null hypothesis of likelihood ratio test was rejected with 1 per cent significance for both the whole sample and the subsample. The outcomes are presented in Table 14. Because some of unemployed were never employed, we may treat this fact parallel to sectoral differences as the important part of individual's experience. The transition statistics presented in subsection 2.5 for these individuals are close to the average and this dummy variable is not significant in our models 7 & 8.

Former industry workers form our reference group. In the whole sample we find individuals previously employed in coal mining, public administration, health care & education significantly less likely to find employment at 5 per cent level. It manifests itself also in the longer unemployment spells experienced by these unemployed - the average and median spell (not presented here) being higher than in industry. Coal miners are less likely to lose a job (Bukowski, Lewandowski, 2005), but they face substantial problems with finding one which may also point to insider-outsider effect and the fact that the inflows to coal mining are very small. Moreover, former coal miners are unlikely to switch to different sector. All these sectors were state-owned at the beginning of transition and as shown by Boeri, Flinn (1997) the unemployed were more likely to find job in private sector, but on the other hand transitions from private to public sector were occurred more often than *vice versa*. It seems that our analysis confirms that public sector employees still exhibit relatively high job stability, but they are unlikely to find employment once unemployed.

In case of construction, the probability of finding a job is reduced at 10 per cent level

which is rather caused by exposure of this sector to seasonal and cyclical fluctuation and limited scale of cross-sector mobility of construction workers. Moreover the probability of transition to inactivity is also reduced, although the significance is weak. All of this suggests that construction workers face higher risk of losing a job and if it happened, they are more likely to remain unemployed. As the share of former construction workers among unemployed has decreased and that the corresponding share among employed has been stable, we draw a conclusion that the high outflow to unemployment and its persistence are balanced by the inflow of entrants into this branch. The transitions to inactivity are also reduced in case of services workers at 5 per cent significance which implies that they are more likely to stay active and rather move between employment and unemployment. The reverse is true for business services, although the significance is very weak.

The outcomes for sectors of economy are similar in both samples considered but the significance of the variables in the model 8 (estimated on the subsample) is lower, especially in case of construction - no longer significant in transitions to inactivity - and public administration, health care & education - no longer significant at all. This suggests that after the adverse shock, the differences stemming only from sector of previous employment have slightly decreased. However, we are unable to account for the cross-sectoral mobility of individuals and, what is probably more important, the individuals who did not give the information required exhibit very low transitions to employment and long spells out of work. They amount to 15 per cent of the sample and we expect them to be previously employed in sectors experiencing high job turnover, short employment spells and also relatively high share of part-time job. The underground economy may also be important here. Hence, the above results are preliminary, especially in case of agriculture, services and construction, because we find these sectors probably employing individuals who have not stated the sector of the previous job.

Table 14: Multinomial logit models for transitions out of unemployment - personal characteristics, length of out-of-employment spell, search activity and sector of last job as explanatory variables

	Model 7:		Model 8:	
	Pooled data 1997-2004		Pooled data 2000-2004	
	Employment	Inactivity	Employment	Inactivity
Female	0.71***	1.66***	0.77***	1.74***
Single	0.72***	0.71***	0.74***	0.76***
Age 15-24	1.24***	1.34***	1.13	1.36*
Age 35-44	0.87**	1.04	0.86**	0.98
Age 45-54	0.70***	1.79***	0.68***	1.83***
Age 55-64	0.37***	4.19***	0.45***	4.61***
Tertiary education	2.21***	0.99	2.30***	1.12
Vocational education	0.81***	0.89	0.79***	0.88
Primary or less education	0.63***	0.96	0.72***	0.93
City over 100000	1.02	1.19*	0.94	1.16
Countryside	1.09	0.99	1.05	1.05
MSoI – self-employment	1.24**	1.36**	1.09	1.20
MSoI – agricultural farm	1.85***	1.06	2.02***	0.95
MSoI - pension	0.96	1.13*	1.01	1.07
MSoI - unemployment benefit	1.32***	1.10	1.43***	1.00
MSoI - other	0.99	1.09	1.01	1.09
Up to 6 months	1.32***	0.80**	1.36***	0.77**
6-12 months	1.17**	1.01	1.15	0.99
24-36 months	0.84**	1.16	0.89	1.22*
36-48 months	0.71***	0.98	0.68***	0.95
48-72 months	0.64***	1.21**	0.61***	1.28**
72-100 months	0.64***	1.27**	0.61***	1.25
More than 100 months	0.60***	1.40*	0.58**	1.47*

Individual search	1.31***	1.12	1.35***	1.08
Advertisements	0.94	1.18*	0.91	1.14
Personal con- tacts	1.05	1.31***	1.13	1.28**
Training	2.70***	1.16	4.19***	1.51
Unregistered	1.00	1.62***	0.91	1.76***
Benefit recipient	1.46***	0.92	1.47***	0.92
Never worked	0.88	1.06	0.86	1.00
Agriculture	0.92	1.07	1.02	1.06
Coal mining	0.66**	1.11	0.68*	1.00
Power engineer- ing	0.92	0.88	0.88	0.87
Construction	0.84*	0.81*	0.82*	0.86
Services	1.04	0.84**	1.12	0.82*
Business services	0.97	1.27*	1.00	1.33*
Public adminis- tration, health care & education	0.79**	0.99	0.82	0.99
Unemployment rate	0.97***	1.00	0.98***	1.00
Year 1997/1998	1.54***	1.22***	-	-
Year 1998/1999	1.14	1.01	-	-
Year 2001/2002	0.72***	0.62***	0.72***	0.62***
Year 2002/2003	1.00	0.63***	0.98	0.64***
Year 2003/2004	0.97	0.80**	0.95	0.81**
Number of obser- vations		12526		8966
Pseudo $R^2$		0.0795		0.0714
Pseudo- likelihood		-10475.3		-7156.2

Notes: MSoI - main source of income. Women aged 15-59 and men aged 15-64. Reference category: male, between 25 and 34, secondary or post-secondary education, married, living in a town with 20000-50000 inhabitants, main source of household's income is from employment, individual not working for 13-24 months, search by PES, registered, not eligible to benefit, previous job in industry, year 2000/2001. (\*), (\*\*), (\*\*\*) denotes significance at 10, 5 and 1 per cent level respectively. Relative risk ratio shows how the probability of observing  $Y = 1$  changes when  $X$  changes from 0 to 1. Standard errors computed with the Huber/White/sandwich robust variance estimates.

Source: Own calculations based on BAEL.

## 7 Conclusions

In this paper we conduct the multinomial logit analysis based on the individual Polish LFS data stretched over the 1997-2004 period. We aim at scrutinizing the determinants of outflows from unemployment at the time when the two shocks have affected the Polish economy and labor market. However, we focus mainly on the supply-side factors influencing probabilities of transitions out of unemployment. We find that age and the level of education attained are among the most important personal characteristics altering the prospects of unemployed to find a job. Those chances are clearly decreasing with age and rising with skill level, regardless of the model specification applied. With respect to the flow out of the labor force, age plays certain role for the youngest and eldest age-groups, whereas the education level is found to be irrelevant. Those outcomes are perfectly in-line with results we present in our companion paper (Bukowski, Lewandowski, 2005) that deals with the flows out of employment. We also found that adverse shock that triggered the vast labor market changes in Poland in 1998 significantly reduced the relative chances of finding employment by the youngest participants, whose participation visibly declined.

With respect to the sources of income we point out that those unemployed that receive unemployment benefit also have relatively higher odds of finding job than those without such entitlement, however we presume that most of this effect can be attributed to the length of unemployment spell that is strictly negatively correlated with the benefit entitlement. In fact, the longer the out-of-employment spell, the smaller the chances to find a job and the larger probability of becoming inactive, and that outcome is very robust to changes in model specification. Confronting the expected length of unemployment spell with educational level of unemployed, we point out that people with tertiary education level attained are in significantly better position than the other.

Interesting feature of Polish unemployment can be seen when search behavior and labor market policies are considered. We find that individual search is much more effective method of looking for a job than relying on the services delivered by public employment offices. Such conclusion is completely in line with institutional weaknesses of Polish PES, widely discussed in literature (i.e. Boni and Golinowska (2004) and Bukowski et al. (2005)). On the other hand, we also find some evidence that training programmes for unemployed increase probabilities of finding a job, although we stress that this result may be biased up by the characteristics of trainings' participants.

As the out of employment flows after 1997 were mainly driven by the industry restructuring, it is important to note that former workers of several branches seem to have relatively weaker prospects of finding a job if they already lost one. We found that this may be especially the case of former coal miners, construction workers or public administration employees. It may be due to the fact that they experience relatively stronger deterioration of skills and work abilities, probably because they are too specifically shaped, exactly as stressed by Ljunqvist and Sargent (1998).

## 8 Appendix

The data used in the analysis originate from the Polish Labor Force Survey (BAEL) carried out between 1997 & 2004. Each individual in the sample answered the survey 4 times - spanned over the 6 quarter period with 2 quarters break in the middle. We compare the labor market status declared by the individual at first and third interview of each wave, so we are sure that each individual is included only once in our analysis. The survey is being conducted 4 times a year, every survey consists of 4 panels compounded of about 11000 individuals. Unfortunately, it hasn't been carried out in 2nd and 3rd quarter 1999 and the continuity of the survey was lost so it is impossible to match 4 waves of BAEL. This lack of data is particularly detrimental when we study the labor market transitions, because substantial changes at the macro-level occurred during this period. Moreover, due to methodological changes, it is impossible to identify all individuals interviewed in 2002. Nevertheless, we can analyse the labor market flows after as well as before the adverse shock.

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Table 15: Sample used in the analysis

Year of the survey	Frequency	Percent
1997/1998	3271	21.5
1998/1999	807	5.3
2000/2001	3684	24.3
2001/2002	3027	19.9
2002/2003	2242	14.8
2003/2004	2150	14.2
Total	15181	100.0

Notes: The panel consists of 4 waves 1997/1998, 1 wave 1998/1999 (first quarter), 4 waves 2000/2001, 3 waves 2001/2002 (first 3 quarters), 4 waves 2002/2003 and 2 waves 2003/2004 (first 2 quarters). Men aged 15-64 and women aged 15-59.

Table 16: The decomposition of the sample with respect to education level , by gender and age

	Primary	Vocational	Secondary or post-secondary	Tertiary	Total
Men	24.2	49.9	23.3	2.6	100.0
Women	19.4	35.2	41.5	3.9	100.0
Age 15-24	16.4	41.4	39.9	2.3	100.0
Age 25-34	17.5	45.4	31.1	6.0	100.0
Age 35-44	22.5	46.8	28.9	1.8	100.0
Age 45-54	30.9	37.2	29.3	2.6	100.0
Age 55-64	40.2	25.2	27.8	6.8	100.0

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points  
Source: Own calculations based on BAEL.

Table 17: The decomposition of the sample with respect to education level, by gender and age

	Women	Men	Total	Age 15-24	Age 25-34	Age 35-44	Age 45-54	Age 55-64	Total
Primary	45.3	54.7	100.0	20.6	20.1	26.0	27.2	6.1	100.0
Vocational	42.4	57.8	100.0	26.7	26.8	27.8	16.8	1.9	100.0
Secondary or post-secondary	35.1	64.9	100.0	33.6	24.0	22.4	17.3	2.8	100.0
Tertiary	39.0	61.0	100.0	19.3	45.6	13.4	14.9	6.8	100.0

Notes: Pooled data 1997-2004. Men aged 15-64 and women aged 15-59. In percentage points  
Source: Own calculations based on BAEL.

Table 18: The decomposition of the unemployed men out of work for up to 1 year with respect to education level attained and age, by benefit recipiency

Without benefit					
	Tertiary	Secondary or post-secondary	Vocational	Primary	Total
Age 15-24	1.4	15.4	19.7	4.3	40.7
Age 25-34	3.0	5.9	12.7	4.0	25.6
Age 35-44	0.3	2.9	11.0	3.1	17.2
Age 45-54	0.5	3.5	6.3	3.5	13.7
Age 55-64	0.1	0.8	1.1	0.8	2.8
Total	5.2	28.5	50.7	15.7	100.0
Benefit recipient					
Age 15-24	0.0	4.7	7.9	1.6	14.1
Age 25-34	1.0	8.8	21.7	4.0	35.5
Age 35-44	0.8	5.9	16.7	5.0	28.4
Age 45-54	0.5	3.6	10.7	5.7	20.5
Age 55-64	0.3	0.4	0.1	0.6	1.4
Total	2.6	23.4	57.1	16.9	100.0

Notes: Pooled data 2000-2004. Men constitute 55.1 percent of unemployed out of work up to 1 year and not eligible to benefit, and 59.5 per cent of beneficiaries out of work for up to 1 year. In percentage points.  
Source: Own calculations based on BAEL.

Table 19: The decomposition of the unemployed women out of work for up to 1 year with respect to education level attained and age, by benefit reciprocity

Without benefit					
	Tertiary	Secondary or post-secondary	Vocational	Primary	Total
Age 15-24	4.4	33.7	12.5	1.8	52.4
Age 25-34	5.6	7.1	5.7	1.2	19.6
Age 35-44	0.6	6.8	5.4	2.7	15.5
Age 45-54	0.5	5.2	4.2	1.8	11.6
Age 55-64	0.4	0.4	0.1	0.0	0.8
Total	11.5	53.1	27.9	7.5	100.0
Benefit recipient					
Age 15-24	0.6	7.8	4.7	0.6	13.7
Age 25-34	1.5	13.3	12.3	3.6	30.7
Age 35-44	1.1	14.4	13.5	4.9	34.0
Age 45-54	0.6	10.2	4.2	6.1	21.1
Age 55-64	0.0	0.2	0.2	0.2	0.6
Total	3.8	45.9	34.9	15.4	100.0

Notes: Pooled data 2000-2004. Women constitute 44.9 percent of unemployed out of work up to 1 year and not eligible to benefit, and 40.5 per cent of beneficiaries out of work for up to 1 year. In percentage points.

Source: Own calculations based on BAEL.

Table 20: Decomposition of the population, employed, unemployed and inactive aged 20-64, by education level attained

		Population							
		1997	1998	1999	2000	2001	2002	2003	2004
	Tertiary	9.2	9.9	10.0	10.3	11.0	12.1	13.5	14.7
	Secondary or post-secondary	35.4	35.6	37.4	37.2	36.7	37.2	37.4	38.1
	Vocational	33.4	33.5	33.0	33.5	34.1	33.4	33.0	32.2
	Primary	22.0	21.0	19.6	18.9	18.2	17.3	16.1	15.0
		Employed							
		1997	1998	1999	2000	2001	2002	2003	2004
	Tertiary	12.2	13.2	13.6	14.3	15.6	17.2	19.3	20.8
	Secondary or post-secondary	36.2	36.7	39.3	38.6	37.8	38.3	37.7	37.9
	Vocational	35.2	35.2	33.8	34.2	34.4	33.3	32.7	31.8
	Primary	16.3	14.9	13.3	13.0	12.1	11.2	10.3	9.4
		Unemployed							
		1997	1998	1999	2000	2001	2002	2003	2004
	Tertiary	3.3	3.7	3.7	4.8	5.7	5.7	6.7	6.8
	Secondary or post-secondary	36.2	35.1	34.7	34.3	35.3	35.3	34.5	34.7
	Vocational	35.2	40.9	41.4	42.7	41.2	41.2	41.2	41.2
	Primary	16.3	20.3	20.2	18.2	17.8	17.8	17.6	17.3
		Inactive							
		1997	1998	1999	2000	2001	2002	2003	2004
	Tertiary	3.8	3.9	4.5	4.5	4.4	5.2	5.7	6.3
	Secondary or post-secondary	34.0	33.9	34.1	35.4	35.5	36.0	38.2	40.0
	Vocational	27.0	27.3	27.8	28.6	29.2	29.8	29.5	28.7
	Primary	35.2	34.9	33.6	31.5	30.9	29.0	26.6	24.9

Source: Own calculations based on BAEL.

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