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# The relationship between geographical mobility and education-job mismatches

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## **Abstract**

In this paper we investigate the relationship between geographical mobility and education-job mismatches. School-leavers might adjust to local labour market frictions by accepting some education-job mismatch combined with a mobility decision. We focus on the relationship between the mobility decision and the following education-job mismatches: a job below the educational level, outside the educational field, part-time or flexible jobs at the beginning of the career. For this purpose we use data about school-leavers from secondary education and higher vocational education in the period 1996-2001. The analysis is conducted at a disaggregated spatial level to incorporate differences in behaviour of school-leavers at the regional level. We find that school-leavers who are more mobile have a lower probability to have a job below the acquired educational level compared with school-leavers who are less mobile. Moreover, school-leavers who are more mobile experience especially a lower probability of a part-time or a flexible job. This result suggests that school-leavers not only try to prevent a job below the acquired educational level, but also other education-job mismatches are incorporated in their mobility decision.

# 1 Introduction

The a location of workers over jobs is rarely optimal due to labour market failures. Discrepancies between supply and demand of labour can lead to unemployment or unfilled vacancies. However, to avoid unemployment, workers also might alter their job-search behaviour and accept jobs that do not match their acquired skills (Wieling and Borghans, 2001) or jobs that are indicated as less favourable (Kalleberg *et al*, 2000; McGovern *et al*, 2004). A considerable amount of research has already been done to explain education-job mismatches which mainly focusses on the educational level of the job (Battu *et al*, 1999; Clogg and Shockey, 1984; Borghans and deGrip, 2000; Groot and Maassen van den Brink, 2000; Sicherman, 1991; Tsang and Levin, 1985). However, there are other mismatches possible between education and job, such as a job outside the own field of study, (Witte and Kalleberg, 1995; Van de Werfhorst, 2001; Wolbers, 2003), and non-standard employment, such as part-time or temporary jobs (Steijn, 1999; Kalleberg, Reskin and Hudson, 2000; McGovern, Smeaton and Hill, 2004).

In this paper we want to investigate education-job mismatches of school-leavers incorporating geographical mobility. We focus on the following education-job mismatches: a job below the educational level, outside the educational field, part-time or flexible jobs at the beginning of the career. For this purpose we use data from large-scale school-leaver surveys held yearly in the period 1996-2001 among Dutch school-leavers from secondary education and higher vocational education. Moreover, school-leavers search for jobs in labour markets that may be more regional than global.<sup>1</sup> The analysis is therefore conducted at a disaggregated spatial level to incorporate differences in behaviour of school-leavers at the regional level.

Previous research have focused on the choice between a job below or at the attained educational level (Van Ham, 2003; Büchel and Van Ham, 2002; Groot and Maassen van den Brink, 2000; Sloane et al., 1999) combined with mobility decisions. Although these studies have provided crucial information about the influence of mobility on the probability of a job at the attained educational level, there is more to explore by expanding the set of education-job mismatches of school-leavers further. Beside the educational level, we expect that school-leavers also incorporate other labour market outcomes, such as a part-time job, a flexible job or a job outside the field of study in their mobility decision. The central aim of this paper is to determine to what extent school-leavers who are more mobile have a better education-job match compared with school-leavers who are less mobile. Moreover, distinguishing between groups of school-leavers emphasizes the differences in their mobility behaviour. Furthermore, as regional labour market characteristics may force school-leavers into a specific education-job mismatch, we will also examine the role of mobility under different labour market conditions.

It appears that school-leavers who are more mobile more often have a job at

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<sup>1</sup>See Büchel and Van Ham, 2003.

the acquired educational level. Moreover, school-leavers who are more mobile more often have especially a full-time or a permanent job. This result suggests that school-leavers not only try to prevent a job below the acquired educational level, but also other education-job mismatches are incorporated in their mobility decision. Furthermore, the relationship between mobility and education-job mismatches varies between groups of school-leavers and local labour market conditions.

The paper is structured as follows. The next section provides some theoretical background concerning labour market mismatches and explores the extent to which these mismatches have been examined in economic literature. Section three outlines the methodology used in the analyses we conducted. Special attention is paid to the data and the specification of the analyses we have used. Section 4 shows the results and section 5 offers some conclusions.

## 2 Theoretical Background

A job at or below the attained educational level has become an important issue for researchers since the educational level of the workforce in the Netherlands (and other countries) has expanded. While at the same time an upgrading of occupations took place, this upgrading process could not compensate the educational expansion (Asselberghs *et al.*, 1998; Huijgen, 1989; Wolbers, de Graaf and Ultee, 2001). As a consequence, more and more employees had to accept a job below their attained level of education. There is a large body of literature on overeducation.<sup>2</sup> This literature is related to the spatial mismatch hypothesis (Kain, 1968; Holzer, 1991) which argues that labour market outcomes such as unemployment for specific groups of the labour force (black workers), are to some extent the result of an increasing spatial separation between the locations of residence and jobs. Restricted spatial flexibility in turn enhances labour market mismatches.

However, according to Büchel and Van Ham (2003) there is surprisingly little attention paid to the spatial aspect to overeducation. Most people only look for a job on the local (regional) labour market. But regional labour markets differ in demand and supply of labour. So, for job-seekers the probability of finding a (suitable) job increases by looking for jobs in a global market rather than a regional one. The study of Büchel and Van Ham shows that workers in Germany reduce the risk of overeducation if they are spatial flexible. For instance, workers who have access to a car for personal use or workers who increase their commuting time are less frequently overeducated. The authors however neglect the fact that job-seekers have other options, such as a job outside the field of study or non-standard jobs, such as part-time or flexible jobs.

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<sup>2</sup>See Groot and Maassen van den Brink (2000) for an overview of the overeducation literature. See Dolton and Vignoles (2000) and Battu *et al.* (1999) for more information about overeducated school-leavers.

In research concerning education-job mismatches, far less attention has been paid to the match between field of study and occupation (Witte and Kalleberg, 1995; Van de Werfhorst, 2001; Wolbers, 2003). For instance, Wolbers (2003) investigated the determinants of the mismatch between field of education and occupation and their labour market effects. One of the results of this study is that workers with a mismatch between field of education and occupation, have jobs with a lower occupational level than workers with a match between field of education and occupation.

Furthermore, since the early 1980s the Dutch labour market has become more flexible (Visser and Hemerijck, 1997; Schippers and Steijn, 1999). The advantage of a flexible labour market is that employers may offer non-standard contracts, - that is, a different employment contract than a permanent job in paid employment, such as a temporary job, on-call work or a part-time job. Flexibilization of the labour market was regarded as a major contribution to the fight against youth unemployment. Since then, youth unemployment in the Netherlands has decreased steadily. At the same time, the share of workers with a non-standard contract has risen (Muffels, Dekker and Stancaelli, 1999; Remery *et al*, 2002; De Beer, 2001; Goudswaard, 2003). Non-standard jobs are often indicated as bad jobs, because the quality of the jobs for employees with a non-standard contract is less favourable than for employees who have a regular employment contracts (Kalleberg, Reskin and Hudson, 2000; McGovern, Smeaton and Hill, 2004)). Non-standard jobs differ from standard jobs in job security, career, salary developments, training possibilities and so on. Therefore, it seems that flexibilization of the labour market offered some groups of job-seekers, who would be unemployed before the 1980s, the opportunity to find work, but this work is relatively often based on non-standard employment arrangements, with relatively bad conditions. So, in the Netherlands (and other countries) unemployment has decreased by offering non-standard contracts, but mismatches between available and preferred jobs still exist.

Wieling and Borghans (2001) investigated the relationship between discrepancies between demand and supply for certain types of education on the one hand and manifestation of adjustment processes on the other hand. However, they did not take spatial flexibility and regional labour market characteristics into their analysis. Van Ham (2003) and Büchel and Van Ham (2002) have shown that the mobility decision of school-leavers affects overeducation as education-job mismatch, but did not take other education-job mismatches into their analysis. It may therefore be informative to investigate the extent to which other mismatches are influenced by the mobility decision. Although earlier studies have provided crucial information about the influence of mobility on the probability of school-leavers having a job below the acquired educational level, there is more to explore by distinguishing several education-job mismatches.

In this paper the following assumptions are made. First, the desirability of a job depends on four matches (i) educational level; (ii) field of study; (iii) type of contract and (iv) number of hours. School-leavers are all employed and have already made a trade-off between all possible adjustments in order to work

in the most desirable job. For simplicity, we assume no wage differences exist between jobs at the same educational level, in the same field of study, a permanent contract and full-time amount of hours. That is, we assume that there are no wage differences due to productivity differences. As the distinguished education-job mismatches will incorporate the remaining wage differences between school-leavers, wages are left out the analyses. Furthermore, a school-leaver is considered to have a job below the educational level or outside the field of study if the school-leaver has more education than is required for the job or works in a different field of study, which are measured subjectively.<sup>3</sup> Incorporating these assumptions, we formulate the following hypothesis: *school-leavers who are more geographical mobile, have a higher probability reducing the mismatch between job and education, compared with school-leavers who are less geographical mobile.* Distinguishing between full-time and part-time contracts, permanent and flexible contract, as well as between inside and outside field of study gives an overview of four education-job mismatches and the role of mobility in preventing these mismatches. The role of mobility may however be different for groups of school-leavers and labour market conditions, therefore a distinction is made between groups of school-leavers and labour market conditions.

### 3 Framework for analyses

#### 3.1 Data

In order to test the hypothesis, we use data from two large-scale school-leaver surveys held in the Netherlands yearly by the Research Centre for Education and the Labour Market (ROA). These comparable surveys consist of RUBS (Registration of Outflow and Destination of Schoolleavers) and HBO-Monitor. In the RUBS survey school-leavers of pre-secondary vocational education (VMBO), upper general secondary education (HAVO), pre-university education (VWO) and secondary vocational education (MBO, also called BOL/BBL) are concerned. The HBO-Monitor contain school-leavers of vocational college (HBO). School-leavers are questioned a year and a half after graduation. The information gathered contains several aspects of the transition from education to work. Data are collected about the nature of the employment contract (flexible, part-time) and job characteristics (educational level of occupation, field of study required for the occupation). We use the surveys for the period 1996-2001, which refer to 1994/1995, 1995/1996, 1996/1997, 1997/1998, 1998/1999 and 1999/2000 school-leaver cohorts. School-leavers who are in paid employment are selected for the purpose of the current analyses<sup>4</sup>. Furthermore, the selection is focussed on school-leavers between the age of 16 till 30 years and

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<sup>3</sup>For details on different measures which can be used to define overeducation and the associate advantages and disadvantages of these measures, see Van der Velden and Van Smoorenburg, 1997.

<sup>4</sup>As no information is available about education-job mismatches and mobility of the unemployed school-leavers, this group is extracted from the sample.

who have attained full-time education. School-leavers from upper general secondary education (HAVO), pre-university education (VWO) are excluded from the analysis, because the share of school-leavers entering the labour market is too low. Incorporating these selections a sample of 83.032 school-leavers remained.

Geographic mobility is measured as follows: The RUBS and HBO-Monitor contains information about the location (town) of education. Furthermore, respondents were asked to indicate the location (municipality) of the current job. Geographical mobility is measured as the distance between the location of education and the current job (in kilometers). Next, a division is made into four categories 1) 0-10 kilometers, 2) 11-30 kilometers, 3) 31-70 kilometers, and 4) more than 70 kilometers.

To measure the match between level of education and the current job we use an employee self-rating of the level of education required for the job. Respondents were asked to indicate the minimum level of education required by the employer for the current job. By comparing this to the school-leavers' attained level of education a division is made between 1) school-leavers with a job at or above the attained level of education and 2) school-leavers with a job below the attained level of education. Respondents were also asked to indicate which field of education was required by the employer for the current job, with response categories: (i) exclusively my own field of study; (ii) my own or a related field of study; (iii) a completely different field of study; (iv) no particular field of study. To measure the match between field of education and the current job a division is made between 1) school-leavers with a job inside the own field of study (categories (i) and (ii)) and 2) school-leavers with a job outside the own field of study (categories (iii) and (iv)).

Next, a distinction is made between school-leavers with a flexible and permanent job. A flexible job refers to school-leavers in temporary-help agency employment, on-call employment or school-leavers with a temporary contract, with no prospect of a permanent contract. A permanent job refers to school-leavers with a permanent contract or school-leavers with a temporary contract, with prospect of a permanent contract. Furthermore, we distinguish between school-leavers with a part-time and school-leavers with a full-time job. Part-time workers are defined as those who work less than 32 hours per week.

To control for differences between school-leavers we have included the school-leavers' age, gender, ethnicity, level of education and field of education in the analysis. The age of school-leavers is measured in years. Differences in gender relates to the distinction between men and women. Ethnicity refers to the distinction between native and immigrant school-leavers. An immigrant is either someone who was born abroad and of whom at least one of the parents was born abroad or someone of whom both parents was born abroad. We distinguish between four levels of education: pre-secondary vocational education; lower secondary vocational education (BOL/BBL level 1/2); upper secondary vocational education (BOL/BBL level 3/4) and vocational college. With respect to field of study we distinguish between eight categories; general; agriculture; education; engineering; economics; health care; behaviour/society and language/culture.

To incorporate regional differences between supply and demand of labour,

regional labour market characteristics are added to the analyses. To distinguish between regions in the Netherlands, we used the 18 RBA areas (Regionaal Bestuur voor de Arbeidsvoorziening; Regional Council for Labour Supply). The RBA areas refer to the location of education of the school-leavers. Furthermore, regional unemployment rates and size of the regional labour force are included in the analysis. The data for the regional unemployment rate and size of the regional labour force are derived from the 1996 to 2001 Labour Force Surveys (EBB) yearly carried out by Statistics Netherlands (CBS). For each RBA area the yearly unemployment rate and size of the labour force is determined. Next, the regional unemployment rates were divided into three categories 1) low (unemployment rate 2-4%); 2) middle (unemployment rate 5-6%); 3) high (unemployment rate 7-12%). The regional labour force is categorized as follows: 1) low (115.000-231.000) ; 2) middle (231.001-467.000) 3) high (467.001-793.000). Table 1 shows the distribution of variables mentioned here.

### 3.2 The analyses

Previous research have focused on the binary choice between a job below or at the attained educational level (Van Ham, 2003; Büchel and Van Ham, 2002; Groot and Maassen van den Brink, 2000; Sloane et al., 1999) combined with mobility decisions. Although these studies have provided crucial information about the influence of mobility on the probability of a job at the attained educational level, there is more to explore by expanding the set of education-job mismatches of school-leavers further. Beside the educational level, we expect that school-leavers also incorporate other education-job mismatches in their mobility decision. For this purpose four education-job mismatches are analysed separately. That is, a job (i) at or below the acquired educational level; (ii) inside or outside field of study; (iii) permanent or flexible contract and (iv) full-time or part-time contract. Table 3 shows the results of these four logit analyses.

In order to examine the role of mobility for different groups of school-leavers and labour market conditions, we regressed these combinations separately. That is, mobility combined with level of education, mobility combined with regional unemployment rate and size of the labour force. Table 4 shows the marginal effects of the combinations separately.

Furthermore, we attempt to model the fullest set of education-job mismatches combinations available to school-leavers. A multinomial logit approach is followed where the dependent variable is a dummy for overeducated or not. In turn, we can calculate the probability  $P_{ij}$  for an individual  $i$  having a job below the acquired educational level ( $j = 1$ ) or not ( $j = 0$ ) conditional on a vector of background characteristics. It is assumed that there are four possible situations in which school-leavers are in defined for each situation  $j$ . That is:

$$Y_j = \beta_j + \beta_j MOB + \beta_j X + e_j \quad (1)$$

where  $Y_j$  can be interpreted as the propensity to be in situation  $j$ . Only the

choices of a job below the acquired level of education, outside the field of study, temporary and part-time contracts are observed. Let  $Y_j = 1$  if  $j$  is chosen;  $Y_j = 0$  otherwise, where  $Y_1 = 1$  is defined as the school-leaver has a job below the acquired educational level and  $Y_1 = 0$ , the school-leaver has a job at the acquired educational level.  $Y_2$  (outside field of study),  $Y_3$  (flexible job) and  $Y_4$  (part-time job) is defined analogously. We regress all possible combinations of mismatches in one model. One of these combinations for example is a job below the acquired educational level, inside the field of study, flexible and full-time. As the estimates from the multinomial logit model are difficult to interpret, we only report the marginal effects. Table 5 shows these effects.

## 4 Results

### 4.1 Descriptives

Table 2 lists all variables used in the analyses broken down by mobility and the four education-job mismatches. On average the distance between the location of education and location of the job is 31 kilometers. It appears that for school-leavers from vocational college this distance is larger, namely 41 kilometers while for school-leavers from lower secondary vocational education this distance is 22 kilometers. Furthermore, school-leavers from vocational college have a better match between education and job than lower secondary vocational education. This holds especially for a job at the educational level and inside field of study.

Also mobility fluctuates between different regional labour conditions. If the size of the labour force is small, school-leavers become more mobile compared with a larger size of the labour force. However, the match between education and job is worse for school-leavers if the labour force is small.

< Insert table 2 >

### 4.2 Regression results: Logit

The four education-job mismatches are analysed separately in order to determine the extent to which mobility leads to education-job matches. The relationship between mobility and the probability of one of the mismatches indicates the importance of a match for the school-leavers. Table 3 shows the results of these analyses. It appears that a higher mobility in general leads to a higher probability of a job at the acquired level of education, the probability of a job with a permanent contract and the probability of a full-time job. This is what we expected, for school-leavers who are geographical mobile the match between education and current job is better than for school-leavers who are less mobile. However, the coherence between mobility and the probability of a job inside the field of study is the opposite. Furthermore, it appears that the coherence between mobility and the probability of a permanent job and the probability of a full-time job is larger than the coherence between mobility and the probability of a job at the acquired level of education. However, it is possible that the

school-leavers who have a job below the acquired educational level also have a part-time job, a flexible contract and a job outside the field of study. Therefore, the relationship between mobility and the probability of one of the education-job mismatches separately may result in correlated estimates for mobility. Subsection 4.4 will therefore show the multinomial logit results.

< Insert table 3 >

Furthermore, table 3 shows that the match between education and current job is better for men and natives than for women and immigrants. Male school-leavers more often than female school-leavers have a job at the acquired level of education, a job inside the own field of study, a permanent job and a full-time job. Natives have more often than immigrant a job inside the own field of study, a permanent job and a full-time job.

Besides, the match between education and job is better for higher educated school-leavers. Higher educated school-leavers more often have a job inside the field of study, a permanent or a full-time job. Contrary to this, the least qualified school-leavers more often have a job at the attained level of education. This is caused by the fact that for the least qualified school-leavers jobs below the own level of education are less available than for higher educated school-leavers. Labour market conditions also influences the mismatch between for school-leavers. A high unemployment rate reduces the probability of finding a permanent job, but enhances the probability of finding a job at the own level of education and the likelihood of finding a full-time job.

### 4.3 Regression results: Interactions

What could be a reason for the great coherence between mobility and a full-time or a permanent job? Selection of individuals or regional characteristics could be one of the reasons. Therefore, we will combine mobility with individual and regional background characteristics in order to explain some of the previous logit results. Table 4 gives an overview of the combinations made. It appears that the mobility behaviour of school-leavers from pre-secondary and lower secondary vocational education mainly results in a permanent or a full-time job. For this group of school-leavers mobility does not have much coherence with the probability of a job at the attained level of education or the probability of a job inside the own field of study. For school-leavers from vocational college a higher mobility results in a higher probability of a job at the level of education, a permanent or a full-time job. However, for school-leavers of vocational college a higher mobility leads to a lower probability of a job inside the field of study.

< Insert table 4 >

These effects could be related with the availability of jobs in the RBA area concerned. If the size of the labour force is small, increasing mobility has a large positive impact on finding a job inside the field of study, a permanent

or a full-time job. Furthermore, the unemployment rate within a RBA area also indicates the situation on the regional labour market the school-leavers are confronted with. It appears that if the unemployment rate is low, a higher mobility results in a lower probability of a job inside the field of study. If the unemployment rate is low, school-leavers do not have to be mobile in order to find a job inside the field of study. This is however not the case for a job at the acquired educational level. If the unemployment rate is low, a higher mobility results in a higher probability finding a job at the acquired educational level. Maybe it concerns mainly school-leavers from upper secondary vocational education and vocational college. Furthermore, a higher mobility leads to a higher probability of a permanent job, only if the unemployment rate is middle or high. This result suggests that leaving an area with bad labour market conditions reduces the likelihood of having a flexible job. Finally, mobility always leads to a higher probability of a full-time job. This is the case for different educational levels of school-leavers and under different labour market conditions.

#### 4.4 Regression results: Multinomial logit

It appeared from table 3 that a higher mobility mainly results in a higher probability of school-leavers having a permanent or a full-time job. This is however not the case for the probability of a job inside the field of study. A ranking of the four possible mismatches and the coherence of mobility with these mismatches is also interesting. For example a total match consists of a job at the educational level, inside field of study, full-time and permanent while a total mismatch is a job below the educational level, outside field of study, part-time and flexible. Table 5 shows an overview of the coherence between mobility and a specific combination of mismatches. It appears that a higher mobility mainly results in a higher probability of a permanent *and* a full-time job (compared with school-leavers who are confronted with a total mismatch, that is a job below level of education, outside field of study, flexible and part-time). Furthermore, table 5 shows that the probability of school-leavers to find a job inside field of study and full-time is larger if mobility is higher than the probability to find a job at the educational level and full-time. The opposite is true for the combination with permanent job. A higher mobility even leads to a lower probability of a job inside field of study and permanent while the probability of a job at the educational level and permanent is higher.

< Insert table 5 >

If school-leavers find a job more than 70 kilometers away from the location of education, the ranking of the coherence between mobility and all possible combinations of mismatches is (i) only a permanent and full-time job; (ii) outside field of study, rest matches and (iii) complete match. For less mobile school-leavers the following ranking can be made: (i) only permanent and full-time; (ii) outside field of study, rest matches (between 31-70 km) or below educational

level, rest matches (11-30 km) and (iii) only inside field of study and full-time matches. There are however, differences between mobility effects on the four distinguished mismatches.

The results indicate that school-leavers not only try to prevent accepting a job below the educational level, but also other mismatches between education and job are incorporated in their mobility decision. Especially the probability of a full-time or a permanent job is greatly affected by mobility.

It is however possible that the unemployment level and the size of the labour force of a RBA region implicitly influences the mobility decision of school-leavers. A higher unemployment level for example could force school-leavers into a higher mobility level. Therefore, a two-step OLS incorporating the unemployment rate and the size of the labour force as instrumental variables for mobility is estimated. The patterns and significance of the results are however identical to the previously presented results and are therefore not presented here.

## 5 Conclusion

In this paper we have investigated the relationship between geographic mobility and education-job mismatches. We focused on mobility decisions of school-leavers combined with the following education-job mismatches: (i) a job below the attained level of educational; (ii) a job outside the own field of study; (iii) a flexible job and (iv) a part-time job. We also analysed the impact of mobility on education-job mismatches for different groups of school-leavers and under different labour market circumstances. This paper attempts to supplement the existing overeducation literature by offering an empirical evaluation of overeducation in relation with other education-job mismatches. Extending the choice set of school-leavers enhances the information about the mobility decision combined with education-job mismatches. We evaluated whether geographical mobility is likely to sufficiently result in a lower probability of education-job mismatches incorporating individual background characteristics and regional labour market characteristics.

Our results show that school-leavers who are mobile have a higher probability of finding a job at the attained level of education, a permanent job or a full-time job. However, the impact of mobility on the probability of finding a permanent or full-time job is much greater than the impact of mobility on the probability of finding a job at the attained level of education. Besides, mobility results in a lower probability of finding a job inside the own field of study. Furthermore, the relationship between of mobility and education-job mismatches differs between high and low educated school-leavers. For school-leavers from pre-secondary and low secondary vocation education mobility results mainly in a higher probability of a permanent job or a full-time job. Mobility does not affect the likelihood of finding a job at the attained level of education or inside the own field of study for these groups of school-leavers. Contrary to this, mobility results in an increase in the probability of finding a job at the attained level of education for

higher educated school-leavers. Moreover, the unemployment rate and size of the labour force within a region also influences the match between education and current job for school-leavers. Mobility results in an increase of the likelihood of finding a job inside the own field of study, a permanent or a full-time job, especially if the size of the labour force is small. Besides, increasing mobility has a positive effect on the probability of finding a permanent job, only if the labour market circumstances are bad. Furthermore, increasing mobility has a negative effect on the probability of a job inside the own field of study if the unemployment rate is low. These results suggest that school-leavers not only try to prevent a job below the acquired educational level, but also other education-job mismatches are incorporated in their mobility decision.

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## 7 Appendix

Table 1: Distribution of variables used in the analysis

	%		%
Job at the own level of education	70	Regional size of the labour force	
Job inside own field of education	70	Low	14
Permanent job	83	Middle	47
Fulltime job	74	High	39
Age <sup>a</sup>	22,4 (2,84)	Mobility	
Gender		Between 0-10 km	35
Male	49	Between 10-30 km	31
Female	51	Between 30-70 km	21
Ethnicity		More than 70 km	13
Native	95	RBA-region	
Immigrant	5	Groningen	5
Level of Education		Friesland	4
Pre-secondary	10	Drenthe	2
Lower secondary	15	IJssel-Vecht/Twente	11
Upper secondary	37	IJssel/Veluwe	1
Vocational collage	38	Arnhem/Oost-Gelderland/Rivierenland	8
Field of education		Flevoland	1
General	2	Midden-nederland	10
Agriculture	5	Noord-Holland Noord	1
Education	6	Zuidelijk Noord-Holland	10
Engineering	29	Rijnstreek	2
Economics	32	Haaglanden	3
Health care	14	Rijnmond	9
Behaviour/society	9	Zeeland	5
Art/language/culture	2	Midden en West Brabant	10
Regional unemployment rate		Noordoost Brabant	3
Low	46	Zuidoost Brabant	5
Middle	33	Limburg	9
High	21	N	83 032

<sup>a</sup> Mean (standard deviation) instead of percentage

Table 2: List of variables included in the analyses, broken down by mobility and four education-job mismatches, (N= 83 032)

	Mobility	Job at the educational level	Job inside own field of study	Permanent job	Fulltime job
	Km.	%	%	%	%
<b>Totaal</b>	<b>31</b>	<b>70</b>	<b>70</b>	<b>83</b>	<b>74</b>
RBA Area					
Groningen	72	70	66	77	62
Friesland	51	69	64	72	70
Drenthe	32	63	57	82	68
IJssel-Vecht/Twente	39	70	75	85	74
IJssel/Veluwe	46	67	57	80	78
Arnhem/Oost-Gelderland/Rivierenland	32	74	75	80	67
Flevoland	29	68	63	72	52
Midden-Nederland	23	72	67	82	71
Noord-Holland Noord	25	76	68	81	81
Rijnmond	17	74	69	85	77
Zuidelijk Noord-Holland	17	69	66	82	79
Rijnstreek	14	69	61	85	53
Haaglanden	31	78	70	87	86
Zeeland	37	64	72	87	72
Midden en West	26	66	72	85	78
Brabant					
Noordoost Brabant	43	74	72	84	82
Zuidoost Brabant	28	76	78	85	81
Limburg	30	69	70	81	74
Age					
Gender					
Male	33	71	71	86	84
Female	28	69	69	80	65
Ethnicity					
Native	31	71	70	83	74
Immigrant	22	67	59	76	70
Educational level					
Pre-secondary vocational education	32	75	53	84	47
Lower secondary vocational education	22	47	55	81	70
Upper secondary vocational education	24	70	72	82	76
Vocational College	41	79	78	84	81
Field of education					
General	27	31	33	75	48
Agriculture	45	63	63	80	77
Education	34	87	86	81	70
Engineering	33	72	76	87	86
Economics	29	69	60	82	83
Health care	26	71	76	83	52
Behaviour/society	26	68	75	76	47
Art/language/culture	34	71	73	79	63
Unemployment level					
Low	29	69	70	87	73
Middle	33	72	70	82	74
High	31	70	70	75	76
Size of labour force					
Low	43	65	67	80	68
Middle	35	71	72	84	75
High	22	71	69	83	74

Table 3: Results of four separate logistic regression analyses<sup>a</sup>

	Probability of a job at the own level of education		Probability of a job inside own field of education		Probability of a permanent job		Probability of a fulltime job	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Constant	-1,230**	0,133	-0,880**	0,111	1,692**	0,129	-1,591**	0,121
Age	0,065**	0,005	-0,002	0,005	0,007	0,006	0,015**	0,005
Gender								
Male	ref	ref	ref	ref	ref	ref	ref	ref
Female	-0,083**	0,020	-0,054**	0,020	-0,253**	0,023	-0,513**	0,023
Ethnicity								
Native	ref	ref	ref	Ref	ref	ref	ref	ref
Immigrant	0,017	0,036	-0,347**	0,034	-0,538**	0,039	-0,094*	0,039
Level of education								
Pre-secondary	ref	ref	ref	ref	ref	ref	ref	ref
Lower secondary	-1,469**	0,038	0,347**	0,036	-0,099*	0,045	1,091**	0,040
Upper secondary	-0,614**	0,039	1,053**	0,037	0,145**	0,046	1,966**	0,042
Vocational collage	-0,382**	0,048	1,342**	0,047	0,369**	0,058	2,305**	0,053
Field of education								
General	ref	ref	ref	ref	ref	ref	ref	ref
Agriculture	0,701**	0,072	0,556**	0,070	-0,175*	0,079	0,296**	0,073
Education	1,758**	0,079	1,423**	0,076	-0,277**	0,080	-0,565**	0,073
Engineering	1,160**	0,065	1,289**	0,062	0,290**	0,070	1,236**	0,063
Economics	1,105**	0,064	0,366**	0,061	0,000	0,068	0,766**	0,062
Health care	1,197**	0,066	1,237**	0,064	0,180*	0,072	-0,598**	0,064
Behaviour/society	0,830**	0,069	0,840**	0,067	-0,382**	0,074	-1,251**	0,067
Art/language/culture	0,686**	0,085	0,713**	0,083	-0,517**	0,093	-1,203**	0,083
Regional unemployment rate								
Low	ref	ref	ref	ref	ref	ref	ref	ref
Middle	0,094**	0,064	-0,003	0,022	-0,584**	0,025	0,106**	0,025
High	0,066*	0,028	-0,022	0,029	-1,097**	0,032	0,089**	0,033
Regional size of the labour force								
Low	ref	ref	ref	ref	ref	ref	ref	ref
Middle	0,083	0,064	0,101	0,061	0,339**	0,069	0,121	0,066
High	0,026	0,085	-0,074	0,083	-0,014	0,094	0,313**	0,090
Mobility								
Between 0-10 km	ref	ref	ref	ref	ref	ref	ref	ref
Between 10-30 km	-0,012	0,019	0,029	0,020	0,089**	0,023	0,138**	0,022
Between 30-70 km	0,049*	0,023	-0,034	0,023	0,109**	0,027	0,235**	0,026
More than 70 km	0,050	0,029	-0,098**	0,028	0,285**	0,034	0,435**	0,033
Pseudo R-square	0,098		0,115		0,063		0,279	
N	83 032		83 032		83 032		83 032	

<sup>a</sup> Logit effects are statistically controlled for RBA area (region of education).

\* p < 0,05 ; \*\* p < 0,01

Table 4: Combinations between mobility and educational level, unemployment rate and size of the labour force

	Job at the educational level	Job inside own field of study	Permanent job	Fulltime job
<b>Unemployment rate: low (1)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	0,014	-0,063	0,062	0,147**
31-70 km	0,041	-0,194**	-0,067	0,232**
> 70 km	0,233**	-0,361**	-0,091	0,445**
<b>Unemployment rate: middle (1)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	0,062	-0,005	0,150**	0,117**
31-70 km	0,129**	-0,001	0,231**	0,269**
> 70 km	0,018	-0,049	0,348**	0,370**
<b>Unemployment rate: high (1)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	-0,163*	0,046	0,039	0,159**
31-70 km	-0,040	-0,058	0,171*	0,182**
> 70 km	-0,236**	-0,049	0,586**	0,513**
<b>Size labour force: low (2)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	-0,216**	0,044	-0,107	0,112
31-70 km	0,096	0,186**	0,070	0,401**
> 70 km	0,041	0,215**	0,323**	0,603**
<b>Size labour force: middle (2)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	0,054	0,057	0,157**	0,068*
31-70 km	0,012	-0,025	0,221**	0,140**
> 70 km	0,028	-0,198**	0,379**	0,390**
<b>Size labour force: high (2)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	-0,015	-0,013	0,089**	0,234**
31-70 km	0,067	-0,147**	0,109**	0,321**
> 70 km	0,153**	-0,092	0,285**	0,229**
<b>Pre-secondary vocational education (3)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	0,093	-0,015	0,287*	0,345*
31-70 km	0,194	-0,173	0,259*	0,745*
> 70 km	-0,497*	-0,146	0,433*	0,300*
<b>Lower secondary vocational education (3)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	0,192*	-0,103*	-0,037	0,163*
31-70 km	0,084	-0,191*	-0,054	0,221*
> 70 km	-0,115	-0,039	0,929*	0,964*
<b>Upper secondary vocational education (3)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	-0,099*	-0,038	0,026	0,133*
31-70 km	0,044	-0,035	0,032	0,297*
> 70 km	0,107*	-0,078	0,177*	0,557*
<b>Vocation College (3)</b>				
Mobility: 0-10 km	ref	ref	ref	ref
11-30 km	-0,002	0,193*	0,168*	0,048
31-70 km	0,079*	0,039	0,197*	0,081
> 70 km	0,171*	-0,098*	0,186*	0,164*

(1) statistically controlled for age, gender, ethnicity, field of study, RBA area (region of education), size of the labour force and level of education;

(2) statistically controlled for age, gender, ethnicity, field of study, RBA area (region of education), unemployment rate and level of education;

(3) statistically controlled for age, gender, ethnicity, field of study, RBA area (region of education), unemployment rate and size of the labour force.

\* p < 0,05 : \*\* p < 0,01

Table 5: Results of multinomial logit analysis: the role of geographical mobility in the probability of a education- job mismatch<sup>a</sup>

	Between 11-30 km <sup>b</sup>		Between 31-70 km <sup>b</sup>		More than 70 km <sup>b</sup>	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Complete match	0,215**	0,070	0,479**	0,092	0,369**	0,106
Not full-time, rest matches	0,175**	0,073	0,455**	0,095	0,164	0,111
Not permanent, rest matches	0,105	0,078	0,420**	0,100	0,203	0,117
Outside field of study, rest matches	0,165*	0,075	0,649**	0,096	0,479**	0,111
Below educational level, rest matches	0,269**	0,075	0,461**	0,097	0,309**	0,113
Only permanent and full-time matches	0,296**	0,075	0,673**	0,096	0,708**	0,112
Only inside field of study and full-time matches	0,260*	0,105	0,555**	0,127	0,118	0,155
Only inside field of study and permanent matches	0,016	0,083	0,140	0,108	-0,348**	0,133
Only educational level and full-time matches	0,203*	0,091	0,197	0,199	0,299*	0,138
Only educational level and permanent matches	0,227*	0,091	0,316**	0,122	-0,015	0,145
Only educational level and field matches	0,064	0,083	0,401**	0,106	-0,139	0,127
Only full-time matches	0,213*	0,085	0,528**	0,108	-0,002	0,133
Only permanent matches	-0,040	0,082	-0,128	0,110	-0,212	0,131
Only field of study matches	0,149	0,119	0,317*	0,148	-0,317	0,104
Only educational level matches	-0,502**	0,129	-0,151	0,170	-0,662**	0,201
No match	ref		ref		ref	
N=83 032						

<sup>a</sup> Statistically controlled for age, gender, ethnicity, field of study, RBA area (region of education), acquired educational level, unemployment rate and size of the labour force.

<sup>b</sup> Against 0-10 km

\* p < 0,05 : \*\* p < 0,01