WZB

Jaap de Koning*, Hassel Kroes, Alex van der Steen

Patterns of Work and Use of Benefits over the Life Course: Estimates and simulations based on Dutch microdata**

discussion paper

* SEOR, Erasmus University Rotterdam, The Netherlands
dekoning@few.eur.nl

** also available in Dutch: Jaap de Koning, Hassel Kroes and Alex van der Steen, Patronen van werk en gebruik van sociale regelingen, Report for the Dutch Ministry of Social Affairs and Employment, SEOR, Rotterdam, 2005.

This research was supported by the thematic network 'Managing Social Risk through Transitional Labour Markets' (acronym TLM-NET) and builds considerably on a project that was funded by the Dutch Ministry of Social Affairs and Employment. TLM-NET was funded by the Fifth Framework Programme of the European Commission. The views expressed in this publication are those of the authors and do not necessarily reflect those of the Ministry or the European Commission.
Thanks are due to the Wissenschaftszentrum Berlin für Sozialforschung (WZB) for enabling Jaap de Koning to work on the report during two visits in October 2005 and February 2006, respectively. The authors are also grateful for the comments by Janine Leschke (WZB) and by the participants of the ECHP workshop organized by Christian Brzinsky-Fay (WZB), Joris Ghysels and Lieve de Lathouwer (both Centre for Social Policy, University of Antwerp) in Antwerp, January 2006.

Mai 2006

ISSN Nr. 1011-9523

Social Science Research Center Berlin
Research Area:
Employment, Social Structure, and Welfare State

Research Unit:
Labor Market Policy and Employment
http://www.wz-berlin.de/ars/ab

Order-Nr.: SP I 2006-112

Wissenschaftszentrum Berlin für Sozialforschung (WZB) •
Reichpietschufer 50 • D-10785 Berlin • www.wz-berlin.de

SUMMARY AND CONCLUSIONS

If people stay out of employment for long periods this often creates social and economic problems. Therefore, it is important to know the risk factors responsible for long-term unemployment and inactivity. Most research is about single spells of unemployment and inactivity. However, it is also highly relevant to know, for example, whether an unemployed person who has found a job, keeps the job or becomes unemployed again after a short time. Studies that deal with a sequence of transitions do exist but are relatively scarce. Furthermore, the period covered in these studies is usually relatively short.

This report analyses patterns of work and use of benefits over the full life course on the basis of Dutch data. The available data, however, only cover a period of twelve years. Therefore, the patterns observed during this period are used to simulate life courses for a cohort. The simulation implies that for each (simulated) member of the cohort we know on a quarterly basis for approximately 50 years whether he has a job, a social benefit or neither a job nor a social benefit. So, we have approximately 200 data points for each (simulated) individual. The original data on which the simulation model is based contain the following individual characteristics: age, gender and ethnic origin. The level of education was estimated on the basis of income data from our dataset. The distinction according to these four characteristics has been maintained in the simulation.

The transition probabilities used in the simulation were estimated using multinomial logit models. The Dutch Statistical Office created the dataset that we have used for the estimation by merging Tax Office data and municipal data, both administrative data. The dataset contains information on almost 80.000 persons aged between 15 and 65 years. Most of them can be followed during the entire data period (1989-2000). We know exactly the starting and ending dates of the subsequent periods in employment, in unemployment while claiming an unemployment insurance benefit, in social assistance, in inactivity while claiming a disability benefit, in inactivity while claiming a sickness benefit, in (pre-)retirement, in inactivity without income (also referred to as ´inactivity`) and in a number of combinations of these situations. Young people in school without a job belong to the inactive without income. Some people are only in the panel for part of this period because they die, reach the official pension age, emigrate, enter active age or immigrate during this period. The four individual characteristics mentioned earlier were included as explanatory variables in the equations and were often significant, pointing at differences between the various groups.

In addition to the four individual characteristics, two other factors were also included:

1. the time a person has already spent in his current situation. It appears that this duration dependence of transition probabilities is often significant. We find that the longer a person is unemployed, the more likely he is going to stay unemployed. Duration dependence, however, is also relevant in case of employment, although here duration has a positive effect on the probability of staying employed;
2. previous unemployment experience. Our results indicate that if a person has experienced previous unemployment, he has a higher chance of becoming unemployed again during the first years in employment. Hence, there is evidence of cumulating unemployment.

In order to obtain indications of the importance of duration dependence and cumulating unemployment, we have made simulations with and without these factors.

With the multinomial logit models the quarterly transition probabilities from a given situation to all other situations can be computed. These probabilities (including the probability to stay in the same situation) add up to 1. Then from this probability distribution random drawings are taken to determine the situation at time t+1 given the situation at t. The following situations are distinguished:

a. having a job;
b. being without a job and claiming an unemployment insurance benefit;
c. being without a job and claiming a social assistance benefit;
d. being without a job and claiming a disability benefit;
e. being without a job and claiming a sickness benefit;
f. being without a job and claiming a (pre-)pension benefit;
g. being without a job and without a benefit;
h. having both a job and an unemployment insurance benefit;
i. having both a job and a disability benefit.

Not every transition between these situations is feasible. A person can, for example, only get an unemployment benefit if he has worked for a sufficiently long period. Furthermore, the duration of this benefit depends on the length of the preceding working period. These types of restrictions have been accounted for in the simulations. Life courses have been simulated for 100.000 individuals in each simulation. This large number is necessary to obtain stable distributions, even for subgroups.

The simulations are first of all used to analyse concentration in the use of social benefits. To that end we calculated the life time use of social benefits by adding up all the benefit spells an individual experiences during his life course. It appears that the 10 percent that has the highest use of benefits account for more than 30 per cent of the total use of benefits by the cohort members during their life courses. This concentration is apparent for all types of benefits: unemployment insurance, disability and social assistance. Although the use of benefits depends on gender, ethnic origin and education, the distinction between social groups only accounts for a small part of the concentration: the concentration within the different groups is of similar size as the overall concentration. Duration dependence and cumulative unemployment lead to higher concentration, but also here the effect is relatively small. Therefore, concentration is largely due to random factors and to routes in social benefits. With the latter we mean that once a person is a benefit claimant he does not just have a certain probability of staying in this situation, but he also has a higher probability of making the transition to a different type of benefit.

The level of concentration on a life-time basis *within the group of benefit users* is similar to the level obtained from the twelve-year data-period. However, the result is different when we also take the group into account that does not use benefits at all during their life course. In the twelve-year period 45 per cent of the panel has a benefit at least once, while this is 90 per cent over the full life course. If we leave out pre-pension and early retirement benefits (which almost everybody in the cohort has), the latter figure is still 75 per cent. This means that if we also take the individuals into account that do not use benefits at all, concentration over the full life course is less than over a shorter period of, for example 12 years.

Whether the total use of benefits during the life course is a problem for society also depends on the total time worked. For 10 per cent in the cohort the total time in a benefit is longer than the total time worked. For the twelve-year period this is 20 per cent. In the cohort almost everybody has worked at least once, while this is 80 per cent in the twelve-year period. In the cohort slightly more than 50 per cent works for more than 30 years in total.

Age is a dominant factor if we look at the pattern of work and use of social benefits during the life course. At older age people tend to work less and make more use of benefits. However, there is no evidence that unemployment insurance benefits are extensively being used as an unofficial exit route to pension age. Next to age, ethnic origin is the most important factor. People originating from non-industrialised countries have less job opportunities and make more use of benefits. Women and the lower educated show a similar level of use of benefits as do higher educated and men, respectively, but work less than the latter.

The report also contains two policy-relevant simulations. The first simulation deals with the possibility of an unemployment insurance benefit based on the idea of individual saving. The idea is that individuals would save for their own unemployment benefit instead of participating in a collective insurance arrangement. The reasoning behind introducing an individualised financing system for unemployment benefits is that it would stimulate people to work and not use benefits. The idea has been seriously discussed in the Netherlands within the framework of reforms of the welfare state.

We are unable to account for behavioural effects in our simulations. Our approach implies that we use the transition probabilities from the previous simulations and assume that:

- people save for unemployment benefits if they work;
- have to finance their income during periods of unemployment from the amount of money saved up to that moment.

The results indicate that the savings variant is totally unrealistic. Most people have not saved enough when they become unemployed and most have money left over at pension age. It is difficult to imagine that the behavioural effects would be such that one could avoid that large number are deployed from a benefit when they need one. Perhaps if the scheme were to apply to a limited percentage of the benefit only, the main part still accounted for collectively, one might consider it. However, then the scheme may not be that effective in inducing behavioural effects that reduce the use of benefits.

The second simulation deals with the impact of the business cycle. During recession periods, when in particular young people have difficulties finding a job, there is concern about the possibility of a lost generation. The fear is that young people entering the labour market as unemployed, and subsequently becoming long-term unemployed, will suffer from an unstable work life. In the base-line scenario there is no business-cycle variation. However, on the basis of the original data, that, as was earlier indicated, cover the period 1989-2000, we could analyse the impact of the business cycle on the transition probabilities.

Then a new simulation was carried out based on the following assumptions:

a. During the first years in the labour market the cohort is confronted with a recession leading to lower chances to find a job and higher chances of losing one's job once employed, compared to the baseline simulation.

b. After this period the recession turns into a booming period of similar length, during which job chances are high and the risk of becoming unemployed is low.

c. After this booming period the labour market gets back to ´normal´ and remains so during the rest of the period.

The results show no sign of a lost generation. The bad start is completely compensated for by the booming period that follows the recession. The simulation is not entirely satisfactory as already before the age of 25 the share of the employed is higher than in the baseline simulation. One would expect a lower employment share during this phase of the life course. Furthermore, it should be noted that our simulation deals with a single cohort. If we were to include different cohorts, it is still possible that the cohort with the bad start has difficulties to compete with previous and later cohorts with a good start. However, our results suggest that as long as the number of jobs generated during the booming period is large enough to absorb (almost) everybody, there may not be much of a problem.

CONTENTS

1 INTRODUCTION

In the report we use micro panel data for the Netherlands to estimate multinomial logit models for the transition probabilities between work, the various types of social benefits and inactivity without a benefit. Then these models are used to simulate complete life courses for a cohort of individuals. The simulations serve a number of purposes. First, we use them to study the concentration in work and the use of benefits. Are unemployment and disability more or less evenly spread over the potential labour force if we follow individuals over their whole life course or is it more or less the same people who use benefits all of the time? Second, the simulations are used to get insight into two important policy issues. The first issue under discussion is whether it is feasible to develop a system of unemployment benefits based on the idea of individual savings. The second issue has become relevant again under the influence of the recent sharp increase in youth unemployment. Similarly as in the 1980s, the government has prioritised the fight against youth unemployment under the assumption that young people faced with long-term unemployment will constitute a lost generation. With our simulation model we can analyse to what extent unemployment after leaving school affects future work lives.

Studies on unemployment and disability usually concentrate on one-period analyses. On the basis of such analyses it can for example be inferred which factors and individual characteristics determine benefit duration. However, such analyses have only limited meaning for the social and budgetary significance of benefits. If a person uses benefits only once during his life course and has jobs for the remaining part of his working-age period, there might not be a big problem, even if the benefit period is longer than a year which is usually seen as problematic by policy makers. It is much more of a problem when individuals face a number of benefit periods during their life course. Short benefit periods are usually not seen as a problem, but frequent short spells may add up to a substantial share of the total working-age period.

In duration analysis it is often found that hazard rates depend on the time a person has already spent in a specific situation. The longer unemployed a person is, the lower hazard rates tend to be. The lower chances of finding a job partly coincide with changes in benefit regime that occur when individuals stay in unemployment long. Most people that become unemployed, that is the ones that worked sufficiently long, initially receive unemployment insurance benefits. But after some time, this benefit expires and then people have to rely on social assistance. However, unemployment may also have spill-over effects to future transitions. If a person has found a job after having been unemployed, he might be more vulnerable to renewed unemployment during the first years in

employment. That would imply that unemployment is causing future unemployment. This might be a factor adding to the concentration in the use of benefits.

Personal characteristics can also be expected to play a role. Factors such as age, gender, education and ethnic origin are likely to affect both the chance of losing a job and the chance of finding one, once being in a situation of unemployment or disability. Therefore, the pattern of work, use of benefits and inactivity without a benefit is expected to vary according to gender, age and education. Furthermore, the degree to which people work and use benefits vary over their life course.

In addition to the factors mentioned there is probably also a considerable random component in the variation in life course patterns between individuals. The fact that one person gets unemployed several times during his life, while another person stays in employment throughout his working-age life may in some cases be due to accidental factors.

The report deals with the following research questions:

1. Is the use of benefits over the life course evenly spread over individuals or does a minority of the potential labour force account for most of the use?
2. If the use of benefits is concentrated on a relatively small group of people, is this due to differences in personal characteristics, self-sustaining effects of unemployment owing to duration dependency and/or future chances of unemployment affected by current unemployment, or to random effects?
3. Does the answers to 1) and 2) differ between the various types of benefits?
4. Is more use of one type of benefit completely or partially compensated by less use of other types of benefits or do we see a cumulating use of benefits?
5. How does the total use of benefits during the life course relate to the total number of years worked?
6. What would be the result if a system would be introduced according to which people were to save part of their benefit?
7. If the labour market situation is bad when young people enter the labour market, to what extent does this have lasting effects on their labour market situation?

We have found only few examples of longitudinal studies that provide information on these questions. In a previous study De Koning, Van Nes and Van der Veen (1998) already made an attempt to develop a simulation model for life courses. The results of this study point to considerable concentration of unemployment. Approximately one-third of the total amount of unemployment experienced by a cohort of individuals is accounted for by the 10 per cent of the

cohort that have the highest life-time unemployment. Life-time unemployment for an individual is defined as the sum total of all the unemployment spells experienced by the individual during his work life. The total amount of unemployment experienced by a cohort is then derived by adding up the life-time unemployment of the individuals in the cohort. This concentration can partly be explained by the fact that some groups (the lower educated, for example) are unemployed more often and longer than others. However, even if we look at relatively homogeneous groups unemployment concentration is considerable. Both duration-dependence, cumulating unemployment (the fact that a current unemployment period affects future job chances negatively), and random factors give rise to this phenomenon.

This previous study has a number of drawbacks, however. The transition probabilities between work, unemployment and 'other' were derived from aggregated tables. Furthermore, this distinction between three situations is too simple. In reality several types of social benefits exists (unemployment insurance benefits, social assistance benefits, disability benefits and early (or pre-) retirement benefits.

De Koning, Van Nes and Van der Veen find some evidence for cumulating unemployment. What does the international literature say on this subject? From an international perspective we know of an older study by Heckman and Borjas in which they analyse the question whether current unemployment increases the chance of future unemployment (Heckman and Borjas, 1980). In this study no evidence of this type of cumulative unemployment is found. Lynch (1985 and 1989) comes to the same conclusion. Omori (1997) on the other hand does find evidence that the hazard rate from current unemployment depends on previous unemployment. He attributes this effect to 'stigma'. Arranz and Muro (2004) draw a similar conclusion on the basis of their research. On the whole, the literature is rather unclear about this effect.

The report is structured as follows. In section 2 we discuss the dataset that was used to develop the simulation model. Then section 3 discusses the modelling and estimation of the transition probabilities. Finally, section 4 treats the simulation model and the outcomes of the simulations.

2 DATA DESCRIPTION

2.1 THE IPO PANEL

The panel starts in 1989 and consists of a representative sample of the Dutch population of 65.000 individuals. The sample is drawn from the tax registers and monitored between 1989 and 2000 on a continuous basis. The data are based on the information provided to the tax office each year. It contains the starting and ending dates of periods during which people held jobs or had a benefit[1]. Furthermore, data on the income obtained during each period is available. By linking the data to information from municipal administrations a number of personal characteristics could be added. The following individual characteristics are available: age, gender and ethnic origin[2].

As the panel data are of administrative origin, there is no attrition owing to non-response or withdrawal. However, during the panel period some individuals leave the panel owing to death or emigration. These are replaced by newborn and immigrants, respectively. As we only deal with the people in active age, people may enter *our dataset* during the period 1989-2000 because of immigration or reaching the age of 15. They may leave our dataset during the period owing to death, emigration or reaching the (official) pension age of 65. Hence, some of the people in the dataset are only in it for part of the period 1989-2000. People who participated in the panel for less than one year have been excluded from the analysis. In total, the panel involves around 80.000 people, some of whom are only part of the 1989-2000 period in the panel.

Of these people we know when and for how long they had a job or a social benefit, and when and for how long they have been inactive. The following types of benefits are distinguished:

- unemployment benefit;
- social assistance benefit;
- disability benefit;
- sickness benefit;
- early retirement/pre-retirement benefit.

---

[1] When a situation continues to exist over the year, the relevant spells are merged.

[2] Also household characteristics are available as well as the sector in which a person works (the latter however only for a couple of years), but these are not exploited in our analyses.

Furthermore, a number of combinations of these situations are possible. When, for example, a company is confronted with a sudden decline in its sales owing to special circumstances out of its control, there is the possibility that its workers obtain an unemployment benefit while they stay employed with the company.

Educational attainment is not available. However, we have estimated educational attainment using the income data in the panel. The underlying assumption is that there is a strong relationship between wage level and educational attainment. The wage data in the panel are cumulative data in the sense that we know wages per time period. We have computed daily wages by dividing cumulative income during the working periods of a person by the number of days in these periods. This daily wage was then used as a dependent variable in a linear regression with age and gender as independent variables (see appendix 1). Normally, people with a given educational attainment earn more the older they are, which makes it necessary to correct for age. Gender affects wages both by the gender gap and the fact that many women work part-time. The number of hours worked is unfortunately not in the database. The residuals are considered as indicators for educational attainment. People have been divided in three groups according to the level of the residuals corresponding to them. The threshold values have been chosen in such a way that the shares of the three resulting groups correspond more or less with the shares of the low educated, the secondary educated and the high educated. People are assumed to be low educated if they fall in the first group, secondary educated if they fall in the second group and high educated if they fall in the third group. Of course this is a rough approximation, but later in the report we will see that it produces results that are quite reasonable in terms of differences in employment and unemployment patterns.

2.2 COMPOSITION OF THE PANEL COMPARED TO THE TOTAL DUTCH WORKING-AGE POPULATION

How did the labour market develop during the panel period, how are the various groups represented in the panel and how does the panel's composition compare to that of the total Dutch working-age population? These are the questions we deal with in this section.

Table 2.1 gives the shares of the Dutch working-age population in the various income situations. This table gives the reader an indication of the labour market trends during the period 1989-1999. The table shows that during the 1990s the share of those with a job has increased. Initially, also the share of persons claiming unemployment insurance benefits increased, but from 1995 on it diminished, reflecting the business cycle movement. The share of social assistance beneficiaries has continuously diminished, while the share of disabled shows a cyclical pattern: until 1993 it increases, and then it declines until 1996,

followed by a new increase that lasts until the end of the period. The development in the use of sickness benefits is strongly affected by changes in legislation. Both in 1994 and 1996 the period during which employers carry the burden of sickness benefits has been lengthened, thereby reducing the number of sickness days paid for collectively.

Table 2.1 also contains the corresponding figures for the IPO panel. The IPO figures in the table are ultimo year stock figures. From the table we can conclude that regarding employment, unemployment insurance and social assistance both the levels and the development between the national figures and the IPO figures is good to reasonably good. The fact that there is a difference in levels with respect to unemployment insurance may be due to the fact that in some situations an unemployment insurance benefit can be combined with another source of income. With respect to social assistance it is unclear what the difference could explain.

With respect to disability and sickness benefits the differences are more profound. However, here we can give clear explanations. In quite a number of cases disability benefits are paid through the former employer. This is for example the case when disabled people are given the opportunity to work in view of a possible return to a regular job. In the national data this is then counted as a disability benefit while in the panel it is counted as wage income. Disability benefits are also often paid through the employer in case of disabled workers employed by social companies, which provide sheltered employment to severely handicapped people. The fact that IPO figures on sickness benefits are much lower than the official figures is caused by the fact that in IPO sickness periods are not counted if they happen in a job. IPO treats the latter case as an uninterrupted job. Evidently, most sickness benefits are paid to workers.

Summing up we think that the IPO panel gives a reasonable representation of the developments in the Dutch labour market between 1989 and 2000. The main deviation from reality is the relatively low incidence of disability benefits in the panel. As was indicated previously, this is probably due to the fact that in IPO part of the disability benefits are counted as wages. But then we would expect that the share of employed persons in the panel was higher than in the national figures, which is not the case. Probably, this had to do with administrative mistakes. In case of a transition from, for example, a benefit to a job, the benefit spell and the job spell are not always administrated as subsequent periods. Then it looks as if there is a period of non-income in between. In the panel this leads to an overestimation of the share of people without a (personal) income. However, we believe that these deviations do not influence the basic patterns of work, use of benefits and no income periods.

A disadvantage of the panel is that it contains no recent data. It should be noted, however, that the period 1989-2000 is a ´normal´ period in which, for example,

unemployment rates comparable with the current level can be observed, but also lower rates. The most important drawback is that since 2000 several changes have occurred in labour market institutions that may have affected labour market transitions. In that sense the patterns emerging from the panel may not completely reflect the current situation.

Table 2.2 below gives the IPO figures for the period 1989-1999. From the table we can conclude that during this period the share of the employed has risen considerably (from 55 to 63 per cent), while the share of those without income has correspondingly declined (from 24 to 17 per cent). The use of social benefits as a whole has remained relatively constant with a decrease of only a few percentage points (from 20 to 19 per cent).

Table 2.1 The Dutch working-age population divided according to type of income, 1989-1999 (end of year stock values)

Year	Percentages of the working-age population with a specific type of income										Total working-age population (in thousands; per ultimo year))	Total number of persons in panel(per ultimo year)
	Wage income[a)]		Unemployment insurance benefit (WW, per ultimo year)		Social Assistance benefit (per ultimo year)		Disability benefit (per ultimo year)		Sickness benefit			
	National data (yearly averages)	Panel (ultimo year)	National data	Panel	National data	Panel	National data	Panel	National data (daily averages)	Panel(per ultimo year)		
1989	54%	55%	2,1%	2,0%	5,9%	5,7%	8,2%	5,9%	2,6%	0,5%	10,300	65.0
1990	55%	56%	2,0%	2,1%	5,5%	5,6%	8,5%	5,6%	2,8%	0,5%	10,300	62.6
1991	56%	58%	2,0%	2,3%	4,9%	5,5%	8,7%	5,7%	2,8%	0,4%	10,300	62.9
1992	57%	58%	2,4%	3,0%	4,8%	5,4%	8,7%	5,7%	2,8%	0,4%	10,300	63.0
1993	57%	57%	3,2%	3,4%	4,7%	5,5%	8,8%	5,7%	2,8%	0,5%	10,300	64.4
1994	57%	58%	3,9%	3,7%	4,8%	5,5%	8,5%	5,5%	1,6%	0,4%	10,300	64.2
1995	58%	59%	3,7%	3,7%	4,6%	5,4%	8,2%	5,7%	1,6%	0,5%	10,300	65.1
1996	59%	60%	3,5%	3,9%	4,5%	5,1%	8,2%	5,9%	0,4%	0,4%	10,300	65.2
1997	60%	62%	3,1%	2,8%	4,1%	5,0%	8,3%	6,7%	0,9%	0,4%	10,300	65.2
1998	62%	63%	2,7%	2,1%	3,7%	4,6%	8,5%	6,3%	1,0%	0,5%	10,300	64.9
1999	64%	63%	2,1%	1,7%	3,4%	4,3%	8,6%	6,7%	1,0%	0,4%	10,300	66.2

a) For those working at least 12 hours per week.

b) Consists of a number of different arrangements (WAO, AAW, Wajong and WAZ).

Sources: CBS Statline and IPO panel.

Table 2.2 The division of persons in the age of 15-65 years over the various income situations according to the IPO-panel, 1989-1999 (stocks at the end of the year)

Year	Employed	Unemployment insurance benefit	Social assistance benefit	Disability benefit	Sickness benefit	Pensions and early retirement	Other pensions	No (personal income)	Unknown	Total	Total number of persons in panel
1989	55%	2,0%	5,7%	5,9%	0,5%	4,6%	1,6%	24%	0,7%	100%	65.058
1990	56%	2,1%	5,6%	5,6%	0,5%	4,6%	1,6%	23%	0,9%	100%	62.551
1991	58%	2,3%	5,5%	5,7%	0,4%	4,6%	1,5%	22%	0,5%	100%	62.876
1992	58%	3,0%	5,4%	5,7%	0,4%	4,5%	1,5%	21%	0,6%	100%	63.022
1993	57%	3,4%	5,5%	5,7%	0,5%	4,7%	1,5%	21%	0,5%	100%	64.362
1994	58%	3,7%	5,5%	5,5%	0,4%	4,7%	1,5%	20%	0,4%	100%	64.222
1995	59%	3,7%	5,4%	5,7%	0,5%	4,8%	1,5%	19%	0,2%	100%	65.101
1996	60%	3,9%	5,1%	5,9%	0,4%	4,8%	1,5%	18%	0,3%	100%	65.200
1997	62%	2,8%	5,0%	6,7%	0,4%	4,2%	1,4%	17%	0,2%	100%	65.177
1998	63%	2,1%	4,6%	6,3%	0,5%	4,2%	1,3%	18%	0,2%	100%	64.921
1999	63%	1,7%	4,3%	6,7%	0,4%	4,3%	1,3%	17%	0,7%	100%	66.219

Source: IPO-panel 1989-2000.

2.3 PATTERNS OF WORK, USE OF SOCIAL BENEFITS AND NONINCOME PERIODS OVER THE PANEL PERIOD

Although the purpose of the report is to construct life course data, it is already interesting to show results for the panel period, which is relatively long. First, for each individual we have computed the total time spent in a job during the panel period by adding up the individual job spells. The same was done for benefit spells and spells in inactivity without a personal income. Then the percentage shares of the three situations were –again for each individual – computed. The results are given by table 2.3. From the table we can see that 27 percent of the individuals constantly had a job during the time they participated in the panel, while 20 percent never had a job. Not less than 43 percent of the people aged between 15 and 65 did receive a social benefit for at least some of the time[3]. However, in terms of the time spent during the panel period, the percentage share of social benefits is relatively small: only seven per cent.

Of the panel members 17 percent received an unemployment insurance benefit for at least some time. Due to the limited duration of unemployment insurance benefits and its dependence on the number of years worked, almost nobody had such a benefit during the whole period. Depending on age and the number of years worked the maximum duration of an unemployment benefit is seven years. Therefore only people who participated in the panel for seven years or less can get an unemployment benefit during the whole period. These are mainly older, unemployed people that reach the age of 65 and therefore leave the panel.

Table 2.3 What percentage of the period 1989-2000 did individuals spent in a job, a social benefit and/or inactivity without a personal income?

Percentage of time in each situation	Job	Inactivity	Social benefit	Unemployment benefit
0 percent	20%	58%	57%	83%
1-50 percent	20%	21%	27%	17%
51-99 percent	33%	10%	10%	0.3%
100 percent	27%	11%	7%	0.1%
Number of individuals	79,288	79,288	79,288	79,288

Source: IPO 1989-2000.

[3] Note that age is measured by year of birth.

Table 2.4 gives us an idea of the mobility in the labour market. About one third of the panel has only one type of income during the panel period, also one third has two or three different periods/situations and the remaining part has more than three different periods. Approximately 50 per cent of those that worked at least for some time during the panel period, held more than one job; 20 per cent even more than 3 jobs. The percentage with multiple spells in a social benefit is similar to the results for jobs, but situations with more than 3 spells in a benefit occur less frequently. Inactivity without a personal income is mostly a one-spell phenomenon.

Table 2.4 How many periods did individuals spend in a job, social benefit and/or inactivity during the period 1989-2000?

Number of periods in each situation	Job	Inactivity	Social benefit	Total number of periods
None	20%	58%	57%	-
1 period	40%	35%	22%	36%
2 periods	15%	6%	11%	18%
3 periods	9%	1%	5%	13%
> 3 periods	16%	0.1%	5%	34%
Number of individuals	79,288	79,288	79,288	79,288

Source: IPO 1989-2000.

By combining the division of time over the various situations and the number of spells in each situation, we can determine certain patterns in the use of jobs, social benefits and inactivity. This results in a number of typologies (table 2.5). The majority of the panel members worked during their whole stay in the panel or during most of their stay. About 17 percent received a social benefit most of the time, while 18 percent can be characterised as (mainly) inactive without an income. Finally, 8 percent switches between jobs, inactivity and social benefits.

To what extent do the types of benefits used differ between groups that are different as to their patterns of work, use of benefits and inactivity without income? People that worked most of the time but also made considerable use of social benefits often received an unemployment benefit. In addition, the group with at least 6 transitions often gets a social assistance benefit. Furthermore, people that received a social benefit during the whole period most often received a disability benefit, followed by a social assistance benefit or early retirement benefit. The group of people receiving a social benefit most of the time, but at the same time experiencing other situations during their stay in the panel, shows the most variety in use of social benefits. About one third of this group also received an unemployment benefit, almost 50 percent received also a social assistance benefit and 40 percent received also a disability and/or early retirement benefit.

The group of people with a mix of situations and less than 5 transitions in total often received a social assistance benefit in case of unemployment. The group of people with at least 5 transitions tend to use both unemployment insurance benefits and social assistance benefits.

Table 2.5 Typologies of panel members on the basis of their history of employment, use of social benefits and inactivity without job during their stay in the panel

Patterns ranked by main activity	% of total
Job	
Always worked with the same employers	21%
Always worked but with several employers	6%
Mainly[1] worked, never a social benefit	11%
Mainly worked, did have social benefit(s), less than 6 transitions in total	11%
Mainly worked, did have social benefit(s), at least 6 transitions in total	8%
subtotal	57%
Social benefit	
Always the same social benefit	5%
Mainly one type of social benefit, but also one other situation (either work, benefit or inactivity)	4%
Mainly social benefit(s), also several other situations	8%
subtotal	17%
Inactivity	
Always inactive	11%
Mainly inactive, but also working for sometime	7%
subtotal	18%
Other	
Mix of social benefit(s), labour and inactivity, less than 5 transitions in total	4%
Mix of social benefit(s), labour and inactivity, at least 5 transitions in total	4%
subtotal	8%
Other	1%
Total	100%
Number of individuals	79,288

[1] *The word 'mainly' refers to: '51 – 99 percent of the total amount of time someone participated in the panel'.*

Source: income panel data 1989-2000.

Table 2.6 shows the composition of the different typologies according to personal characteristics. Gender differences are most apparent concerning

inactivity without income. Women tend to have more periods of inactivity. Men can be found somewhat more in typologies with work as the main activity. Differences between young and older people seem to be mostly related to mobility: older people are overrepresented in typologies with only one situation, while younger people tend to be more concentrated in typologies with a high number of transitions. The same seems to be the case for non-native people. They appear more often in classes with several different situations, especially when these situations involve the use of one or more social benefits. Educational attainment influences the chances of being employed: people with a low educational indication are less often employed and more often in a situation of inactivity without (personal) income or benefit dependence.

Table 2.6 Characteristics of different typologies based on the panel members´ histories regarding employment, use of social benefits and inactivity without income in 1989-2000

Patterns ranked by main activity	Male	Aged 40 years or older in 1989	Native	Educational indication: low
Job				
Always worked with the same employers	69%	34%	89%	16%
Always worked but with several employers	57%	10%	87%	26%
Mainly[1] worked, never a social benefit	45%	8%	86%	32%
Mainly worked, did have social benefit(s), less than 6 transitions in total	62%	37%	84%	28%
Mainly worked, did have social benefit(s), at least 6 transitions in total	57%	8%	81%	26%
Social benefit				
Always the same social benefit	60%	82%	82%	- [1]
Mainly one type of social benefit, but also one other situation (either work, benefit or inactivity)	54%	82%	82%	51%
Mainly social benefit(s), also several other situations	54%	54%	71%	68%
Inactivity				
Always inactive	15%	61%	77%	- [1]
Mainly inactive, but also working for sometime	31%	14%	80%	53%
Other				
Mix of social benefit(s), labour and inactivity, less than 5 transitions in total	43%	47%	75%	56%
Mix of social benefit(s), labour and inactivity, at least 5 transitions in total	44%	13%	73%	48%
Total panel	51%	34%	82%	33%

[1] *Educational attainment can only be approximated for people that had a job for some time during the panel period since it is based on earned income.*

Source: IPO 1989-2000.

3 MODEL SPECIFICATION AND ESTIMATION

3.1 OUTLINE OF OUR APPROACH

The IPO dataset provides us with the labour market histories of a large number of individuals. For each of them we know the sequence of spells in employment, various types of benefits and inactivity without income. In order to make the analysis of the data more tractable, we have constructed individual quarterly data from the original dataset. Using the original data we simply looked at the situation at the end of each quarter. Hence we have 48 data points for individuals that have been panel members for the whole period. With this data we can then analyse transitions between employment, use of benefits and inactivity without (personal) income.

This data is then used to estimate models for the transition probabilities by using econometric methods. The models determine the probabilities that a person stays in the same situation or makes the transition to one of the other situations. Such models are estimated for the following starting situations: employment, unemployment insurance, social assistance and inactivity. For the other situations the transition probabilities have been computed by taking the sample averages differentiated by age, gender and ethnic origin. For some of the other starting situations (disability, pensions) econometric models are less relevant as transitions from these situations do not occur or only rarely. The remaining situations cover only a small percentage of the total time during the panel.

The simulation results we will present in the next chapter are mostly based on the econometric models (supplemented with transition probabilities based on the sample probabilities for some transitions). However, we also made a simulation on the basis of transition probabilities solely based on sample averages. In the next section we discuss these transition probabilities based on sample averages. Then the model specification and the model estimations are discussed in section 3.3.

3.2 TRANSITION PROBABILITIES BASED ON SAMPLE AVERAGES

We use the IPO data to determine the situation of each panel member at the end of each quarter. By comparing the situation at the end of quarter t with it situation at the end of t+1, we can identify transitions. For each social group (defined by gender, age, ethnic origin and educational indication) we compute the percentage staying in a given situation and the percentages moving to a different situation by taking the sample averages. These percentages are also referred to as transition probabilities. In this section we discuss the outcomes.

The following situations are distinguished in the computations[4]:

- job;
- unemployment benefit;
- social assistance benefit;
- disability benefit;
- sickness benefit;
- early retirement/pre-retirement benefit;
- inactivity;
- job in combination with an unemployment benefit;
- job in combination with a disability benefit.

Inactivity

On average the probability of remaining inactive from one quarter to another is 96 percent (see first line of table 3.1). Men have a higher probability of finding a job from inactivity than women (7 percent for men against 3 percent for women).Young inactive people also have a relatively high chance of finding a job. This is mainly caused by those who find a job after leaving school. Ethnic origin does not seem to influence transition probabilities from inactivity. People with a high or a secondary education (note that the level of education has been estimated; see also appendix 1) have a slightly higher chance of making the transition from inactivity to employment than people with a low education (7 percent against 5 percent).

Job

The average probability of keeping one's job from one quarter to another is 98 percent. This percentage does not differ much between men and women. The probability of staying employed slightly increases with age until older age (55 years of age). Then it becomes considerably lower in favour of (early) retirement. For people of Dutch origin and for people with a higher education the chance of keeping one's job is somewhat higher than average.

[4] Job-to-job mobility is not taken into consideration. Therefore, subsequent jobs count as one period of employment. The reason for not taking job-to-job mobility into account is that we were not sure whether individual job durations were sufficiently accurately measured in the data.

Unemployment benefit

The average probability of remaining in an unemployment insurance benefit is 73 percent. Approximately 12 percent of the unemployed has a job next quarter, while 8 per cent is then in a situation of combining a job with unemployment benefit. Male unemployed have a somewhat higher chance of finding a job than females: 13 percent against 10 percent. The same is true for the transition to social assistance, although for this transition the differences between the sexes are even smaller. Women, on the other hand have higher chances on going into inactivity without income.

The probability of continued unemployment increases with age: it is 43 percent for the group aged between 15 and 25 years and no less than 95 percent for the group aged older than 54 years. A reverse pattern exists for the transition probability from unemployment to employment: it declines from 30 percent for young people (15-25 years) to only 1 percent for older people (over 55). Also the chances to go to social assistance or to a situation with both a job and an unemployment benefit decrease with age.

Table 3.1 Transitions probabilities from one quarter to another

	Distribution in quarter *t* +1											
Situation in quarter *t*	Inactivity	Job	Early retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Job combined with disability benefit	Job combined with un-employment benefit	Other pensions	Total
Inactivity	95.79%	3.43%	0.07%	0.01%	0.09%	0.02%	0.41%	0.06%	0.00%	0.00%	0.06%	100%
Job	0.63%	97.62%	0.19%	0.13%	0.07%	0.47%	0.18%	0.08%	0.12%	0.43%	0.01%	100%
early retirement	0.19%	0.92%	97.96%	0.00%	0.41%	0.06%	0.06%	0.19%	0.02%	0.01%	0.11%	100%
Sickness benefit	2.95%	12.79%	0.14%	58.79%	11.21%	8.01%	2.02%	0.16%	0.63%	1.47%	0.08%	100%
Disability benefit	0.23%	0.17%	0.09%	0.02%	98.07%	0.24%	0.09%	0.02%	0.90%	0.02%	0.05%	100%
Unemployment benefit	1.32%	11.61%	0.30%	1.57%	0.25%	72.42%	2.69%	0.19%	0.03%	8.10%	0.06%	100%
Social assistance benefit	1.06%	4.10%	0.03%	0.05%	0.13%	0.08%	93.99%	0.08%	0.01%	0.03%	0.09%	100%
unknown situation	1.59%	13.75%	1.53%	0.22%	0.24%	0.86%	0.71%	80.03%	0.03%	0.23%	0.04%	100%
Job combined with disability benefit	0.08%	3.28%	0.13%	0.04%	6.20%	0.13%	0.03%	0.01%	89.74%	0.32%	0.02%	100%
Job combined with unemployment benefit	0.16%	24.72%	0.11%	0.50%	0.07%	10.82%	0.65%	0.09%	0.13%	62.61%	0.01%	100%
Other pensions	0.05%	0.14%	0.32%	0.00%	0.04%	0.00%	0.05%	0.01%	0.00%	0.00%	99.35%	100%
Total (percentage)	19.92%	53.44%	3.08%	0.26%	5.05%	1.48%	4.96%	0.37%	0.94%	0.95%	1.15%	100%
Total (in numbers)	561.350	1.505.880	86.698	7.306	142.189	41.740	139.763	10.295	26.403	26.864	32.392	2.817.810

Non-natives originating from a Western country have a slightly lower chance of finding a job from unemployment (9.7 percent against 12 percent for natives and 11.3 for non-natives from Non-Western countries). Non-natives originating from Non-Western countries have a lower chance of staying in an unemployment benefit. This is caused by the fact that they have higher chances of going from an unemployment benefit to a social assistance benefit.

Finally, people with a low education have a lower chance on finding a job from unemployment and a higher chance of moving to a social assistance benefit compared to people with a higher education.

Social assistance benefit

The average probability of staying in social assistance the next quarter is 94 percent. This probability is slightly higher for women while men claiming social assistance have a higher chance of finding a job. As people get older their chance of staying in a social assistance benefit increases. Young social assistance claimants on the other hand have higher chances of finding a job (11 percent for the group aged between 15 and 25 years against 0.2 percent for the group aged older than 55). Ethnic origin does not seem to influence transition probabilities from social assistance.

People with a low educational indication have a higher chance on staying in social assistance than people with a secondary or higher education. This is mainly caused by the fact that the latter have higher chances of finding a job.

Disability benefit

The average probability for people claiming a disability benefit at quarter t still having one at time t+1 is 98 percent. Neither this probability nor the other transition probabilities from disability seem to differ much between the various social groups. The probability of staying in a disability benefit is slightly increasing with age (from 95 percent for the group aged between 15 and 25 years to 99 percent for the group aged over 54). Young people with a disability benefit have a relatively high chance of combining a job with a disability benefit.

Other situations

The average probability of keeping a **sickness benefit** is 59 percent. The main transition probabilities are: job (13 percent), disability benefit (11 percent) and unemployment benefit (8 percent). Women have somewhat higher chances of moving to inactivity. Young people have higher chances of going from a sickness benefit to a job again, while older people have a high chance of keeping their sickness benefit. Natives have a higher chance of finding a job while non-European non-natives more often move to social assistance.

The average probability of staying in a situation in which a **job is combined with an unemployment benefit** is 63 percent. This probability is highest for older and native people. The probability of moving to an unemployment benefit (without a job) is 11 percent while the probability of moving to a job (without unemployment benefit) is 25 percent. This last probability decreases with age.

Of those that combine a **job with a disability benefit** 90 percent stays in this situation the next quarter. Women and young people have higher chances of moving to other situations, mostly to a job or a to disability benefit (not combined with any of the other situations).

Overall transition patterns

Summing up, we conclude that in general men, people of Dutch origin and people with a higher education have higher probabilities of staying in their job and also of finding one from inactivity or unemployment. Age is an important determinant of the probabilities that one stays in the same situation. Older people tend to stay longer in the same situation, while young people generally have higher chances of moving from any given situation to a job.

3.3 MODEL APPROACH

3.3.1 SPECIFICATION

Instead of computing the transition probabilities directly from the data as we did in the previous section, it is also possible to specify mathematical formulas for them in which they are made dependent on the background characteristics. This makes it possible for us to test for the relevance of two phenomena:

- Duration dependency: this refers to the phenomenon that the duration of staying in a certain situation influences the probability of moving to another situation. For example, the longer someone stays unemployed the smaller his chances of getting a job again may get.
- The influence of current unemployment on the transition probabilities from future spells: when a person has been unemployed it might increase the

chance of future unemployment. We refer to this phenomenon as the cumulative effect.

These phenomena are relevant as they may lead to a pattern where more or less the same people suffer from unemployment all the time.

We use multinomial logit models to model the transition probabilities. The transition probability from situation *i* to situation *j* (j=1,….,N), P(i →j), is then defined by:

$$P(i \to j) = \frac{\exp(\beta_j^i z)}{1 + \sum_{k=1}^{N-1} \exp(\beta_k^i z)} \qquad (j = 1, \ldots, N-1) \qquad (1)$$

And (by definition):

$$P(i \to N) = 1 - \sum_{k=1}^{N-1} P(i \to k) \qquad (2)$$

In equation (1) β_j^i and z denote vectors for the coefficients and the independent variables, respectively. For most of the transition probabilities the term $\beta_j^i z$ is defined as follows[5]:

$$\beta_j^i z = \beta_j^i(0) + \beta_j^i(1) d_i + \beta_j^i(2)(d_i)^2 + \beta_j^i(3) p \qquad (3)$$

The symbols used have the following meaning:

d = duration of stay in situation i until date;

p = vector of personal characteristics (age, gender, ethnic group and (estimated) level of education);

The $\beta_j^i(k)$'s are coefficients that must be estimated from the data.

The fact that d is included implies that the transition probabilities are made dependent on duration. The fact that we use a quadratic form in d implies a fairly

[5] We have also estimated models in which a business cycle indicator was added to the equation. We will come back to that in the next chapter when we analyse the effect of entering the labour market during a recession period.

general specification. It accounts for positive and negative duration dependence, as well as for changing duration dependence during the spell.

The possibility of cumulative unemployment is modelled by the hypothesis that people in a job less than two years that have been unemployed before have a higher chance of losing the job than those without a previous unemployment experience. This leads to the following formula.

$$\beta_j^i z = \beta_j^i(0) + \beta_j^i(1)d_i + \beta_j^i(2)(d_i)^2 + \gamma_j^i p + \delta_j^i(1)dum\_wl * dum\_bn + \delta_j^i(2)dum\_bn \quad (4)$$

In which dum_bn takes the value 1 if job duration until date is shorter than 2 years, and 0 if it is longer; dum_wl is equal to 1 if the person received an unemployment benefit or social assistance benefit for at least some time during the period prior to the job.

As was already said these dummy variables are only included when estimating the transition probabilities from employment. It is also possible that previous unemployment influences transition probabilities from a present situation of unemployment. This however correlates with duration dependency in a complex manner and is therefore very difficult to separate.

3.3.2 ESTIMATION RESULTS

In this section we examine more closely the estimation results for the transition probabilities from employment, from unemployment insurance, from social assistance and from inactivity without an income. The interpretation of the estimated coefficients as they directly appear from the multinomial logit model is not straightforward[6]. The reason is that the different transition probabilities associated with a given starting situation add up to 1 and hence depend on each other. For that reason it is customary to look at the quasi-elasticities. This quasi-elasticity is defined as follows:

$$QE = \frac{\partial P(i \rightarrow j)}{\partial x} x \quad (5)$$

This quasi-elasticity represents the percentage point change in the transition probability as the result of a one percent change in the exogenous variable. If x is a dummy variable the quasi-elasticity is computed by taking the difference of the probability in case x is equal to 1 and the case where it is 0. This can be

[6] The direct output of the logit analysis is presented in Appendix 2.

interpreted as the percentage point change in the transition probability if the dummy variable changes from 0 to 1.

$$QE = P(i \rightarrow j; x = 1) - P(i \rightarrow j; x = 0) \qquad (6)$$

The quasi-elasticity depends on the values of the other explanatory variables. Therefore it will be different for different types of persons. In this section we present the quasi-elasticities for a reference individual. A reference individual is defined as: male, 40 years old, of native origin and with a low education[7]. The definition of the reference person differs slightly between the different models as a result of the fact that the duration variable differs between the different situations. For example, the average duration of unemployment differs from the average duration of employment spells. In order to test whether the quasi-elasticities for a reference person give us a good indication of the influence of the independent variables on transition probabilities we randomly changed values of the independent variables and computed quasi-elasticities for these different values. It appears that the quasi-elasticities for a reference person are not too different from the corresponding elasticities for other types of individuals.

[7] Initially we used the term ´average person`, but that is hardly justified if it refers only to men. We thought of using the term `mean person´, which seems to be more appropriate when referring solely to men, but decided in the end to use the more neutral term ´reference person`.

Table 3.2 Quasi-elasticities: transitions from work

Situation	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Probability for reference person (a)	0.002	0.988	0.000	0.001	0.000	0.004	0.000	0.000	0.001	0.004
Elasticities										
Age	-0.001	0.003	-0.004	0.004	0.000	0.000	0.001	-0.001	-0.001	0.000
Age (quadratic term)	0.000	-0.002	0.002	-0.002	0.000	0.001	-0.001	0.001	0.001	0.000
Duration of working (in days)	-0.003	0.007	0.000	-0.001	0.000	-0.001	-0.001	0.000	0.000	-0.001
Duration of working (in days, quadratic term)	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Female	0.004	-0.006	0.000	0.001	0.000	-0.001	0.000	0.000	0.000	0.001
Non-European non-native	0.000	-0.008	0.000	0.001	0.000	0.002	0.001	0.000	0.000	0.003
European non-native	0.000	-0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
Low educational indication	0.002	-0.004	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000
High educational indication	-0.001	0.004	0.000	0.000	0.000	-0.001	0.000	0.000	0.000	-0.001
Dummy with value 1 for person working less than two years until quarter of measurement and received an unemployment or social assistance benefit before that.	-0.001	-0.030	0.000	0.002	0.001	0.014	0.001	0.000	0.000	0.013
Dummy with value 1 for person working less than two years until quarter of measurement	0.000	0.003	0.000	0.000	0.000	-0.001	0.000	0.000	0.000	-0.001

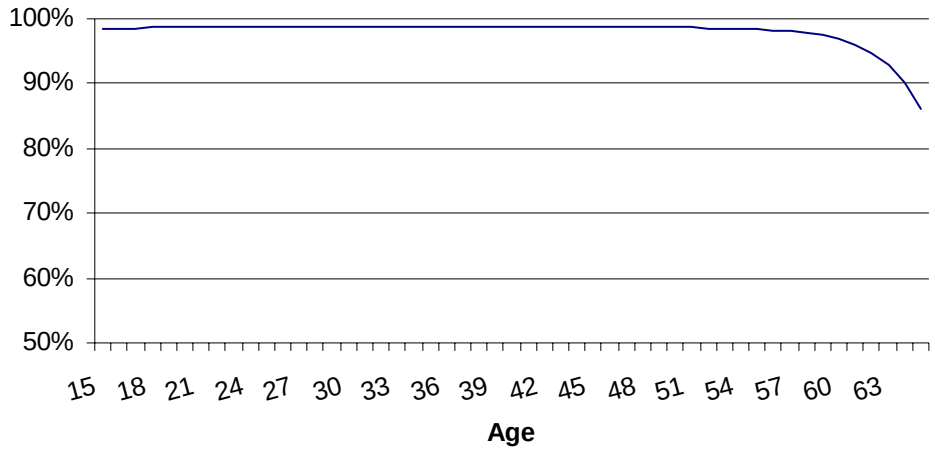
a) A reference person is defined as: male, 40 years old, working for three years until quarter of measurement, native origin and a middle educational indication.

Results: transitions from employment

Table 3.2 shows the transition probabilities for people in a job. The first row contains the probabilities for an reference person of remaining in the job or changing to the other situations. The other rows contain the quasi-elasticities. For example the probability for a woman to make the transition from employment to inactivity without income is 0.4 percent point higher than it is for a man. For the reference person (which is assumed to be a man) this probability is 0.2%. So, for a woman with, apart from gender, the same characteristics it will be 0.6% (0.2% plus 0.4%).

The probability of remaining in the job is 98.8 percent for our reference person (see first row of table 3.2). Although the transitions probabilities to other situations are very small they do tell us something about the relation between transitions and observed characteristics. Men have a higher probability of staying in the job than women. Figure 3.1 shows this probability for different ages (keeping other variables at their average value). The probability of remaining employed is fairly constant until the age of around 60. After this age there is a sharp decline which is mainly caused by early retirement. The chances on a transition from a job to unemployment or social assistance benefit are highest for non-natives, people with a low educational and people with that have only worked for a short period.

Figure 3.1 Probability of staying employed for different age levels



As was explained earlier two dummy-variables are included to deal with cumulative unemployment. As can be seen from the first row of table 3.2 the probability for an average person of going from employment to an unemployment benefit is 0.3 percent. Someone who has worked less than two years and has been unemployed before, has a probability of 1.6 percent to go

from work to unemployment benefit (0.3 percent plus 1.3 percent). In addition, the probability of moving to a situation in which work is combined with an unemployment benefit is 1.4 percent. Altogether the probability of a transition from employment to unemployment is 2.4 percent higher for a person that has been unemployed before than for our reference person. This shows that previous periods of unemployment influence future unemployment.

Table 3.3 Quasi-elasticity's: transitions from unemployment benefit

Situation	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Probability for reference person (a)	0.004	0.179	0.001	0.013	0.001	0.668	0.013	0.003	0.001	0.117
Age	-0.007	0.301	-0.002	0.026	0.000	-0.528	-0.117	-0.010	0.065	0.271
Age (quadratic term)	0.000	-0.326	0.002	-0.018	0.000	0.559	0.039	0.002	-0.033	-0.227
Duration of unemployment benefit (in days)	0.002	-0.073	0.000	0.002	0.001	0.077	0.006	0.001	0.000	-0.015
Female	0.013	-0.094	0.000	0.014	0.000	0.096	-0.005	-0.002	-0.001	-0.021
Non-European non-native	-0.001	-0.062	-0.001	0.007	0.001	0.063	0.009	-0.001	-0.001	-0.014
European non-native	0.000	-0.023	0.000	0.000	0.000	0.030	0.002	-0.001	-0.001	-0.007
Low educational indication	0.003	-0.044	0.000	0.002	0.002	0.016	0.012	0.000	0.002	0.009
High educational indication	-0.001	0.048	0.000	-0.003	-0.001	-0.031	-0.001	-0.001	0.001	-0.013

a) An reference person is defined as: male, 40 years old, receiving unemployment benefit for one year until quarter of measurement, native origin and a middle educational indication.

Results: transitions from an unemployment insurance benefit

In table 3.3 transition probabilities are shown for people that are receiving an unemployment insurance benefit. The probability of remaining in the same situation is 66.8 percent. Two other important destinations are employment (17.9 percent) and employment in combination with an unemployment benefit (11.7 percent).

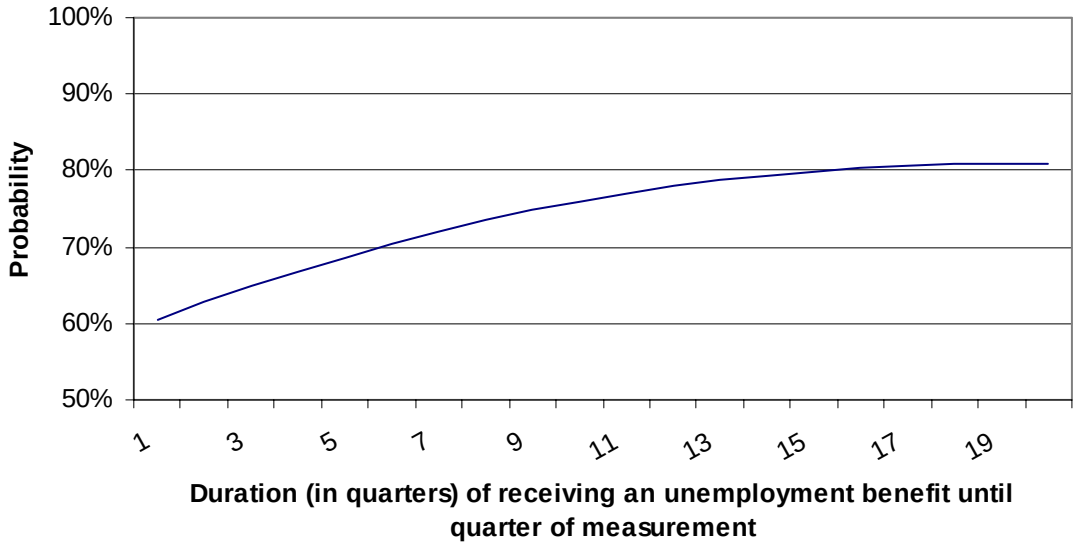
Women have a higher probability of remaining claimants of an unemployment insurance benefit than men. When they move to another situation they more often move to inactivity and less often to a job. Non-natives more often stay unemployed (unemployment, social assistance or disability benefit) than natives and less often move to a job or inactivity. The same pattern applies to people with a low education, while people with a high education tend to have exactly the opposite pattern. The higher one's education is, the higher the chances of finding a job and the lower the chances of staying unemployed.

Age has an important influence on the transitions from an unemployment insurance benefit to employment and to social assistance (see figure 3.2). The probability of staying in an unemployment benefit sharply increases with age. This increase is most pronounced for people between 30 and 50 years of age. Probabilities of going from unemployment benefit to work or to social assistance both decrease with age.

The probability that claimants of an unemployment insurance benefit find a job declines the longer the person is already receiving this benefit. At the same time the chances of staying in an unemployment benefit or going to a social assistance benefit or a disability benefit increases. The probability of staying in an unemployment benefit as a function of duration is graphically represented in figure 3.3. This probability is approximately 60 percent for people that only recently became an unemployment insurance benefit claimant and it increases to 75 per cent for a person claiming this type of benefit for already 10 years.

Figure 3.2 Transition probabilities of claimants of an unemployment insurance benefit to a number of destinations for different age levels

Figure 3.3 Probability of staying a claimant of an unemployment insurance benefit as a function of the time one is already receiving such a benefit

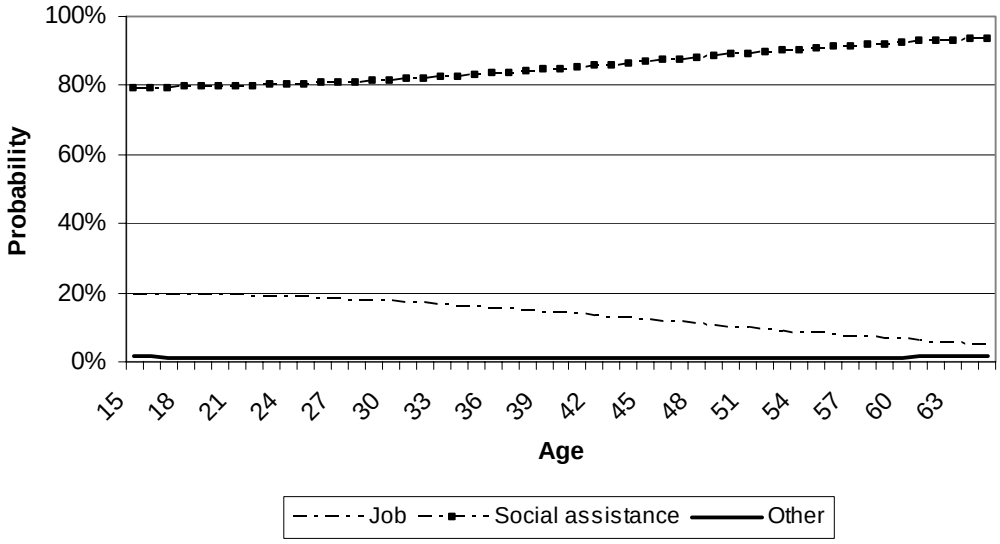


Results: transitions from social assistance

For an reference person claiming assistance at quarter t the chance of still being in social assistance one quarter later is nearly 85 per cent (table 3.4). Also a considerable percentage (14 per cent) makes the transition from social assistance to employment. For women with otherwise similar characteristics the probabilities are somewhat different. The quasi-elasticities show that women have a higher probability of staying in social assistance, a higher chance of becoming inactive without income and a lower chance of getting a job. The picture is also markedly different for the higher educated. They have a considerably lower chance of staying in social assistance, while their chance of getting a job is a lot higher. Being of ethnic origin does not have a lot of influence on the transitions from social assistance. Also the role of duration dependence is relatively small.

For young people the chance to stay in social assistance is approximately 80 per cent. This chance increases with age (figure 3.4). People aged above 55 years have more than 90 per cent chance of staying in social assistance. The transition probability from social assistance to a job shows an opposite pattern with age: the chance that a social assistance claimant finds a job decreases with age.

Figure 3.4 Transition probabilities of claimants of social assistance benefit for different age levels



Results: transitions from inactivity

There is 94 per cent likelihood that a reference person in inactivity is still in inactivity one quarter later. The transition probability to a job is the only one of some significance. Of the background variables one age seems to matter.

The chance of staying inactive without a benefit is highest around the age of 50 years. Younger people have higher chances of moving to a job while older people have higher chances of moving to an early retirement or disability benefit.

Figure 3.5 Transition probabilities of inactive persons for different age levels

Table 3.4 Quasi-elasticities: transitions from a social assistance benefit

Situation	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Probability for reference person (a)	0.005	0.141	0.000	0.001	0.001	0.002	0.847	0.001	0.000	0.001
Age	-0.004	0.096	0.000	0.007	-0.006	0.006	-0.104	0.007	0.000	-0.001
Age (quadratic term)	0.001	-0.124	0.001	-0.004	0.003	-0.003	0.129	-0.004	0.000	0.000
Duration of social assistance benefit (in days)	-0.001	-0.015	0.000	0.000	0.000	-0.001	0.017	0.000	0.000	0.000
Female	0.007	-0.079	0.000	0.000	0.000	0.000	0.074	-0.001	0.000	0.000
Non-European non-native	-0.001	-0.043	0.000	0.000	0.000	0.000	0.045	0.000	0.000	0.000
European non-native	-0.001	-0.026	0.000	0.000	0.000	0.000	0.028	0.000	0.000	0.000
Low educational indication	0.001	-0.073	0.000	0.000	0.001	-0.001	0.072	0.000	0.000	0.000
High educational indication	-0.001	0.112	0.000	0.000	0.000	-0.001	-0.113	0.003	0.000	0.000

a) An reference person is defined as: male, 40 years old, receiving social assistance benefit for one year until quarter of measurement, native origin and a middle educational indication.

Table 3.5 Quasi-elasticities: transitions from inactivity

Situation	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Probability for reference person (a)	0.935	0.048	0.001	0.000	0.002	0.004	0.008	0.001	0.000	0.000
Age	0.034	-0.150	-0.005	0.001	-0.003	0.046	0.084	-0.013	0.000	0.005
Age (quadratic term)	0.002	0.055	0.003	-0.001	0.005	-0.020	-0.050	0.008	0.000	-0.003
Duration of inactivity (in days)	-0.006	0.006	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000
Female	0.028	-0.017	0.000	0.000	-0.002	-0.004	-0.004	-0.001	0.000	0.000
Non-European non-native	-0.018	-0.005	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000
European non-native	-0.010	0.000	0.000	0.000	-0.001	0.004	0.008	-0.001	0.000	0.000
Low educational indication	0.012	-0.008	0.000	0.000	0.001	-0.002	-0.002	0.000	0.000	0.000
High educational indication	-0.003	0.002	0.000	0.000	0.000	-0.002	0.001	0.000	0.000	0.000

a) An reference person is defined as: male, 40 years old, inactive for one year until quarter of measurement, native origin and a middle educational indication.

4 SIMULATION RESULTS

4.1 OUTLINE OF THE METHOD USED

By using the multinomial logit models (and for some less important transitions the sample means from the IPO data), transition probabilities for the various groups of individuals (defined by gender, ethnic group and education indicator) were computed. For each group the probabilities vary with age. Some of them are also depend on duration and on previous unemployment. Then these probabilities are used to simulate life courses for a cohort of people. A life course is defined as the period that starts with leaving school and ends at the pension age of 65. We sometimes also use the phrase ´work life'. In this section we explain the method underlying the simulations.

As a starting point for the life course we take the age of 15. From there on we have to determine how many 15-year-olds leave school, how many 16-years-olds leave school, etcetera. Furthermore, we have to specify the percentages of school-leavers going to work, social assistance, disability benefit or inactivity. This information has been distracted from the Dutch 2002 Labour Force Survey. This survey provides the information about the school-to-labour market transition differentiated by personal characteristics (gender, age, educational attainment and ethnic origin) as well as the situation directly after leaving school (work, social assistance, disability and inactivity). More details can be found in Appendix 3.

Given the initial situation of the cohort of people leaving school and its composition according to gender, ethnic group and educational indicator, the transition probabilities were applied to simulate complete work lives, with subsequent periods of work, unemployment, etc. Work lives cover the period starting on the age of 15 until 65. The simulations are based on random drawings taken from the computed probability distributions. A simulation consists of 100.000 individual work lives, so that the resulting frequency distribution for the number and the duration of employment and unemployment periods becomes stable. Time is again made up from quarters. Hence, for each imaginary person 200 points in time have been computed (50 years and 4 quarters in each year).

A number of restrictions are incorporated into the simulation model. The first restriction applies to unemployment insurance benefits. According to the Unemployment Act people qualify for an unemployment insurance benefit only after they have had a job prior to the unemployment period. In general people have to work for at least 26 of the last 39 weeks to qualify for a short-term unemployment benefit of 6 months. When people worked at least 4 of the last 5 years they qualify for an unemployment benefit with duration between 6 months and 5 years depending on their age and the years of working experience. Ignoring

these rules in our simulation could imply that a person receives an unemployment insurance benefit for much longer than is legally possible. Therefore we have constructed a variable that computes at each point in time the entitlement of a person to an unemployment insurance benefit given the work life of the person until this time. If a person becomes unemployed at that time he cannot stay longer in this situation than is possible on the basis of his entitlement. If he is still unemployed when reaching the end of the entitlement period, he automatically moves to social assistance. A similar approach is taken with respect to sickness benefits. People are allowed to stay in a sickness benefit for at most two years. If they are then still unfit for work they automatically go to a disability benefit.

A third restriction we make is to exclude certain transitions that occur in our (IPO) dataset because of administrative inaccuracies, but that are impossible or highly unlikely to occur from a theoretical or practical point of view. The main restriction is the exclusion of all transitions to an unemployment insurance benefit other than from a situation of work or sickness benefit. Finally, we impose the restriction is that all people leave school between 15 and 25 years of age. In reality some, although not many, people leave school after the age of 25 but this is not possible in our simulations.

We have made several simulations. The baseline simulation is the one based on the logit models in which duration dependence and cumulative unemployment are included. We have also carried out two other simulations: a) a simulation based on logit models with duration dependence but no cumulative unemployment, and b) a simulation solely based on IPO sample averages for the transition probabilities. The results for a) are very similar to those of the baseline simulation and will not be discussed further. Also the results for b) are similar but here the differences are sometimes somewhat more pronounced. We will only present results for the baseline simulation, but mention the cases where the differences with the latter simulation are somewhat bigger. It is important to note, though, that the impact of cumulative unemployment as we have modelled it is small. Duration dependence is more important, but including it does not alter the outcomes fundamentally. The outcomes of the baseline simulation are presented in the next section.

The simulation model can also be used for policy-relevant simulations. The following policy-relevant simulations were simulated:

1. Introduction of a saving variant for unemployment benefits according to which people save for part of their own future benefit.
2. A simulation under the assumption that school leavers enter the labour market during a recession period, which is then followed by a period of recovery.

During the preparation of the reform of the Unemployment Act that is taking place, one of the options discussed was the introduction of an individualised system according to which people were to save for their own future benefits (or for part of it). The idea behind such a system is that it would provide incentives for people to stay out of unemployment.

The second simulation has been carried out in view of the fact that during recession periods unemployment tends to increase particularly among young people. This gives rise to the fear of a lost generation. With the simulation we analyse to what extent a 'bad' start in the labour market also affects future job chances negatively.

4.2 OUTCOMES OF THE BASELINE SIMULATION

4.2.1 GENERAL PATTERNS

It turns out that almost everyone has a job for at least some time during their life course (last column, table 4.1). About 90 percent receives a social benefit at least once during their working lives. The types of social benefits used most are early retirement (51 percent) and social assistance benefit (46 percent) followed by unemployment benefits (36 percent).

The percentage of people in a job is highest in the group aged between 25 and 35 years. After the age of 35 this percentage steadily decreases. During the first phase of the life course (until the age of 25) 29 percent of all simulated persons receive a social benefit at least once. This mainly consists of social assistance benefits. During the next phases (25-55) the percentage of people receiving a social benefit remains around 30 percent. Only the composition of the use of benefit types changes from mainly use of social assistance benefit to more using unemployment insurance benefits and disability benefits. During the last phase the percentage of people receiving a social benefit sharply increases to 79 percent. This is mainly caused by early retirement.

Table 4.1 Percentage of people with a job or one of the social benefits during different stages of life and during the entire life course

Percentage of people that were at least once in the situation concerned	In the age of 15-25	In the age of 25-35	In the age of 35-45	In the age of 45-55	In the age of 55-65	During the entire life course
Job	94%	97%	94%	90%	81%	99%
Social benefit	29%	26%	29%	31%	79%	90%
Benefits:						
Unemployment benefit	6%	10%	10%	11%	8%	36%
Combining work and unemployment benefit	7%	11%	9%	8%	5%	32%
Disability benefit	3%	6%	8%	12%	19%	29%
Social assistance benefit	24%	15%	16%	14%	12%	46%
Sickness benefit	3%	3%	2%	1%	0.2%	13%
Early retirement	0%	0%	0%	0%	51%	51%

Source: Simulation based on transition probabilities from the income panel 1989-2000 and a cohort of school leavers 2002.

4.2.2 CONCENTRATION IN THE USE OF SOCIAL BENEFITS

As mentioned before around 90 percent of all cohort members received a social benefit and around 40 percent received an unemployment benefit for at least some time. Although many people receive a social benefit for at least some time during their working lives the use of social benefits is not evenly distributed among these people. This can be visualised by Lorenz curves. To do so individuals are sorted based on the total time during which they receive a social benefit. This total time is computed by taking the sum total of all the benefit spells during the life course. The Lorenz curve indicates which part of the total amount of time in social benefits accounted for by all the cohort members together (y) is taken care of by the first x per cent of the (sorted) benefit receivers (starting with the non-users). A perfectly equal distribution is represented by the straight line y = x. The 'flatter' the line, the more unequal the distribution.

Figure 4.1 shows the Lorenz curve for the use of social benefits in general. It appears that the 10 per cent of the people that use social benefits most during their work lives account for 36 percent of the total amount of time spent in social benefits by the whole cohort. If we look at the concentration in the use of unemployment insurance benefits separately, the result is similar to that of social benefits as a whole (figure 4.2). However, the concentration in the use of social *assistance* benefits is higher. The 10 per cent 'big' users of this type of benefit take care of almost half of the total amount of time spent in social assistance benefits by the whole cohort. The use of disability benefits is less concentrated than the use of unemployment insurance benefits. Finally, among the various

social benefits, early retirement benefits are the type of benefit with the lowest concentration among the ones that use it.

As was mentioned previously we have also made a simulation in which the transition probabilities are directly computed from the IPO data, differ according to the personal characteristics, but do not depend on duration or previous unemployment experience. Although the results of this simulation are in general very similar to the results presented here for the baseline simulation, they do differ with respect to concentration in the use of benefits. Without duration dependence and cumulative unemployment, concentration is lower, the 10 per cent 'biggest' users of social benefits accounting for 30 per cent of the total (compared to 36 per cent in the baseline simulation).

Figure 4.1 Lorenz curve of the use of social benefits

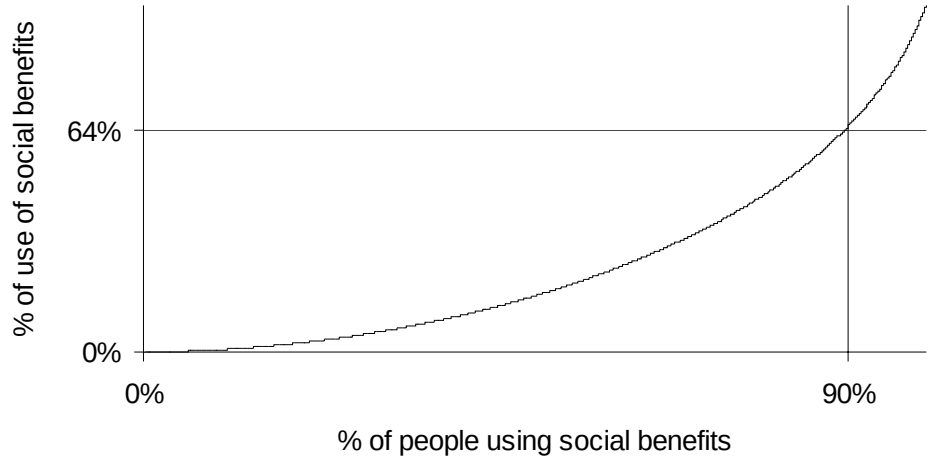
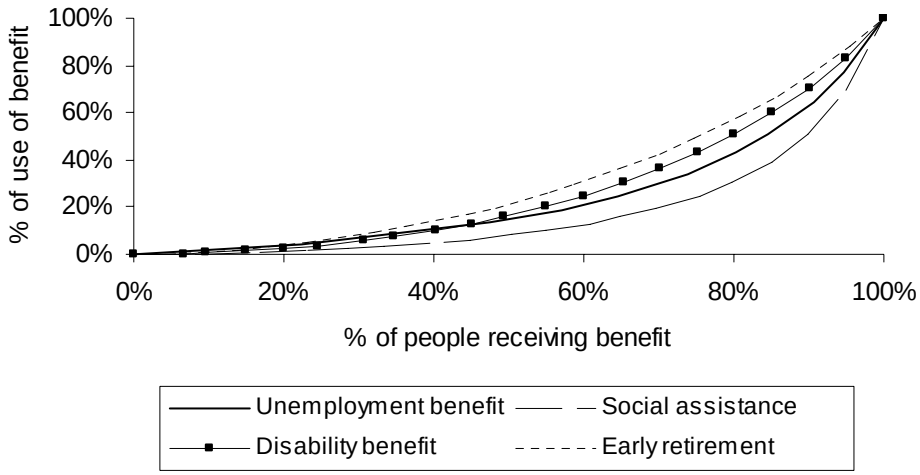


Figure 4.2 Lorenz curves of the use of different social benefits



How is the use of social benefits for different groups based on gender, ethnic origin and educational indication? The first column of table 4.2 show the number of social benefit users within each group (male, female, etc.). It appears that differences for gender and ethnic origin are relatively small. Men and non-natives tend to make somewhat more use of social benefits than women and native people. Educational indication shows more differences. People with higher educational education less often received a social benefit. The second column shows the amount of concentration within each group. As can be seen the amount of concentration is very much the same for all groups (10 percent of the biggest users account for about 33 percent of total use). Only the group of non-European non-natives shows a lesser degree of concentration (25%).

Table 4.2 Concentration in the use of social benefits for different groups

	% receiving a social benefit at least once during their life course	Concentration within the group of users of social benefits (10% of the users account for ..% of total use of social benefits)
Total cohort	90%	36%
Gender		
Male	93%	32%
Female	87%	35%
Ethnic origin		
Native	89%	34%
Non-European non-native	97%	25%
European non-native	93%	33%
Educational indication		
Low	94%	32%
Average	91%	33%
High	83%	32%

Source: Simulation based on transition probabilities from the income panel 1989-2000 and a cohort of school leavers 2002.

In table 4.3 the use of social benefits during the life course is shown. Each simulated person in our cohort has the same age at each moment during the life course. Therefore, each age group in the table represents all 100,000 simulated persons. Concentration in the use of social benefits is more or less constant until the age of 45. For the last two age groups concentration is lower.

Table 4.3 Concentration in the use of social benefits over the life course

Use of social benefits over the life course	Concentration within the group of users of social benefits (10% of the users account for ..% of total use of social benefits)
Cohort during age period:	
15-25 years	33%
25-35 years	31%
35-45 years	31%
45-55 years	21%
55-65 years	20%

Source: Simulation based on transition probabilities from the income panel 1989-2000 and a cohort of school leavers 2002.

What kind of people makes most use of social benefits? Table 4.4 shows the characteristics of these people. It does this for all types of benefits taken together, but for unemployment, social assistance, disability and early retirement benefits separately. The group of people making use of social benefits most is in general characterised as mainly female, low educated and relatively often non-native. This is very similar to the groups making most use of social assistance benefit and (to a lesser degree) disability benefits. Therefore it is likely that this is mainly the same group of people. The characteristics of the people claiming often unemployment insurance and early retirement benefits are not so different from the characteristics of the entire cohort of people.

Table 4.4 Characteristics of people making most use of social benefits in total and of each benefit separately.

Characteristics of 5 percent of users of benefit making most use of it	Male	Native	Low educational indication	Average educational indication
Social benefits	20%	49%	70%	28%
Unemployment benefit	51%	79%	24%	59%
Social assistance benefit	14%	43%	77%	22%
Disability benefit	36%	69%	46%	44%
Early retirement benefit	56%	87%	28%	51%
Percentage of total cohort	48%	85%	30%	49%

Source: Simulation based on transition probabilities from the income panel 1989-2000 and a cohort of school leavers 2002.

4.2.3 RISK PROFILE

Which people are in high risk of becoming dependent on social benefits? One way of measuring this is dividing total time in social benefits by total working time over the life course. In this way we compute risk profiles for each individual. Table 4.5 shows this ratio for several classes of risk profiles. Only 10 per cent of the cohort members never received a social benefit during their life course. For about 60 per cent of the cohort the total time spent in a benefit is 30 per cent or less than the total time spent in employment. Almost 10 percent spent more time receiving a social benefit than working.

Women, non-natives and people with a low education have the most unfavourable risk profiles. This is in line with the previous section, which showed that these are the characteristics of people making most use of social benefits.

Table 4.5 Risk profile of cohort members (total time in social benefits divided by total time in employment)

Risk profile	Ratio	Percentage of individuals
Never received social benefit	0%	10%
More time working than receiving a social benefit	1-15%	38%
	15-30%	21%
	30-45%	10%
	45-60%	5%
	60-100%	6%
More time receiving a social benefit than working	>100%	10%
	Total	100%
Total cohort		100.000

Source: Simulation based on transition probabilities from the income panel 1989-2000 and a cohort of school leavers 2002.

4.3 POLICY SIMULATIONS

4.3.1 INDIVIDUAL SAVING FOR UNEMPLOYMENT INSURANCE BENEFITS

What would it mean if people were to save for their own benefit (or part of their benefit)? To that end we assume that for each day a person is in employment he saves an amount of money corresponding with 0.035 days claiming unemployment insurance benefits. This means that given the patterns found in the baseline simulation on average there is roughly enough saving to pay for the benefits. However, given the risk profiles treated in the previous section, one might expect that some people save not enough to finance (all) their benefits, while others will save too much.

An aspect not incorporated in this risk profile is the chronological order of working and receiving a benefit. We just used summations over the life course. However as was mentioned earlier according to the Unemployment Act people qualify only for an unemployment benefit after some period of work[8]. Therefore, at each point in time we compute the level of savings for each individual. It depends both on the total time in employment and the total time in an

[8] In general 26 of the last 39 weeks to qualify for an unemployment benefit of 6 months. When people worked at least 4 of the last 5 years they qualify for an unemployment benefit with duration between 6 months and 5 years depending on age and years of working experience.

unemployment benefit to date. If a person works he adds to his savings, but if he becomes unemployed he uses some or all of the savings for his benefit. One of the implications of such a system is that it is possible that during one's life course one does not save enough, while at the same time savings are left unused at the end of the life course. We assume that the benefit level per day is fixed and that people always use their savings when being unemployed.

Table 4.6 Saving for unemployment benefit

	% of cohort	Average surplus of savings at 65 years of age
Never received an unemployment benefit	53%	99%
Saved for 1-25 percent of required benefit	14%	57%
Saved for 25-50 percent of required benefit	13%	45%
Saved for 50-75 percent of required benefit	6%	44%
Saved for 75-99 percent of required benefit	3%	42%
Saved for 100 percent of required benefit	11%	62%
Total cohort	100%	77%

Source: Simulation based on transition probabilities from the income panel 1989-2000 and a cohort of school leavers 2002.

Table 4.6 shows how many people never received an unemployment benefit at all and how many people saved for what part of the required benefit. About half of the cohort never received an unemployment benefit during their life course[9]. Only 10 percent worked long enough to pay for their entire unemployment benefit, while 27 percent of our cohort members (more than half of those using unemployment insurance at least once) face a substantial shortage of savings. At the end of the life cycle however most people have a surplus of savings due to the fact that they often work for sometime after receiving an unemployment benefit.

The same patterns apply to specific groups of people differentiated by gender, ethnic origin and level of educational (see Appendix 4). Around 10-12 percent of each group saves enough to finance all the benefits needed. Around 25 percent faces a substantial shortage of saving. Those originating from non-Western countries face substantially higher shortage than other groups, while there are fewer people with a substantial lack of savings among those with high education.

[9] 64 percent if we leave out the situation in which a job is combined with an unemployment benefit.

Our conclusion is that saving for one's own benefit is not feasible. One could argue that the risk of being short of savings or, once in unemployment, lacking the financial means to pay for the benefits, would have an impact on behaviour. People might put more effort in to avoid becoming unemployed and, if that appears to be impossible, to leave unemployment as soon as possible. However, it is very unlikely that the behavioural effects are big enough to create equality between savings and use of benefits. One might, of course, consider a system in which only part of the benefit is individualized. However, if we assume that in such a system unemployed people are at least paid the social minimum, this would imply that for many people the difference with the current (completely collectively financed) system is not so big. As a result the incentives created by a partly individualized system will be small, particularly for those that have to rely on low-paid labour. However, this is exactly the latter group for which the unemployment problem is really serious and one would like to see an effect. So, if we design an individualized system in such a way that it creates strong incentives, it is totally unacceptable from a social point of view, but if we adapt it to a more socially acceptable form it is not effective anymore for the groups for which one would like to create effects in view of their high unemployment.

4.3.2 DOES A RECESSION HAVE PERSISTENT EFFECTS ON WORK LIVES?

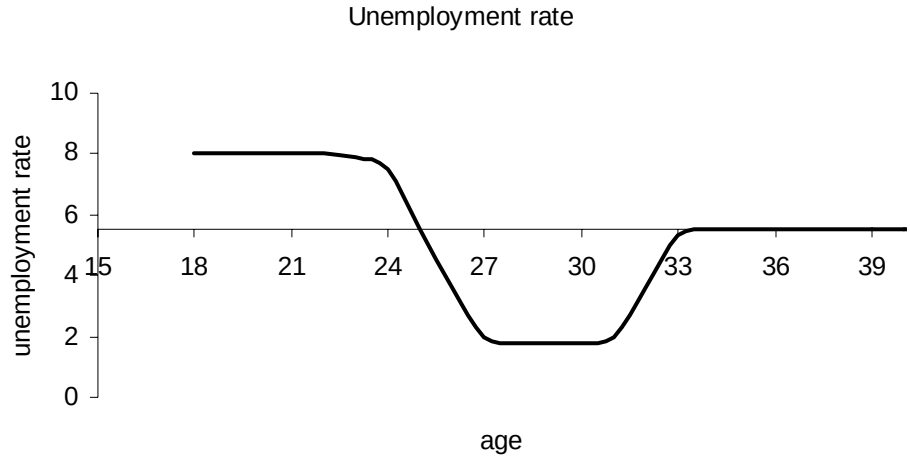
During recession periods the increase in youth unemployment is usually much stronger than the increase in average unemployment. This situation gives rise to a fear for a lost generation. The basic reasoning behind this fear is that when young people enter the labour market and directly become unemployed for a considerable time, their future chances will be affected negatively. In this section we attempt to test this hypothesis.

We assume that there is an economic recession during the first part of the life course when people are in the age between 18 to 24 years. At the age of 25 the overall unemployment rate the economy is back on its structural level. Then, the economy is supposed to boom until the cohort reaches the age of 33, when the economy retains its structural level. For the rest of the cohort it then stays on this structural level. We use the overall unemployment rate as business cycle indicator. Figure 4.3 gives the graphical representation. We used the following values for the unemployment rate for the different phases of the business cycle: 8% representing a recession period, 5% representing the structural level of the economy and 1.8% representing a booming economy).

In order to simulate the effects of the business cycle we have to make a connection between this cycle and the transition probabilities. To that end we have also estimated logit models in which the overall unemployment rate was added as an indicator of the business cycle. From these models we determined the impact of the business cycle on the transition probabilities. Then we used these effects to adjust the transition probabilities from the baseline simulation.

Appendix 5 contains more details about the transition probabilities at different unemployment rates.

Figure 4.3 Business cycle in the simulation



In figures 4.4a-4.4g the outcomes of the simulation with the effects of the business cycle are compared with the outcomes of the initial simulation. Between 15 to 25 years of age the average use of social benefits is, as expected, higher than that in the baseline simulation due to the business cycle (see figure 4.4a until 4.4e). But in the next years, from 25 until 35 years of age, the time in a social benefit is already less than in the baseline simulation. It turns out that after the age of 35, when the unemployment rate returns to its average level, the effects of the booming period sustain. Average working time remains higher in the simulation including the business cycle and average time in social benefits remains lower. The only deviation from this pattern is the age group '45-55' where we see a higher use of unemployment benefits in the business cycle simulation compared to the initial simulation. This is due to the fact that in the business cycle simulation people create more entitlement to this type of benefit as more time is spent in employment[10].

[10] In both simulations about the same number of people between 45 and 55 years of age received an unemployment benefit. This means that in the simulation with the business cycle effect people on average receive this type of benefits for a longer time.

Figure 4.4a Average use of unemployment benefits with and without the business cycle (in quarters)

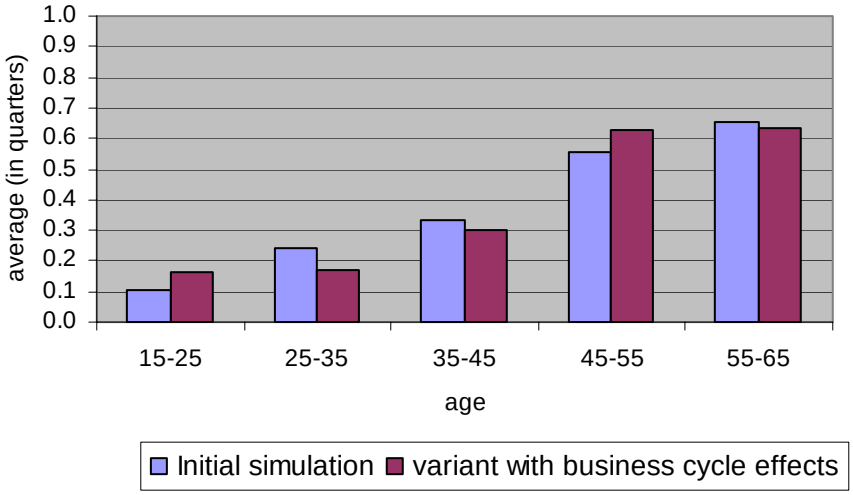
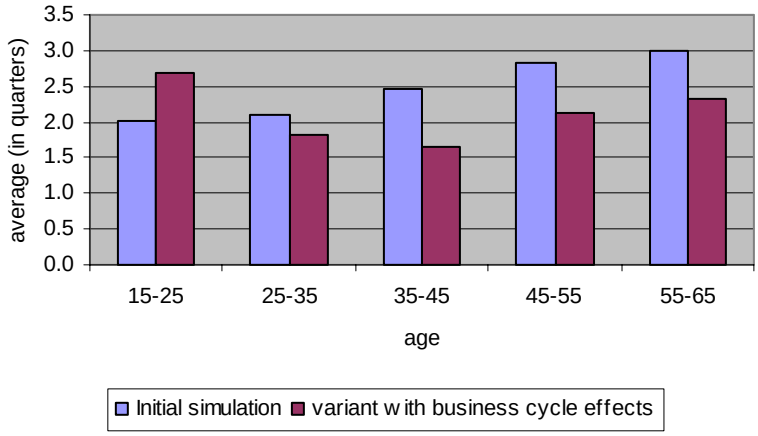


Figure 4.4b Average use of social assistance benefits with and without the business cycle (in quarters)



Less satisfactory features of this simulation are that even before the age of 25 the employment share in the business cycle simulation is higher and the share of inactivity without income is lower than in the baseline simulation (see figures 4.4f and 4.4g). This might lead to a too optimistic picture for the work life over 25. However, this does not alter the result that a ´bad´ start in the labour market owing to a recession period seems to have only a temporary effect when the recession is followed by a recovery period.

A limitation of our method of simulation is that we use a cohort of people that have the same age at all times and therefore experience the same business cycle at the same time. In reality the labour force consists of people of different ages who all face different transition probabilities in times of high or low unemployment. This could lead for example to a crowding-out of young people in the labour market in times of high unemployment. Unemployment among youngsters then could be higher than it is in our simulations. However, we still think that our simulation indicates that it is not likely that a bad start in the labour market lead to a permanent higher risk of unemployment.

Figure 4.4c Average use of disability benefits with and without the business cycle (in quarters)

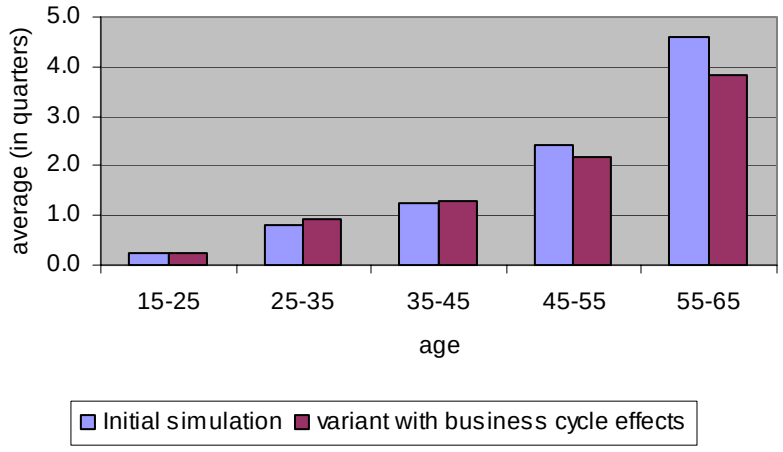


Figure 4.4d Average use of early retirement benefits with and without the business cycle (in quarters)

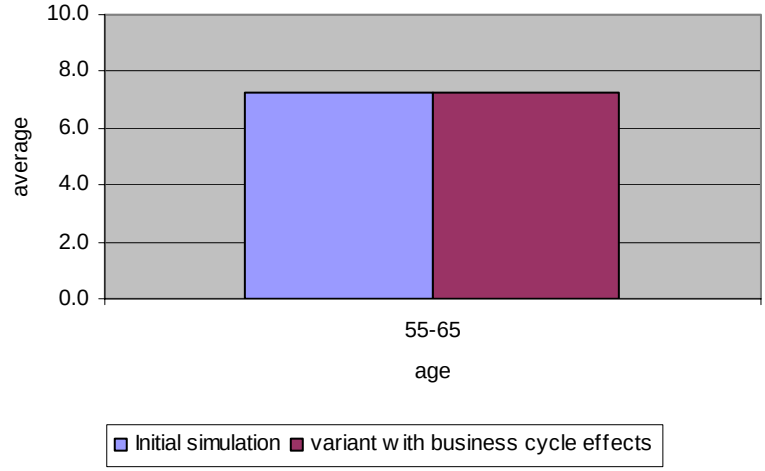


Figure 4.4e Average use of the total of social benefits with and without the business cycle (in quarters)

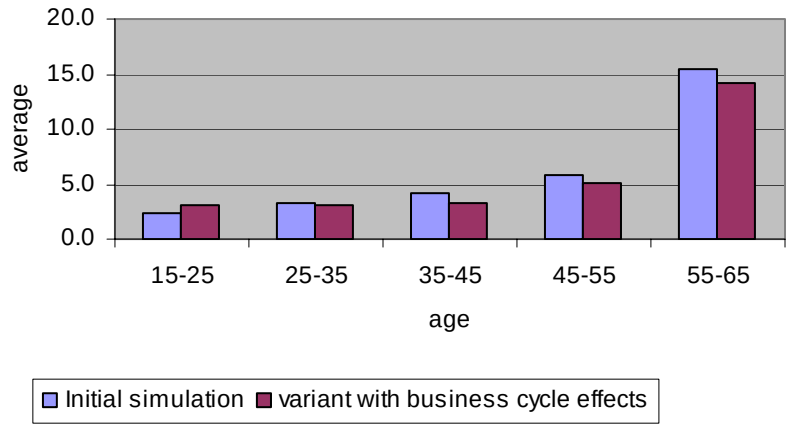


Figure 4.4f Average working time with and without the business cycle (in quarters)

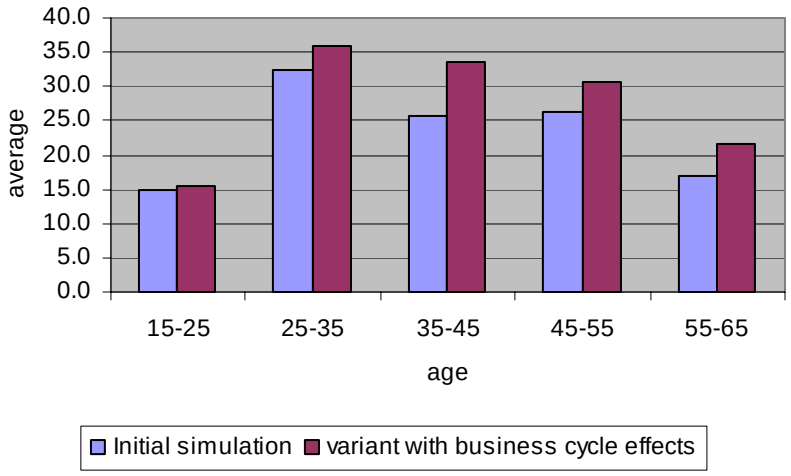
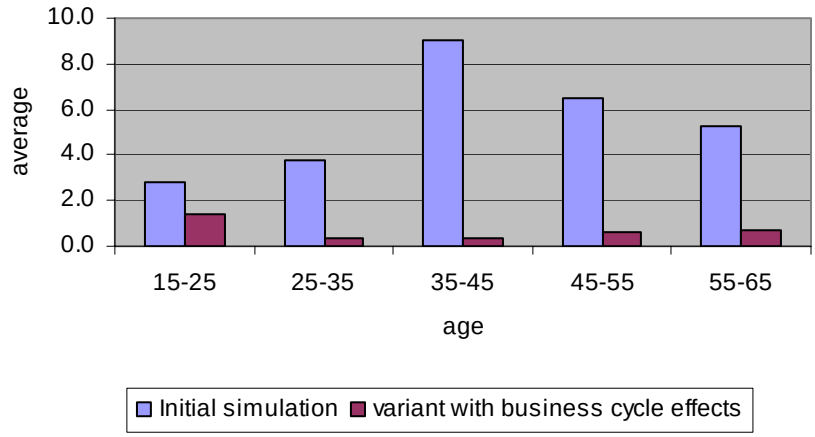


Figure 4.4g Average time without work or social benefit with and without the business cycle (in quarters)



5 CONCLUDING REMARKS

This report used patterns in work, use of benefits and inactivity without (a personal) income as could be observed from the Dutch IPO panel for the period 1989-2000 to simulate life courses for a large cohort of individuals. The simulations are carried out on the basis of transition probabilities that have been derived from the panel data. They depend on the personal characteristics of an individual. The following characteristics are available: age, gender, ethnic origin and level of education (the latter estimated from the income data in the panel).

For the baseline simulation the transition probabilities were based on the multinomial logit models that have been estimated for several situations. In these models we also took account of duration dependence and (only in the model for the transitions from employment) of cumulating unemployment. By the latter we mean that current unemployment causes future unemployment. Duration dependence means that the transition probabilities from a certain situation depend on the time the person has already stayed in this situation. Both effects appeared to be significant. However, the cumulating unemployment effect appears to be relatively weak in the simulations. The simulation with only duration dependence shows only slight difference with the one with both effects. Both simulations do show differences with a simulation based on sample means of the transition probabilities for detailed groups. However, the differences are not that big. Therefore, the significance of duration dependence and particularly cumulating unemployment is less than one might have expected a priori.

An important outcome of the analysis is that the use of social benefits is fairly concentrated. If we determine the total use of benefits during the work life for each individual that has used benefits at least once and rank them from the smallest user to the highest user, then the 10 per cent highest users make up for 36 per cent of the total use of all the users taken together. Of a cohort that is monitored throughout its work life, 90 per cent has a benefit at least once. If we include the non-users than the 10 per cent highest users take care of approximately 40 per cent.

We find this concentration among all social groups. It varies with age and it is somewhat lower at older age, partly because most people enter pre-pension or early retirement schemes before the age of 65. The concentration increases with the level of education. This is also true if we exclude the non-users. However, including the non-users gives a larger difference in concentration between the various educational levels as higher educated people have a higher chance of staying non-users during their whole work life.

The concentration in the use of social benefits implies that the idea of an individualised benefit system where people save for their own benefits is not

feasible. Such a system would imply that many would save not enough to finance their benefits from the savings. It has been proposed in order to stimulate people to avoid the use of benefits and, if they still become dependent of a benefit, to get out of this situation as soon as possible. However, for a considerable proportion of the benefit users the total time as a benefit claimant during their work life is relatively long compared to the total time in employment. The difference is of such size, that it is not realistic to assume that behavioural changes (which are not taken into account in the simulations) could lead to a balance between savings for benefits and spending on benefits.

We also tried to simulate what happens if people enter the labour market in a recession period, which is then followed by a period of economic recovery. Although this simulation is not satisfactory in all respects, it indicates that the effects of a ´bad´ start in the labour market are only temporary. This would mean that there is no ground for the fear for a lost generation in recession periods. However, this conclusion is conditional on the assumption that the recession period is temporary and is followed by a period of strong recovery.

The simulation model could be extended and improved in several ways. The underlying data do not provide many options to introduce behavioural elements into the model, but one could use the results from other research to incorporate such elements. One could think, among other things, on making the transition probabilities dependent on replacement rates and participation in inactive labour market policy. Furthermore, one could think of extending the model to different generations so that it could represent total labour supply, making it possible to make a link to the demand side of the labour market.

REFERENCES

Arranz, J.M. and J. Muro, Recurrent Unemployment, Welfare Benefits and Heterogeneity, *International Review of Applied Economics*, 2004, vol. 18, pp. 423-441.

De Koning, J., P.J. van Nes and C. van der Veen (1998), *Patronen van werkloosheid*, VUGA, Den Haag.

Heckman, J.J. and G. Borjas (1984), Does Unemployment Cause Future Unemployment?, *Economica*, pp. 247-283.

Lynch, L.M. (1985), State Dependence in Youth Unemployment: a Lost Generation?, *Journal of Econometrics*, pp. 71-84.

Lynch, L.M. (1989), The Youth Labour Market in the Eighties: Determinants of Re-employment Probabilities for Young Men and Women, *Review of Economic Studies*, pp. 37-45.

Omori, Y. (1997), Stigma Effects of Nonemployment, *Economic Enquiry*, 35, pp. 394-416.

APPENDIX 1 ESTIMATING THE LEVEL OF EDUCATION

Educational attainment is not available from the data. Therefore we have estimated it using the income data in the panel after correction for the influence of age and gender. We have computed daily wages by dividing the wage income earned during an employment period by the number of days in this period. This daily wage is then used as the dependent variable in a linear regression with independent variables age and gender (see table A1.1). Both gender and age highly influence daily wage. This justifies our decision to correct daily wage for these two variables. The residuals of the regression that are 'cleaned' from gender and age aspects are used as an indication for educational attainment.

Table A1.1 Linear regression output with dependent variable 'daily wage'

	Beta	t-value
Constant	-62.24	-39.03
Gender	26.60	64.48
Age (average over total period)	4.57	49.32
Age (quadratic term)	-0.05	-37.00
	N = 59.875	
	R^2 = 0.168	

We divided the residuals into three equally distributed groups. The group with lowest residuals is considered to be the group with low educational attainment, the group with the average values as the group with average educational attainment and the group with the highest residuals as the group with high educational attainment.

Of course this is a rough estimator. An important limitation of this estimator is that we were unable to correct for differences in weekly working hours. Partly this effect is covered by the gender variable since women more often work part-time than men. However, also some of the men work part-time and some of the of women work full-time. Especially for people that work part-time there will be an underestimation of educational attainment since they receive a lower income than people that work full-time.

We believe however that the proxy is a reasonable estimator for educational attainment. This is confirmed by the patterns we observe for the different groups. People for whom the estimated level of education is low are, for example, on average older and more often unemployed than people for whom the estimates indicate a higher education, which is exactly what we observe in reality.

APPENDIX 2 ESTIMATION RESULTS FOR THE MULTINOMIAL LOGIT MODELS

MULTINOMIAL REGRESSION OUTPUT: STARTING SITUATION JOB

Variable	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Intercept	-4.419***	0.000	-0.275	-7.508***	-8.441***	-5.408***	-5.459***	-3.969***	-7.788***	-5.166***
Age	-0.014	0.000	-.532***	.098***	0.009	-0.003	0.033	-.217***	-0.023	-0.001
Age (quadratic term)	0.000	0.000	.008***	-.001***	0.000	0.000	-.001***	.003***	.001***	0.000
Duration of working (in days)	-.126***	0.000	.068***	-.102***	0.003	-.021**	-.178***	-.083***	.04**	-.027***
Duration of working (in days, quadratic term)	.002***	0.000	-.001***	0.001	0.000	-.001***	.002***	.002***	-.001**	0**
Female	1.016***	0.000	-.2***	.655***	.555***	-.145***	.428***	.356***	.287***	.253***
Non-European non-native	0.075	0.000	0.192	.872***	.458***	.411***	1.239***	0.184	.376***	.57***
European non-native	.122**	0.000	0.051	0.045	0.049	0.057	.433***	0.044	0.129	.142**
Low educational indication	.641***	0.000	-0.097	0.142	.554***	-0.077	.792***	.476***	.738***	.096**
High educational indication	-.354***	0.000	-.251***	-.338***	-.35***	-.278***	-.653***	0.050	-.479***	-.384***
Dummy with value 1 for person working less than two years until quarter of measurement and received an unemployment or social assistance benefit before that.	-.623***	0.000	0.216	1.092***	1.099***	1.602***	1.155***	0.087	0.131	1.592***
Dummy with value 1 for person working less than two years until quarter of measurement	0.091	0.000	.404**	-.682***	-.628**	-.174*	-.8***	0.221	-0.045	-.482***

* significant on 90%-level

** significant on 95%-level

*** significant on 99%-level

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	184170,632			
Final	166744,537	17426,095	99	,000

Pseudo R-Square

Cox and Snell	,022
Nagelkerke	,099
McFadden	,089

Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	166744,537(a)	,000	0	.
LFT_KW	167565,398	820,861	9	,000
LFT_KW2	168072,725	1328,187	9	,000
DUUR_HI2	167185,342	440,804	9	,000
DUUR_HIK	167132,730	388,192	9	,000
GESL	167889,685	1145,147	9	,000
ETN_NWA	167160,240	415,703	9	,000
ETN_WA	166769,653	25,115	9	,003
OPL_LG	167239,761	495,223	9	,000
OPL_HG	167012,339	267,802	9	,000
HXDUM	168627,518	1882,981	9	,000
DUM	166819,302	74,765	9	,000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

(a) This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

MULTINOMIAL REGRESSION OUTPUT: STARTING SITUATION UNEMPLOYMENT BENEFIT

Variable	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Intercept	-3.662***	-.609***	-7.798***	-4.543***	-6.542***	0.000	1.705***	-2.877***	-33.702***	-1.835***
Age	-0.029	.062***	-0.027	.071**	0.011	0.000	-.203***	-0.067	1.4**	.078***
Age (quadratic term)	-0.0005	-.002***	0.001	-.001***	-0.0005	0.000	.001***	0.000003	-.018***	-.002***
Duration of unemployment benefit (in days)	.101***	-.131***	.05***	0.003	.104***	0.000	.077***	0.029	0.035	-.06***
Female	1.36***	-.882***	-0.011	.607***	0.118	0.000	-.659***	-1.005***	-1.125*	-.336***
Non-European non-native	-.397**	-.51***	-15.945	.338***	.719**	0.000	.433***	-0.729	-0.911	-.222***
European non-native	-0.031	-.182***	-0.031	-0.018	0.120	0.000	0.103	-0.332	-16.504	-.11*
Low educational indication	.545***	-.305***	-0.231	0.092	.887***	0.000	.624***	-0.194	0.884	0.052
High educational indication	-.358**	.284***	0.238	-.239**	-0.688	0.000	-0.029	-0.155	0.858	-0.068

* significant on 90%-level

** significant on 95%-level

*** significant on 99%-level

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	69999,586			
Final	62035,814	7963,772	72	,000

Pseudo R-Square

Cox and Snell	,196
Nagelkerke	,229
McFadden	,112

Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	62035,814(a)	,000	0	.
LFT_KW	62241,258	205,444	9	,000
LFT_KW2	62335,261	299,447	9	,000
DUUR_HI2	62766,461	730,648	9	,000
GESL	62955,683	919,869	9	,000
ETN_NWA	62193,084	157,271	9	,000
ETN_WA	62053,654	17,841	9	,037
OPL_LG	62207,369	171,555	9	,000
OPL_HG	62101,317	65,503	9	,000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

(a) This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

MULTINOMIAL REGRESSION OUTPUT: STARTING SITUATION SOCIAL ASSISTANCE BENEFIT

Variable	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Intercept	-4.269***	-1.444***	-9.041***	-8.747***	-2.993**	-7.218***	0.000	-8.911***	-5.954	-6.369***
Age	-0.017	.02*	-0.039	0.156	-.204***	0.072	0.000	0.131	-0.088	-0.020
Age (quadratic term)	0.00002	-.001***	0.002	-0.002	.003***	-0.001	0.000	-0.002	0.0003	0.0001
Duration of unemployment benefit (in days)	-.039***	-.032***	-.039**	-.057***	-.029**	-.077***	0.000	-0.014	0.031	0.002
Female	.761***	-.913***	.835**	-0.450	-.375*	-0.288	0.000	-.72***	-1.018*	-.678*
Non-European non-native	-.278***	-.417***	0.137	0.026	-.486*	-0.197	0.000	-0.183	-0.667	-0.613
European non-native	-.236**	-.238***	0.380	-0.302	-0.058	-0.007	0.000	-0.443	-0.180	-0.792
Low educational indication	.164*	-.81***	0.164	-0.253	0.492	-.484*	0.000	-0.059	0.017	-0.174
High educational indication	-0.104	.73***	0.090	-0.293	-0.165	-0.298	0.000	1.271***	1.348*	-0.176

* significant on 90%-level

** significant on 95%-level

*** significant on 99%-level

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	52055,293			
Final	48319,625	3735,668	72	,000

Pseudo R-Square

Cox and Snell	,044
Nagelkerke	,092
McFadden	,070

Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	48319,625(a)	,000	0	.
LFT_KW	48340,407	20,782	9	,014
LFT_KW2	48360,582	40,957	9	,000
DUUR_HI2	48691,016	371,390	9	,000
GESL	49272,471	952,846	9	,000
ETN_NWA	48480,242	160,617	9	,000
ETN_WA	48355,479	35,854	9	,000
OPL_LG	48805,456	485,831	9	,000
OPL_HG	48642,557	322,931	9	,000

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

(a) This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

MULTINOMIAL REGRESSION OUTPUT: STARTING SITUATION INACTIVITY

Variable	Inactivity	Job	Retirement	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown situation	Work+ disability benefit	Work+ unemployment benefit
Intercept	0.000	-1.086***	-4.458***	-11.084***	-6.931***	-11.52***	-9.13***	-2.949***	-11.134***	-15.857***
Age	0.000	-.079***	-.216***	.158**	-0.032	.273***	.266***	-.236***	0.017	.445***
Age (quadratic term)	0.000	.001***	.003***	-.002*	.001***	-.003***	-.004***	.004***	0.001	-.006**
Duration of inactivity (in days)	0.000	.034***	.031***	-0.002	-.03***	-0.011	.021***	-.038***	0.008	-0.033
Female	0.000	-.462***	-.505***	-.713**	-2.341***	-2.101***	-.747***	-.881***	-2.274***	-1.144**
Non-European non-native	0.000	-.094***	0.146	.946**	-0.109	-0.006	1.399***	-0.284	1.286**	0.404
European non-native	0.000	0.002	.451**	0.508	-.88**	.732***	.693***	-.523**	-0.544	-0.619
Low educational indication	0.000	-.201***	-.321*	0.315	0.343	-.835***	-.24***	-.332**	0.686	-0.024
High educational indication	0.000	.052**	0.181	0.504	-0.103	-0.451	.158**	0.027	0.965	0.843

* significant on 90%-level

** significant on 95%-level

*** significant on 99%-level

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	124822,230			
Final	118657,161	6165,069	72	,000

Pseudo R-Square

Cox and Snell	,021
Nagelkerke	,049
McFadden	,038

Likelihood Ratio Tests

Effect	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	118657,161(a)	,000	0	.
LFT_KW	119562,588	905,428	9	,000
LFT_KW2	119411,717	754,556	9	,000
DUUR_HI2	119829,944	1172,783	9	,000
GESL	119712,409	1055,248	9	,000
ETN_NWA	119085,656	428,496	9	,000
ETN_WA	118743,520	86,359	9	,000
OPL_LG	118794,715	137,554	9	,000
OPL_HG	118675,469	18,308	9	,032

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

(a) This reduced model is equivalent to the final model because omitting the effect does not increase the degrees of freedom.

APPENDIX 3 CHARACTERISTICS OF SCHOOL-LEAVERS IN 2002

The following table is based on the Labour Force Survey 2002 of Statistics Netherlands and contains the inflow of school-leavers on the labour market. This table was used as a starting point of the simulations. Based on this table we determined at what age people leave school and with what situation they start after leaving school.

Table A3.1 Transition from school to the labour market in 2002

Age	Educational level	Gender	Ethnic origin	Job	Unemployed	Other	Disabled	Total	Number
15	Low	Male	native	0%	0%	32%	0%	32%	438
		Female	native	32%	11%	10%	0%	54%	740
			Non-European non-native	15%	0%	0%	0%	15%	201
			Total	46%	11%	42%	0%	100%	1.379
16	Low	Male	native	18%	6%	17%	0%	41%	4.765
			Non-European non-native	2%	0%	1%	0%	2%	280
			European non-native	1%	0%	3%	0%	4%	461
		Female	native	18%	5%	10%	0%	33%	3.853
			Non-European non-native	10%	6%	0%	0%	16%	1.878
			European non-native	0%	3%	1%	0%	4%	522
			Total	47%	21%	32%	0%	100%	11.759
17	Low	Male	native	30%	7%	4%	0%	42%	7.678
			Non-European non-native	1%	0%	0%	0%	1%	197
			European non-native	0%	0%	2%	0%	2%	344
		Female	native	21%	3%	6%	0%	30%	5.455
			Non-European non-native	1%	0%	0%	0%	1%	176
			European non-native	3%	0%	1%	0%	4%	741
	Secondary	Male	native	8%	1%	2%	0%	11%	1.947
		Female	native	6%	1%	3%	0%	10%	1.789

Age	Educational level	Gender	Ethnic origin	Job	Unemployed	Other	Disabled	Total	Number
			Non-European non-native	1%	0%	0%	0%	1%	106
			Total	70%	12%	18%	0%	100%	18.433
18	Low	Male	Native	9%	3%	3%	0%	14%	2.921
			Non-European non-native	2%	1%	1%	0%	4%	865
			European non-native	3%	0%	0%	0%	3%	593
		Female	Native	13%	2%	1%	0%	16%	3.280
			Non-European non-native	0%	1%	0%	1%	2%	447
			European non-native	1%	1%	1%	0%	3%	664
	Secondary	Male	Native	12%	3%	6%	0%	21%	4.197
			Non-European non-native	3%	0%	1%	0%	4%	745
			European non-native	1%	0%	1%	0%	2%	350
		Female	Native	15%	3%	8%	0%	26%	5.206
			Non-European non-native	1%	0%	0%	0%	1%	144
			European non-native	1%	1%	2%	0%	5%	927
			Total	60%	15%	24%	1%	100%	20.339
19	Low	Male	Native	9%	2%	2%	1%	13%	2.246
			Non-European non-native	0%	4%	0%	0%	4%	632
			European non-native	1%	0%	0%	0%	1%	230
		Female	Native	10%	1%	2%	0%	13%	2.222
			Non-European non-native	2%	0%	0%	0%	2%	426
			European non-native	1%	0%	0%	0%	1%	150
	Secondary	Male	Native	15%	3%	4%	0%	21%	3.726
			European non-native	2%	0%	1%	0%	3%	543
		Female	Native	31%	4%	3%	0%	38%	6.589
			Non-European non-native	1%	1%	1%	0%	3%	540
			European non-native	1%	0%	0%	0%	1%	155
			Total	73%	14%	12%	1%	100%	17.459

Age	Educational level	Gender	Ethnic origin	Job	Unemployed	Other	Disabled	Total	Number
20	Low	Male	Native	5%	1%	1%	0%	7%	1.649
		Female	Native	3%	0%	1%	0%	4%	889
			Non-European non-native	0%	0%	1%	0%	1%	155
			European non-native	1%	0%	0%	0%	1%	191
	Secondary	Male	Native	25%	2%	3%	0%	29%	6.575
			Non-European non-native	1%	1%	3%	0%	4%	903
			European non-native	2%	0%	2%	0%	4%	812
		Female	Native	28%	8%	3%	0%	39%	8.671
			Non-European non-native	2%	1%	0%	0%	4%	937
			European non-native	3%	0%	0%	0%	3%	570
	High	Male	Native	0%	1%	0%	0%	1%	128
		Female	Native	2%	0%	1%	0%	3%	676
			Non-European non-native	0%	0%	1%	0%	1%	266
			Total	72%	14%	14%	0%	100%	22.422
21	Low	Male	Native	2%	0%	0%	0%	2%	260
		Female	Native	1%	0%	0%	0%	1%	109
	Secondary	Male	Native	20%	15%	2%	0%	36%	6.048
			Non-European non-native	4%	0%	0%	0%	4%	694
		Female	Native	25%	4%	2%	0%	31%	5.262
			Non-European non-native	3%	0%	0%	1%	4%	702
			European non-native	2%	0%	1%	0%	3%	477
	High	Male	Native	3%	0%	0%	0%	3%	471
			European non-native	1%	0%	0%	0%	1%	245
		Female	Native	14%	0%	0%	0%	14%	2.331
			Non-European non-native	1%	0%	0%	0%	1%	179
			Total	75%	19%	5%	1%	100%	16.778

Age	Educational level	Gender	Ethnic origin	Job	Unemployed	Other	Disabled	Total	Number
22	Low	Male	European non-native	0%	0%	1%	0%	1%	193
		Female	Native	0%	2%	0%	0%	2%	276
	Secondary	Male	Native	18%	4%	1%	0%	23%	3.746
			European non-native	1%	0%	2%	0%	3%	480
		Female	Native	21%	2%	0%	0%	23%	3.674
			Non-European non-native	3%	0%	0%	0%	3%	444
			European non-native	2%	0%	0%	0%	2%	354
	High	Male	Native	17%	3%	0%	0%	21%	3.362
		Female	Native	19%	2%	2%	0%	22%	3.568
			Non-European non-native	1%	0%	0%	0%	1%	83
			Total	82%	12%	6%	0%	100%	16.180
23	Low	Male	Native	1%	0%	0%	0%	1%	193
	Secondary	Male	Native	11%	1%	0%	0%	12%	1.659
			European non-native	0%	0%	1%	0%	1%	140
		Female	Native	9%	3%	1%	0%	12%	1.777
	High	Male	Native	16%	9%	1%	0%	26%	3.709
			Non-European non-native	1%	0%	0%	0%	1%	129
			European non-native	1%	0%	0%	0%	1%	196
		Female	Native	36%	3%	1%	0%	40%	5.746
			Non-European non-native	0%	0%	2%	0%	2%	291
			European non-native	3%	0%	0%	0%	3%	415
			Total	78%	16%	6%	0%	100%	14.255

Age	Educational level	Gender	Ethnic origin	Job	Unemployed	Other	Disabled	Total	Number
24	Low	Male	European non-native	1%	0%	0%	0%	1%	210
		Female	European non-native	1%	0%	0%	0%	1%	200
	Secondary	Male	Native	4%	3%	0%	0%	6%	946
			Non-European non-native	4%	3%	0%	0%	7%	974
			European non-native	3%	0%	0%	0%	3%	438
		Female	Native	5%	2%	0%	0%	7%	1.009
	High	Male	Native	26%	12%	3%	0%	41%	6.033
			European non-native	1%	0%	0%	0%	1%	186
		Female	Native	28%	2%	1%	0%	31%	4.541
			Non-European non-native	1%	0%	0%	0%	1%	103
			Total	74%	21%	4%	0%	100%	14.640

Source: Labour Force Survey 2002, Statistics Netherlands.

APPENDIX 4 DETAILED RESULTS OF THE SIMULATION OF AN UNEMPLOYMENT INSURANCE ARRANGEMENT ON THE BASIS OF INDIVIDUAL SAVING

Table A4.1 Degree to which savings for unemployment benefits are sufficient and surplus at the age of 65: gender

	Men		Women	
	% of cohort	Average surplus at 65	% of cohort	Average surplus at 65
Never received an unemployment benefit	52%	100%	54%	98%
Saved for 1-25 percent of required benefit	12%	62%	16%	54%
Saved for 25-50 percent of required benefit	13%	46%	12%	44%
Saved for 50-75 percent of required benefit	7%	45%	6%	42%
Saved for 75-99 percent of required benefit	4%	44%	3%	39%
Saved for 100 percent of required benefit	13%	65%	10%	59%
Total cohort	100%	78%	100%	76%

Table A4.2 Degree to which savings for unemployment benefits are sufficient and surplus at the age of 65: ethnic origin

	Native		Non-European non-native		European non-native	
	% of cohort	Average surplus at 65	% of cohort	Average surplus at 65	% of cohort	Average surplus at 65
Never received an unemployment benefit	55%	99%	40%	93%	51%	98%
Saved for 1-25 percent of required benefit	13%	60%	26%	45%	15%	52%
Saved for 25-50 percent of required benefit	12%	46%	16%	37%	14%	42%
Saved for 50-75 percent of required benefit	6%	45%	6%	36%	6%	40%
Saved for 75-99 percent of required benefit	3%	42%	3%	35%	3%	43%
Saved for 100 percent of required benefit	11%	63%	9%	56%	11%	60%
Total cohort	100%	79%	100%	63%	100%	74%

Table A4.3 Degree to which savings for unemployment benefits are sufficient and surplus at the age of 65: education

Educational indication	Low		Secondary		High	
	% of cohort	Average surplus at 65	% of cohort	Average surplus at 65	% of cohort	Average surplus at 65
Never received an unemployment benefit	51%	97%	50%	99%	63%	100%
Saved for 1-25 percent of required benefit	15%	54%	15%	57%	10%	64%
Saved for 25-50 percent of required benefit	14%	42%	13%	45%	9%	51%
Saved for 50-75 percent of required benefit	7%	42%	6%	44%	4%	47%
Saved for 75-99 percent of required benefit	3%	40%	3%	41%	3%	45%
Saved for 100 percent of required benefit	11%	59%	11%	63%	11%	65%
Total cohort	100%	74%	100%	76%	100%	84%

APPENDIX 5 ESTIMATING THE INFLUENCE OF THE BUSINESS CYCLE ON THE TRANSITION PROBABILITIES

In order to simulate the effects of the business cycle we had to make a connection between this cycle and the transition probabilities. To that end we have also estimated logit models in which the overall unemployment rate was added as an indicator of the business cycle.

From these models we then calculated the transition probabilities from jobs, unemployment benefits and social assistance benefits at high, average and low unemployment rates (1.8, 5.0 and 8.0 percent). To use the resulting probabilities in our baseline simulation the sum of these probabilities should equal zero. Therefore we used the probabilities at high and low rates minus the probabilities at average unemployment rate (5 percent).

In table b5.1, b5.2 and b5.3 the transition probabilities at low, average and high unemployment rates are shown.

Table B5.1 Probabilities from unemployment benefits at low, average and high unemployment rates

	WW									
Unemployment rate	Inactivity	Job	Pension	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown	Job + disability benefit	Job + unemployment benefit
1.8	0.32%	27.10%	0.09%	1.78%	0.12%	57.84%	1.15%	0.38%	0.45%	10.77%
5.0	0.36%	19.65%	0.08%	1.37%	0.11%	65.16%	1.27%	0.31%	0.14%	11.54%
8.0	0.39%	14.10%	0.08%	1.03%	0.10%	70.69%	1.36%	0.24%	0.04%	11.95%
Difference probability at low and average rates	-0.04%	7.45%	0.00%	0.42%	0.01%	-7.32%	-0.13%	0.07%	0.32%	-0.77%
Difference probability at high and average rates	0.03%	-5.55%	0.00%	-0.33%	-0.01%	5.52%	0.09%	-0.06%	-0.09%	0.41%

Table B5.2 Probabilities from social assistance benefits at low, average and high unemployment rates

	Social assistance benefit									
Unemployment rate	Inactivity	Job	Pension	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown	Job + disability benefit	Job + unemployment benefit
1.8	0.45%	19.36%	0.02%	0.15%	0.12%	0.14%	79.58%	0.04%	0.02%	0.12%
5.0	0.51%	15.10%	0.02%	0.12%	0.08%	0.20%	83.76%	0.11%	0.01%	0.09%
8.0	0.57%	11.82%	0.03%	0.09%	0.06%	0.28%	86.83%	0.25%	0.01%	0.06%
Difference probability at low and average rates	-0.06%	4.26%	0.00%	0.03%	0.04%	-0.06%	-4.18%	-0.06%	0.00%	0.03%
Difference probability at high and average rates	0.06%	-3.28%	0.01%	-0.03%	-0.03%	0.08%	3.08%	0.14%	0.00%	-0.02%

Table B5.3 Probabilities from a job at low, average and high unemployment rates

	Job									
Unemployment rate	Inactivity	Job	Pension	Sickness benefit	Disability benefit	Unemployment benefit	Social assistance benefit	Unknown	Job + disability benefit	Job + unemployment benefit
1.8	0.13%	99.29%	0.04%	0.07%	0.08%	0.12%	0.02%	0.03%	0.12%	0.11%
5.0	0.12%	99.09%	0.04%	0.07%	0.06%	0.25%	0.03%	0.03%	0.08%	0.23%
8.0	0.12%	98.66%	0.04%	0.06%	0.04%	0.49%	0.04%	0.03%	0.06%	0.46%
Difference probability at low and average rates	0.00%	0.20%	0.00%	0.00%	0.02%	-0.13%	-0.01%	0.00%	0.04%	-0.12%
Difference probability at high and average rates	0.00%	-0.44%	0.00%	0.00%	-0.01%	0.23%	0.01%	0.00%	-0.03%	0.22%

Books published by members of the research unit Labor Market Policy and Employment

(only available from commercial retailers)

Dietmar Dathe, Günther Schmid
Urbane Beschäftigungsdynamik. Berlin im Standortvergleich mit Ballungsregionen
2001
Berlin, edition sigma
175 pp.

Mathias Eberling, Volker Hielscher, Eckart Hildebrandt, Kerstin Jürgens
Prekäre Balancen. Flexible Arbeitszeiten zwischen betrieblicher Regulierung und individuellen Ansprüchen
2004
Berlin, edition sigma
279 pp.

Werner Eichhorst, Stefan Profit, Eric Thode
in collaboration with the "Benchmarking" team at the „Bündnis für Arbeit, Ausbildung und Wettbewerbsfähigkeit" Alliance: Gerhard Fels, Rolf G. Heinze, Heide Pfarr, Günther Schmid, Wolfgang Streeck
Benchmarking Deutschland: Arbeitsmarkt und Beschäftigung. Bericht der Arbeits-gruppe Benchmarking und der Bertelsmann-Stiftung
2001
Berlin/Heidelberg/New York, Springer
440 pp.

Jürgen Gabriel, Michael Neugart (eds.)
Ökonomie als Grundlage politischer Entscheidungen
2001
Opladen, Leske + Budrich
343 pp.

Silke Gülker, Christoph Hilbert, Klaus Schömann
Lernen von den Nachbarn. Qualifikations-bedarf in Ländern der OECD
2000
Bielefeld, W. Bertelsmann Verlag
126 pp.

Markus Gangl
Unemployment Dynamics in the United States and West Germany. Economic Restructuring, Institutions and Labor Market Processes
2003
Heidelberg, New York: Physica/Springer
300 pp.

Miriam Hartlapp
Die Kontrolle der nationalen Rechtsdurchsetzung durch die Europäische Union
2005
Köln, Campus Verlag
254 S.

Werner Jann, Günther Schmid (eds.)
Eins zu eins? Eine Zwischenbilanz der Hartz-Reformen am Arbeitsmarkt
2004
Berlin: edition sigma
112 pp.

Max Kaase, Günther Schmid (eds.)
Eine lernende Demokratie - 50 Jahre Bundesrepublik Deutschland
WZB-Jahrbuch 1999
1999
Berlin, edition sigma
586 pp.

Hartmut Kaelble, Günther Schmid (eds.)
Das europäische Sozialmodell.
Auf dem Weg zum transnationalen Sozialstaat
WZB-Jahrbuch 2004
2004
Berlin, edition sigma
455 pp.

Jaap de Koning and Hugh Mosley (eds.)
Labour Market Policy and Unemployment: Impact and Process Evaluations in Selected European Countries
2001
Cheltenham, UK, Edward Elgar
317 pp.

Hugh Mosley, Jacqueline O'Reilly, Klaus Schömann (eds.)
Labour Markets, Gender and Institutional Change. Essays in Honour of Günther Schmid
2002
Cheltenham, UK, Edward Elgar
382 pp.

Hugh Mosley, Holger Schütz, Günther Schmid with the collaboration of Kai-Uwe Müller
Effizienz der Arbeitsämter: Leistungsvergleich und Reformpraxis, Reihe „Modernisierung des öffentlichen Sektors"
2003
Berlin, edition sigma
179 pp.

Ralf Mytzek, Klaus Schömann (eds.)
Transparenz von Bildungsabschlüssen in Europa. Sektorale Studien zur Mobilität von Arbeitskräften
2004
Berlin, edition sigma
198 pp.

Michael Neugart, Klaus Schömann (eds.)
Forecasting Labour Markets in OECD Countries. Measuring and Tackling Mismatches
2002
Cheltenham, UK, Edward Elgar
322 pp.

Jacqueline O'Reilly, Colette Fagan (eds.)
Part-Time Prospects. An International Com-parison
1998
London/New York, Routledge
304 pp.

Jacqueline O'Reilly, Inmaculada Cebrián and Michel Lallemant (eds.)
Working-Time Changes: Social Integration Through Transitional Labour Markets
2000
Cheltenham, UK, Edward Elgar
369 pp.

Jacqueline O'Reilly (ed.)
Regulating Working-Time Transitions in Europe
2003
Cheltenham, UK, Edward Elgar
325 pp.

Birgitta Rabe
Implementation von Arbeitsmarktpolitik durch Verhandlungen. Eine spieltheoretische Analyse
2000
Berlin, edition sigma
254 pp.

Stefan Ramge, Günther Schmid (eds.)
Management of Change in der Politik? Reformstrategien am Beispiel der Arbeitsmarkt- und Beschäftigungspolitik
Ein Werkstattbericht, Gesellschaft für Programmforschung, GfP (ed.), Bd. 55 der Reihe „Schnittpunkte von Forschung und Politik",
2003
New York, München, Berlin: Waxmann
165 pp.

Günther Schmid, Jacqueline O'Reilly, Klaus Schömann (eds.)
International Handbook of Labour Market Policy and Evaluation
1996
Cheltenham, UK, Edward Elgar
954 pp.

Günther Schmid, Bernard Gazier (eds.)
The Dynamics of Full Employment. Social Integration Through Transitional Labour Markets
2002
Cheltenham, UK, Edward Elgar
443 pp.

Günther Schmid
Wege in eine neue Vollbeschäftigung. Übergangsarbeitsmärkte und aktivierende Arbeitsmarktpolitik
2002
Frankfurt/Main, Campus
477 pp.

Holger Schütz, Hugh Mosley (Hg.)
Arbeitsagenturen auf dem Prüfstand. Leitungsvergleich und Reformpraxis der Arbeitsvermittlung
2005
Berlin, edition sigma
351 S.

Sylvia Zühlke
Beschäftigungschancen durch berufliche Mobilität? Arbeitslosigkeit, Weiterbildung und Berufswechsel in Ostdeutschland
2000
Berlin, edition sigma,
206 pp.

The Research Area “Employment, Social Structure, and Welfare State” has existed since 1 January 2003. It encompasses the research units “Labor Market Policy and Employment” and “Inequality and Social Integration” and the research group “Public Health”.

Research Unit Labor Market Policy and Employment

Discussion Papers 2003

Carroll Haak
Weiterbildung in kleinen und mittleren Betrieben: Ein deutsch-dänischer Vergleich
Order number: SP I 2003-101

Günther Schmid
Gleichheit und Effizienz auf dem Arbeitsmarkt: Überlegungen zum Wandel und zur Gestaltung des „Geschlechtervertrages“
Order number: SP I 2003-102

Holger Schütz
Controlling von Arbeitsverwaltungen im internationalen Vergleich
Order number: SP I 2003-103

Stefan Schröter
Berufliche Weiterbildung in Großbritannien für gering qualifizierte Arbeitskräfte
Order number: SP I 2003-104

Magnus Lindskog
Forecasting and responding to qualification need in Sweden
Order number: SP I 2003-105

Heidi Oschmiansky und Frank Oschmiansky
Erwerbsformen im Wandel: Integration oder Ausgrenzung durch atypische Beschäftigung? Berlin und die Bundesrepublik Deutschland im Vergleich
Order number: SP I 2003-106

Katrin Vitols
Entwicklungen des Qualifikationsbedarfs in der Bankenbranche
Order number: SP I 2003-107

Achim Kemmerling
Die Rolle des Wohlfahrtsstaates in der Entwicklung unterschiedlicher Dienstleistungssektoren – Wohlfahrtsstaatsregime und Dienstleistungsbeschäftigung
Order number: SP I 2003-108

Thomas A. DiPrete, Dominique Goux, Eric Maurin, Amélie Quesnel-Vallée
Work and Pay in Flexible and Regulated Labor Markets: A Generalized Perspective on Institutional Evolution and Inequality Trends in Europe and the U.S.
Order number: SP I 2003-109

Discussion Papers 2004

Thomas A. DiPrete, Markus Gangl
Assessing Bias in the Estimation of Causal Effects: Rosenbaum Bounds on Matching Estimators and Instrumental Variables Estimation with Imperfect Instruments
Order number: SP 1 2004-101

Andrea Ziefle
Die individuellen Kosten des Erziehungsurlaubs: Eine empirische Analyse der kurz- und längerfristigen Folgen für den Karriereverlauf von Frauen
Order number: SP 1 2004-102

Günther Schmid, Silke Kull
Die Europäische Beschäftigungsstrategie. Anmerkungen zur "Methode der offenen Koordinierung"
Order number: SP 1 2004-103

Hildegard Theobald
Entwicklung des Qualifikationsbedarfs im Gesundheitssektor: Professionali-

sierungsprozesse in der Physiotherapie und Dentalhygiene im europäischen Vergleich
Order number: SP 1 2004-104

Magnus Lindskog
Labour market forecasts and their use – Practices in the Scandinavian countries
Order number: SP 1 2004-105

Hildegard Theobald
Unternehmensberatung: Veränderter Qualifikationsbedarf und neue Ansätze in Ausbildung und Regulierung des Berufszugangs
Order number: SP 1 2004-106

Günther Schmid
Gewährleistungsstaat und Arbeitsmarkt Neue Formen von Governance in der Arbeitsmarktpolitik
Order number: SP I 2004-107

Karin Schulze Buschoff
Neue Selbstständigkeit und wachsender Grenzbereich zwischen selbstständiger und abhängiger Erwerbsarbeit – europäische Trends vor dem Hintergrund sozialpolitischer und arbeitsrechtlicher Entwicklungen
Order number: SP 1 2004-108

Christoph Hilbert
Performanzmessung und Anreize in der regionalen Arbeitsvermittlung: Der Schweizer Ansatz und eine Modellrechnung für Deutschland
Order number: SP 1 2004-109

Günther Schmid
Soziales Risikomanagement durch Übergangsarbeitsmärkte
Order number: SP I 2004-110

Lennart Delander, Jonas Månsson, Erik Nyberg
Using the Unemployed as Temporary Employment Counsellors: Evaluation of an Initiative to Combat Long-Term Unemployment
Order number: SP I 2004-111

Discussion Papers 2005

Achim Kemmerling, Oliver Bruttel
New Politics in German Labour Market Policy? The Implications of the Recent Hartz Reforms for the German Welfare State
Order number: SP I 2005-101

Kamil Zawadzki
Transitional Labour Markets in a Transitional Economy. Could They Work? The Example of Poland
Order number: SP I 2005-102

Magnus Lindskog
The Swedish Social Insurance System for the Self-Employed
Order number: SP I 2005-103

Rebecca Boden
The UK social security system for self-employed people
Order number SP I 2005-104

Philip Wotschack
Household Governance and Time Allocation – Structures and Processes of Social Control in Dutch Households
Order number SP I 2005-105

Holger Schütz, Peter Ochs
Das Neue im Alten und das Alte im Neuen - Das Kundenzentrum der Bundesagentur für Arbeit: Die öffentliche Arbeitsvermittlung zwischen inkrementellen und strukturellen Reformen
Order number: SP I 2005-106

Carroll Haak
Künstler zwischen selbständiger und abhängiger Erwerbsarbeit
Order number: SP I 2005-107

Ralf Mytzek-Zühlke
Einflussfaktoren betrieblicher Weiterbildungsaktivität in Dänemark, Schweden, Deutschland und dem Vereinigten Königreich.
Analysen der Mikrodaten der zweiten Europäischen Weiterbildungserhebung (CVTS2)
Order number: SP I 2005-108

Oliver Bruttel
Contracting-out and Governance Mechanisms in the Public Employment Service
Order number: SP I 2005-109

Colette Fagan, Jacqueline O'Reilly and Brendan Halpin
Job opportunities for whom? Labour market dynamics and service sector employment growth in Germany and Britain
Order number SP I 2005-110

Monique Aerts
The Dutch Social Insurance System for Self-Employed
Order number SP I 2005-111

Discussion Papers 2006

Günther Schmid
Sharing Risks. On Social Risk Management and the Governance of Labour Market Transitions
Order number SP I 2006-101

Rosie Page, Jim Hillage
Vocational Education and Training in the UK. Strategies to overcome skill gaps in the workforce
Order number SP I 2006-102

Anton Hemerijck
Recalibrating Europe's Semi-Sovereign Welfare States
Order number SP I 2006-103

Paul Ryan, Howard Gospel, Paul Lewis
Large Employers and Apprenticeship Training in Britain
Order number SP I 2006-104

Lorenz Lassnigg
Approaches for the anticipation of skill needs in the perspective of "Transitional Labour Markets" – the Austrian experience
Order number: SP I 2006-105

Paula Protsch
Lebens- und Arbeitsqualität von Selbstständigen.
Objektive Lebens- und Arbeitsbedingungen und subjektives Wohlbefinden einer heterogenen Erwerbsgruppe
Order number: SP I 2006-106

Karin Schulze Buschoff
Die soziale Sicherung von selbst ständig Erwerbstätigen in Deutschland
Order number SPI 2006-107

Janine Leschke, Günther Schmid, Dorit Griga
On the Marriage of Flexibility and Security: Lessons from the Hartz-reforms in Germany
Order number SP I 2006-108

Anders Stenberg
Skill Needs and Continuing Vocational Training in Sweden
Order Number SP I 2006-109

Philip Wotschack, Rafael Wittek
Negotiating Work and Household Demands.
Effects of Conflict Management Strategies in Dutch Households on the Labor Supply of Male and Female Employees
Order number: SP I 2006-110

Christian Brzinsky-Fay
Lost in Transition - Labour Market Entry Sequences of School Leavers in Europe
Order number SP I 2006-111

Jaap de Koning, Hassel Kroes, Alex van der Steen
Patterns of Work and Use of Benefits over the Life Course: Estimates and simulations based on Dutch microdata
Order number SP I 2006-112

Bei Ihren Bestellungen von WZB-Papers schicken Sie, bitte, unbedingt einen an Sie adressierten **Aufkleber** *mit, sowie* ***je Paper*** *eine* ***Briefmarke im Wert von € 0,55*** *oder einen* ***"Coupon Réponse International"*** *(für Besteller aus dem Ausland).*

Please send a ***self-addressed label*** *and* ***postage stamps in the amount of € 0,55*** *or a* ***"Coupon-Réponse International"*** *(if you are ordering from outside Germany) for* ***each*** *WZB-Paper requested.*

Bestellschein — *Order Form*

Paßt im Fensterumschlag! ● Designed for window envelope!

An das
Wissenschaftszentrum Berlin
für Sozialforschung gGmbH
PRESSE- UND INFORMATIONSREFERAT
Reichpietschufer 50

D-10785 Berlin

Absender ● Return Address:

_____

_____

_____

_____

Hiermit bestelle ich folgende(s)Discussion Paper(s) ● Please send me the following Discussion Paper(s)

Autor(en) / Kurztitel ● Author(s) / Title(s) in brief	Bestellnummer ● Order no.