

Documento de trabajo

E2004/60

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RESUMEN

En este artículo, analizamos la calidad del ajuste en el puesto de trabajo para las personas con discapacidad. No encontramos evidencia de una mayor importancia del fenómeno de sobre-educación en este grupo en comparación con el resto de la población. Los principales resultados son los siguientes: Los discapacitados experimentan una menor probabilidad de estar sobre-educados durante 3 ó más años, así como una mayor probabilidad de abandonar tanto una situación general de desajuste educativo y de sobre-educación hacia una situación de inactividad o empleo marginal, una menor probabilidad de abandonar esta situación general de desajuste educativo y de sobre-educación hacia un mejor ajuste en el puesto de trabajo, y una mayor probabilidad de movilidad desde una situación de empleo hacia la inactividad o el empleo marginal. Estos resultados están probablemente relacionados con las inversiones en educación, relativamente bajas, por parte de este grupo de individuos. El análisis empírico se basa en datos españoles extraídos del Panel de Hogares de la Comunidad Europea para el período comprendido entre 1995 y 2000.

Palabras clave: desajuste educativo, discapacidad, sobre-educación, infra-educación, movilidad, discriminación, sobre-cualificación.

ABSTRACT

In this article, we analyze the job-matching quality of people with disabilities. We do not find evidence of a higher importance of over-education in this group in comparison to the rest of the population. The main results are the following: people with disabilities have a lower probability of being over-educated for 3 or more years, a higher probability of leaving mismatch in a broad sense or merely over-education towards inactivity or marginal employment, a lower probability of leaving mismatch in a broad sense towards a better match, and a higher probability of employment mobility towards inactivity or marginal employment. These results are probably linked to the relatively low investment in education of this disadvantaged group. The empirical analysis is based on Spanish data from the European Community Household Panel from 1995 to 2000.

Key words: mismatch, disability, over-education, under-education, mobility, discrimination, over-qualification.

JEL Classification: I29, I12, J41, J62, J71.

* Miguel A. Malo acknowledges the financial support received from the 'Junta de Castilla y León' (research project SA092/02).

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1. Introduction

Since the seminal work of Freeman (1976), the literature on over-education and under-education has grown rapidly as the overview of Sloane (2004) shows. Educational mismatch has been analyzed from a variety of perspectives such as career mobility, the returns of education, the quality of the match between jobs and workers, etc. One of the least treated approaches is the analysis of specific population groups. Here, we will focus on one specific group in a disadvantaged position in the labour market: people with disabilities. We will analyse not only the extent of educational mismatch in this collective, but also whether disability affects to the educational mismatch, the temporal persistence of this mismatch, the mobility towards a better match, and the employment mobility in general (discounting the eventual influence of educational mismatch on this type of mobility).

Disadvantaged groups (because of discrimination, for example) find it more difficult to compete in the labour market and educational mismatch may be one consequence of this. People with disabilities are specially affected by discrimination based on prejudices and a lack of accurate information in the rest of society about impairments and their consequences. Furthermore, we know that different disabilities are related to different levels and types of prejudices, as Baldwin and Johnson (1995) discuss in terms of the labour market discrimination suffered by people with disabilities. Therefore, the case of people with disabilities is potentially interesting as it shows how education and skills are related to job requirements when individuals are in a weaker situation in the labour market.

For our purpose, we use Spanish data from the European Community Household Panel (ECHP), which includes information on educational mismatch and disability. As we will explain later, we restrict ourselves to the period 1995-2000. The main reason for this is to use homogeneous information related to disability. In addition, this data base allows us to distinguish different types of educational mismatch: over-education; educational mismatch in a broad sense (over-education, under-education or 'horizontal' mismatch), and horizontal mismatch (the job's entry requirements includes a certain educational level, but this is not used in the daily activities of the job). The use of these three different definitions of educational mismatch will provide a much richer analysis. Finally, as the data base is a panel we will be able to check the persistence of the different types of mismatch.

The main results are the following. People with disabilities have a lower probability of being over-educated for 3 or more years, a higher probability of leaving mismatch in a broad sense or merely over-education towards inactivity or marginal employment, a lower probability of leaving mismatch in a broad sense towards a better match, and a higher probability of employment mobility towards inactivity or marginal employment. The explanation of these results is linked to the relatively low investment in education of this disadvantaged group.

The remainder of the paper is as follows. In the next section, we review previous literature about the educational mismatch of disadvantaged groups. In the third section, we present the empirical analysis in three parts. First, we describe the data base and we define the main variables, educational mismatch and disability. Second, the descriptive analysis shows the main characteristics of the data, and the most important features of educational mismatch in regard to people with disabilities. Third, the econometric analysis includes different multinomial logit models to find out the determinants of the persistence of mismatch, mobility improving job matching and employment mobility in general. A final section summarises the main conclusions of the article.

2. Background

Disadvantaged groups experience a weaker position in different aspects of their participation in the labour market compared to the average attainments of all individuals. Presumably this weaker position could affect the quality of the job matching for these groups. To our knowledge, literature on mismatch has analysed two disadvantaged collectives: ethnic minorities and women.

Battu and Sloane (2002) have analysed the case of ethnic minorities in Britain, finding that non-whites have a higher probability of being over-educated. This difference could be explained by discrimination and/or spatial constraints. On one hand, some employers could only hire members of ethnic minorities who possess higher educational levels or qualifications than whites *for the same job*. On the other hand, commuting is harder for isolated ethnic communities and it reduces the probability of a better match (increasing the probability of having educational mismatch).

Concerning females, Frank (1978) presents a theory of differential over-education by gender. Women who live in a couple will have a higher probability of being over-educated because their job search is conditioned by the job search of their

spouses. As men usually enjoy higher wages, the family will try to optimise the quality of the job match of males, while the job search of females will be optimally subject to the previous optimization. The result is that these women have a job search spatially constrained to the territory where their spouses have their job. Therefore, these women will have a higher probability of being over-educated. Frank (1978) offers empirical evidence supporting his theory and McGlodrick and Robst (1996) present an opposing result using a different data base.

Presumably, the educational mismatch of people with disabilities will have some of the characteristics of the problems described for the other groups, but with new aspects. There is previous literature confirming that labour market discrimination exists for people with disabilities. For example, Baldwin and Johnson (1995) find that there is a large difference between the employment rate of disabled and non-disabled women, but only a small part of the differential is attributable to wage discrimination. However, we should consider that disability is not only a feature potentially related to discrimination, but to lower productivity too. Therefore, an educational mismatch can exist not only because of discrimination but as a form of compensation for lower productivity too. In addition, the extent of the educational mismatch might be potentially related to the behaviour of people with disabilities concerning investment in education. A 'stylised fact' at international level is the relatively lower educational level of people with disabilities, especially in Spain (García-Serrano and Malo¹, 2002; Malo, 2003). At first sight, this is paradoxical because the scarce literature about the effect of education on the labour market performance of people with disabilities remarks on the advantages of reaching higher educational levels (Dean and Dolan, 1992; Hendricks et al., 1997). However, a lower investment in education might be rational if people with disabilities anticipates lower returns in respect to the rest of the population for the same educational levels or if the educational system is not adapted to the special requirements of different types of disabilities. In addition, we have to consider that the allocation of time is affected by disability, mainly because disability is a characteristic which 'stole' time (Oi, 1991). Therefore, the relative valuation of long-term investments in education can be severely affected by disability. Obviously, this effect will be different for people

¹ This article is based on the wider report (in English) freely available on line: http://www.employment-disability.net/frame_main.asp?pag_id=34

who become disabled after their entry into the labour market than for those who are disabled before².

Another interesting issue is the relationship between mismatch and mobility, and how disability could affect this relationship. The theory of career' mobility (Sicherman and Galor, 1990) predicts that over-education is a temporary problem because over-educated workers will move towards better jobs (inside or outside the firm) in order to enjoy a higher quality job match (and, *ceteris paribus*, higher wages). However, the empirical evidence is ambiguous about this prediction. Sloane (2004) summarises different articles showing that some of them supports that educational mismatch is a transitory feature of workers' career (Sicherman, 1991) while others find that mismatch seems to be permanent (Robst, 1995). Presumably, this sort of mobility to improve job match is related to individual characteristics, for example, disability. If people with disabilities suffer discrimination and/or mismatch as a sort of compensation for the low productivity related to disability, they will have a lower probability of moving towards a job with a better match.

3. Empirical analysis

3.1. Data base and definitions of main variables

The ECHP is a household panel survey promoted by EUROSTAT. This data base is suitable for our analysis because it includes information on disability and educational mismatch. The first year of this survey was 1994. Nonetheless, we will use the Spanish data for the period 1995-2000 because of two reasons: the questions on disability were slightly changed in 1995 and the type of contract (temporary and permanent) is available from 1995 onwards. This data base has been used before to analyse educational mismatch in Spain by Alba-Ramírez and Blázquez (1994)³.

In general, we can distinguish two main types of definitions for educational mismatch: "objective" and "subjective" definitions. The subjective definitions are based on individual workers' self-reports on their level of skill utilisation. Either workers are asked directly whether they are over-educated or under-educated for the work they do, or they are asked what minimum education is required for their job. The self-reported level of required education is compared to the worker's actual educational level to

² In our data base, we only have information about the current disability status of interviewees, but not the date of the beginning of their disability or functional limitation.

³ Previous works analysing educational mismatch in Spain with other data bases are Alba-Ramírez (1993) and García-Serrano and Malo (1996).

assess the job match. The objective definitions can also be classified into two types. In the first type, educational mismatch is assessed by comparing years of education with the average educational level in the worker's current occupation. Workers are classified as over-educated if they have more than the average years of education for their occupation plus one standard deviation. In the second type, educational mismatch is defined by comparing the current educational level and the job-level requirements.

Although the ECHP does not provide direct information on the educational requirements of jobs, it contains several questions that provide us with enough information to assess the type of job match from a subjective perspective. Workers are allocated different types of job match according to their responses to the following three questions:

1. *Do you feel you have skills or qualifications to do a more demanding job than the one you have now?* The possible answers are 'yes' and 'no'.
2. *Have you had formal training or education that has given you the skills needed for your present type of job?* The possible answers are 'yes' and 'no'.
3. *How much has this training or education contributed to your present job?* The answers are 'a lot', 'a fair amount', 'not very much', and 'not at all'. Only those individuals answering 'yes' to the previous questions are asked this third question.

The response to the first question provides us with the first definition of educational mismatch. People reporting that they have the skills or qualifications to do a more demanding job will have an educational mismatch related to over-education or over-qualification. We will call it mismatch type A.

The two following questions are used to obtain two additional definitions of mismatch. First, we define mismatch type B for those who answer 'no' to the second question and those who answer 'yes' to the second question but 'not very much' or 'not at all' in the third question. The scope of this definition is very wide because it includes under-educated workers and /or people having the job educational requirements but not the specific field of education required by the job⁴. Second, we define mismatch type C for those people answering 'yes' in the second question and 'not very much' or 'not at all' in the third question. Here, we will have people who needed an educational level to

⁴ For example, at the Spanish Public Administration a huge majority of jobs are defined in terms of educational level (primary, secondary or university level) but not in terms of specialization fields, for example for the university level it is not specified whether the degree is in economy, sociology, education, etc.

take the job but this level is not really needed for this type of job⁵. We will call it a ‘horizontal’ mismatch, and, by definition, it is a subcategory of mismatch type B.

Therefore, using these three definitions we will have a richer empirical analysis focusing on different aspects of the job match quality. Nevertheless, we will focus on type A and B, because for some empirical analyses there will be very few cases for type C.

To sum up, mismatch type A represent over-education or over-qualification, type B is mismatch in general (over-, under-education or horizontal mismatch), and type C is horizontal mismatch (which is a subcategory of mismatch type B).

Now, we proceed to describe the variables related to disability. The questions about disability are the following:

Q158: Do you have any chronic physical or mental health problem, illness or disability? If Yes → Q159

Q159: Are you hampered in your daily activities by this chronic or mental health problem, illness or disability?

Yes, severely / Yes, to some extend / No

Those who answer ‘yes’ (severely or to some extend) can be defined as people with disabilities. Of course, this is a self-evaluation and it does not refer to an ‘objective’ definition of disability. Nevertheless, it provides a useful approach to measuring the self-perceived disability. The initial filtering question was added in the second wave (1995). In order to avoid any problems related to this change in the questionnaire, we will only use data from 1995.

We would like to point out the two main characteristics of the disability definition included in the ECHP:

- It is not exactly correspondent with the international definition provided by the World Health Organization (WHO), and, therefore, there is a lack of comparability with other international surveys on disability.
- It is not correspondent with the administrative definitions, which are mainly ‘work disability’. In fact, this is a positive characteristic, because it means that the ECHP definition is closer to the WHO definition, which defines disability in terms of disability in respect to daily activities.

⁵ For example, considering that there are a lot of people with a university degree, employers can ask for a university degree for some jobs where the qualifications related to the university degree are not applied.

Therefore, the figures obtained from the ECHP give an approximation of the phenomenon of disability, not strictly comparable with other data sources designed to follow the international definitions of disability, but closer to them than any sort of administrative data (which usually focuses strictly on disability in respect to work).

Although the questionnaire allows us to define two subtypes of disability (severely hampered, and only hampered to some extent), we will use only one category which consists of the aggregation of both subtypes of disability. The main reason is that the subtypes do not correspond to any standard subgroups of the WHO definition of disability. The main effect of this aggregation is that we will have a disabled population with a greater heterogeneity than in other definitions (especially in respect to the administrative definitions)⁶.

3.2. Descriptive analysis

In this section we provide the main characteristics of the selected sample. Table 1 contains some descriptive statistics (mean and standard deviation) for two alternative definitions of educational mismatch (A and B, because for 'horizontal' mismatch the results are very similar). The variables, used as explanatory variables in the rest of the analysis, relate to personal and job characteristics: sex, marital status, age, educational attainments, training, type of contract⁷, type of firm, and seniority in current job. The descriptive analysis is made for the total sample, and separately for people with and without disabilities.

When comparing people with and without disabilities, we can observe clear differences in the sample means. People with disabilities tend to be older (around 44 years old on average, in contrast to 37 years old for the group of people without disabilities) and with lower educational attainments (70% of people with disabilities report having just their primary education completed, while the percentage of people without disabilities reporting a lower secondary education diploma as the maximum educational level completed, is around 46%). This low educational level is consistent

⁶ Although it is potentially very interesting, we have not considered the information included in the ECHP about disability pensions, because they are mixed with short-term sickness benefits and, therefore, it would be not suitable for our analysis.

⁷ The variable describing the type of contract in current job is not available for the 1994 survey. Thus, our estimations are based on the waves 1995-2000.

with the ‘stylized facts’ on disability in Spain (see Malo, 2003) and the European Union (see García-Serrano and Malo, 2002)

The reported results also reveal that people with disabilities are less likely to receive on-the-job training provided by the employer.

Regarding job characteristics, we find that the percentage of people with disabilities working in private firms with less than 20 employees, is slightly higher than the corresponding percentage in the group of people without disabilities. In contrast, people without disabilities are more likely to work in the public sector and private firms with more than 20 employees. Finally, the descriptive analysis reveals that people with disabilities tend to exhibit longer durations in their current job than those people without disabilities.

As regards the incidence of educational mismatch, we can appreciate in Table 2 clear differences depending on the definition. People with disabilities are clearly more likely to suffer a mismatch type B. More than 70% of this group of people report being in such a situation, in contrast to 56.5% corresponding to the group of people without disabilities. Nonetheless, we obtain the opposite result when using mismatch type A definition. In this case the percentage of people with disabilities who report being mismatched is around 44%, while the corresponding percentage among the group of people without disabilities is around 58%.

Table 3 shows the distribution of disability and mobility of mismatched individuals (definitions type A and B). For both definitions we see that the mobility of people with disabilities towards inactivity or marginal employment is double (almost 50 %) that of people without disabilities (around 25 %). The mobility towards a better match (a reduction of educational mismatch) is different considering both definitions of mismatch. For mismatch type B (general mismatch) only 16.5 % of people with disabilities move towards a better match while for people without disabilities this percentage goes to 37. For mismatch type A (over-education) this percentage is almost the same for both groups (37.0 and 36.6 respectively).

To sum up, we see that people with disabilities do not tend to have higher educational levels in order to ‘compensate’ for their disabilities. Considering educational mismatch, the descriptive analysis show that people with disabilities have lower levels of mismatch type A (over-education) but higher levels of mismatch type B (mismatch in a broad sense). In addition, we have seen that mobility from mismatch towards inactivity or marginal employment is much higher for people with disabilities

than for people without them. However, mobility towards a better match presents no difference considering disability for over-education (mismatch type A), but it is substantially different considering mismatch in a broad sense (type B) in contrast to people with disabilities.

3.3. Econometric analysis

The aim of this section is twofold. First, we analyze the determinants of educational mismatch and its persistence in alternative definitions of educational mismatch. Second, we analyze the relationship between educational mismatch and mobility under two directives: mobility towards a better job match, and job mobility in a broad sense.

In order to attempt the first goal we estimate a multinomial logit model for each definition of educational mismatch. The multinomial logit regressions results are given in Tables 4, 5 and 6, where the dependent variable is a four point variable indicating the persistence of educational mismatch. The variable takes value 0 if, in each year the individual is observed, he/she reports not suffering an educational mismatch; 1 if the individual reports being mismatched for one year; value 2 if the individual has experienced an educational mismatch for two years; and value 3 if the duration of the educational mismatch is longer than two years⁸. For each definition of educational mismatch, three set of coefficients are estimated⁹. From these three sets of coefficients, we can calculate the probability that an individual experiences an educational mismatch, for one, two or more than two years, conditional on a vector of explanatory variables that includes personal and job characteristics.

It is worth mentioning that, independently of the definition of educational mismatch, there is no evidence of people with disabilities exhibiting either higher or lower probabilities of being mismatched. Even in Table 5 we see that people with disabilities have a lower probability of being over-educated for 3 or more waves. Therefore, we find a pattern of educational mismatch for people with disabilities different to that of other disadvantaged group in the labour market such as ethnic minorities or women who exhibit higher levels of over-education. Probably, this result is linked to the lower educational levels reached by people with disabilities.

⁸ These two last categories also include individuals who suffer educational mismatch during several non-consecutive years.

⁹ People who report not being mismatched are the omitted category.

Nonetheless, as we will argue later, the weaker situation of people with disabilities will be clear when we analyse the determinants of the probability of moving from a mismatch towards a better job match and the determinants of the probability of employment mobility in general.

For the rest of the variables, there are clear differences in their distributions depending on the definition of educational mismatch. For types A (over-qualification) and B (mismatch including under-education), we find males being more likely than females to experience an educational mismatch in a persistent way. For the three definitions, we also find that the probability of being mismatched increases with age, in a non-linear way.

The most significant differences among the three definitions are those concerning educational attainments. For types A (over-qualification) and B (mismatch including under-education) we find that the educational level exerts a strong influence on the probability of experiencing an educational mismatch, either one, two or more than two years. Nonetheless, the difference is in the sign of the estimated coefficients of the educational variables. People who have completed higher secondary and university education are less likely to exhibit an educational mismatch in a broad sense, and this effect increases when mismatched two or more than two waves. These results are coherent assuming that mismatch type B potentially includes under-education, a job-quality problem which usually affects workers with lower educational levels. The opposite is observed for over-qualification (type A), but the increasing pattern of this effect is even more important than for the previous definition of mismatch. Finally, when using 'horizontal' mismatch (type C), the results show that individuals with university education are less likely, than those with just primary education completed, to experience this type of educational mismatch for two years. In contrast, we observe that people who have completed higher secondary and university education are more likely to exhibit this type of educational mismatch for more than two years. Therefore, the effects of higher educational levels on 'horizontal' mismatch are only detected for long-term mismatch and they are positive for secondary education and university.

Our results also reveal different effects of on-the-job training on the probability of experiencing an educational mismatch, based on the definition we use. Individuals receiving on-the-job training, provided by the employer, are less likely to experience a mismatch type B (mismatch including under-education), for either one or more than two years. However, receiving on-the-job training increases the probability of experiencing

a mismatch type A (over-qualification) for two, or more than two years. Finally, on the job training does not affect the ‘horizontal’ mismatch (type C).

Individuals working in the public sector have a lower probability of being mismatched type B¹⁰ (mismatch including under-education). In contrast, the estimated coefficients of this explanatory variable are not statistically significant when mismatch type A definition (over-qualification) is used.

Finally, independently of the mismatch definition, the estimations show a positive and significant influence of seniority on the likelihood of being mismatched for more than two years.

The second part of this section concerns the relationship between educational mismatch and mobility. Special attention is given to the incidence of being a person with disabilities on both, the probability of getting a better match, and job mobility.

In order to analyze the determinants affecting the probability of getting a better match, we estimate a multinomial logit model. The sample selected for this analysis is composed of wage and salary workers who are mismatched the first time they are interviewed. The dependent variable takes value 0 if the individual remains mismatched over the rest of the interviews, 1 if the individual gets a better match at any time over the following interviews, and 2 if the individual moves to other situations¹¹. The results of these estimations are reported in Tables 7 and 8¹². Our main interest is in the estimated coefficient for the dummy variable indicating whether the individual is a person with or without disabilities. We can see that people with disabilities are less likely to get a better match while more likely to move towards other situations (inactivity or marginal employment), when we use the definition of mismatch in a broad sense (type B). In contrast, when we use the variable for over-education (mismatch type A definition), we do not observe people with disabilities being less or more likely to improve their job match, but we still observe this group as having a higher probability of moving towards other situations¹³.

¹⁰ The estimated coefficient of these variables is statistically significant for the three sets of estimated coefficients.

¹¹ Other situations includes self-employment, unpaid family work, jobs of less than 15 hours per week, unemployed and economically inactive workers.

¹² We have estimated the same model for the third definition of mismatch (type C, horizontal mismatch), but the results were not reliable because of the very small sample size.

¹³ For both definitions, when we exclude economically inactive workers from the non-employment category, we do not observe people with disabilities being more likely to move towards a non-employment situation.

As regards the remaining explanatory variables, some points are worth mentioning. First, we observe that for mismatch type A (over-qualification) and B (mismatch in a broad sense), receiving on-the-job training and holding a permanent contract diminishes the probability of moving towards other situations, although a permanent contract increases the probability of leaving mismatch towards a better match using the broad definition of mismatch (type B). Second, our results show that the estimated coefficients of the educational variables are not statistically significant for mismatch including under-education (type B). Nonetheless, we observe that people who have completed higher secondary and university education are less likely to get a better match for over-qualification (type A). This result is consistent with those obtained from the multinomial logit estimation, reported in Table 5, where we observed an increasing coefficient for these explanatory variables with the persistence of educational mismatch. For both definitions we find evidence of people working in the public sector and in private firms with more than 20 employees being less likely to move towards inactivity or marginal employment. We also find a negative and significant influence of seniority on the probability of moving towards inactivity or marginal employment.

Finally, we analyse the influence of disability and educational mismatch on job mobility in general.

A multinomial logit model is used to model the transition probabilities from job to job¹⁴ or other situations. Both demand-, and supply-side factors influence the transition probabilities. Therefore, the estimated multinomial logit model can be regarded as a reduced form model capturing the combined effect of both types of factors. A broad set of explanatory variables including individual and job-related characteristics is used. The individual characteristics are: sex, marital status, age and its square, maximum level of educational attainments, and a dummy variable indicating whether the individual is a person with or without disabilities. The job-related characteristics include: type of contract, on-the-job training, type of firm, seniority, a dummy variable indicating whether the individual is mismatched or not, and a set of occupational dummy variables. The results of this estimation are reported in Tables 9 and 10¹⁵. Our main interest is in the estimated coefficients of the dummy variable

¹⁴ Here, job-to-job indicates that the individual is working in different waves of the survey, although it is possible that some individuals will have non-observed unemployment or inactivity periods between both jobs.

¹⁵ Again, we have tried to estimate this model for mismatch type C, but the results were not reliable because of the very small sample size.

indicating whether the individual is a person with or without disabilities, and on the dummy variable indicating whether the individual is mismatched. With respect to the first variable, we do not observe people with disabilities experiencing either a higher or lower probability of changing job. Nonetheless, the results reveal that this group of people is more likely to move towards other situations, although the effect disappears when excluding economically inactive workers from the ‘other situations’ category. As regards the effects of being mismatched on job mobility, we find that the estimated coefficient of this variable is not statistically significant when using mismatch including under-education (type B definition). Nonetheless, for over-qualification (mismatch type A), the results provide evidence in favour of the hypothesis that mismatched workers are more likely to change job.

About the rest of variables, we see that the educational level is only important for mobility to other situations (a university degree decreases the probability of this transition in Tables 9 and 10). Training and seniority decreases all types of job mobility, and the effect of seniority is increasing. All types of firms have a lower mobility in respect to being in a private firm with less than 20 workers, with the exception of being in a private firm between 20 to 500 workers, which is non significant for job-to-job mobility. Gender is barely significant, but the sign is as it was expected: being male increases the probability of job-to-job mobility but decreases the probability of moving towards other situations. Being married does not affect to job mobility. Finally, age has a non-linear influence on both types of mobility and it decreases mobility but at a decreasing rate.

4. Conclusions

In this article, we have analysed the quality of the job match of people with disabilities in terms of their educational mismatch. As they are a disadvantaged group in the labour market, we expect that they suffer higher levels of mismatch than other disadvantaged groups such as ethnic minorities or women (Battu and Sloane, 2002; Frank, 1978). Using Spanish longitudinal data from the ECHP covering the period 1995-2000, we define three measures of mismatch for the empirical analysis: over-qualification; mismatch in a broad sense (including under-education); and ‘horizontal’ mismatch (their educational level was required to be hired, but this level is not really needed for this type of job). The results concerning people with disabilities are broadly the same with each of the three definitions of mismatch.

First of all, although people with disabilities can have low quality jobs, the quality of their mismatch is not bad considering the relatively low level of mismatch among them. In addition, we do not find a significant influence of disability on the probability of being mismatched, with the exception of a negative effect on the probability of being mismatched more than three waves using the definition of over-education (mismatch type A). Of course this result does not imply the non-existence of wage discrimination or absence of discrimination in the hiring process. In fact, wage discrimination for people with disabilities has been previously documented and the huge difference between the participation rates of people with and without disabilities can be attributed, at least partially, to discrimination (see, for example, Baldwin and Johnson, 1995, and Kidd et al., 2002). Therefore, our results suggests that when people with disabilities get a job they do not suffer mismatch with a higher probability because of their disabilities. However, when people with disabilities are mismatched they leave with a lower probability their mismatch in a broad sense (type B), unless they move to non-employment or marginal employment. Disability seems to be more related to the educational mismatch in general than to over-education. This last result reveals the weak position of this group in the labour market.

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Table 1. Means and standard deviations (in italics) for different definitions of educational mismatch

Variable	OVERB			OVERA		
	All	People without disabilities	People with disabilities	All	People without disabilities	People with disabilities
Male	0.642 <i>0.479</i>	0.643 <i>0.479</i>	0.614 <i>0.488</i>	0.642 <i>0.479</i>	0.643 <i>0.479</i>	0.614 <i>0.488</i>
Married	0.626 <i>0.483</i>	0.623 <i>0.484</i>	0.714 <i>0.451</i>	0.626 <i>0.483</i>	0.623 <i>0.484</i>	0.714 <i>0.451</i>
Age	38.0 <i>10.9</i>	37.7 <i>10.8</i>	44.3 <i>11.2</i>	38.0 <i>10.9</i>	37.7 <i>10.8</i>	44.3 <i>11.2</i>
<i>Educ. Level</i>						
Primary	0.472 <i>0.498</i>	0.463 <i>0.498</i>	0.701 <i>0.459</i>	0.472 <i>0.498</i>	0.462 <i>0.498</i>	0.701 <i>0.459</i>
Second.	0.210 <i>0.407</i>	0.213 <i>0.409</i>	0.149 <i>0.357</i>	0.210 <i>0.407</i>	0.213 <i>0.409</i>	0.149 <i>0.357</i>
University	0.317 <i>0.464</i>	0.324 <i>0.467</i>	0.149 <i>0.357</i>	0.318 <i>0.465</i>	0.325 <i>0.467</i>	0.149 <i>0.357</i>
Training	0.322 <i>0.467</i>	0.326 <i>0.468</i>	0.239 <i>0.426</i>	0.322 <i>0.467</i>	0.326 <i>0.468</i>	0.239 <i>0.426</i>
Open-ended contract	0.662 <i>0.472</i>	0.662 <i>0.472</i>	0.656 <i>0.476</i>	0.662 <i>0.472</i>	0.662 <i>0.472</i>	0.656 <i>0.476</i>
Mismatch	0.570 <i>0.495</i>	0.565 <i>0.496</i>	0.706 <i>0.456</i>	0.571 <i>0.494</i>	0.577 <i>0.494</i>	0.437 <i>0.497</i>
<i>Type of firm</i>						
Pub.Adm./Pub. firm	0.263 <i>0.440</i>	0.264 <i>0.440</i>	0.257 <i>0.433</i>	0.263 <i>0.440</i>	0.264 <i>0.440</i>	0.257 <i>0.433</i>
Private(<20)	0.366 <i>0.482</i>	0.365 <i>0.481</i>	0.392 <i>0.488</i>	0.366 <i>0.482</i>	0.365 <i>0.481</i>	0.392 <i>0.488</i>
Private (20-500)	0.289 <i>0.453</i>	0.289 <i>0.453</i>	0.279 <i>0.449</i>	0.289 <i>0.452</i>	0.289 <i>0.453</i>	0.279 <i>0.449</i>
Private (>500)	0.082 <i>0.273</i>	0.082 <i>0.274</i>	0.072 <i>0.259</i>	0.082 <i>0.273</i>	0.082 <i>0.274</i>	0.072 <i>0.259</i>
<i>Seniority</i>						
< 1 year	0.217 <i>0.408</i>	0.218 <i>0.409</i>	0.206 <i>0.399</i>	0.217 <i>0.408</i>	0.218 <i>0.409</i>	0.206 <i>0.399</i>
1-5 years	0.284 <i>0.450</i>	0.286 <i>0.451</i>	0.248 <i>0.432</i>	0.284 <i>0.450</i>	0.286 <i>0.451</i>	0.248 <i>0.432</i>
5-10 years	0.134 <i>0.339</i>	0.134 <i>0.340</i>	0.129 <i>0.335</i>	0.134 <i>0.339</i>	0.134 <i>0.340</i>	0.129 <i>0.335</i>
> 10 years	0.365 <i>0.480</i>	0.362 <i>0.480</i>	0.417 <i>0.490</i>	0.365 <i>0.480</i>	0.363 <i>0.480</i>	0.417 <i>0.490</i>
Disability	0.040 <i>0.195</i>			0.040 <i>0.195</i>		

Source: ECHP1995-2000 (Spain).

Table 2. Mismatch rates for people with and without disabilities

Mismatch Type B						
Year	1995	1996	1997	1998	1999	2000
Without disab.	59%	57%	54%	55%	55%	57%
With disab.	74%	68%	69%	67%	76%	73%

Mismatch Type A						
Year	1995	1996	1997	1998	1999	2000
Without disab.	54%	56%	60%	60%	59%	59%
With disab.	41%	44%	50%	42%	41%	46%

Mismatch Type C						
Year	1995	1996	1997	1998	1999	2000
Without disab.	15%	14%	14%	13%	15%	11%
With disab.	16%	12%	15%	14%	16%	16%

Source: ECHP1995-2000 (Spain).

Table 3. Distributions of disability and mobility of mismatched individuals towards a better match or other situation (percentages)

MISMATCH TYPE B				
Mobility				
	z=0 (no mobility)	z=1 (mobility to a better match)	z=2 (mobility to other situation)	Total
W/O disab.	94.79	97.58	91.07	1,967
W. disab.	5.21	2.42	8.93	109
Total	100	100	100	2,076
	W/O disab.	W. disab.	Total	
z=0	36.1	35.78	749	
z=1	36.96	16.51	745	
z=2	26.94	47.71	582	
Total	100	100	2,076	
MISMATCH TYPE A				
	z=0 (no mobility)	z=1 (mobility to a better match)	z=2 (mobility to other situation)	Total
W/O disab.	98.55	97.13	94.88	1,852
W. disab.	1.45	2.87	5.12	54
Total	100	100	100	1,906
	W/O disab.	W. disab.	Total	
z=0	40.39	20.37	759	
z=1	36.61	37.04	698	
z=2	23	49.59	449	
Total	100	100	1,906	

Source: ECHP1995-2000 (Spain).

Table 4. Multinomial Logit Model on the probability of having educational mismatch in a broad sense (mismatch type B). ECHP 1995-2000 (Spain)

Variable	$\ln \left[\frac{\Pr(y = 1)}{\Pr(y = 0)} \right]$		$\ln \left[\frac{\Pr(y = 2)}{\Pr(y = 0)} \right]$		$\ln \left[\frac{\Pr(y = 3)}{\Pr(y = 0)} \right]$	
	Coef.	t	Coef.	t	Coef.	t
Male	0.154	1.54	0.338	2.92	0.433	4.03
Married	0.075	0.63	0.087	0.64	0.395	3.12
Age	0.001	0.02	0.073	1.96	0.121	3.38
Age ²	0.000	0.04	-0.001	-2.21	-0.002	-4.27
<i>Educational Level</i>						
Primary						
Secondary	-1.085	-7.77	-1.087	-7.26	-1.382	-9.80
University	-1.478	-10.42	-1.948	-11.81	-2.179	-14.56
Training	-0.427	-3.94	-0.098	-0.77	-0.313	-2.71
Open-ended contract	-0.344	-2.59	0.062	0.41	0.183	1.31
Disability	0.138	0.50	0.356	1.22	-0.245	-0.83
<i>Type of Firm</i>						
Pub. Adm./Pub. Firm	-0.306	-2.32	-0.431	-2.80	-0.243	-1.73
Private (<20 workers)						
Private (20-500 w.)	-0.028	-0.24	-0.081	-0.60	0.029	0.23
Private (>500 w.)	0.370	2.03	0.063	0.30	0.428	2.30
<i>Seniority</i>						
< 1 year						
1-5 years	0.293	2.22	0.352	2.36	0.931	6.59
5-10 years	-0.113	-0.62	-0.125	-0.60	0.432	2.27
>10 years	-0.064	-0.36	-0.019	-0.09	0.609	3.25
Constant	1.056	1.62	-1.351	-1.80	-2.306	-3.23
N			5,016			
Distribution (%)	28.57		17.07		29.98	
Log Likelihood			-5,707			

y=0: The individual is not mismatched in any wave.

y=1: The individual is mismatched in 1 wave.

y=2: The individual is mismatched in 2 waves (consecutive or not).

y=3: The individual is mismatched in 3 waves or more (consecutive or not).

Table 5. Multinomial Logit Model on the probability of having over-education (mismatch type A). ECHP 1995-2000 (Spain).

	$\ln \left[\frac{\Pr(y = 1)}{\Pr(y = 0)} \right]$		$\ln \left[\frac{\Pr(y = 2)}{\Pr(y = 0)} \right]$		$\ln \left[\frac{\Pr(y = 3)}{\Pr(y = 0)} \right]$	
	Coef.	t	Coef.	t	Coef.	t
Male	0.133	1.36	0.436	4.11	0.373	3.74
Married	-0.105	-0.92	-0.018	-0.15	0.141	1.22
Age	0.041	1.41	0.042	1.30	0.117	3.72
Age ²	-0.000	-1.63	-0.001	-1.95	-0.002	-4.87
<i>Educational Level</i>						
Primary	-	-	-	-	-	-
Secondary	0.817	6.08	1.057	7.51	1.237	9.21
University	0.821	5.29	1.093	6.77	1.412	9.24
Training	0.075	0.63	0.241	1.97	0.384	3.40
Open-ended contract	0.158	1.23	0.104	0.75	0.221	1.67
Disability	-0.282	-1.43	-0.180	-0.82	-0.686	-2.94
<i>Type of Firm</i>						
Pub. Adm. and Pub. Firm	-0.095	-0.70	0.036	0.25	0.238	1.77
Private (<20 workers)	-	-	-	-	-	-
Private (20-500 w.)	-0.150	-1.40	-0.055	-0.47	0.161	1.44
Private (>500 w.)	-0.281	-1.53	-0.445	-2.24	0.029	0.17
<i>Seniority</i>						
< 1 year	-	-	-	-	-	-
1-5 years	-0.109	-0.89	0.160	1.19	0.640	4.89
5-10 years	-0.576	-3.10	-0.050	-0.26	0.556	3.04
> 10 years	-0.794	-4.80	-0.243	-1.35	0.377	2.19
Constant	-0.215	-0.35	-1.124	-1.66	-2.983	-4.50
N			4,905			
Distribution (%)	28.93		21.04		31.42	
Log Likelihood			-6,322			

y=0: The individual is not mismatched in any wave.

y=1: The individual is mismatched in 1 wave.

y=2: The individual is mismatched in 2 waves (consecutive or not).

y=3: The individual is mismatched in 3 waves or more (consecutive or not).

Table 6. Multinomial Logit Model on the probability of having horizontal mismatch (mismatch type C). ECHP 1995-2000 (Spain).

	$\ln \left[\frac{\Pr(y = 1)}{\Pr(y = 0)} \right]$		$\ln \left[\frac{\Pr(y = 2)}{\Pr(y = 0)} \right]$		$\ln \left[\frac{\Pr(y = 3)}{\Pr(y = 0)} \right]$	
	Coef.	t	Coef.	t	Coef.	t
Male	0.094	1.22	0.127	1.00	0.218	1.12
Married	0.060	0.66	0.003	0.02	0.338	1.49
Age	0.005	0.21	0.085	2.03	0.134	1.86
Age ²	0.000	0.31	-0.001	-2.03	-0.001	-1.86
<i>Educ. Level</i>						
Primary Ed.	-	-	-	-	-	-
Second. Ed	0.049	0.52	0.054	0.37	0.727	3.20
University	-0.173	-1.63	-0.440	-2.48	0.494	1.94
Training	-0.015	-0.17	0.223	1.62	0.041	0.21
Open-ended contract	0.376	3.87	0.427	2.61	1.057	3.77
Disability	-0.052	-0.31	-0.178	-0.60	-0.706	-1.17
<i>Type of firm</i>						
Pub. Adm. And public firm	-0.202	-1.91	0.096	0.57	0.493	1.96
Private (<20)	-	-	-	-	-	-
Private (20-500)	0.004	0.05	0.084	0.58	0.154	0.61
Private (>500)	-0.057	-0.41	0.218	1.06	0.751	2.63
<i>Seniority</i>						
< 1 year	-	-	-	-	-	-
1-5 years	0.206	2.21	0.603	3.59	1.124	3.44
5-10 years	-0.110	-0.79	0.431	1.89	0.513	1.29
> 10 years	-0.309	-2.38	0.374	1.70	0.640	1.68
Constant	-1.660	-3.35	-5.311	-5.81	-8.207	-5.55
N			4,888			
Distribution (%)	26.86		7.73		3.15	
Log Likelihood			-4,397			

y=0: The individual is not mismatched in any wave.

y=1: The individual is mismatched in 1 wave.

y=2: The individual is mismatched in 2 waves (consecutive or not).

y=3: The individual is mismatched in 3 waves or more (consecutive or not).

Table 7. Multinomial logit model on the probability of leaving a mismatch defined in a broad sense (mismatch type B). ECHP 1995-2000 (Spain).

Variable	$\ln \left[\frac{\Pr(z = 1)}{\Pr(z = 0)} \right]$		$\ln \left[\frac{\Pr(z = 2)}{\Pr(z = 0)} \right]$	
	Coef.	t	Coef.	t
Male	0.007	0.05	-0.319	-2.33
Married	-0.035	-0.25	0.131	0.84
Age	0.048	1.18	-0.184	-4.66
Age ²	-0.000	-0.12	0.003	5.67
<i>Educational Level</i>				
Primary	-	-	-	-
Secondary	0.133	0.88	0.279	1.69
University	0.044	0.23	-0.051	-0.21
Training	0.251	1.81	-0.472	-2.43
Open-ended contract	0.336	2.07	-0.722	-4.40
Disability	-0.967	-3.22	0.599	2.43
<i>Type of Firm</i>				
Pub. Adm. and Pub. Firm	-0.099	-0.61	-1.114	-5.26
Private (<20 workers)	-	-	-	-
Private (20-500 w.)	0.054	0.40	-0.590	-4.16
Private (>500 w.)	0.122	0.60	-0.502	-1.95
<i>Seniority</i>				
< 1 year	-	-	-	-
1-5 year	-0.100	-0.52	-0.294	-1.83
5-10 year	-0.146	-0.62	-0.913	-3.70
> 10 year	-0.322	-1.36	-0.962	-4.04
Constant	-1.387	-1.50	5.316	6.03
N		2,076		
Distribution (%)	35.89		28.03	
Log Likelihood		-1,979		

Sample: Wage and salary workers who are mismatched the first time they are interviewed.

z=0: The individual does not leave his/her mismatch.

z=1: The individual leaves his/her mismatch for a better match.

z=2: The individual leaves his/her mismatch for other situations.

'Other situation' means self-employment, unpaid family work, jobs of less than 15 hours per week, unemployed and economically inactive workers

Table 8. Multinomial Logit Model on the probability of leaving over-education (mismatch type A). ECHP 1995-2000 (Spain).

Variable	$\ln \left[\frac{\Pr(z = 1)}{\Pr(z = 0)} \right]$		$\ln \left[\frac{\Pr(z = 2)}{\Pr(z = 0)} \right]$	
	Coef.	t	Coef.	t
Male	-0.439	-3.49	-0.494	-3.37
Married	0.162	1.16	0.174	1.04
Age	0.105	2.34	-0.062	-1.33
Age ²	-0.001	-1.49	0.001	2.39
<i>Educational Level</i>				
Primary	-	-	-	-
Secondary	-0.544	-3.48	-0.033	-0.19
University	-1.050	-5.86	-0.618	-2.95
Training	-0.108	-0.85	-0.657	-3.95
Open-ended contract	-0.212	-1.24	-0.842	-4.57
Disability	0.287	0.72	0.797	1.94
<i>Type of Firm</i>				
Pub. Adm. and Pub. Firm	-0.317	-1.92	-0.823	-4.16
Private (<20 workers)	-	-	-	-
Private (20-500 w.)	-0.244	-1.59	-0.652	-3.95
Private (>500 w.)	-0.364	-1.69	-0.742	-2.70
<i>Seniority</i>				
< 1 year	-	-	-	-
1-5 years	0.009	0.05	-0.379	-2.07
5-10 years	-0.084	-0.34	-0.647	-2.43
> 10 years	0.242	0.96	-0.779	-2.84
Constant	-0.690	-0.76	2.872	3.05
N		1,906		
Distribution (%)	36.62		23.56	
Log Likelihood		-1,808		

Sample: Wage and salary workers who are mismatched the first time they are interviewed.

z=0: The individual does not leave his/her mismatch.

z=1: The individual leaves his/her mismatch for a better match.

z=2: The individual leaves his/her mismatch for other situations.

'Other situation' means self-employment, unpaid family work, jobs of less than 15 hours per week, unemployed and economically inactive workers

Table 9. Multinomial Logit Model on the probability of employment mobility. Educational mismatch in a broad sense (mismatch type B). ECHP 1995-2000 (Spain).

Variable	$\ln \left[\frac{\Pr(x=1)}{\Pr(x=0)} \right]$		$\ln \left[\frac{\Pr(x=2)}{\Pr(x=0)} \right]$	
	Coef.	t	Coef.	t
Male	0.183	1.75	-0.171	-1.85
Married	0.097	0.79	0.141	1.31
Age	-0.076	-2.19	-0.211	-7.75
Age ²	0.001	2.02	0.003	9.27
<i>Educational Level</i>				
Primary	-	-	-	-
Secondary	0.009	0.07	0.058	0.51
University	-0.113	-0.76	-0.472	-3.47
Training	-0.587	-4.53	-0.584	-5.22
Open-ended contracts	-1.430	-11.51	-1.078	-9.89
Disability	0.321	1.29	0.572	3.05
<i>Type of Firm</i>				
Pub. Adm. and Pub. Firm	-0.772	-5.11	-0.980	-7.79
Private (<20 workers)	-	-	-	-
Private (20-500 w.)	-0.124	-1.12	-0.588	-5.87
Private (> 500 w.)	-0.186	-0.91	-0.606	-3.60
<i>Seniority</i>				
< 1 year	-	-	-	-
1-5 years	-0.297	-2.61	-0.212	-1.93
5-10 years	-0.823	-4.54	-0.855	-5.08
> 10 years	-1.888	-9.05	-1.074	-6.82
Mismatch type B	-0.035	-0.31	0.053	0.54
Constant	2.135	2.96	5.354	9.38
N		4,472		
Distribution (%)	18.00		26.86	
Log Likelihood		-3,539		

x=0: The individual does not move from his/her job.

x=1: The individual leaves his/her job to get another job.

x=2: The individual leaves his/her job to go to other situations.

'Other situation' means self-employment, unpaid family work, jobs of less than 15 hours per week, unemployed and economically inactive workers

Table 10. Multinomial Logit Model on the probability of employment mobility. Over-education (mismatch type A). Source: ECHP 1995-2000 (Spain).

	$\ln \left[\frac{\Pr(x=1)}{\Pr(x=0)} \right]$		$\ln \left[\frac{\Pr(x=2)}{\Pr(x=0)} \right]$	
	Coef.	t	Coef.	t
Male	0.174	1.67	-0.174	-1.89
Married	0.110	0.90	0.147	1.36
Age	-0.083	-2.39	-0.212	-7.78
Age ²	0.001	2.25	0.003	9.31
<i>Educational Level</i>				
Primary	-	-	-	-
Secodary	-0.072	-0.54	0.022	0.19
University	-0.196	-1.32	-0.523	-3.85
Training	-0.598	-4.61	-0.592	-5.29
Open-ended contract	-1.427	-11.45	-1.076	-9.87
Disability	0.353	1.42	0.583	3.11
<i>Type of Firm</i>				
Pub. Adm. and Pub. Firm	-0.759	-5.02	-0.979	-7.80
Private (<20 workers)	-	-	-	-
Private (20-500 w.)	-0.137	-1.25	-0.591	-5.90
Private (>500 w.)	-0.184	-0.90	-0.598	-3.55
<i>Seniority</i>				
< 1 year	-	-	-	-
1-5 years	-0.280	-2.45	-0.205	-1.86
5-10 years	-0.818	-4.49	-0.853	-5.07
> 10 years	-1.853	-8.86	-1.065	-6.76
Mismatch Type A	0.335	3.29	0.134	1.54
Constant	2.091	2.91	5.342	9.41
N		4,467		
Distribution (%)	17.98		26.86	
Log Likelihood		-3,529		

x=0: The individual does not move from his/her job.

x=1: The individual leaves his/her job to get another job.

x=2: The individual leaves his/her job to go to other situations.

'Other situation' means self-employment, unpaid family work, jobs of less than 15 hours per week, unemployed and economically inactive workers