

Assessing flows out of employment in Poland: evidence from multinomial logit analysis ^{*}

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Abstract

This paper investigates the determinants of the flows out of employment in Poland using multinomial logit model based on the individual LFS panel data covering the 1997-2004 period. It focuses on the influence of the personal characteristics, macroeconomic environment, industry restructuring and labor market institutions on the individual's labor market prospects. Special attention is devoted to social security benefits and pensions as co-determinants of labor market behavior of older workers.

JEL classification: J2, H31

Key words: Labor dynamics, transition economies, job destruction, multinomial logit

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1 Introduction

In the last fifteen years formerly centrally planned economies of Central and Eastern European countries went through the process of deep restructuring enabling them to enter European Union at May 1st 2004. The transformation has brought severe changes to all spheres of socio-economic life in CEE states including their labor markets. In fact one can look on the process from the “creative destruction” theory perspective (Aghion, Howitt, 1992) as on the continuous stream of allocative shocks resulting in huge job flows from less to more productive economy branches. In this paper we concentrate our attention on Poland which is not only the largest country among the ten New Member States but also the country that magnifies most of the labor market phenomena one can observe in the region. Our analysis is limited to seven year pre-accession period 1997-2004 not only from technical reasons (availability of the data) but also because of the intensity of the changes on Polish labor market in that time. In fact, since 1997 Poland has faced two subsequent episodes of economy-wide employment restructuring that put its labor market far away from other countries in the region regardless whether we take into account employment, activity or unemployment rate. As Bukowski et al. (2005) argue, those episodes can be attributed to one external and one internal shock - the 1998 Russian crisis and 2001-2002 cyclical slowdown. The overall impact of those shocks on Polish labor market was tremendous - between 1998 and 2004 the unemployment rate doubled reaching 20.0 percentage level, whereas employment rate fell by almost one tenth levelling at 51.2 percentage points. Important decrease could also be observed with respect to participation rate that already in 1998 belonged to the lowest in Europe.

The preceding papers analyzing transitions on Polish labor market were based on firm level data on job destruction and job creation (Faggio, Konings, 2001) and did not focused on personal characteristics. Our approach is different as we make use of the LFS data in order to look for the individual determinants of the out-of-employment transitions within the period of interest. Therefore, we try in our paper to add to empirical literature on labor market transitions by focusing mainly on supply-side features and turning to econometric analysis on the micro level, in order to evaluate the relevance of personal and household’s characteristics for individual prospects on the labor market.

Important part of our analysis concentrates on the role of institutional factors in determining the strength of flows out of employment. We supplement in that way the so called *Optimal Speed of Transition* literature - Aghion, Blanchard (1994) - that has extensively explored the labor market dynamics in connection with fiscal variables, but at the same time it has not paid enough attention to changes of economic activity, namely to decline in the participation rate. As was stressed by Bruno (2003), Góra (2003) or Bukowski et al. (2005), dismissed workers have the opportunity to choose an *outside-option*, i.e. an alternative to the labor force participation, especially when confronted with policy measures subsidizing leisure. Therefore much of our attention is devoted to social security benefits and pensions as co-determinants of labor market behavior of older workers.

The paper proceeds as follows. In section 2, we describe the data and we report gross job 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 4-7, we discuss the results obtained in various models. We conclude in section 8.

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 analyzing one-year transitions and to our knowledge this is the first such analysis conducted for Poland. In order to assess transitions out of employment we excluded from our sample men aged 65 or more and women aged more than 60, i.e. above statutory retirement age in Poland. Of course some of these people still work, but they show disproportional high transition rates to inactivity which probably would bias our estimates. Our sample consist of 78690 individuals. The more detailed description of the data can be found in Appendix.

It is crucial to diversify between unemployment and inactivity, because of the declining activity rates in Poland, as discussed earlier, and different factors presumably contributing to transitions from employment to each of these states. We are aware that we are not distinguishing between individuals who hold the same job and who have changed it, as well as we do not take into account changes in the labor market status during the year between interviews, but the nature of the study makes does not enables this kind of analysis. On the other hand, focusing on one-year transitions enables us to control for seasonal fluctuations.

The frequencies of employed remaining employed or moving to other states, presented in Table 1, exhibit interesting differences in time. The percentage of individuals staying in employment has declined substantially from 94.0 per cent in 1997 to minimum level of 92.1 per cent in 2001. In 2002 it was higher but decreased once again in 2003. The increase in 2002 is incomprehensible and is not in line with macro data; therefore we treat it as partially spurious, because it is not computed on the basis of the whole 2002 wave of the survey.¹ We also notice an increase in the transitions to unemployment which have almost doubled between 1997 and 2000. They declined later, but remained obviously higher than before the 1999 adverse shock. The most rapid increase in the number of unemployed occurred between 1998 and 2000 and it is confirmed by presented transitions to unemployment. We may infer from data in Table 1 that these transitions indicate slight improvement on Polish labor market after 2002.

The importance of transitions to inactivity has changed only slightly during the period, and although they are rather stable, they happened relatively more often than flows to unemployment before the shock. As Bukowski et al. (2005) argue, it can be explained by institutional factors, like relatively easy access to pre-retirement benefits, early pensions and disability benefits which were used to cushion vulnerable groups from unemployment. Although transitions to unemployment gained on significance when the labor market conditions became more severe, transitions out of the labor force remained more important for some groups of workers. We will discuss the subject later. It is worth noticing that anticipation of the government's intentions

¹Because of methodological changes introduced by GUS, it is impossible to match the whole samples and construct the full panel. Hence, the results obtain may differ from the real ones in systematic way.

to limit the availability of certain benefits (so called Hausner's plan) can explain the recent phenomena of accelerating outflow to inactivity in 2004.² We should also stress that the increase in the number of economically inactive people between 2001-2002 is due to lengthening the education spells by youngest cohorts (Bukowski et al., 2005). Because the differences in transition rates in time are rather modest, we will later pool all the observations in econometric model. In the following subsections we will also look at the transition probabilities for different groups of workers, in order to verify which groups face the highest risks of losing a job, which have stable jobs and which mostly choose to become inactive. Because individual characteristics interact with each other, in the Appendix we present cross-tables indicating the size of these effects.

Table 1: Transitions from employment (in percentage points)

Destination state	1997/1998	1998/1999	2000/2001	2001/2002	2002/2003	2003/2004	Total
Employment	94.0	93.5	92.7	92.1	94.1	92.5	93.2
Unemployment	2.1	2.9	4.1	4.0	3.2	3.5	3.2
Inactivity	3.9	3.6	3.8	3.3	2.7	4.0	3.6

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

Source: Own calculations based on BAEL.

2.1 Transitions out of employment and personal characteristics

First of all, there are some differences between genders, presented in Table 2. Men constitute 55 per cent of our sample and this proportion has been stable during the period considered. However, the transition rates between genders differ, as lower percentage of women has been staying in employment. But the most important discrepancy is the structure of the outflow from employment: only 2.8 per cent of women become unemployed - the parallel frequency being 3.6 per cent in case of men - and 4.5 per cent of women leave the labor market - 2.8 per cent in case of men. The difference in percentage of men and women remaining employed in one-year time between interviews is mainly due to substantial difference observed in late 90s. From 2000 on, both genders show very similar probabilities of repeated employment, so it reveals that reduction of gender gap in employment and unemployment - that has occurred in last few years - has resulted from more severe worsening of the labor market position in case of males. Indeed, men usually work in sectors of economy especially struck by the negative aggregate shock, like for example construction, whereas women more often work in public sector offering secure jobs. Furthermore, the difference in structure of the outflow prevailed but the rise in transition to inactivity in 2003 is mainly caused by females - probably trying to take advantage

²The most important reform limiting possibilities to leave the labor market was tightening the eligibility criteria to pre-retirement benefits and significant reduction of benefits' amount.

of the early pension arrangements before they are abandoned.³ Nevertheless, as stressed by Bukowski et al. (2005), both genders in Poland benefit from various forms of social security transfers and the fact that women seem more likely to leave the labor market is rather due to sectoral differences and also to prevailing pattern of division of work (hence cultural factors) and different eligibility conditions of various benefits than to possibility that women are offered broader scope of various benefits.

Table 2: Transitions from employment by gender and age (in percentage points)

	Employment	Unemployment	Inactivity
Men	93.6	3.6	2.8
Women	92.7	2.8	4.5
Age group 15-24	85.9	8.6	5.5
Age group 25-34	94.1	3.7	2.2
Age group 35-44	95.7	2.6	1.7
Age group 45-54	93.6	2.2	4.2
Age group 55-64	87.3	1.1	11.6
Total	93.2	3.2	3.6

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

Different age groups also show different transition rates, as confirmed by the data in Table 2. People aged 15-24 exhibit the lowest probability of repeated employment and the proportion of employed becoming unemployed is more than two times higher than in any other age group. The transitions to inactivity are also relatively high - only people aged 55-64 (55-59 in case of women) show higher transitions out of the labor market. In general, people younger than 45 years are more likely to become unemployed than inactive and the frequency of the flow to unemployment declines with age. Sharp increase of the intensity of the outflow to inactivity after 55 years of age can be attributed to existence of early retirement and disability benefits, targeted mainly at this group.⁴ It is also worth noting that the transitions out of the labor force accelerate in Poland among younger age groups than it is on average in OECD countries. Prime-aged employed are rather diverse with respect to transitions to unemployment and stability of employment: people aged 35-44 benefit from the most secure jobs in economy. On the other hand, the transition to inactivity does not differ between the prime-aged subgroups.

The significant role played by personal characteristics and human capital is even more ap-

³In line with the pension system reform introduced in 1999, from 2007 on it should be not possible to receive pension benefits before reaching statutory retirement age. However, this period was prolonged by the Polish Parliament to the end of 2007.

⁴In fact, according to OECD data the effective retirement age in Poland is very low in comparison to other member countries. Moreover, the disability benefits are granted to people at least 5 years younger than OECD's average (OECD, 2003).

parent when we focus on the education level attained (Table 3).⁵ The proportion of individuals holding a job differs significantly between individuals with tertiary and lower education level attained and to lesser extent between workers with at most primary education level attained. In fact, the share of the individuals with less than secondary education in the working population has been steadily declining in Poland which can be to some extent explained by the increasing incidence of tertiary education and soaring numbers of graduates, but also by the visibly lower outflows from employment and better prospects of finding a job when unemployed among individuals with tertiary education (Bukowski et al., 2005). Moreover, the increase of the transitions out of the labor force in case of workers with primary education is connected to their relatively higher age (see Tables 12 & 13 in Appendix).

Table 3: Shares in the stock of employed and transitions for different education levels attained in Poland (in percentage points)

Education level	Percentage of employed	Employment	Unemployment	Inactivity
Tertiary	13.2	97.1	1.0	1.9
Secondary & post secondary	35.8	93.6	2.9	3.5
Vocational	35.2	92.5	4.3	3.2
Primary or less	15.8	90.3	3.4	6.3
Total	100	93.2	3.2	3.6

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

Source: Own calculations based on BAEL.

The two most numerous groups among employed are constituted by secondary & post-secondary education graduates and workers with vocational education level attained. We find the 1.1 percentage points difference in stability of employment in favor of secondary graduates and also different structure of outflow, as these individuals are more likely to become inactive. Moreover, workers with vocational education are the only ones whose transitions to unemployment are more frequent than to inactivity. Most of them are men and they work mainly in sectors especially affected by the adverse aggregate shocks which explains why they become rather unemployed in case of losing a job. Eventually, employed with at least secondary education level attained are more likely to become inactive than unemployed after losing a job. Because many of them work in secure sectors of economy, they often lose their jobs when they have the opportunity to receive some benefits. Besides, most of them are women. Age may also play important role here (see Tables 12 & 13 in Appendix) That proves that in order to isolate the importance of these factors we have to turn to econometric analysis.

⁵In the Appendix we present also the structure of the sample by the education level attained within gender and age groups.

2.2 Sectoral differences in transitions out of employment

Several studies document how individual establishments adjust their workforce in response to the multitude of shocks they are exposed to and find substantial differences between intensity of job creation and job destruction processes between companies of various sizes and operating in different sectors of economy (Davis, Haltiwanger, 1991), (Abowd et al., 1996), (Albaek, Sorensen (1998)). These distinctions are often augmented by cyclical factors. In case of Poland, the findings about such features of worker flows as their magnitude, persistence, cyclicality may be even more interesting, because of the economy being not only affected by business cycle, but also undergoing deep restructuring. Furthermore, what makes Poland even more distinct from for example UE-15 economies, is substantially higher share of workers working in agriculture.⁶ Public administration, health care & education make up to significant share of employment and are rather different than the private sector with respect to job security and vulnerability to external shocks. Therefore we look at the flows by sectors of the economy.

We decided to cluster workers in 8 groups, which are: agriculture, industry, coal mining, power engineering, construction, public administration with education and health care, simple services & trade, business services. The breakdown of the workforce and frequencies of transitions computed on the basis of pooled data are presented in Table 4. Some changes in the structure of employment occurred during the period considered. The share of agriculture declined between 1997 and 2004, although it was substantially higher in 2000 & 2001 which indicates that this sector was not affected by the contracting employment and rising unemployment as other sectors were.⁷ It is confirmed by very low outflow to unemployment which is nearly three times lower than the outflow to inactivity. Because the majority of Polish farmers run small farms and they face different institutional surrounding than other employed,⁸ the outflow to unemployment is very low and maybe lower than it is in reality. Furthermore, the actual employment and its persistence may be overstated, so we have to treat these numbers with caution. The average share of industry is equal to average share of agriculture, but it has steadily declined from 21.5 per cent in 1997 to 20.1 per cent in 2004. The transitions of industry workers, who have low persistence of employment and are more likely to become unemployed than inactive, suggest that this decrease was mainly due to the reduction of employment in industry. The proportion of industry workers made redundant was increasing from 1997 on to reach its highest level in panel 2001/2002, when to 6.6 per cent of them became unemployed and 4.8 per cent inactive. The situation in construction has been similar and even worse, although its share in employment has been stable and declined significantly only at the end of the period

⁶In 2003 17.2 percent of all employed in Poland worked in agriculture, the respective shares in NMS9 (NMS10 except Poland) and UE15 were equal to 7.1 and 3.7 per cent. On the other hand, the agriculture's contribution to total value added amounted to 3.0, 3.4 and 2.0 per cent respectively in in Poland, NMS9 and UE15 (European Commission, 2004).

⁷And also that it has probably absorbed some of the workers made redundant.

⁸First of all, there is a distinct pension system for farmers, named KRUS, and individual farmers cannot be registered as unemployed in labor market office.

considered, when the construction still suffered from the earlier weakness of economy and lack of investment. Nevertheless, the probability of losing a job was very high in case of construction workers. More than 10 per cent of interviewed between 2000 & 2004 became unemployed in one-year time. Because the transitions from unemployment to employment were in this period low for workers, who held their last job in construction sector,⁹ we argue that the stable share of construction in the stock of employed is probably due to the inflow of entrants. Industry and construction are sectors dominated by males, so these factors indicate, why males have been affected by the adverse shock more severely than females.

Coal mining and power engineering are characterized by low outflows from employment, as can be seen in Table 4. They offer jobs rather incomparable with other sectors, especially power engineering where earnings are high and the it has potential to benefit from monopoly power. It exhibits the highest persistence of employment and its share in total employment and transition frequencies were stable during the period. The share of coal mining declined by 1 percentage point, which is due to the ongoing restructuring of the sector.¹⁰ Generous public help programs have cushioned coal miners from unemployment and they were granted them severance payments what in conjunction with possibilities of early retirement even before the age of 50, has very often made them inactive. Transitions of employed in public sector, education & health care are very similar, with 95.9 per cent individuals remaining employed and inactivity also prevailing over unemployment. However, the structure of the employed regarding gender, age and education level is completely different as will be discussed later. Low outflows from employment in this sector have also contributed to the increase in its share in total employment.

We have divided the services into 2 subsectors that differ especially with respect to education level attained by average employee - business services employees are much better educated, with nearly 80 per cent of them having at least secondary education. This difference directly translates into different transition patterns - the persistence of employment in simple services is almost as low as in industry and the flows to unemployment dominate over the flows to inactivity, the reverse being true for business services. Nevertheless, the share of both types of services in total employment has increased during the period.¹¹ It may be also explained by higher inflows to services, corresponding with better prospects of finding a job by services' employees in comparison to industry & construction (Bukowski, Lewandowski, 2005).

Various sectors of Polish economy have experienced very different transition patterns: con-

⁹The transitions out of unemployment are discussed in the companion paper by the same authors (Bukowski, Lewandowski, 2005).

¹⁰The reduction of employment in coal mining amounted to 35400 in 1998 and 34300 people in 1999 which were the highest outflows in last 15 years, more than two times higher than in other years included in our sample. Unfortunately, it is impossible to include this period in our analysis, but we presume, that although the outflow then was higher than in years included in analysis, its structure was the same.

¹¹One has to remember that the share of services' in total employment is in Poland substantially lower than in UE15 but also lower than in NMS9, with the respective shares equal to 53.7, 57.8, 67.9 per cent (European Commission, 2004).

Table 4: Shares in total employment and transitions from employment by sector of the economy

Sector	Share in employment	Employment	Unemployment	Inactivity
Agriculture	20.6	95.6	1.2	3.2
Industry	20.6	91.1	4.5	4.4
Coal mining	1.8	95.0	1.0	4.0
Power engineering	1.8	96.8	1.2	2.0
Construction	6.5	88.6	7.8	3.6
Services	24.2	91.5	4.4	4.1
Business services	5.7	93.5	3.0	3.5
Public administration, education & health care	18.8	95.9	1.5	2.7
Total	100	93.2	3.2	3.6

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

Source: Own calculations based on BAEL.

struction, industry & services are characterized by higher outflows; coal mining, power engineering, agriculture and public administration with education & health care offer the most secure jobs. As the factors explaining these features are different, we now look at the structure of the employment in each sector regarding gender, age and education level attained.

The data presented in Table 5 indicate that low outflows of employees with tertiary education are partly due to their clustering in very secure public administration, education & health care. Despite the fact that tertiary education is a signal of relatively higher level of human capital, the nature of the employment in this sector increases persistence of employment in case of individuals with tertiary education. It also contributes to the outflow to inactivity being higher than to unemployment. The same is true for transition patterns of females. Employees with secondary or post-secondary education also benefit from stable public sector jobs, but to lesser extent. They were more affected by the adverse aggregate shock because they more often work in industry and services. As we have noticed, the situation of these workers with respect to labor market transitions became slightly more similar to the one experienced by workers with vocational education. Such convergence was partially limited by the fact that majority of individuals with secondary or post-secondary education are women and on the other hand men represent the overwhelming majority among workers with vocational education.

The different vulnerability to external shocks of each sector has played a crucial role in outflows of workers with vocational education. Such workers constitute about 50 per cent of employed in industry and construction and because of changing demand for labor, their skills probably become obsolete relatively faster than in other sectors. The share of services in total employment is near to the share among workers with vocational education, but these workers probably hold the most risky jobs in this sector. Most of employed in coal mining also have vocational education level attained, which increases the outflow to inactivity among this

education group, and on the other hand explains why the former miners only rarely switch to different sector and have low probability of finding a job (Bukowski, Lewandowski, 2005). Regarding the workers with primary or less education attained, more than half of them work in agriculture. It is worth stressing that workers with such education level attained exhibit higher transitions to inactivity than to unemployment regardless of the sector of the economy, except for construction, which we presume is due to the fact that they are relatively older (see Tables in 12 & 13 Appendix). Moreover, individuals with primary or less education make up a stable share among unemployed, hence it indicates also that the high inflow to unemployment of the low skilled graduates has been occurring during the period.

Interactions between education level and sector of economy, described in preceding paragraph, are parallel to the interactions between gender and sectors. Women work mainly in public administration, education & health care which reduces the risk of losing a job and amplifies the relative intensity of their inflow to inactivity rather than to unemployment. On the other hand, women exhibit higher transitions to inactivity than to unemployment regardless of the sector of economy, so we conclude that although the sector-specific arrangements play important role in determining the size and directions of the outflow (as in case of coal-mining) inactivity is a phenomena directly connected to gender and institutional incentives.

Table 5: The sectoral structure of employment by gender and education level attained

Sector	Males	Females	Primary education or less	Vocational education	Secondary and post- secondary education	Tertiary education
Agriculture	21.5	19.4	52.9	23.1	10.6	2.4
Industry	23.7	16.9	16.6	28.2	18.8	14.5
Coal mining	2.9	0.5	1.1	3.0	1.4	0.7
Power engineering	2.6	0.8	0.9	2.0	2.1	1.3
Construction	10.9	1.1	5.8	9.8	4.7	3.4
Services	23.4	25.2	12.9	24.6	31.3	17.7
Business services	4.9	6.7	2.2	2.5	8.1	11.9
Public administration, education & health care	10.1	29.3	7.7	6.8	23.0	52.4
Total	100	100	100	100	100	100

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

Source: Own calculations based on BAEL.

2.3 Transitions out of employment by size of the company and the type of the employment contract

We have described the importance of individual and sectoral characteristics for transitions out of employment, but we argue that some other factors also play a significant role. These are: type of a contract held, self-employment and size of the company where the individual works. They are found as significant determinants of the labor market transitions in EU-15 countries (see for example European Commission (2004)), and they also seem to play important role in Poland. For example, Konings, Lehmann and Schaffer (1996) analyze large firm-level data for Polish manufacturing and find most job destruction occurring in the state owned firms, while most new jobs are created in the private sector (which includes privatized firms). Nevertheless, due to crucial role played by the 1999 adverse we decided that we would rather focus on the question to what extent small, medium and large enterprises differ with respect to job destruction odds from employees' point of view. Such features like sector of economy as well as self-employment and size of the company interact with each other, so we treat information presented in this paragraph as supplementary to the one included in the preceding subsection.

Table 6: Shares in total employment and transitions from employment for different types of employment and company size

Workplace characteristics	Percentage of employed	Employment	Unemployment	Inactivity
Employed	71	92.8	3.6	3.6
Self-employed	23.3	96.2	1.4	2.4
Self-employed outside agriculture	9.1	94.4	2.9	2.7
Part-time job	6.5	85.3	5.9	8.8
Total	100	93.2	3.2	3.6
Firm size 0-20 employees	48.3	92.7	3.6	3.7
Firm size 20-100 employees	19.4	92.7	3.7	3.3
Firm size over 100 employees	32.3	93.9	2.5	3.6
Total	100	93.2	3.2	3.6

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

Source: Own calculations based on BAEL.

The data in Table 6 indicate that self-employment delivers very stable employment, as 96.2 per cent of self-employed have a job year after the initial interview. The outflow to unemployment is very low and it is lower than outflow to inactivity. Is partially caused by very low probability to become unemployed experienced by farmers, who constitute about 60 per cent of self-employed in the sample. When we consider the transitions of self-employed working outside the agriculture, we obtain higher outflows and unemployment is gaining on importance.

Nevertheless, job stability of self-employed is much higher than in case of employed. Working part-time significantly reduces the persistence of employment, with about 5.9 per cent of part-time workers ending up in unemployment in one-year time and about 8.8 per cent of them leaving the labor force. Majority of these workers are women and the presented percentages show that part-time workers are presumably more likely to lose or quit the job than full-time workers.

Companies employing up to 20 workers does not seem to differ significantly in terms of transition frequencies from companies employing between 20 and 100 workers. Because majority of farms are very small in terms of number of people employed, workers in agriculture exhibit low outflows, especially to unemployment, and on the other hand there is a lot of small companies in services, the transitions within this group are very heterogeneous. Middle size companies are important employers in industry, construction, health care and also services, so the transitions also differ in line with sectoral characteristics. Big companies make up majority of jobs in industry, coal-mining, power engineering and public administration, education and health care, so employees of such companies are more likely to become inactive than unemployed. The relative homogeneity of the transition frequencies between firms of different size and high variance within such groups stresses the importance to use econometric methods.

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

Multinomial logit model of the labor market transitions is appropriate to estimate the influence of individual factors on the probabilities of transitions on the labor market. The probabilities of occurrence of each of possible transitions are normalized 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 our case, the most frequent outcome is remaining in employment, hence the probability of transition from employment to any of the other states j ($j \in \{U, I\}$) is expressed as:

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

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 $j \in \{U, I\}$:

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

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)¹² 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 staying.

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),
- 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),
- tenure in the current job,
- 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 calculated as the one-year average unemployment rate in every state district at the quarter when the individual entered the survey.

Gender, age and education mark substantial differences between individuals with regard to labor supply decisions, level of human capital and situation on the labor market. They are also confirmed by the transition statistics presented earlier. We can interpret them as the supply-side factors. We include tenure on the basis of human capital accumulation argument. According to this, labor market experience helps to acquire additional skills and gather firm-specific knowledge, because of learning-by-doing, on-the-job training and etc. Furthermore, tenure can also be used to control for some immeasurable heterogeneity of workers and their

¹²RRR is simply equal to Euler's constant to the power equivalent to the estimated parameter's value.

bargaining position within the company. In fact, as stressed by Farber (1998), one of the central facts describing worker mobility is that the probability of job ending declines with tenure. The indicators for the size of the dwelling place are on the brink of the supply and demand side factors. Namely, 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.

Because we are interested on the transitions to unemployment and inactivity and we treat the labor supply decisions as being made within the household, we include the main source of income of the household as the explanatory variable.¹³ We suspect that the employed person living in household with the main source of income from pension or benefit may be less attached to labor market than the reference group. Individuals whose main income comes from running a farm, have very low probability of becoming unemployed, because even if they work outside the farm, in case of losing their job they can switch to work on the farm. There are also vague different sources of income, which may to some extent indicate engagement in underground economy.

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.

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.¹⁴

4 Personal characteristics and workplace features

First model evaluates the importance of the supply-side factors like gender, marital status, age, education and source of household's income. The results from primary simple model are presented in Table 7, columns 2 & 3.

¹³The nature of the survey does not allow to determine the structure of the household's income with respect to work, social security benefits and transfers.

¹⁴In 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 labor 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.

4.1 Influence of gender, age and education level attained

The model illustrates the crucial role played by the human capital in labor market transitions in Poland. First of all, gender does not directly modify probability of becoming unemployed, but women are significantly more likely to become inactive. Therefore, higher outflows to inactivity are explained by gender which confirms that women more often interrupt their careers and leave the labor market. On the other hand, lower outflow to unemployment in case of women is not gender-related, so the fact that women are relatively less likely to become unemployed (see Table 2) is explained by other characteristics operating in favor of women, for example by education level.

The obtained estimates show that age is highly significant determinant of the outflow to inactivity - every age group differs from the comparison group. On the other hand, age alters probability of unemployment only in case of young and older workers. Because relative risk ratios for 15-24 group are higher than 1 in both transitions, in comparison to employed aged 25-34, it is clear that young workers are more likely to lose the job. The distinctions between prime-age workers are not so visible: age 35-44 decreases risk of inactivity by 28 per cent, but is not an important determinant of transition to unemployment. The transitions by age groups presented earlier (see Table 2) show that the outflow to inactivity is more frequent than to unemployment once the age exceeds 45 years of age. It is also confirmed by our model: workers aged 45-54 are by 81 per cent more likely to become inactive than reference group, the correspondent difference for individuals aged 55-64 is 524 per cent. Age group 45-54 is not significantly different with respect to transitions to unemployment, but 55-64 dummy decreases the probability of such outflow. Thus we conclude that workers reaching retirement, or even pre-retirement, age mainly leave the labor market in case of the job loss.

Unemployment affects by the similar magnitude employed aged 25-44, to lesser extent workers aged 55-64 and young workers face significantly higher risk of unemployment. The outcomes for inactivity are due to males, because in their case leaving the labor market is strongly connected with age. Females aged 25-34 are less likely than females aged 35-44 to be active, because of the maternity duties. We will come back to this matter later, but it is essential to keep in mind that age alters the labor supply decisions of both genders rather differently, partially due to insitutional factors and eligibility criteria in social security system.

To clarify remarks on the importance of age, we have to consider the influence of tenure, which decreases probabilities of both outflows. Therefore we conclude that when controlling for age, this is a tenure that matters for unemployment and because it is usually increasing with age, it explains why older workers exhibit lower outflows to unemployment on the macro-level even if the age difference is with this respect not significant in the model. Examining marital status, we see that married workers are more likely to become inactive than unemployed in case of losing a job, although the outflows for them are lower than outflows experienced by single workers.¹⁵

¹⁵90.9 per cent of single workers stays in employment, the correspondent frequency for married ones is 93.8

We find education level as very important determinant of transition probabilities, in line with our presumptions based on the descriptive statistics. We clearly see that tertiary education improves relative prospects on the labor market to much greater extent than other nominal education levels. All education dummies are significant at 1 per cent level in both equations and they modify probabilities much stronger in case of unemployment. Individuals with tertiary education are significantly more likely to have stable employment and the influence of the variable is stronger in case of unemployment - probability of such transition is by 64 per cent lower in comparison to the reference group. As the education level decreases, the likelihood of unemployment increases by respectively 69 per cent & 90 per cent, and the likelihood of inactivity rises by 24 per cent & 91 per cent for workers with vocational and primary or less education attained. This underlines that human capital alters transitions to unemployment stronger than to inactivity, which are rather connected with age, hence with institutional incentives.

4.2 Influence of size of the dwelling place and source of household's income

Individuals living in cities with 100000 or more inhabitants have lower probability of becoming unemployed and those living on countryside have lower probability of losing a job, compared to those living in cities with 20-50 thousand dwellers, or even to all other cities, as they do not differ. Thus we present only the relative risk ratios for these two significant dummies. So individuals in big cities face relatively less tough labor market and benefit from the clustering there of sectors offering stable jobs, but corresponding dummy variable is significant only at 10 per cent level. The result obtained for those living on countryside is a little bit spurious, because it emerges from the specific nature of Polish agriculture explained earlier.

The preceding remark is confirmed by the influence of main sources of income of the household. If it comes from self-owned agricultural farm, the probability of leaving employment significantly declines. At the other hand, as the productivity of Polish agriculture is rather low, we suppose that this outcome may reflect disguise unemployment. The members of household living of benefits and pensions does not significantly differ from those whose main source of income is employment. We will come back to this matter with greater scrutiny later. Individuals declaring different source of income are more likely to become inactive which indicates that they probably receive some form of transfers, reducing both the need to work and its attractiveness. This variable is important only at 10 per cent significance level.

4.3 Influence of time dummies

Looking at time dummies, we find that before the adverse aggregate shock struck, the labor market in Poland was characterized by significantly lower outflows to unemployment, whereas the outflows to inactivity were not different in comparison to 2000/2001. This strongly confirms

per cent.

that the scope of the outflow to inactivity is dependent on institutional factors - as the probability of losing the job increased in the aftermath of the adverse shock, the economic activity among people over 45 declined, hence the relative probability remained the same. Transitions to inactivity were relatively lower in 2001/2002 and 2002/2003 and in 2003/2004 they seem to not differ from 2000/2001 - they accelerated in 2003/2004 if compared to two preceding panels. The 2002/2003 dummy significantly reduces both transitions out-of-employment which may indicate the improvement on the labor market.¹⁶ To some extent the differences in time are also captured by the unemployment rate which significantly increases probabilities of both outflows.¹⁷

To sum up, we see substantial difference before and after the shock and its quite high persistence. On the other hand, the outflows to inactivity have declined slightly after 2000 which is in line with institutional changes (limiting the availability of benefits) and macro-evidence. The increase in intensity of this outflow in 2003/2004 probably is temporary, because it reflects the impending abolishment of early pensions and tightening the conditions for receiving pre-retirement benefits.

4.4 Influence of firm characteristics and type of the contract held

So far we have modelled only the influence of the supply-side factors. Now we include workplace characteristics like firm size (company employing 20-100 people being the reference group) as well as dummy variables for self-employment and part-time job. The results obtained for model 2 are presented in columns 4 & 5 of Table 7. The model has higher explanatory power confirmed by likelihood-ratio test null hypothesis rejected with 1 per cent significance. First we review the outcomes for additional variables and then we will discuss how their inclusion has changed the importance and relative risk ratios connected to variables used in simpler model 1.

All of newly included variables are significant determinants of both transitions at 1 per cent level, except for dummies for part-time and company employing as much as 20 workers in transition to unemployment which are significant at 5 per cent level. The type of contract held by individual is one of the crucial determinants of persistence of his job because part-time workers are 17 per cent more likely to become unemployed and 75 per cent more likely to become inactive than comparison group employed full time. This is in line with gross flows presented in the subsection 2.3 and proves that part-time jobs are characterized by high job uncertainty. To the contrary, self-employment reduces both outflows by 50 per cent which stresses the differences between self-employed and employees even more clear-cut than gross flows presented earlier.

¹⁶It is rather spurious result, because we were not able to include in our analysis all the data from 2002 wave of BAEL. It is also reflected in incomprehensible transition frequencies presented in Table 1.

¹⁷Unemployment rate may significance may also results from regional differences but when we substitute this variable with regional dummies, we found only few of them significant. Hence we infer that relevance of unemployment rate spreads from evolution of the situation on the labor market after the adverse shock.

Individuals employed in small companies experience significantly lower persistence of employment with probability of transition to unemployment increased by 16 per cent and to inactivity by 34 per cent in comparison to reference group - employees of companies compounded of 20-100 people. However, individuals employed in large companies have probability of unemployment reduced and the one of inactivity increased which reveals that their jobs are not more secure, but the structure of the outflow is different than in comparison group. It is to some extent connected to sectoral differences - their importance we will evaluate later. Nevertheless, large firms' employees are more likely to become inactive than the reference group which is in line with statistics presented earlier (Table 6). They may have benefited from state help aimed at preventing the workers in restructured companies from unemployment and presumably took greater advantage of easy access to benefits.

From the total number of 18365 self-employed in the sample, only 176 of them work in company of middle or big size. Moreover, 65 per cent of part-time workers are employed in small companies. Thus, we observe substantial dissimilarity between three types of individuals employed in small companies: self-employed have high job persistence (96.2 per cent of them maintained their job), full-time workers face higher risk, as the correspondent frequency of repeated employment for them is 90.5 per cent and they more often become unemployed than inactive, and eventually part-time workers face high risk of losing a job, because 14.7 per cent of them has lost job in one-year time between interviews and two thirds of these individuals have become inactive.

4.5 Changes in the influence of personal characteristics

Now we turn to the influence of the variables included also in the model 1, because there are some interesting modifications. Gender is now significant determinant of both transitions: females have probability of becoming unemployed lower by 9 per cent and of becoming inactive higher by 81 per cent. This is due to the strong surplus of males among self-employed - they make up to 63.3 per cent - and higher number of females among part-time workers - 54.2 per cent -, whereas men constitute 55.0 per cent of the whole sample. Because the type of the contract held is very powerful determinant of transition probabilities and it works in favor of men when we consider outflows, women exhibit in such model lower probabilities of becoming unemployed than men. We have to remember that these relative risk ratios have to be treated as supplementary information: women have higher outflows but the structure is different than in the case of men. Taking into account personal and workplace characteristics and predicting theoretical outflows, women should exhibit higher transitions to unemployment, but it is not so, thus gender alters the risk of unemployment provided that the job was lost. In other words, including variables which control for workplace features determines the outflow takes place and gender differences settle the destination state.

Similar reasoning explains why the influence on transition to unemployment of age 15-24 and education levels lower than secondary has been smaller than in more elementary model

1. Part-time job is much more popular among young and older people than among prime-age workers.¹⁸ The share of self-employed increases with age, from 10.3 per cent in 15-24 group to 24.9 per cent in 35-44 group to 37.8 per cent in 55-64 group. Therefore the adverse influence of young age on probability of transition to unemployment is mitigated.

Less educated individuals are also more likely to hold part-time jobs - they make up to 58 per cent of all part-time workers. On the other hand, they represent 64.2 per cent of self-employed, so these effects partly offset. As we presume that the nature of self-employment is different for individuals with different education level attained because of the sectoral differences, we will come back to the issue later. Nevertheless, less educated workers slightly more often work in small companies, so the straight effect of lower education on transition probabilities has decreased. The remaining estimates seem to be stable.

¹⁸12.9 per cent of working individuals aged 15-24 and 16.5 per cent of working people aged 55-64 held a part-time job, a correspondent share being less than 5 per cent in all other age groups.

Table 7: Multinomial logit models for transitions out of employment - personal and workplace characteristics

	Model 1: Personal characteristics as explanatory variables		Model 2: Personal and workplace characteristics as explanatory variables	
	Unemployment	Inactivity	Unemployment	Inactivity
Female	0.95	1.92***	0.91**	1.81***
Single	1.38***	0.77***	1.32***	0.74***
Age 15-24	1.44***	2.73***	1.38***	2.51***
Age 35-44	1.03	0.72***	1.03	0.72***
Age 45-54	1.05	1.81***	1.05	1.77***
Age 55-64	0.76*	6.24***	0.75**	5.74***
Tertiary education	0.36***	0.48***	0.37***	0.48***
Vocational education	1.60***	1.24***	1.56***	1.22***
Primary or less education	1.90***	1.91***	1.79***	1.86***
Tenure	0.89***	0.99***	0.90***	0.99**
City over 100000	0.87*	0.96	0.88*	0.96
Countryside	0.85**	0.81**	0.84**	0.85**
MSoI – agricultural farm	0.34***	0.50***	0.36***	0.57***
MSoI – pension or benefit	1.01	1.09	1.02	1.05
MSoI – other	1.21	1.51*	1.19	1.43
Self-employed	-	-	0.50***	0.51***
Part time	-	-	1.17**	1.75***
Firm size<20	-	-	1.16**	1.34***
Firm size>100	-	-	0.79***	1.17***
Unemployment rate	1.03***	1.03***	1.03***	1.03***
Year 1997/1998	0.47***	0.94	0.47***	0.93
Year 1998/1999	0.64***	0.89	0.65***	0.89
Year 2001/2002	0.99	0.85**	1.03	0.79***
Year 2002/2003	0.81**	0.69***	0.80***	0.66***
Year 2003/2004	0.92	1.06	0.96	0.98
Pseudo R^2	0.0986		0.1061	
Pseudo-likelihood	-21079.6		-20905.6	

Notes: MSoI - main source of income. Number of observation: 78690, 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 form employment or self-employment, employed full-time, size of company 20-100, year 2000/2001. (*), (**), (***) denotes significance at 10, 5 and 1 per cent level respectively. RRR 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.

Because majority of the self-employed work in agriculture, we have estimated the model on the sub-sample consisting only of 62489 individuals working outside the agriculture. The significance of personal and workplace characteristics have not change and the differences in relative risk ratios are rather small. Self-employment still significantly reduces probabilities of both outflows, but its influence is smaller in subsample. The relative risk ratios for part-time work and indicators of size of the company have not changed. In case of personal characteristics, the influence of education levels lower than secondary is more severe in the subsample; the same is true for the age group 15-24. Dummy variable for females in unemployment is now significant only at 10 per cent level, although its relative risk ratio has not changed. Having analyzed the importance of personal and workplace characteristics, we can scrutinize the sectoral differences.

5 Influence of sectors of economy

Jobs in various sectors of economy differ with respect to workplace characteristics and distribution of the forms of employment which was briefly presented in section 2.2. Namely, self-employment and small companies are clustered in agriculture and services, small companies also constitute up to 50 per cent of employment in construction. Middle size companies are much more important employers in industry, whereas companies employing over 100 people operate in sectors characterized by secure jobs, on the other hand they are affected by restructuring in some sectors. The sectoral differences are also connected to gender, education level attained and finally to some extent to age.

Therefore we add a set of new explanatory variables to the former model, in order to capture the interaction between personal characteristics, features of workplace and sectors of economy. The results for this model (labelled model 3) are presented in Table estimates2 along with model 2. The former model is nested in the present one which has higher explanatory power confirmed by the likelihood-ratio test, as the null hypothesis was rejected at 1 per cent confidence level.¹⁹ We begin with examining how different sectors influence the probabilities to reach given destination state comparing to industry which is the reference group. Then we discuss how the inclusion of these variables has changed the relative risk ratios attached to personal characteristics.

5.1 Importance of sectoral indicators

Working in agriculture significantly increases job security because it reduces probabilities of both outflows, but the effect is stronger in the case of unemployment - likelihood reduced by

¹⁹We have also excluded workplace characteristics and estimated simpler model, also nested in the presented one. The results for personal characteristics seem not to differ from the ones arising from the model 1 (presented earlier and in columns 1-2 in Table 7) and the influence of the sectors of economy was almost the same, except for the services. Thus we decide not to present them in the paper and we find the following outcomes and interpretations more interesting and comprehensive.

46 per cent - than in inactivity - likelihood reduced by 27 per cent. Thus, these workers are less likely than industry workers to lose the job but once it happens they rather leave the labor market. However, it is misleading to compare these sectors without accounting for differences in size of typical firm in these sectors. The actual difference may be smaller, because probability of unemployment decreases with the size of the company. Such formulation of the model allows us to isolate the influence of sector-specific factors and workplace characteristics, but we have to adjust for their interactions when we interpret the outcomes. The same applies to business services, where employees face probabilities of outflow to unemployment lower by 27 per cent and to inactivity lower by 26 per cent; as well as to services where unemployment-transition likelihood is reduced by 10 per cent and inactivity-transition by 13 per cent. The results for services are significant only at respectively 10 and 5 per cent level.

However, when discussing the outcomes for business services we should adjust also for differences in education level attained by average employee in given sector. Agriculture, industry and services are rather similar with this respect, but working in business services requires on average higher level of education. Because the risk of losing the job decreases with education level attained, this disparity in education level works in favor of business services' employees. Thus, the difference between both types of services we distinguish becomes more visible, as the workers of simple services & trade face substantially higher job insecurity and job turnover than in business services. Our results are in line with macro-evidence, showing a decline in the employment in industry and increase only in some types of services (Bukowski et al., 2005)).

Comparing coal mining and power engineering to industry, we can assume that the size of the company and education level do not matter. These sectors differ with respect to the exposure to competition which makes individuals employed in coal mining and power engineering benefiting from special treatment by the authorities. Especially power engineering is characterized by relatively high wages and it is immune from competition which is confirmed by our analysis - working there reduces probabilities of transition to unemployment by 59 per cent and to inactivity by 53 per cent - the most powerful influence of all obtained. The outcome for coal mining - lower probability of the outflow to unemployment and no significant difference with respect to inactivity - may be spurious because we haven't captured in our sample the substantial outflow from this sector that happened in late 90s, so we have to treat relative risk ratios as preliminary.

As we noted earlier, construction has probably been the sector most severely affected by the aggregate shocks and exhibiting persisting contraction of demand and output. Although its share in total employment has been quite stable during the period considered (and it was even increasing till 2000) and industry was also severely affected by the adverse shock, construction is the only sector with higher probability of transition to unemployment than industry. It is not in line with the stylized fact for 13 EU countries, found by Gomez-Salvador, Messina and Vallanti (2004), that the job destruction is higher in the industry than in construction and services. We found such reverse relation is clearly due to the adverse shock and restructuring

Table 8: Multinomial logit models for transitions out of employment - personal, workplace and sectoral characteristics

	Model 3: Personal, work- place characteristics and sec- toral dummies as explanatory variables		Model 2: Personal and work- place characteristics as ex- planatory variables	
	Unemployment	Inactivity	Unemployment	Inactivity
Female	1.020	1.98***	0.91**	1.81***
Single	1.32***	0.73***	1.32***	0.74***
Age 15-24	1.40***	2.45***	1.38***	2.51***
Age 35-44	1.03	0.73***	1.03	0.72***
Age 45-54	1.05	1.79***	1.05	1.77***
Age 55-64	0.76*	5.97***	0.75**	5.74***
Tertiary education	0.43***	0.55***	0.37***	0.48***
Vocational education	1.43***	1.13**	1.56***	1.22***
Primary or less education	1.73***	1.78***	1.79***	1.86***
Tenure	0.91***	1.00	1.00***	0.99**
City over 100.000	0.88*	0.95	0.88*	0.96
Countryside	0.89	0.88*	0.84**	0.85**
MSoI – agricultural farm	0.47***	0.62***	0.36***	0.57***
MSoI – pension or benefit	1.06	1.07	1.02	1.05
MSoI – other	1.20	1.44	1.19	1.43
Self-employed	0.53***	0.52***	0.50***	0.51***
Part time	1.24***	1.77***	1.17**	1.75***
Firm size<20	1.13**	1.28***	1.16**	1.34***
Firm size>100	0.79***	1.10*	0.79***	1.17***
Agriculture	0.54***	0.73***	-	-
Coal-mining	0.44***	1.20	-	-
Power engineering	0.41***	0.47***	-	-
Construction	1.42***	1.05	-	-
Services	0.90*	0.87**	-	-
Business services	0.73***	0.74***	-	-
Public administration, health care, education	0.52***	0.56***	-	-
Unemployment rate	1.03***	1.03***	1.03***	1.03***
Year 1997/1998	0.47***	0.93	0.47***	0.93
Year 1998/1999	0.66***	0.89	0.65***	0.89
Year 2001/2002	1.03	0.80***	1.03	0.79***
Year 2002/20003	0.81***	0.66***	0.80***	0.66***
Year 2003/2004	0.97	1.01	0.96	0.98
Pseudo R^2	0.1122		0.1061	
Pseudo-likelihood	-20757.1		-20905.6	

Notes: MSoI - main source of income. Number of observation: 78690, 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 form employment or self-employment, employed full-time, size of company 20-100, employed full-time, size of company 20-100, industry, year 2000/2001. (*), (**), (***) denotes significance at 10, 5 and 1 per cent level respectively. RRR 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.

taking place with relatively slow pace. On the other hand, it is insignificant in transitions to inactivity which is related to the fact that both construction and the reference group - industry - are dominated by men with vocational education, whose elasticity of labor supply is low, especially with respect to activity.²⁰

Working in public administration, education & health care significantly reduces both outflows from employment by more than 40 per cent which is in line with investigation of transitions on the macro level and the decomposition of the workforce in these sectors. The sole effect of sectoral differences is augmented by diverse education level attained by the average employee that is much lower in industry. Although the relative risk ratios of both outflows are nearly equal in case of public administration, education & health care workers, on the macro level they are almost twice more likely to become inactive. This is due to the fact that females constitute about 70 per cent of employed in this sector.

5.2 Influence of sectoral differences on outcomes for personal and workplace characteristics

Our analysis indicates that sectors are significant determinants of the transitions out of employment. However, to assess the job security experienced by average employee in every one of them, we have to adjust mainly for the differences in gender, education level and workplace characteristics. Inclusion of the sectoral dummies may alter the influence of other explanatory variables. First of all, we find that gender is no longer significant determinant of the outflow to unemployment, but its influence on inactivity has even increased - women are almost two times more likely to become inactive. This change results from the overrepresentation of women in sectors exhibiting more stable jobs. The influence of education levels has decreased, because part of its explanatory power is taken over by sectoral dummies. Concerning the age groups, the only difference is higher adverse influence of the age 15-24 variable which points out that the sectoral structure of the employment among young workers was slightly more favorable with respect to labor market transitions than among other age groups. Interestingly, when we control for both supply-side and demand-side effects, tenure is no longer significant determinant of the outflow to inactivity. So we conjecture that it is the tenure that matters with respect to unemployment and age in case of inactivity. It reaffirms that inactivity to much greater extent reflects the deliberate decisions of individuals having possibilities to leave the labor market.

There are some changes in the importance of the workplace characteristics, but they are rather small. In particular, the role of self-employment has not changed, part-time job increases the probability of unemployment by 7 percentage points stronger than in the simpler model. The relative risk ratios of transition to unemployment in case of firm sizes are virtually the same and their influence on inactivity has declined, but is still highly significant. Thus our earlier remarks concerning this matter are valid. We also notice that village dummy is no

²⁰Low elasticity of labor supply of prime-age men finds a strong support in the empirical literature (Pencavel, 1999), (Leibfritz et al., 1997).

longer significant which indicates that its previous importance (in models 1 & 2) was due to the agriculture.

6 The role of social security benefits and pensions - determinants of inactivity

We have noticed that Poland exhibits very low employment rate and the lowest activity rate in the whole EU and OECD. Inactivity may be treated as the alternative to unemployment and in the 90s it was used in that way as the result of deliberate policy to prevent vulnerable groups from unemployment. The access to various benefits was easy and it is confirmed by the transitions frequencies in 1997/1998 and 1998/1999 - inactivity prevailed over unemployment (see Table 1.). From 2000/2001 on these proportions have been reversed which is due mainly to the tougher labor market but also to limited availability of benefits targeted at older individuals.²¹ Therefore we have included in previous analysis the main source of household's income as the explanatory variable and now we investigate the topic more carefully, namely we use as the explanatory variables only personal characteristics and a range of main and additional source of income indicators, i.e. we augment the set of explanatory variables from model 1. We estimated the models on the whole sample and on the subsample consisting of 49461 individuals who took part in BAEL 2000-2004, to check if the factors determining the probability of the transitions out of the labor force have changed.

Main income from employment or self-employment forms the reference group and we distinguish between incomes from self-owned agriculture farm, pensions and disability benefits, unemployment benefits and other sources.²² Comparing to the models presented earlier, we now distinguish between incomes arising from unemployment benefits and incomes from pensions & disability benefits.²³

Concerning the additional source of income we take as the reference group individuals who do not have additional income or it comes from employment or self-employment.²⁴

²¹In fact the number of granted disability benefits has been declining from 1999 on, but as the number of granted early pensions and pre-retirement assistance & benefits has been increasing, the total number of individuals younger than statutory retirement age and granted various benefits have rather been stable around 350000 in period 1999-2001 then dropped in 2002 but has been increasing since then.

²²These probably are transfers from family members or income arising from working in the shadow economy.

²³The survey does not allow to distinguish between pensions and disability benefits. It is also not clear how pre-retirement benefits & assistance are classified, they may be treated as form of pensions but also as income from other sources.

²⁴We decided to treat members of households' with additional income from employment as a part of the reference group because this group partly overlaps with group receiving main income from pensions and benefits, so the results we obtained were misleading if we used as the reference group individuals living in household without additional income.

6.1 Estimates on the whole period

The relative risk ratios from model estimated on the whole sample, labelled as model 4, are presented in Table 9, columns 2 & 3. Comparing to model 1 presented in columns 2 & 3 of Table 7, the influence of personal characteristics has not changed except for the countryside dummy which is now insignificant. It is due to the negative impact of any kind of income from farm, because 50 per cent of individuals who work and live in the countryside receives some income from private farms. Investigating the role of sources of income on the transition probabilities we find that only individuals living in household with main income from farm have both of the outflow probabilities reduced, by respectively 70 per cent and 57 per cent. Similar but smaller influence we find for additional income from farm. This result reflects the potentially substantial disguise unemployment on Polish countryside - farmers and members of their families can always declare that they work in the farm.

All other sources of main income are insignificant for transitions to unemployment, whereas inactivity-transition probability is increased in case of pensions & disability benefits and different type of incomes. That suggests that any possibilities to receive transfers cause individuals to leave the labor market. Interestingly, when the main income is from unemployment benefit, the transition probabilities do not differ from the reference group. Probably these households live in conditions nearing poverty and on the other hand, they are not eligible to any other benefits or pensions, so they cannot afford to leave the labor market.

We find more substantial importance of additional sources of income. Income from self-owned farm reduces both outflows, pensions reduce outflow to unemployment and increase to inactivity. Such income is presumably received by spouse, so individual confronted with tough labor market chooses to join a spouse in inactivity. It also confirms that easy access to benefits and early pensions may have aggravated or even caused the outflow to inactivity. We find the influence of additional sources of income as parallel. Our analysis proves that if the individual's household has any opportunity to receive social transfers, the individual is significantly more likely to leave the labor market. In this context, the system of social security transfers and benefits has contributed to declining activity rates in Poland. Additional income from unemployment benefit increases the outflow to unemployment which may indicate that some individuals seek to receive these benefits instead of work. On the other hand, it may be also connected with low level of human capital of these workers, especially if we assume that it is quite homogenous within household.²⁵

6.2 Estimates on the period 2000-2004

The preceding analysis was based on the results from the model estimated on the whole sample. Now we discuss the results from the model 5, consisting the same explanatory variables

²⁵Because the unemployment benefits in Poland have been relatively low in last few years (they amounted to 23 per cent of average wage in gross terms and to 30 in net terms), the benefits are mainly received by the members of relatively poor households.

as model 4, but estimated on observations from BAEL conducted from 2000 on. The relative risk ratios are shown in columns 4 & 5 in Table 9. The importance of age for transition to inactivity has declined slightly. Main sources of income contribute to the transition probabilities in very similar manner, although pensions and different sources of income exert even more negative effect, increasing the probability in question by respectively 46 and 66 per cent. Concerning additional sources of income, pensions increase the outflow to inactivity in the subsample, contrary to modifying the structure of the outflow in the whole sample. If the household receives additional income from the unemployment benefit, the individual is more likely to move out of employment in the subsample.

We have to remember that the relative risk ratios inform about the difference in the probability of given outflow between individual exhibiting certain feature and the reference group. Therefore we have to compare the results obtained from the model estimated on the whole sample and on the subsample with caution because they are different with regard to the labor market transitions for the groups we have distinguished. In particular, in the whole sample only individuals living in households with main income from unemployment benefit exhibit higher transitions to unemployment than to inactivity. In the sub-sample this is true also for individuals with main income from employment or self-employment; hence the distinctions between pensions & benefits beneficiaries and comparison group are stronger. Thus, the influence of the transfers and pensions implied by relative risk ratios is higher. We conjecture that the adverse effect of these transfers is due to two factors. First of all, the evolution of the social security scheme in Poland is characterized by the rather stable inflow of new beneficiaries as the reforms in some of its elements have been accompanied by broadening of the access to other benefits. Moreover, the total number of beneficiaries under statutory retirement age has even been increasing because it is virtually impossible to lose the entitlement to pension, the majority of the disability benefits are open-ended and pre-retirement benefits & allowances also are paid till the statutory retirement age is reached (for a more comprehensive discussion see Bukowski et al. (2005)). As beneficiaries of these transfers are getting older they become more responsive to incentives to leave the labor market even if they have earlier combined collecting benefits and working. The same applies for spouses of such people.

Another important difference between the models is the insignificance of the unemployment rate in the model estimated on the subsample. Thus, the adverse effect of the unemployment rate on the risk of becoming unemployed spreads from the difference between observation before and after the aggregate shock. Panels 1997/1998 and 1998/1999 were characterized by lower unemployment rates and lower outflows from employment than the period from 2000 on. When the subsample is considered and the unemployment is flat in time and varies between regions, this variable is no longer significant. However, we may expect that higher unemployment increases the probability of transition to unemployment because of the tougher labor market. The obtained outcome suggests that significant portion of the labor force in Poland (especially over 45) has reacted to the adverse shock by quitting economic activity.

Table 9: Multinomial logit models for transitions out of employment - determinants of inactivity

	Model 4: Pooled data 1997-2004		Model 5: Pooled data 2000-2004	
	Unemployment	Inactivity	Unemployment	Inactivity
Female	0.95	1.92***	0.93	1.87***
Single	1.40***	0.75***	1.31***	0.76***
Age 15-24	1.46***	2.78***	1.51***	2.66***
Age 35-44	1.02	0.73***	0.97	0.66***
Age 45-54	1.04	1.77***	1.01	1.69***
Age 55-64	0.78*	5.98***	0.76*	5.81***
Tertiary education	0.36***	0.48***	0.39***	0.52***
Vocational education	1.60***	1.24***	1.59***	1.25***
Primary or less education	1.93***	1.96***	1.85***	1.99***
Tenure	0.89***	0.99***	0.89***	0.99
City over 100.000	0.87*	0.96	0.88	0.96
Countryside	0.98	0.90	0.89	0.85*
MSoI – agricultural farm	0.30***	0.43***	0.26***	0.42***
MSoI – pension or benefit	1.04	1.26***	0.99	1.46***
MSoI – unemployment benefit	1.43	1.27	1.85*	1.63
MSoI – other	1.16	1.56**	1.14	1.66**
ASoI – agricultural farm	0.45***	0.58***	0.44***	0.45***
ASoI – pension or benefit	0.88**	1.21***	0.93	1.22***
ASoI – unemployment benefit	1.44***	1.16	1.39**	1.09***
ASoI – other	1.20*	1.36***	1.17	1.31***
Unemployment rate	1.02**	1.03***	1.00	1.02**
Year 1997/1998	0.47***	0.95	-	-
Year 1998/1999	0.64***	0.89	-	-
Year 2001/2002	0.99	0.85**	0.99	0.85**
Year 2002/2003	0.80***	0.68***	0.80***	0.67***
Year 2003/2004	0.87*	1.07	0.90	1.03
Pseudo R^2	0.1027		0.1043	
Pseudo-likelihood	-20978.2		-13828.9	

Notes: MSoI - main source of income. ASoI - additional source of income. Number of observation: 78690 (columns 2 & 3) or 49461 (columns 4 & 5), 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 form employment or self-employment, no additional source of income or income 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.

7 Gender patterns of inactivity

In previous sections we have found gender as one of the most powerful determinants of the transition to inactivity and this result was robust in all formulations of the model. On the aggregate level, we have shown that women are much more likely to become inactive and that their outflow to inactivity is quite stable in time. In order to compare how personal characteristics and various sources of income influence transitions in case of both genders, we have estimated the model 5 separately for men and women. The relative risk ratios implied by the models, labelled 6 & 7, are presented in Table 10.

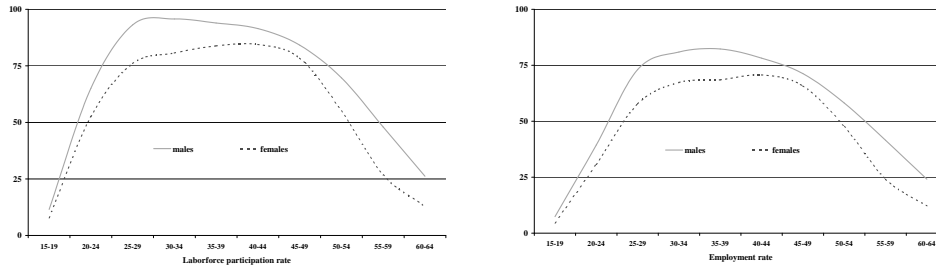
7.1 Influence of age, marital status and education level on transitions for both genders

Transitions to inactivity are clearly connected to age among males which is confirmed by relative risk ratios highly significant and steeply increasing with age once the age of 35 is reached. Moreover, every older group is characterized by higher increment in the relative risk ratio which we find reasonable. Among individuals aged more than 45 it has been possible to apply for early pensions (in case of individuals working in so called special conditions), the percentage of males eligible to benefits is increasing with age and the probability that the spouse is already inactive also rises. Because the labor supply decisions should be analyzed within the household (Killingsworth, Heckman, 1999), (Pencavel, 1999) these factors explain why age is probably the most important determinant of the transition to inactivity among men. In case of women, individuals aged 15-24 and 55-64 are more likely to become inactive than comparison group aged 25-34, but the differences are small when they are confronted with corresponding ones among men. Moreover, women aged 35-44 have the odds of becoming inactive reduced by 59 per cent which we associate with the childbearing taking place mainly after 25 years of age. Women aged 45-54 have significantly lower probability of transition to unemployment, the reverse being true for the same age group of men. These outcomes are in line with the evolution of employment and activity rates for both genders during the lifetime, presented on the Figure 1 below.

In general, activity and employment rates are higher for men and women leave the labor market earlier. The highest differences in these rates prevails among individuals aged 25-30 but the employment and activity rates for women rise after the age of 30, as many females return to or even enter the labor market, to stabilize around 70 per cent till 45. Males exhibit higher employment and activity rates but they tend to decline for cohorts older than 40. These diverse patterns of activity and employment are confirmed by the outcomes from our models.

We find another important difference among genders in the influence of marital status. Single men have the probability of outflow to unemployment increased by 52 per cent and to inactivity by 35 per cent in comparison to married men, whereas in case of women these probabilities respectively increase by 31 per cent and decrease by 34 per cent. The transitions

Figure 1: Activity and employment rates by gender in Poland in 2004



Source: BAEL GUS.

frequencies (not presented here) show that single individuals face substantially lower persistence of employment but single women have equal transitions to inactivity and unemployment, as married ones are two times more likely to become inactive than unemployed. We think it is partly due to the fact that single women cannot afford to quit the labor force and partly to the higher average education level attained by the single women. Moreover, they are less likely to have a family to care for which also alters the decision to leave the labor market. Education level attained also exerts more powerful influence among males, but in case of tertiary education - which we find the most important distinction in the pooled sample - the relative risk ratios are exactly the same. So we infer that the divergent influence of vocational and primary education level in case of both genders is connected to sectoral differences, as women work in sectors offering much more secure jobs.

7.2 Influence of sources of income and other factors for both genders

Before we discuss the results for the sources of income, we conjecture that it is more likely that the main source of household's income is rather approximation of the income of male, whereas the additional source may indicate the income of female member of the household. Then the distinctive responses are reasonable, especially for not specified sources of income which may be constituted by benefits or income from working in shadow economy.

The main income from pension or disability benefit increases probability of transition to inactivity among men with 1 per cent significance but this variable is significant among women only at 10 per cent level. The additional income from pension or disability benefit significantly increases transition to inactivity among men and its insignificant among women which reaffirms our earlier interpretations. Because women in general leave the labor market earlier and are younger than their spouses, males have strong incentive to also leave the labor market and join their wives in inactivity. Our models do not indicate that the parallel effect is valid for women. The important role may be also played by the survivor's benefits which are received

by widows even younger than statutory retirement age. The above factors indicate that the additional source of income from benefits or pension is more important among males, as females are more likely to leave the labor market even if the household is eligible to only one social transfer. We find that this effect is partly captured by the age groups indicators and partly by benefit-dummy.

Moreover, as the suggested by the Figure 1 and by the fact that males receiving disability pensions are relatively younger than females (Bukowski et al., 2005)), it may be so that employed males, living in the household with main income from pension or disability benefit, are eligible to these transfers. Then they are visibly less attached to the labor market which also may explain the different outcomes for both genders.

If the additional income comes from unemployment benefit, males have both the probabilities increased, whereas females only the one to unemployment. Similar responses occur for households receiving income from agriculture farm - such income increases employment persistence in case of both genders. This is true for main and additional income. We have to be careful with interpreting the influence of different sources of income. They may approximate underground economy, then the increased probability of transition to unemployment in case of men and to inactivity in case of women seems meaningful. But they can also mean that the household receives some form of transfers (for example from family members) or social security benefits (different than pensions, disability benefits and unemployment benefits), then it is more likely that increased transitions to inactivity follow.

We also find that the lower probabilities of transition to unemployment of the individuals living in cities with more than 100000 inhabitants or on countryside, which were weakly significant in the model 5 estimated on the pooled data (Table 9), are due to their high significance in case of women. Among males, size of the dwelling place does not play any role. Probably it is due to the clustering of public administration, education & health care in large cities. This sector offers stable jobs and 70 per cent of its employees are women.

The unemployment rate has parallel, adverse effect on the probabilities of the transition to inactivity for both genders, but it increases the one to unemployment only in case of men. The worsening of the labor market prospects has caused the vulnerable groups to leave the labor market, but it seems to be unimportant in case of women's flows to unemployment. It is in line with the fact that the narrowing of the gender gap in employment and unemployment was due to the more severe worsening of the situation of men. The weak significance of the year 2003/2004 dummy in women's transitions to inactivity indicates that the higher outflow to inactivity that year was probably due to ensuing abolishment of early pensions.

Table 10: Multinomial logit models for transitions out of employment - estimates for males and females

	Model 6: Influence of sources of income on men		Model 7: Influence of sources of income on women	
	Unemployment	Inactivity	Unemployment	Inactivity
Single	1.52***	1.35***	1.31***	0.56***
Age 15-24	1.34***	4.51***	1.60***	2.22***
Age 35-44	1.10	2.26***	0.92	0.41***
Age 45-54	1.26**	5.31***	0.82*	1.08
Age 55-64	0.76	16.33***	0.92	3.81***
Tertiary education	0.37***	0.47***	0.36***	0.47***
Vocational education	1.67***	1.26***	1.56***	1.27***
Primary or less education	2.15***	2.17***	1.69***	1.82***
Tenure	0.90***	0.99***	0.88***	0.99*
City over 100.000	1.04	1.08	0.70***	0.89
Countryside	1.13	0.94	0.76**	0.85*
MSoI – agricultural farm	0.30***	0.40***	0.29***	0.41***
MSoI – pension or benefit	1.11	1.34***	0.92	1.18*
MSoI – unemployment benefit	1.07	1.37	2.15*	1.16
MSoI – other	1.60**	1.40	0.63	1.60**
ASoI – agricultural farm	0.35***	0.58***	0.64***	0.55***
ASoI – pension or benefit	0.89	1.46***	0.86	1.04
ASoI – unemployment benefit	1.30**	1.32*	1.71***	1.09
ASoI – other	1.20	1.36***	1.25	1.64***
Unemployment rate	1.02***	1.03***	1.01	1.03***
Year 1997/1998	0.47***	0.83**	0.47***	1.06
Year 1998/1999	0.66***	0.86	0.61***	0.90
Year 2001/2002	1.03	0.84*	0.94	0.86*
Year 2002/2003	0.78***	0.54***	0.84*	0.79**
Year 2003/2004	0.92	0.86	0.87	1.18*
Pseudo R^2	0.1118		0.0987	
Pseudo-likelihood	-10877.4		-9949.2	

Notes: MSoI - main source of income. ASoI - additional source of income. Number of observation: 43217 (columns 2 & 3) or 35473 (columns 4 & 5), 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 form employment or self-employment, no additional source of income or income 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.

8 Conclusions

In this paper we scrutinized the determinants of the flows out of employment in Poland using multinomial logit model based on the individual LFS panel data covering the 1997-2004 period. First of all we look at the influence of personal characteristics on individual's labor market prospects. We find that odds of becoming unemployed are not very diversified among age-groups apart from youngest workers. At the same time, age is found to be crucial determinant of transition out of the labor force as the chances to become inactive soar after 45th year of age. This outcome was very robust to every change in our model specification. Interestingly, women aged 25-34 experience much higher risk of becoming inactive than the slightly older group, probably due to maternity reasons. This pattern is much different than that of men, whose chances of inactivation rise steadily with age, which shows that many mothers re-enter the labor market probably when their children reach the school age, presumably at the time when some fathers are already withdrawing.

Apart from age, the second most important individual determinant of out-of-employment flows we point at is the attained education level. Our analysis reveals that higher skills decrease the odds of losing a job, although reduced probability of transition to inactivity does not mean that elder workers with tertiary education level remain active significantly longer than their less educated counterparts. In fact, we point out that individuals living in households receiving disability benefits, pensions, pre-retirement benefits or allowances have significantly higher risk of leaving the market, especially in case of men. Our results are in line with the observation of Boeri and Terrell (2002) who note on basis of their extensive survey of literature that the evolution of Polish labor market during transition involved large flows to inactivity and strikingly stagnant unemployment pools that can be largely attributed to availability of benefits targeted at people out of the labor force.

We find that sector of employment was in the period considered very important determinant of individual probabilities of becoming unemployed or inactive. As the sectors with the largest relative risks of a job-loss were industry and construction, we infer that much of the employment reduction after 1997 was coincided with or was even triggered by the severe restructuring process in these economy branches. It seems also that the social security system was an important cushion for this productivity improving measures, resulting however in the probably permanent fall of participation rates of certain age groups. The restructuring was much less intense in case of agriculture that still remain the reservoir of hidden unemployment. The much more secure employment in public administration, health care and education can be found as the only reason why women have on macro level smaller chances of becoming unemployed. On the other hand, significantly larger odds of becoming inactive in case of women seem to be closely connected to social security benefits available to relatively younger and broader group of workers which we find clearly associated with eligibility criteria.

9 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 analyze the labor market flows after as well as before the adverse shock.

In order to assess transitions out of employment we excluded from our sample men aged 65 or more and women aged more than 60, i.e above statutory retirement age in Poland. Of course some of these people still work, but they show disproportional high transition rates to inactivity which probably would bias our estimates. Therefore, we are left with 78690 individuals, whose distribution over the period considered is presented in Table 11. The following cross-tables illustrate most important interaction between individual characteristics we find as the most important with respect to labor market status and transitions.

Table 11: Sample used in the analysis

Year of the survey	Frequency	Percent
1997/1998	23465	29.8
1998/1999	5764	7.4
2000/2001	17935	22.3
2001/2002	13130	16.7
2002/2003	9599	12.2
2003/2004	8797	11.2
Total	78960	100

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 12: The decomposition of the sample with respect to education level attained, by gender and age (in percentage points)

	Primary	Vocational	Secondary or post-secondary	Tertiary	Total
Men	16.3	43.7	29.0	11.0	100.0
Women	15.2	24.9	44.1	15.8	100.0
Age 15-24	17.2	39.7	40.2	2.9	100.0
Age 25-34	8.1	38.8	36.9	16.2	100.0
Age 35-44	11.5	37.9	37.6	13.0	100.0
Age 45-54	20.7	31.3	34.3	13.7	100.0
Age 55-64	39.1	20.3	24.2	16.4	100.0

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

Table 13: The decomposition of the sample with respect to education level attained, by gender and age (in percentage points)

	Women	Men	Total	Age 15-24	Age 25-34	Age 35-44	Age 45-54	Age 55-64	Total
Primary	43.4	56.6	100.0	10.9	12.0	22.6	37.2	17.3	100.0
Vocational	31.9	68.1	100.0	11.3	26.0	33.6	25.1	4.0	100.0
Secondary or post-secondary	55.5	44.5	100.0	11.3	24.3	32.7	27.0	4.7	100.0
Tertiary	54.1	45.9	100.0	2.1	29.0	30.7	29.5	8.7	100.0

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

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