Job Mismatches and their Labour Market Effects among School-leavers in Europe

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Editorial Note:

Maarten Wolbers is Senior Researcher at the Research Centre for Education and the Labour Market (ROA), Maastricht University. He is project manager of a large-scale annual survey among school-leavers from secondary education (the RUBS survey). His main research interests include social stratification and school-to-work transitions. The current paper draws on work carried out as part of the project 'Evaluation and Analyses of the LFS 2000 Ad-hoc-module on Transitions from School to Work', co-funded by Eurostat.

Abstract

In this paper, we investigate the determinants of job mismatches with respect to field of education among school-leavers in Europe. In addition, the effects of having a job mismatch on the labour market position of school-leavers are examined. Special attention is paid to cross-country variation in this respect. The data that are used come from the EU LFS 2000 ad hoc module on school-to-work transitions. The results of the empirical analysis show that several individual, job, and structural characteristics affect the likelihood of having a job mismatch. Furthermore, the incidence of job mismatches differs between European countries: in countries where the share of upper secondary education students in school-based vocational education is high, the incidence of job mismatches among school-leavers is higher than in countries where this share is low. With respect to the labour market effects of job mismatches, the most important finding is that school-leavers with a non matching job achieve less occupational status than those with a matching one. This negative effect of job mismatches is smaller in countries where the share of school-based, respectively apprenticeship-type vocational education is higher. Moreover, the analysis reveals that school-leavers with a job mismatch use adjustment strategies to improve fit. A first strategy refers to job search activities: school-leavers with a non matching job more frequently look for another job than school-leavers with a matching job. In countries where the share of school-based vocational education is high, the effect of having a job mismatch on the likelihood of looking for another job is smaller than in countries where this share is low. A second adjustment strategy concerns training participation: on average, there is a negative effect of having a job mismatch on the probability of participating in continuous vocational training. However, in countries where the share of school-based, respectively apprenticeship-type vocational education is low, the impact of having a job mismatch on training participation is positive.

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1 Introduction

In modern societies, education is probably the most important characteristic in the allocation and selection process on the labour market. Labour market theories differ, however, about the mechanisms by which educated persons are allocated to jobs. According to human capital theory (Becker, 1964) the skills acquired in education represent human capital. Investments in human capital are useful, as long as they lead to higher productivity on the labour market. Employers value labour productivity by offering the highest wages to those individuals who have obtained most human capital. Job competition theory (Thurow, 1975), on the other hand, suggests that wages are determined primarily by job characteristics and not by individual characteristics (i.e. the productivity of workers). Employers seek to employ the best available candidate for their vacancy, at the least training costs. They use educational qualifications as a signal for trainability (Spence, 1974). For that purpose, job seekers are ranked in an imaginary labour queue according to their expected training costs, and employers match this queue of applicants to a queue of vacant jobs that are classified on the basis of their level (Thurow, 1975; Sørensen and Kalleberg, 1981). The best positions go to the individuals with the lowest training costs (i.e. the highest qualifications), and education is regarded as a positional good (Hirsch, 1977; Ultee, 1980).

A combination of both theories is job matching theory (Sattinger, 1993) which states that the quality of a job match, i.e. the degree of fit between required and acquired skills, determines the productivity level and earnings in a job. If an employee works in a non matching job, his acquired skills are underutilized. This imposes a limitation on his labour productivity, resulting in lower wages. The allocation of workers over jobs is optimal if every worker is matched to a job in which he performs relatively the best compared to all other workers. The incidence of job mismatches, then, is explained by differences in the shares of vacant jobs of a given level and available workers with adequate educational qualifications.

Most of the research addressing the topic of job mismatches refers to overeducation. (see among others Borghans and De Grip, 2000; Clogg and Shockey, 1984; Freeman, 1976; Groot and Maasen van den Brink, 2000; Halaby, 1994; Hartog and Oosterbeek, 1988; Smith, 1986; Wolbers, De Graaf and Ultee, 2001). Workers are overeducated if the level of education they have acquired exceeds the level of education required to perform their job adequately. Far less attention is paid to job mismatches referring to the field of education obtained (exceptions are Witte and Kalleberg, 1995; Solga and Konietzka, 1999; Van de Werfhorst, 2001). Moreover, the minor attention to job mismatches with regard to field of education is based on empirical studies that consider only one single country. This paper tries to fill in this gap by analysing job mismatches with regard to field of education from a cross-country perspective. We investigate to what extent school-leavers in Europe are working in jobs that do not match their field of education attended in initial education. First, the determinants of job mismatches are studied. Next, the effects of job mismatches on the labour market position of school-leavers are examined. The data that are used originate from the EU LFS 2000 ad hoc module on

school-to-work transitions. In this dataset the virtues of large-scale Labour Force Surveys (LFS) with special topical information on the transition from school to work are combined. The analysis covers thirteen European countries for which reliable data are available.

The paper is structured as follows. In the second section we derive hypotheses on the determinants of job mismatches among school-leavers in Europe. In addition, we formulate hypotheses on the consequences of job mismatches for the labour market position of school-leavers. Special attention is paid to cross-country differences in this respect. The third section describes the data and variables that are used in analysing job mismatches. The fourth section presents the determinants of job mismatches among school-leavers in Europe. The fifth section looks at the consequences of job mismatches for three labour market outcomes of school-leavers: occupational status attainment, job search activities, and participation in continuous vocational training. The sixth section discusses the main conclusions of the paper.

2   Theoretical background

2.1   Determinants of job mismatches

The transition from school to work is often regarded as a 'rite of passage' in which young people are introduced to the world of labour. This transition process takes place in stages and it is characterized as a turbulent and uncertain period (OECD, 1998; Kerckhoff, 2000). First of all, school-leavers have to compete for the available jobs with those who have already gained a position on the labour market. Their lack of work experience forces them to face unemployment quite often. Secondly, a relatively large number of school-leavers ends up in jobs that do not match their educational qualifications very well. These job mismatches are the result of incomplete information on the abilities of school-leavers and the characteristics of jobs offered by employers. Logan (1996) refers to this as a two-sided matching game. By changing jobs or (re-)training, school-leavers and employers attempt to achieve a better job match. Job mismatches then can be considered as a temporary position that allows a transition to a better one (Sicherman, 1991).

With regard to the determinants of job mismatches it is obvious that education plays a key role. Three aspects of educational qualifications are important here. First of all, the amount of specific human capital matters. It is assumed that school-leavers from vocational education have acquired more specific human capital needed to perform adequately on the work floor than those who have completed general education only and, therefore, we hypothesize that the former group of school-leavers is less likely to be employed in a non matching job. The provision of vocational education (school-based versus workplace-based vocational education, or a combination of both in the form of apprenticeship training) may have additional effects on the likelihood of preventing a job mismatch. It is assumed that workplace-based and – to a somewhat lesser extent – apprenticeship-type vocational education decreases the selection and allocation costs for employers: it offers them a opportunity to

teach students skills to the firm's specific needs and to screen them during their training. From the point of view of the school-leavers, workplace-based and apprenticeship-type vocational education offers them an advantage in the matching process as well. They have already a (temporary) position in a firm and can thus more easily get access to a position that fits their training than leavers from school-based vocational education.

Secondly, the extent to which school-leavers from vocational education are able to find a job that matches their training experiences differs between vocational programmes. Here the relative degree to which the curriculum of the educational programme provides the required knowledge and skills matters. It is expected that the more a study specifically prepares students for a few particular jobs, the closer the fit between education and employment. In vocational programmes that are mainly occupation-specific – irrespective of how these programmes are provided by the education system –, school-leavers have specific skills, which prepare them for a few, particular jobs. Good examples are the fields education and health/welfare, where a close link exists between the field of education left and the occupation found. Both fields of education prepare for a small number of professions such as teacher or medical doctor; occupations that are accessible only with the right certificate.

Thirdly, the level of education attained by school-leavers determines the likelihood of being employed in a non matching job. In a situation of overeducation, the oversupply of highly educated school-leavers may lead to a process of bumping down as these higher educated start competing with lower educated school-leavers (Borghans and De Grip, 2000). As a result, higher educated school-leavers find work in a related field, but at a lower job level. For lower educated school-leavers, however, this strategy is less useful, since their opportunities to switch to an even lower level job are restricted, simply due to the fewer alternatives that exist for them. Therefore, we expect that the level of education attained by school-leavers is negatively associated with the likelihood of being in non matching job.

In addition to educational qualifications, other individual characteristics affect the likelihood of having a job mismatch. Gender differences on the labour market are found along a large number of dimensions. In general, women have less favourable prospects on the labour market than men (Blossfeld and Hakim, 1997). Their unemployment risk is larger, their opportunities for career mobility are smaller, their training participation is lower, their work life is more often interrupted by family obligations, and so forth. It is likely that these gender differences also play a role with regard to job mismatches. Since women's employment chances are lower, they may be more easily inclined to accept a job outside their own occupational domain. Also, since their mobility rates are lower, their probability of moving from a non matching job to a better fitting one is smaller. We suppose therefore that women are more often employed in a job that does not match their field of education than men.

Furthermore, we hypothesize that, other things being equal, older workers are more likely to be in a in job that does not match the field of education attended than younger workers. Witte and Kalleberg (1995) mention two arguments to expect an increasing likelihood of having a job mismatch with age. First of all, the skills obtained in initial education may become obsolete, mainly due to changing

technology (Miles and Ducatel, 1994). Secondly, the relative value of vocational qualifications attended in initial education in the total amount of human capital acquired decreases over the life-course, since other forms of human capital (work experience, on-the-job-training) accumulate with age.

Concerning job tenure, we expect to find a negative relationship with the likelihood of having a job mismatch. The longer a school-leaver is employed in the same job, the higher the probability that deficiencies in initial education in the meantime are compensated for by work experience and/or additional training. However, the causal order may also be the other way around: if a school-leaver has a job that does not match with the field of education, then there is a strong incentive to change to another job that fits better.

Besides job tenure, the nature of the employment contract has an effect on the likelihood of having a job mismatch. In general, the labour market opportunities for workers in a temporary and/or part-time job are worse than for those in a permanent and/or full-time position. An important reason for the less favourable labour market position of employees with a temporary and/or part-time contract is that it is less profitable for employers to invest in such wokers, because of the shorter pay-off period (Psacharopoulos, 1987). In the case of part-time employment, the returns to the investment must be recovered in a smaller number of hours. In the case of temporary employment employers are more reluctant to invest, because of the greater risk of employees leaving, resulting in a lower expected pay-off period. It is assumed that these investment arguments of employers also hold with respect to job mismatches – just as is the case with other labour market opportunities. In addition to this, temporary and/or part-time employment often leads to a loss of productive skills and a lack of relevant work experience. Hence, it is possible that job mismatches among temporary and/or part-time workers are used as a compensation for that (Groot and Maassen van den Brink, 1996). Based on these arguments, we presume that school-leavers with a temporary and/or part-time contract have more often a job mismatch than school-leavers with a permanent and/or full-time contract.

Apart from individual and job characteristics, various labour market structures matter. First of all, fluctuations in the business cycle are expected to have an impact on the likelihood of being employed in a non matching job. It is assumed that school-leavers who enter the labour market during an economic recession, suffer disadvantage with respect to the chance of finding a job that fits with the field of education attended. High unemployment makes that school-leavers adjust their goals and, therefore, more easily switch to jobs outside their field of education, instead of carry on searching for a job which is better suited to the skills acquired through the field of education.

Another kind of labour market structure refers to the organization in which a school-leaver is working. With respect to the effect of firm size we assume that the likelihood of having a job mismatch decreases with firm size. Main argument for this hypothesis is that larger firms can provide more opportunities for individuals to find a job that matches their field of education. Moreover, larger firms invest considerably more in the training of their employees than smaller ones (OECD, 1991) so that initial skill deficiencies can easily be compensated for in the meantime.

We also expect that the incidence of job mismatches differs between the private and public sector. The argument for this hypothesis is rather simple. Since it is assumed that school-leavers from an educational programme in education and health/welfare are less often having a job mismatch, and because the public sector comprises all educational and health care organizations, our expectation is that the incidence of job mismatches regarding field of education is lower in the public sector than in the private sector. With respect to overeducation, similar empirical evidence is found in Van der Meer and Glebbeek (2001).

Last but not least, differences between countries are expected with respect to job mismatches among school-leavers. Cross-national variation with regard to institutional arrangements in education and training systems affect the integration process of young people into the labour market (Gangl, forthcoming; Van der Velden and Wolbers, forthcoming). Countries differ in the extent to which there is an institutional link between the education and training system on the one hand and the employment system on the other (Allmendinger, 1989; Hannan, Raffe, and Smyth 1997; Kerckhoff, 1995; Müller and Shavit 1998). Basically, this debate refers to the extent to which education systems differentiate between general and vocational education. Some countries offer mainly general education. In such countries, education is weakly related to the workplace and vocational training is primarily obtained on-the-job. In other countries, occupation-specific skills are taught in the education and training system. Here, the link between the education and employment system is much closer. The institutional structure of vocational education, however, may differ between these countries. In some countries, the teaching of vocational skills is shared between vocational schools and the workplace, such as with the apprenticeship-type vocational education in Germany ('dual system'). In other countries, by contrast, the provision of vocational skills is mainly school-based. It is supposed that in countries with a strong orientation towards vocational education, the association between educational qualifications and labour market outcomes is more tightened, and subsequently, the incidence of job mismatches is lower. This leads to the hypothesis that the more vocational oriented the education system is in a country, the less likely it is that within this country school-leavers are employed in a non matching job.

2.2 Labour market effects of job mismatches

In the literature, job mismatches are reported to have serious effects on a number of labour market outcomes. Most of the economic research has been developed regarding the effect of overeducation on wages (see Hartog, 2000). The empirical results suggest that individuals working in jobs for which a lower level of education is required than actually obtained (i.e. overeducated persons) earn less than individuals with adequate employment. Concerning job mismatches with regard to field of education there are wage effects as well: individuals working in their own field of education have higher wages than those working outside their field of education (Van de Werfhorst, 2001). Both findings are in line with the earlier mentioned job matching theory (Sattinger, 1993). In most social stratification research, however, labour market outcomes are assessed by measuring occupational rewards in terms of social status or prestige instead of earnings. The division of labour is the kernel of social inequality and

occupation, therefore, is the main dimension of social stratification. In this paper we adopt this sociological approach by looking at occupational status attainment.[1] We hypothesize that having a job mismatch coincides with lower occupational returns on the labour market.

Other labour market effects of job mismatches in particular deal with adjustment strategies. In fact, two adjustment strategies are possible for school-leavers who have a job mismatch. A first strategy to improve fit, is looking for another job. Job search theory indicates that school-leavers will continue to change jobs until an optimal match has been achieved (Jovanovic, 1979; Tuma, 1985). For that reason, it is expected that school-leavers with a non matching job are more often looking for another job than those with a matching one. The reasons for this job search are probably diverse, but it is assumed that job dissatisfaction is one of the main reasons for the job search behaviour of school-leavers who have a job mismatch (Allen and Van der Velden, 2001). Job mismatches are an important cause of job dissatisfaction (Tsang and Levin, 1985; Burris, 1985), which provide an incentive for school-leavers to change jobs, hopefully leading to position that better matches their knowledge and skills.

A second strategy to deal with job mismatches is to invest in additional training in order to compensate for skill deficiencies in initial education. It is assumed that if the field of education obtained by school-leavers corresponds to the field which is required on the work floor, the need for further training is less (Barron, Black and Loewenstein, 1989; Van Smoorenburg and Van der Velden, 2000). Hence, we formulate the hypothesis that school-leavers who work outside their field of education are more likely to participate in additional training than school-leavers who have a job in their own field.

Concerning cross-country variation in the labour market effects of job mismatches, two contrasting hypotheses can be formulated. On the one hand, it can be expected that in countries characterized by a weak association between education and work the consequences of having a job mismatch for the labour market position of school-leavers are smaller than in countries where education is strongly related to the labour market. With respect to occupational returns, it is thus expected that for school-leavers with a job mismatch in a country where the education system is mainly vocationally oriented, the loss in occupational status is larger than for corresponding school-leavers in a country that mainly provides general education. The reason why school-leavers with a job mismatch are less 'penalized' in countries where vocational education is less developed, lies in the fact that in these countries educational qualifications obtained in initial education are used primarily as a screening device to determine the trainability of school-leavers (Arrow, 1973; Spence, 1974). By means of on-the-job-training occupation-specific skills are acquired that make promotion to a better fitting job possible. For that reason, we expect that in countries where the education system is rather general than vocational,

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[1]   Also from a more pragmatic point of view the emphasis here is on occupational status attainment. Information on income is (for most countries) not available in the data set that is used in this paper, and therefore, occupational status is used as a proxy for wages to estimate the effect of job mismatches.

the likelihood of participation in continuous vocational training and job search activities among school-leavers with a job mismatch is higher.

On the other hand, it may be the case that in countries with a tight education-employment relationship the labour market effects of job mismatches are smaller than in countries where education is loosely linked to the labour market. The rationale behind this hypothesis lies in the safety net function of vocational education (Shavit and Müller, 2000a, 2000b). Vocational education appears to be more effective in countries where it is well focused, specific rather than general, and relevant to the skills needed on the work floor. Therefore, it is assumed that the loss in occupational status among school-leavers with a job mismatch is smaller here and adjustment strategies to improve fit are less common.

3   Research design

3.1   Data

The data that are used for the empirical analysis come from the EU LFS 2000 ad hoc module on school-to-work transitions. This data set combines information from the original Labour Force Surveys (LFS) with special topical information on the transition from school to working life. The analysis that follows, covers thirteen European countries (Austria, Belgium, Denmark, Spain, Finland, France, Greece, Hungary, Italy, Luxembourg, the Netherlands, Sweden, and Slovenia) for which reliable data are available.[2] School-leavers are defined as those individuals aged 15-35 years old, who have once left initial education within the past five (Finland, Luxembourg, the Netherlands, and Sweden) or ten (all other countries) years. Since this definition implies that people who are in initial education at the time of the survey, but who have already left education (at least once) in the past five or ten years (for more than one year), belong to the selection of school-leavers, a modified ILO definition (ILO, 1990) is applied to define the employed labour force. All people who are employed at the time of the survey, but who are in initial education at the same time, are excluded from the active labour force. Furthermore, the sample is restricted to persons who have attended a vocational programme before leaving initial education for the first time. Since lower secondary education is considered as general in nature, it does not make sense to study whether those who left initial education with a diploma at the level of ISCED1-2 have a (non) matching job and, therefore, all school-leavers from this level of education are excluded from the analysis. For the same reason, school-leavers from upper secondary education and graduates from tertiary education with a general programme are not analysed. At the ISCED3-4 level this concerns 16 per cent of the school-leavers (in particular those from upper general secondary education which prepares for

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[2]   Data from Ireland, Lithuania, Latvia, Portugal, Romania, Slovakia, and the United Kingdom are excluded, due to small sample sizes and/or serious problems with measurement or comparability of one or more crucial variables of interest.

tertiary education); at the ISCED5-6 level it concerns only 1 per cent of the graduates. We also exclude self-employed persons and family workers (i.e. we analyse only persons in paid employment). Finally, armed forces are not analysed to be sure that military personnel is not mixed up with school-leavers who are in military service. Considering these selections and after list wise deletion of respondents for whom information is missing on any of the variables used, an analytic sample of 36,268 school-leavers remains.

3.2   Measurement of variables

To determine the fit between the field of education attended by school-leavers in initial education and the job found on the labour market, an objective measure is used. A job mismatch is defined as a discrepancy between the current occupation a school-leaver is working in and the field of education attended. Individuals working outside their field of education are treated as school-leavers with a non matching job. In Table A1 of the Appendix an overview is given of the occupations that match to a particular field of education. Basic criterion used when assigning occupational codes to a field of education is the assumed congruence of skills acquired through the field of education and those needed on the job. All other combinations between field of education and occupation are considered as job mismatches.

To investigate the consequences of job mismatches for the labour market position of school-leavers we analyse three labour market outcomes. First of all, the occupational status of the current job is used to estimate the effect of job mismatches. The occupational status of a job is determined on the basis of the International Socio-Economic Index (ISEI), which represents an internationally compa-rable measure of occupational status (Ganzeboom, De Graaf and Treiman 1992; Ganzeboom and Treiman 1996). Status scores were assigned to occupational titles (based on 3-digit information from the ISCO-88 classification) according to a scale that ranges from 16 for occupations with the lowest status to 90 for occupations with the highest status. Secondly, we study the effect of job mismatches on job search activities. For this purpose, information is used on whether or not school-leavers had actively looked for another job during the last four weeks before the survey. Thirdly, the effect of job mismatches on training participation is analysed. Training participation of school-leavers is restricted here to participation in continuous vocational training to advance or change the working career (i.e. participation in initial education is excluded) in the last four weeks before the survey.

As independent variables, the following characteristics are included into the analysis. To control for differences in educational attainment, we introduce the level and field of education. Level of education concers the highest level of education successfully completed when leaving initial education. It is measured in terms of ISCED 1997 (see OECD (1999) for more details). We distinguish two levels: upper secondary and post-secondary, non tertiary education (ISCED3-4) and tertiary education (IS-CED5-6). Field of education refers to the latest educational programme attended before leaving initial education. This definition implies that field of education does not necessarily relates to the highest

educational level successfully completed.[3] Eight fields are distinguished (see Andersson and Olsson (1999) for more information): 1) education; 2) humanities and arts; 3) social sciences, business and law; 4) sciences; 5) engineering, manufacturing and construction; 6) agriculture; 7) health and welfare; 8) services. In addition to the measurement of the level and field of education, a variable is included that determines whether a school-leaver has obtained a (non tertiary) vocational qualification or not.[4] For those who have obtained a vocational qualification, a further distinction is made between a school-based, workplace-based or apprenticeship-type vocational qualification. School-leavers for whom adequate information is not available to make such a distinction, are assigned to the category of 'type unknown'.

Other individual characteristics that are taken into account, are gender (female versus male) and age. The latter variable is measured in age groups (15-19; 20-24; 25-29; 30-35).

To determine the impact of job characteristics, we use three variables. First of all, job tenure is taken into account (measured in years). Job tenure is based on the year in which a school-leaver started working in his/her current job. Furthermore, we include information on the nature of the work contract (permanency of the job and full-time versus part-time distinction). The permanency of a job is measured by making the contrast between permanent and temporary jobs. A temporary position reflects a job with a contract of limited duration. The part-time versus full-time distinction is built on the subjective evaluation of the individual and not on the actual number of hours worked per week.

Labour market circumstances when leaving education are controlled for by using the aggregate unemployment level in the year of entry. The required unemployment figures are published in OECD (2001).[5]

Two organizational characteristics are included in the analysis. We first look at the size of the firm in which school-leavers work. We distinguish small (1-10 persons) and larger firms (11+ persons). Secondly, the economic sector is operationalized by adding a dummy variable that represents individuals working in the public sector.

Finally, differences between countries are taken into account. First, we use a set country dummies to determine cross-country variation. Then, we investigate to what extent the variation found between the countries can be explained by national differences in the participation of upper secondary education students in vocational education. These differences are indicated by two measures (see OECD, 2000: Table 2.2): the share of school-based, respectively apprenticeship-type vocational education in a country.

A statistical description of the variables used in the analysis can be found in Table 1.

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[3] Only in Denmark and Italy this is the case, where information on field of education is related to the highest level of education completed.
[4] Once again, this piece of information does not necessarily refer to the highest qualification obtained.
[5] The unemployment data from Slovenia are based on ILO (2001).

Table 1.   Statistical description of the variables used in the analysis (N = 36,268)

Variable	minimum	maximum	mean	standard deviation
Job mismatch (vs. job match)	0.000	1.000	0.361	0.480
Occupational status (ISEI)	16.000	85.000	46.381	15.095
Looking for another job (vs. not looking)	0.000	1.000	0.099	0.299
Participating in continuous training (vs. not participating)	0.000	1.000	0.051	0.221
ISCED3-4 (vs. ISCED5-6)	0.000	1.000	0.555	0.497
Field of education (vs. education)				
Humanities, arts	0.000	1.000	0.064	0.244
Social sciences, business, law	0.000	1.000	0.331	0.471
Sciences	0.000	1.000	0.065	0.247
Engineering, manufacturing, construction	0.000	1.000	0.297	0.457
Agriculture	0.000	1.000	0.025	0.155
Health, welfare	0.000	1.000	0.087	0.282
Services	0.000	1.000	0.083	0.276
Vocational (non tertiary) qualification (vs. no)				
Yes, school-based	0.000	1.000	0.103	0.304
Yes, workplace-based	0.000	1.000	0.002	0.045
Yes, apprenticeship-type	0.000	1.000	0.035	0.185
Yes, type unknown	0.000	1.000	0.318	0.466
Female (vs. male)	0.000	1.000	0.504	0.500
Age (vs. 15-19)				
20-24	0.000	1.000	0.327	0.469
25-29	0.000	1.000	0.477	0.500
30-35	0.000	1.000	0.173	0.378
Job tenure (years)	0.000	10.000	2.713	2.856
Temporary job (vs. permanent job)	0.000	1.000	0.244	0.429
Part-time job (vs. full-time job)	0.000	1.000	0.098	0.297
Unemployment level in entry year (%)	2.600	23.700	11.280	4.411
Larger firm (vs. small firm)	0.000	1.000	0.691	0.462
Public sector (vs. private sector)	0.000	1.000	0.235	0.424
Country (vs. the Netherlands)				
Austria	0.000	1.000	0.055	0.228
Belgium	0.000	1.000	0.039	0.192
Denmark	0.000	1.000	0.027	0.162
Spain	0.000	1.000	0.156	0.362
Finland	0.000	1.000	0.043	0.204
France	0.000	1.000	0.246	0.431
Greece	0.000	1.000	0.058	0.233
Hungary	0.000	1.000	0.116	0.321
Italy	0.000	1.000	0.174	0.379
Luxembourg	0.000	1.000	0.004	0.060
Sweden	0.000	1.000	0.030	0.170
Slovenia	0.000	1.000	0.033	0.178
Share of school-based vocational education (%/10)	1.100	7.200	4.879	1.690
Share of apprenticeship-type vocational education (%/10)	0.000	4.400	0.739	1.165

Source: EU LFS 2000 ad hoc module on school-to-work transitions

4   Determinants of job mismatches

Table 2 displays the results of logistic regression analysis of having a job mismatch. Model 1 shows that as expected young people who left school at the ISCED3-4 level have more often a job mismatch than those who graduated at the ISCED5-6 level. The implied odds ratio is 2.119 ($e^{0.751}$). With respect to field of education, it is found that school-leavers from humanities/arts, agriculture, and sciences have more frequently a job mismatch than school-leavers from education (i.e. reference category). Those from engineering/manufacturing/construction, health/welfare, social sciences/business/law, and services, in contrast, have a higher likelihood of being employed in a non matching job. The attainment of a (non tertiary) vocational qualification has hardly any significant effect on the odds of having a job mismatch. Only school-leavers who have obtained a vocational qualification, but for whom information on the type of the vocational qualification is missing, are somewhat more often employed in a non matching job. Furthermore, the results of model 1 indicate that men are more often employed in a job that does not fit the field of education attended than women. Also, older workers are more likely to be working in a non matching job than younger workers.

In addition to these individual factors, job characteristics matter. First of all, job tenure has a negative effect on the likelihood of being employed in a non matching job: school-leavers who work for a long time now in their current job have less often a job mismatch than school-leavers who hold their current job only recently. Secondly, school-leavers who have a temporary contract are more often in a job that does not match their field of education attended than those with a permanent contract. Thirdly, school-leavers with a part-time job have more often a job mismatch than those who work full-time.

With respect to structural circumstances it is found in model 1 that the aggregate unemployment rate in the year of labour market entry has a significant positive effect on the odds of having a job mismatch for school-leavers. This finding indicates that in times of high unemployment school-leavers have to accept more often a job that does not fit their field of education attended in initial education than in times of low unemployment. Also the structure of the organization a school-leaver is working in affects the odds of having a job mismatch. First of all, in larger firms the likelihood of having a non matching job is lower than small ones. Moreover, school-leavers who work in the public sector are less likely to be employed in a non matching job than those who work in the private sector.

Model 2 presents cross-country differences in the odds of having a job mismatch. The country dummies show that in Italy, Denmark, Greece, Hungary, and Sweden the incidence of job mismatches among school-leavers is significantly higher than in the Netherlands (i.e. reference category). In Luxembourg, on the other contrary, the odds of having a job mismatch for school-leavers is significantly lower. All other countries show results that do not deviate significantly from the Netherlands.

Table 2. **Results of logistic regression analysis of having a job mismatch: logit effects (N = 36,268)**

Model	1	2	3
Constant	-0.884**	-1.068**	-1.078**
ISCED3-4 (vs. ISCED5-6)	0.751**	0.713**	0.720**
Field of education (vs. education)			
Humanities, arts	0.992**	0.996**	1.001**
Social sciences, business, law	-0.748**	-0.713**	-0.723**
Sciences	0.383**	0.409**	0.396**
Engineering, manufacturing, construction	-1.075**	-1.036**	-1.059**
Agriculture	0.551**	0.604**	0.580**
Health, welfare	-0.885**	-0.813**	-0.857**
Services	-0.717**	-0.688**	-0.706**
Vocational (non tertiary) qualification (vs. no)			
Yes, school-based	0.001	0.076	0.048
Yes, workplace-based	-0.251	-0.148	-0.230
Yes, apprenticeship-type	0.075	0.223*	0.171*
Yes, type unknown	0.090**	-0.023	0.078*
Female (vs. male)	-0.059*	-0.064*	-0.060*
Age (vs. 15-19)			
20-24	0.195*	0.171*	0.189*
25-29	0.274**	0.229**	0.273**
30-35	0.301**	0.208*	0.299**
Job tenure (years)	-0.033**	-0.031**	-0.032**
Temporary job (vs. permanent job)	0.165**	0.195**	0.180**
Part-time job (vs. full-time job)	0.160**	0.197**	0.168**
Unemployment level in entry year (%)	0.014**	0.012	0.014**
Larger firm (vs. small firm)	-0.149**	-0.122**	-0.148**
Public sector (vs. private sector)	-0.246**	-0.249**	-0.249**
Country (vs. the Netherlands)			
Austria		0.027	
Belgium		0.180	
Denmark		0.495**	
Spain		0.178	
Finland		-0.001	
France		0.138	
Greece		0.336**	
Hungary		0.247*	
Italy		0.516**	
Luxembourg		-0.654**	
Sweden		0.245*	
Slovenia		0.064	
Share of school-based vocational education (%/10)			0.040**
Share of apprenticeship-type vocational education (%/10)			-0.015
Model Chi^2	3,391**	3,561**	3,430**
Df	22	34	24
Pseudo R^2	0.122	0.128	0.124

* = p < 0.05; ** = p < 0.01

Source: EU LFS 2000 ad hoc module on school-to-work transitions

In model 3 we test to what extent the variation found between the countries can be explained by national differences in the participation of upper secondary education students in vocational education. These differences are measured by two indicators: the share of school-based vocational education and the share of apprenticeship-type vocational education. By comparing the fit of the models 1, 2, and 3, it can be calculated that almost one quarter of the total cross-country variation can be attributed to both country characteristics ((3,430 - 3,391) / (3,561 - 3,391) = 0.229). In Figure 1 the impact of these country characteristics is visualized. The regression lines show the estimated effects of model 3, whereas the dots represent the observed percentages for each country separately.

The upper part of this figure shows that in countries where the percentage of upper secondary education students in school-based vocational education is large, the incidence of job mismatches among school-leavers is higher than in countries where the percentage of upper secondary education students in school-based vocational education is low. According to model 3 of Table 2 this effect is significant. With respect to the share of upper secondary education students in an apprenticeship, it seems that the higher this percentage is in a country, the lower the incidence of job mismatches among school-leavers in this country (see the lower part of Figure 1). This effect, however, is not significant.

5 Labour market effects of job mismatches

5.1 Occupational status attainment

In Table 3 the results of linear regression analysis of achieved occupational status are presented. Model 1 shows that school-leavers with a job mismatch attain significantly less occupational status than school-leavers with a matching job. The difference is 5.021 status points. Once other characteristics are taken into account, the lower achieved occupational status for those with a job mismatch remains significant (see model 2). Now, the difference in occupational status is 4.207 points. Of these other characteristics, level of education has a strong positive impact on the occupational status achieved. School-leavers with ISCED3-4 level achieve 11.163 points less occupational status than graduates from ISCED5-6. Differences between fields of education exist as well. Graduates who attended a degree in sciences achieve significantly more occupational status than those from education. School-leavers from health/welfare, services, agriculture, and engineering/manufacturing/construction, in contrast, receive less occupational status for the jobs they hold. Furthermore, age differences in status attainment are present: older workers hold jobs with more occupational status than younger workers.

Figure 1   **The relationship between the share of school-based, respectively apprenticeship-type vocational education in a country and the likelihood of having a job mismatch**
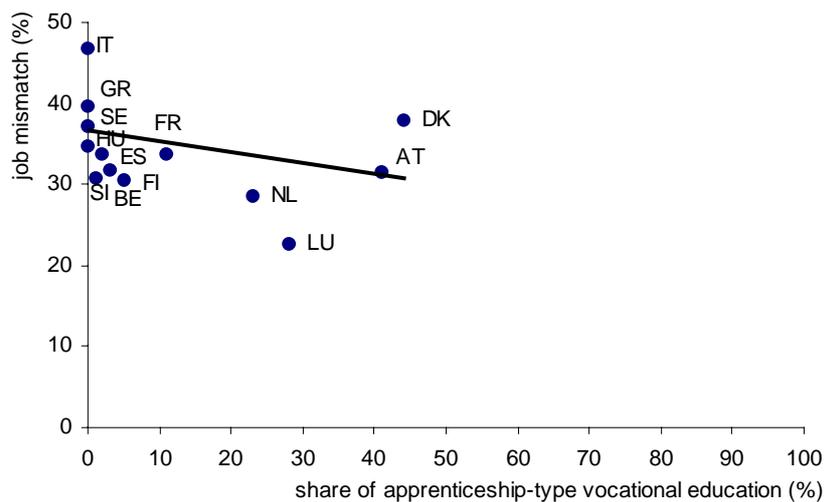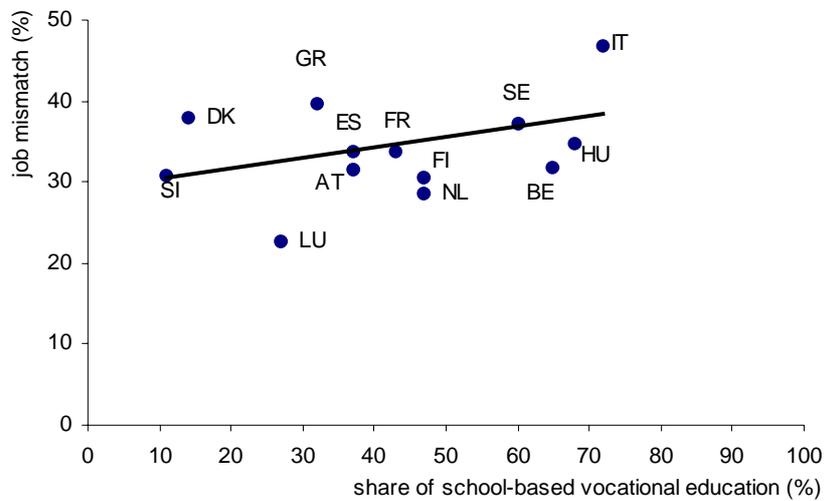
Source: EU LFS 2000 ad hoc module on school-to-work transitions

With regard to job characteristics, it is found that job tenure has a negative effect on achieved occupational status. This finding can be interpreted as follows: the longer someone stays in his/her current job, the less likely it is that he/she will be promoted to a job with more occupational status. The nature of the job contract has a negative impact on achieved occupational status as well. School-leavers with a temporary and/or part-time job have jobs with less occupational status than school-leavers with a permanent and/or full-time job. The estimated difference in status is 1.904 and 2.370 points respectively.

Table 3   Results of linear regression analysis of achieved occupational status (ISEI):
unstandardized regression effects (N = 36,268)

Model	1	2	3	4	5
Constant	48.193**	57.598**	58.013**	54.667**	56.532**
Job mismatch (vs. job match)	-5.021**	-4.207**	-4.397**	-4.286**	-9.541**
ISCED3-4 (vs. ISCED5-6)		-11.163**	-12.569**	-11.628**	-11.619**
Field of education (vs. education)					
Humanities, arts		0.624	1.440**	0.763	0.748
Social sciences, business, law		-0.271	0.783*	0.102	0.011
Sciences		3.813**	4.895**	4.008**	3.961**
Engineering, manufacturing, construction		-4.643**	-3.732**	-4.398**	-4.500**
Agriculture		-4.975**	-3.908**	-4.528**	-4.690**
Health, welfare		-6.172**	-4.919**	-5.768**	-5.795**
Services		-5.529**	-4.942**	-5.346**	-5.474**
Vocational (non tertiary) qualification (vs. no)					
Yes, school-based		0.201	0.054	0.868**	.984**
Yes, workplace-based		-1.437	-1.859	-1.116	-1.073
Yes, apprenticeship-type		-2.979**	-4.598**	-1.554**	-1.599**
Yes, type unknown		-1.162**	-0.054	-1.343**	-1.431**
Female (vs. male)		0.087	0.010	0.072	0.050
Age (vs. 15-19)					
20-24		4.161**	3.528**	4.080**	4.115**
25-29		7.081**	6.544**	7.082**	7.090**
30-35		10.427**	9.794**	10.414**	10.366**
Job tenure (years)		-0.200**	-0.238**	-0.190**	-0.185**
Temporary job (vs. permanent job)		-1.904**	-1.535**	-1.687**	-1.646**
Part-time job (vs. full-time job)		-2.370**	-1.781**	-2.262**	-2.255**
Unemployment level in entry year (%)		-0.343**	-0.153**	-0.346**	-0.348**
Larger firm (vs. small firm)		-0.051	0.312*	-0.029	-0.049
Public sector (vs. private sector)		2.859**	2.825**	2.821**	2.767**
Country (vs. the Netherlands)					
Austria			1.516*		
Belgium			-3.351**		
Denmark			-4.773**		
Spain			-4.561**		
Finland			-2.049**		
France			-5.803**		
Greece			-0.939		
Hungary			-0.496		
Italy			0.322		
Luxembourg			-2.499*		
Sweden			-4.141**		
Slovenia			-0.953		
Share of school-based vocational education (%/10)				0.609**	0.294**
Share of apprenticeship-type vocational education (%/10)				-0.219**	-0.579**
Interactions with job mismatch (vs. job match)					
Share of school-based vocational education (%/10)					0.902**
Share of apprenticeship-type vocational education (%/10)					1.112**
F	950**	844**	606**	794**	742**
Df	1	23	35	25	27
Adjusted R^2	0.025	0.348	0.369	0.353	0.356

* = $p < 0.05$; ** = $p < 0.01$

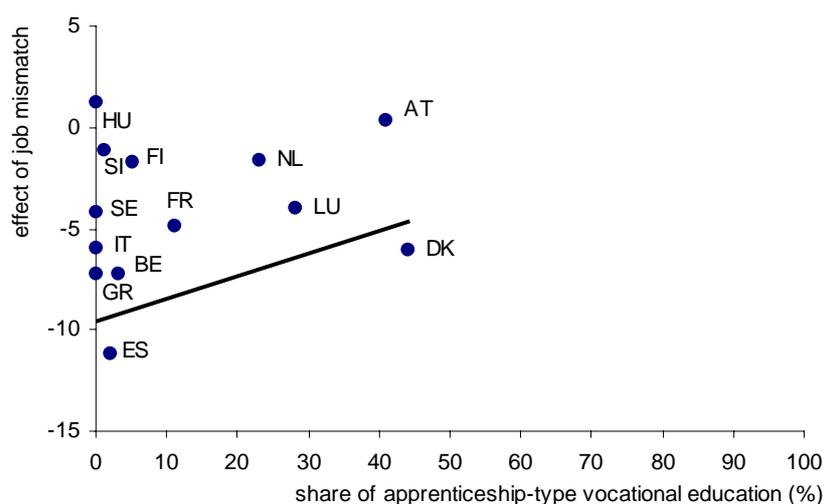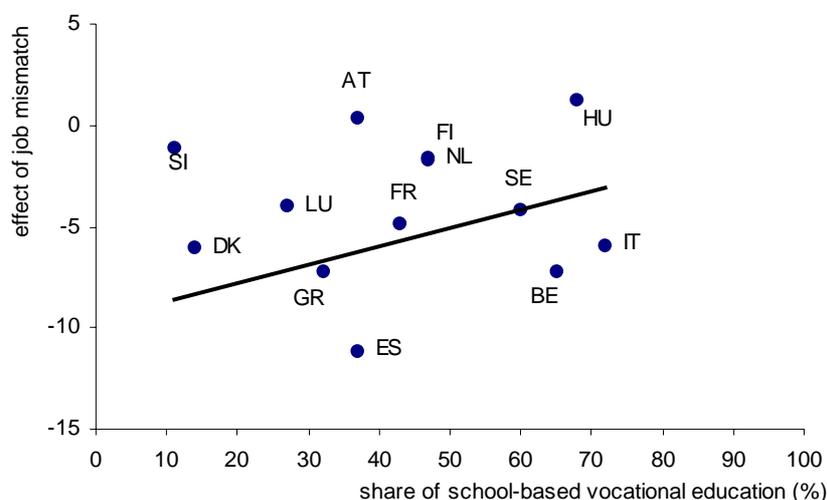*Source: EU LFS 2000 ad hoc module on school-to-work transitions*

School-leavers who enter the labour market during an economic recession achieve less occupational status with their job than school-leavers who start working in a period of an economic upswing. The estimated regression coefficient indicates that an increase of the aggregate unemployment rate with ten percent, coincides with a loss in occupational status of more than 3 points (10 * -0.343 = -3.430). Furthermore, school-leavers who work in the public sector attain significantly more occupational status than school-leavers who are employed in the private sector.

Model 3 displays that the average occupational status achieved by school-leavers differs significantly between countries. In Austria, school-leavers attain most occupational status with their jobs; in France they achieve the least. The difference in the average achieved occupational status between these countries amounts to over seven status points (1.516 + 5.803 = 7.319).

In model 4 the country dummies have been replaced by the two country characteristics measuring national differences in the participation of upper secondary education students in vocational education. The model shows that in countries with a high share of school-based vocational education the average occupational status achieved by school-leavers is higher than in countries with a low share of school-based vocational education. With respect to the share of apprenticeship-type vocational education the opposite effect is found: in countries where the percentage of upper secondary education students in an apprenticeship is high, the average occupational status attained is higher than in countries where the percentage of upper secondary education students in an apprenticeship is low.

In model 5 statistical interaction terms between the country characteristics and the job mismatch vari-abele are added in order to determine the impact of both educational characteristics on the relation-ship between having a job mismatch and the occupational status achieved. Figure 2 present the results of model 5. The regression lines display the estimated loss in occupational status as a result of having a job mismatch for varying shares of school-based, respectively apprenticeship-type vocational education, whereas the dots indicate the observed loss in occupational status for each country separately. The figure demonstrates that the negative effect of having a job mismatch on the occupational status achieved by school-leavers is smaller in countries where the shares of upper secondary education students in school-based and apprenticeship-type vocational education are high than in countries where these shares are low. This implies that the loss in occupational status among school-leavers with a job mismatch is smaller in countries where the education system is more vocationally oriented.

Figure 2   The relationship between the share of school-based, respectively apprenticeship-type vocational education in a country and the effect of having a job mismatch on achieved occupational status (ISEI)

Source: EU LFS 2000 ad hoc module on school-to-work transitions

5.2   Job search activities

Table 4 desribes the results of logistic regression anlysis of looking for another job. In model 1 we see that for school-leavers with a job mismatch the odds of looking for another job is 1.576 ($e^{0.455}$) times larger than the corresponding odds for school-leavers with a matching job. This effect is reduced to some extent if other factors are taken into account. Nevertheless, model 2 shows that, other things being equal, the estimated effect is still significant. Now, the implied odds ratio is 1.399 ($e^{0.336}$). In addition, model 2 displays that school-leavers with a certificate at the ISCED3-4 level are less often looking for another job than graduates with a degree at the ISCED5-6 level. Differences between fields of education with respect to job search activities hardly exist. Only school-leavers from agriculture are significantly less often looking for

another job than those from education. Having obtained a (non tertiary) vocational qualification affects job search activities as well. School-leavers with a school-based vocational qualification or with a vocational qualification of which the type of training is unknown are more often looking for another job than those who have not obtained a vocational qualification. Furthermore, age has a positive effect on the likelihood of looking for another job. For school-leavers within the oldest age group the odds of looking for another job is 1.756 ($e^{0.563}$) times larger than the corresponding odds for school-leavers within the youngest age group.

Job tenure has a negative effect on job search activities: the longer a school-leaver has been in his/her current job, the smaller the likelihood of looking for another one. Atypical employment is positively related to job search activities: school-leavers who work on a temporary and/or part-time basis are more often looking for another job than those with a permanent and/or full-time position.

With respect to structural labour market circumstances model 2 demonstrates that in times of high unemployment the probability of job search among school-leavers is smaller than in times of low unemployment. This finding suggests that individuals look for job security during an economic recession and do not want to run the risk of losing established rights by changing jobs. Moreover, there are a few alternative jobs during a recession, which renders the costs of finding one high.

The organizational characteristics controlled for in the analysis both significantly affect job search activities: school-leavers who work in larger firms and/or the public sector are less often looking for another job than school-leavers who are employed in small firms and/or the private sector.

Model 3 shows that the incidence of job search activities differs cross-nationally. Swedish school-leavers are most often looking for another job, followed by school-leavers from Italy, Finland, Denmark, Belgium, and France. In Hungary and Spain, on the other hand, job search activities are least often found among school-leavers.

In model 4 the country dummies have been replaced once again by the two characteristics of the education system in a country. Both characteristics are significant and indicate that in countries with a high share of school-based, respectively apprenticeship-type vocational education job search activities among school-leavers are higher than in countries with a low share of both kinds of vocational education.

In model 5 interactions between the two country characteristics and the job mismatch variabele are added again. Figure 3 illustrates the results of this model. The regression lines display the logit effect of having a job mismatch on the likelihood of looking for another job for varying shares of school-based, respectively apprenticeship-type vocational education, whereas the dots represent the observed logit for each country separately. The figure shows that the positive effect of having a job mismatch on job search activities among school-leavers is smaller in countries where the shares of upper secondary education students in school-based, respectively apprenticeship-type vocational education are high than in countries where these shares are low. Only with regard to the share of apprenticeship-type vocational education, the interaction effect is significant.
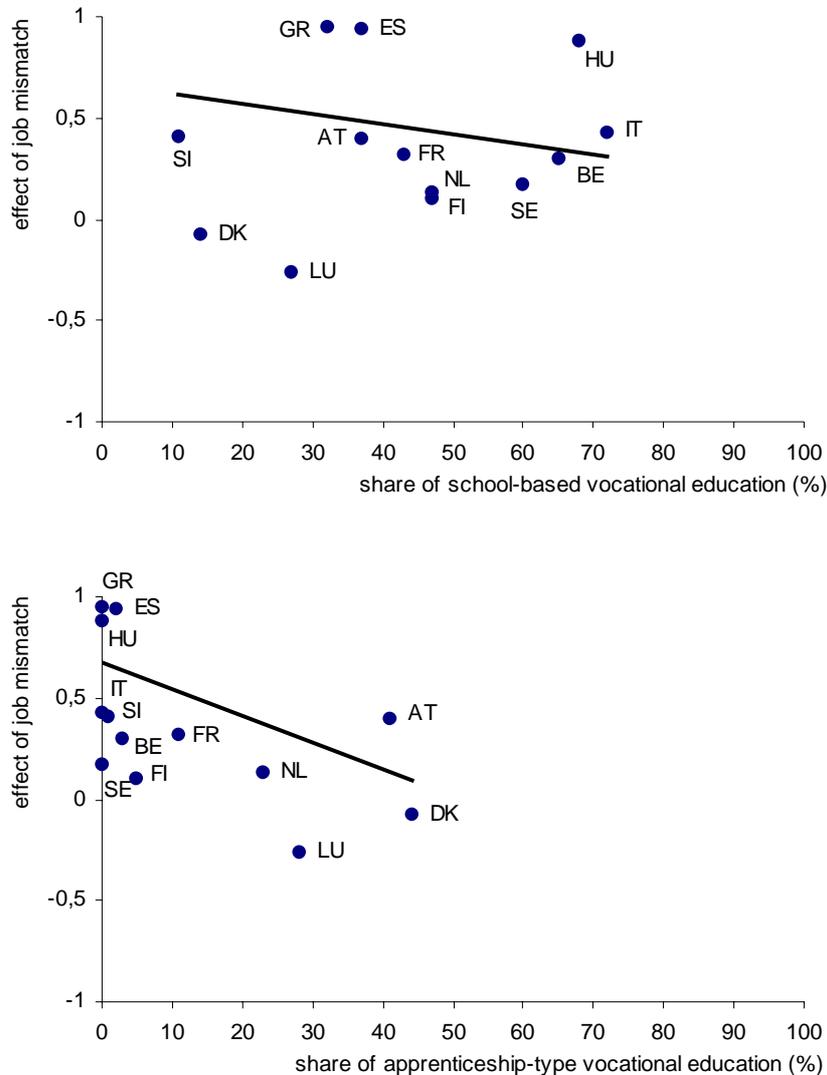
Table 4   Results of logistic regression analysis of looking for another job: logit effects (N = 36,268)

Model	1	2	3	4	5
Constant	-2.393**	-2.686**	-3.277**	-3.136**	-3.295**
Job mismatch (vs. job match)	0.455**	0.336**	0.346**	0.333**	0.675**
ISCED3-4 (vs. ISCED5-6)		-0.423**	-0.243**	-0.443**	-0.443**
Field of education (vs. education)					
Humanities, arts		-0.038	-0.182	-0.026	-0.024
Social sciences, business, law		-0.058	-0.074	-0.027	-0.016
Sciences		-0.116	-0.219	-0.102	-0.095
Engineering, manufacturing, construction		-0.136	-0.095	-0.108	-0.098
Agriculture		-0.430**	-0.361*	-0.393**	-0.375*
Health, welfare		0.039	-0.008	0.075	0.080
Services		-0.103	-0.143	-0.088	-0.076
Vocational (non tertiary) qualification (vs. no)					
Yes, school-based		0.172*	0.046	0.195**	0.182*
Yes, workplace-based		-0.393	-0.098	-0.373	-0.397
Yes, apprenticeship-type		0.125	0.162	0.082	0.084
Yes, type unknown		0.699**	0.093	0.652**	0.655**
Female (vs. male)		0.007	0.030	0.008	0.009
Age (vs. 15-19)					
20-24		0.211	0.059	0.186	0.183
25-29		0.489**	0.269*	0.466**	0.465**
30-35		0.563**	0.219	0.536**	0.541**
Job tenure (years)		-0.083**	-0.071**	-0.084**	-0.084**
Temporary job (vs. permanent job)		1.312**	1.325**	1.333**	1.332**
Part-time job (vs. full-time job)		1.185**	1.174**	1.183**	1.183**
Unemployment level in entry year (%)		-0.062**	-0.002	-0.055**	-0.054**
Larger firm (vs. small firm)		-0.188**	-0.145**	-0.190**	-0.189**
Public sector (vs. private sector)		-0.418**	-0.461**	-0.419**	-0.417**
Country (vs. the Netherlands)					
Austria			0.104		
Belgium			0.385*		
Denmark			0.579**		
Spain			-0.714**		
Finland			0.660**		
France			0.375*		
Greece			0.028		
Hungary			-1.709**		
Italy			0.674**		
Luxembourg			0.640		
Sweden			0.918**		
Slovenia			-0.351		
Share of school-based vocational education (%/10)				0.072**	0.093**
Share of apprenticeship-type vocational education (%/10)				0.055*	0.109**
Interactions with job mismatch (vs. job match)					
Share of school-based vocational education (%/10)					-0.050
Share of apprenticeship-type vocational education (%/10)					-0.132**
Model Chi^2	162**	2,901**	3,440**	2,923**	2,933**
Df	1	23	35	25	27
Pseudo R^2	0.009	0.162	0.190	0.163	0.163

$*$ = $p < 0.05$; $**$ = $p < 0.01$

Source: EU LFS 2000 ad hoc module on school-to-work transitions

Figure 3   **The relationship between the share of school-based, respectively apprenticeship-type vocational education in a country and the effect of having a job mismatch on looking for another job**

Source: EU LFS 2000 ad hoc module on school-to-work transitions

5.3   **Participation in continuous vocational training**

In Table 5 the findings of logistic regression analysis of participating in continuous vocational training are presented. Model 1 shows that, on average, school-leavers with a job mismatch less often participate in continuous vocational training than school-leavers with a matching job. The implied odds ratio is 0.795 ($e^{-0.229}$). After taking individual, job, and structural characteristics into account in model 2, the estimated odds ratio takes the value of 0.872 ($e^{-0.137}$). Of these characteristics, the level of education attained by school-leavers has a positive effect on training participation: school-leavers with

ISCED3-4 level less often follow continuous vocational training than graduates with ISCED5-6 level. Besides, the field of education attended by school-leavers has an effect on the likelihood of training participation. In any field of education (with the exception of sciences) participation in continuous vocational training is significantly higher than in education. The probability of continuous vocational training also depends on whether or not a school-leaver has obtained a (non tertiary) vocational qualification. School-leavers with a school-based vocational qualification participate more frequently in continuous training than those with no vocational qualification. School-leavers with a vocational qualification of which the type of training is unknown, in contrast, participate less often in continuous training. In addition, women are less often involved in continuous training than men. And with respect to age, it is found that school-leavers in the age group of 25-29 years participate most often in continuous vocational education.

Concerning job characteristics, model 2 shows that job tenure has a negative effect on training participation. The longer a school-leaver is employed in his/her current job, the lower the probability that he/she participates in continuous vocational education. Furthermore, one aspect of the nature of the employment contract matters: school-leavers with a temporary job more often participate in continuous vocational training than those with a permanent one. Probably, labour market entrants invest in additional training to acquire firm-specific skills and only after finishing this training and applying the acquired skills successfully in the firm, employers change their temporary contracts into permanent ones.

In times of high unemployment, investments in continuous vocational education are smaller than in times of low unemployment. Furthermore, in larger firms and in the public sector, the probability of training participation among school-leavers is higher than in small firms and in the private sector.

Once differences in training participation between countries are taken into account, the effect of job mismatches becomes non-significant (see model 3). This means that the earlier found effect of job mismatches on the likelihood of participating in continuous vocational training is the result of the country-specific composition of the data. Regarding cross-country variation in training participation, model 3 demonstrates that the incidence of continuous vocational training is highest in Denmark and Finland. In Spain, Italy, and Greece, on the other hand, the participation in continuous vocational training is lowest. So, with respect to training participation among school-leavers, there is a clear north-south contrast within Europe.

According to model 4, the vocational orientation of the education system has a positive impact on the incidence of training participation. In countries where the share of school-based, respectively apprenticeship-type vocational education is high, school-leavers are more likely to participate in continuous vocational training than in countries where these shares are low. So, at the macro level continuous vocational training build on the occupation-specific skills already acquired in initial education.

Table 5 **Results of logistic regression analysis of participating in continuous training: logit effects (N = 36,268)**

Model	1	2	3	4	5
Constant	-2.841**	-1.461**	-2.095**	-2.246**	-2.394**
Job mismatch (vs. job match)	-0.229**	-0.137*	-0.103	-0.137*	0.296
ISCED3-4 (vs. ISCED5-6)		-0.374**	-0.399**	-0.306**	-0.308**
Field of education (vs. education)					
Humanities, arts		0.454**	0.602**	0.485**	0.486**
Social sciences, business, law		0.487**	0.464**	0.468**	0.472**
Sciences		-0.053	-0.045	-0.047	-0.044
Engineering, manufacturing, construction		0.272*	0.082	0.291*	0.297*
Agriculture		0.500**	0.166	0.477*	0.491**
Health, welfare		0.432**	0.178	0.428**	0.433**
Services		0.346*	0.103	0.363*	0.369*
Vocational (non tertiary) qualification (vs. no)					
Yes, school-based		0.597**	0.311**	0.447**	0.444**
Yes, workplace-based		0.530	0.869*	0.524	0.521
Yes, apprenticeship-type		0.125	0.037	-0.349**	-0.347**
Yes, type unknown		-0.384**	-0.039	-0.473**	-0.466**
Female (vs. male)		-0.199**	-0.202**	-0.200**	-0.198**
Age (vs. 15-19)					
20-24		0.232	0.031	0.194	0.190
25-29		0.376*	0.160	0.340	0.337
30-35		0.355	0.108	0.334	0.333
Job tenure (years)		-0.027**	-0.010	-0.040**	-0.040**
Temporary job (vs. permanent job)		0.307**	0.376**	0.336**	0.334**
Part-time job (vs. full-time job)		-0.031	-0.130	-0.083	-0.086
Unemployment level in entry year (%)		-0.160**	0.037*	-0.120**	-0.119**
Larger firm (vs. small firm)		0.203**	0.027	0.157**	0.159**
Public sector (vs. private sector)		0.375**	0.370**	0.383**	0.384*
Country (vs. the Netherlands)					
Austria			0.097		
Belgium			-0.357*		
Denmark			0.424**		
Spain			-4.225**		
Finland			0.378*		
France			-1.242**		
Greece			-3.271**		
Hungary			-0.679**		
Italy			-3.364**		
Luxembourg			-1.177*		
Sweden			0.105		
Slovenia			-1.011**		
Share of school-based vocational education (%/10)				0.057**	0.083**
Share of apprenticeship-type vocational education (%/10)				0.243**	0.260**
Interactions with job mismatch (vs. job match)					
Share of school-based vocational education (%/10)					-0.079*
Share of apprenticeship-type vocational education (%/10)					-0.054
Model Chi^2	20**	925**	2,272**	1,028**	1,032**
Df	1	23	35	25	27
Pseudo R^2	0.002	0.076	0.183	0.084	0.084

* = p < 0.05; ** = p < 0.01

Source: EU LFS 2000 ad hoc module on school-to-work transitions

Figure 4. The relationship between the share of school-based, respectively apprenticeship-type vocational education in a country and the effect of having a job mismatch on participating in continuous training
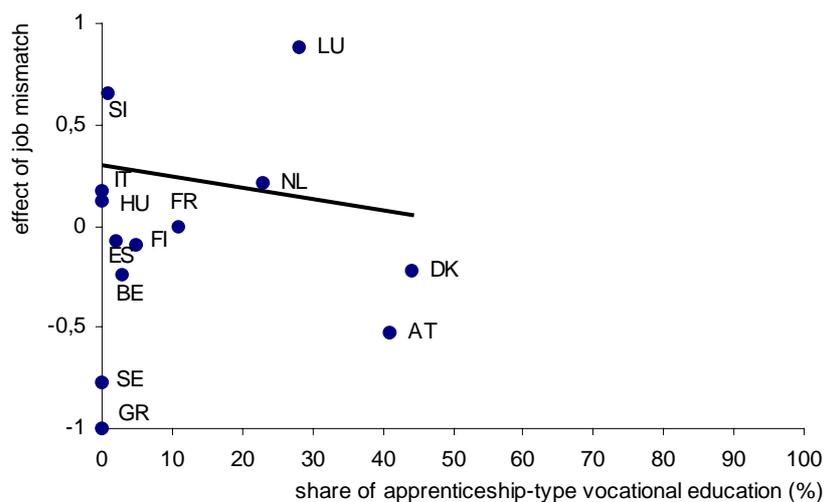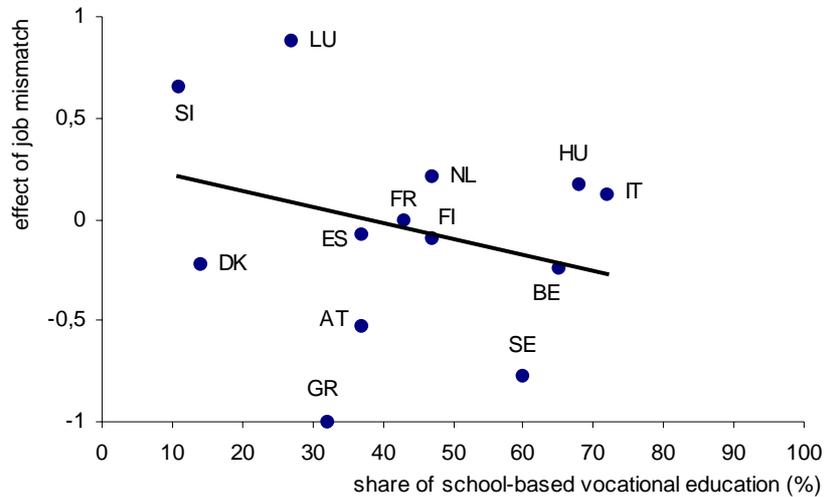
Source: EU LFS 2000 ad hoc module on school-to-work transitions

Model 5 further qualifies the effect of job mismatches on training participation. By including interactions between the country characteristics that measure the vocational orientation of the education system and the job mismatch variable it turns out that the effect of job mismatches is actually positive in countries with a low share of school-based, respectively apprenticeship-type vocational training (see Figure 4). The higher these shares are, however, the smaller the impact of job mismatches on the likelihood of participating in continuous vocational training. In the case of school-based vocational education, where the interaction term is significant, the effect of job mismatches even becomes negative after a certain point.

6 Conclusions and discussion

In this paper, we have investigated the determinants of job mismatches with respect to field of education among school-leavers in Europe. In addition, the effects of having a job mismatch on the labour market position of school-leavers have been examined. Special attention has been paid to cross-country variation in this respect. For that purpose, data from the EU LFS 2000 ad hoc module on school-to-work transitions have been used in the empirical analysis.

The results of this analysis show that several factors affect the likelihood of having a job mismatch. First of all, individual characteristics matter. As expected, higher educated and occupation-specific qualified school-leavers are less often employed in a job that does not fit the field of education attended in initial education than lower educated and less occupation-specific trained school-leavers. Having obtained a (non tertiary) vocational qualification, however, hardly affects the likelihood of being in a non matching job. Surprisingly enough, male school-leavers have more often a job mismatch than their female counterparts. Furthermore, older employees are more likely to be working in a non matching job than younger ones. Secondly, the odds of having a job mismatch is determined by different job characteristics. According to our hypothesis, job tenure has a negative effect on the likelihood of having a job mismatch. Moreover, the nature of the employment contract has the supposed effect: school-leavers with a temporary and/or part-time contract are more frequently employed in a job that does not match their field of education attended than those with a permanent and/or full-time contract. Thirdly, structural characteristics affect the probability of having a job mismatch. In times of high unemployment the likelihood of having a job mismatch is higher than in times of low unemployment. In addition, school-leavers who work in larger firms and/or in the public sector have less often a job mismatch than those who are employed in small firms and/or the private sector. These findings are in support of the formulated hypotheses. Fourthly, the incidence of job mismatches differs between European countries. Almost one quarter of this cross-country variation can be attributed to national differences in the participation of upper secondary education students in vocational education. The findings show that, opposite to our expectations, in countries where the share of upper secondary education students in school-based vocational education is high, the incidence of job mismatches among school-leavers is higher than in countries where the share of upper secondary education students in school-based vocational education is low.

With respect to the labour market effects of job mismatches, the most important finding is that school-leavers with a non matching job achieve less occupational status than those with a matching one. However, the effect of having a job mismatch on achieved occupational status varies between European countries. The loss in occupational status among school-leavers with a job mismatch is smaller in countries where the education system is more vocationally oriented, i.e. where the share of school-based, respectively apprenticeship-type vocational education is higher.

Moreover, the analysis reveals that school-leavers with a job mismatch use adjustment strategies to improve fit. A first strategy refers to job search activities: school-leavers with a non matching job more frequently look for another job than school-leavers with a matching job. Once again, the impact of job

mismatches differs within Europe: in countries where the share of school-based vocational education is high, the effect of having a job mismatch on the likelihood of looking for another job is smaller than in countries where this share is low. A second adjustment strategy concerns training participation. The results are less clear in this respect. On average, there is a negative effect of having a job mismatch on the probability of participating in continuous vocational training. Interacting the effect of having a job mismatch with characteristics of the education system, however, indicates that in countries where the share of school-based, respectively apprenticeship-type vocational education is low, the impact of having a job mismatch on training participation is positive.

Finally, we have to remark on two issues here. First of all, the question can be raised whether having a job mismatch with respect to field of education is by definition a negative phenomenon. In contrast with job mismatches regarding level of education (i.e. overeducation), the interpretation of job mismatches with respect to field of education is less clear. If a lack of fit between the field of education attended by school-leavers in initial education and the type of job they hold is the result of discrepancies between acquired and required occupation-specific skills, then these job mismatches can be considered as negative. This is in particular the case in (sector-)specific jobs. However, in more general jobs occupation-specific skills are less important and here a job mismatch with regard to field of education may rather reflect the flexibility of that field of education to switch to alternative jobs. The empirical findings suggest that the former interpretation dominates: job mismatches clearly coincide with lower occupational rewards on the labour market.

Secondly, the analysis of cross-country differences with respect to job mismatches among school-leavers has been incomplete. In general, the integration of young people into the labour market depends on whether or not there is an institutional link between the education and employment system. What matters actually, is the extent to which education systems differentiate between general and vocational education. At the one extreme is the United Kingdom and – to lesser extent – Ireland, where general programmes dominate the education system. At the other extreme is Germany, characterized by its extensive dual system. However, both extremes of the same continuum were missing in the data analysis. It is likely that the absence of these countries has affected the cross-national results found in this paper. In future research, therefore, it is desirable to extend the analysis by including data from these countries.

7   References

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8 Appendix

Table A1   Field of education and matching jobs

Field of education	matching jobs (ISCO-88 (COM) 3-digit codes)
Education	200, 230, 231-235, 300, 330, 331-334
Humanities, arts	200, 230, 231, 232, 243, 245, 246, 300, 347, 348, 500, 520, 521, 522
Social sciences, business, law	100, 110, 111, 121-123, 130, 131, 200, 230-232, 241-245, 247, 300, 341-344, 346, 400, 401-422
Sciences	200, 211-213, 221, 230-232, 300, 310-313, 321
Engineering, manufacturing, construction	200, 213, 214, 300, 310-315, 700, 710-714, 721-724, 730-734, 740-744, 800, 810-817, 820-829, 831-834
Agriculture	200, 221, 222, 300, 321, 322, 600, 611-615, 800, 833, 900, 920, 921
Health, welfare	200, 221-223, 244, 300, 321-323, 330, 332, 346, 500, 510, 513, 900, 910, 913
Services	300, 345, 400, 410-419, 421, 422, 500, 510-514, 516, 520, 522, 800, 831-834, 900, 910, 913