

Overeducation and economic recovery: The case of Spanish university graduates

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(Preliminary version)

Abstract

This paper focuses on the consequences of the economic recovery period, from 2014 to 2019, on overeducation incidence and its persistence in the Spanish labour market for recent university graduates. To fulfil our objectives, we use data extracted from the Labour Insertion Survey for Recent University Graduates, conducted by INE in 2014 and 2019, that collect information of graduates from 2010 and 2014 respectively.

All along this research work, we study the incidence and persistence of this type of mismatch and the effect of the economic recovery on both aspects. All in all, our results show that graduates in 2014 did not only experience a lower probability of overeducation than those graduated in 2010, but they also exhibit lower persistence in this type of job-education mismatch. We therefore find that the economic recovery seems to have a relevant role regarding the incidence and persistence of overeducation. We also find evidence of the differences in incidence and persistence of overeducation across fields of study, which may change depending on the economic cycle.

JEL-Classification: I21, J24, C25

Keywords: job-education mismatch; college education; discrete choice models; sample selection.

1. Introduction

The increase in the educational attainment of the labour force, the worldwide competition and an ageing population, among other relevant socioeconomic changes, have caused the appearance of educational mismatches in the labour market over the last decades (Flisi et al., 2017). Although this phenomenon has been studied since the 70s by the pioneering works of Freeman (1976) and Thurow (1975) in the context of the United States economy, it is still present in nowadays labour markets.

Following the International Labour Organization definitions, job-education mismatches can be differentiated in two types: vertical mismatches and horizontal or field-of-study mismatches. A job-education mismatch is vertical when the level of qualification of an individual is higher (overqualification) or lower (underqualification) than required. However, a mismatch is horizontal when the type or field of education is different from the one required. Moreover, for the case of vertical mismatches, when the qualification of an individual is fully determined by his educational attainment, which will be our case of study, the International Labour Organization defines this mismatch as overeducation or undereducation rather than over or underqualification. Nevertheless, those concepts are generally used indifferently in the literature.

Looking at European data we can check that this job-education mismatch issue is still a problem for these days labour markets. For instance, in 2019, 21.9% of individuals with tertiary education in the European Union and aged from 20 to 64 were overqualified (Eurostat, 2019). The Spanish case is especially noteworthy: Spain has a 36.6% of overqualified individuals among those aged from 20 to 64 years old with tertiary education. This is the highest value of the EU-27, noticeably above the figures of other similar economies like Italy (20.2%) or Portugal (14.8%). The Spanish case is even more worrisome if we consider the proportion of tertiary educated people aged between 25 and 54 years old, which amounts to 42.3% in 2019, significantly higher above the average of the EU-27 (34.6%), and other similar economies like Portugal (30.1%) or Italy (22.0%). Therefore, we can deduce that Spain produces more tertiary educated people than other European countries, which increases the dimension of its already significant overqualification problem, implying an important underuse of human capital.

Moreover, the case of recent graduates is particularly relevant insofar as there is evidence that the risk of overqualification is higher among the youths (24-29 years old) compared to older ones (25-65 years old) (Sicherman, 1991; Groot, 1996; Vahey, 2000; Cedefop, 2015). For instance, in the Spanish case, Ramos (2017) states that for 2010 university graduates, 38% were overqualified in their first job after finishing their university degree and 25,2% were still so 4 years after. This encourages our focus on recent graduates and the need to study the persistence of overeducation.

Nevertheless, all along this research we concentrate our attention on analysing the effect of the recovery period registered in Spain from 2014 to 2019 on overeducation. This is especially interesting since the Spanish labour market has historically suffered from a very high elasticity between employment and the economic cycle. This high dependence of Spanish employment on the business cycle can be observed in the strong changes in unemployment, passing from an 8.2% unemployment rate in 2007 to a 26,1% in 2013 and to a 14.1% in 2019 (Eurostat, 2019). Therefore, measuring the effects of the recovery from the Great Recession on both the incidence and persistence of overeducation seems especially convenient for the Spanish case.

There is almost no existing literature that analyses the relevance of recovery periods on the incidence and persistence of overeducation, and how it may affect the relevance of other determinants of overeducation, such as the field of study. Therefore, this paper attempts to fill this gap in the literature.

In particular, the aim of our research work is to study job-education mismatches in the Spanish labour market for recent university graduates. More precisely, the objective is to analyse the importance of the economic recovery period, from 2014 to 2019, which followed the end of the Great Recession in Spain, on both the incidence and persistence of vertical mismatch (i.e., overeducation) among university graduates in Spain four years after graduation. The relevance of some of the determinants of overeducation will also be studied, mainly the field of study, which has traditionally been an important determinant factor in the overeducation literature. We will also determine to what extent the effect of the field of study can change due to the impact of the recovery period.

To fulfil the main purposes of this paper we use microdata extracted from the Labour Insertion Survey for Recent University Graduates (EILU) in Spain, performed by the National Statistics Institute (INE) for years 2014 and 2019.

The rest of the paper is organized as follows. In Section 2 we review the most relevant literature on job-education mismatches. Section 3 presents the data and methods used in this work. In Section 4 we present the results obtained. Finally, Section 5 offers some concluding.

2. Literature review

Since the pioneering works of Freeman (1976) and Thurow (1975) in the context of the United States, job-education mismatches have been widely studied in the Labour and Education Economics literature, especially for developed countries. The main contributions to this area focus on the analysis of vertical mismatches, mainly overeducation (see Leuven and Oosterbeek, 2011). Nowadays, most of the existing literature is composed of empirical works that analyse the effect of job-education mismatches on wages or well-being (Verhaest et al., 2017). Regarding wages, empirical literature finds that overeducated individuals tend to earn less than adequately matched with the same level of education. However, overeducated individuals tend to earn more than individuals who are in an equivalent job but with an adequate level of education (Allen and Van der Velden, 2001). Some works concerning the Spanish case obtain similar results, even considering the possible differences in match when accounting for the necessary skills for the job position, and not only education (Nieto and Ramos, 2017; Lahiguera and Martínez, 2012).

An important part of our study is the analysis of the persistence of overeducation, both from a general perspective and considering the relevance of the recovery period on it. Regarding the literature on persistence, we can distinguish mainly two theoretical approaches regarding the duration of the mismatch. On the one side, some theories consider overqualification as a temporary issue. In this branch of the literature, we can cite the Occupational mobility theory (Rosen, 1972; Sicherman and Galor, 1990) or the Matching theory (Jovanovic, 1979). On the other side, among the theories that state the long-lasting nature of overeducation, we can mention the Assignment theory (Sattinger, 1993), the Job-screening theory (Spence, 1973) or the Job-competition theory (Thurow, 1975). With a mixed view on the persistence of overqualification, the Spatial mobility theory (Büchel and Van Ham, 2003) that considers that overqualification would last as long as workers cannot access to the global labour market or until local job markets improve their offer. Other alternative approaches to this issue are inspired by the human capital theory (Becker, 1964), and suggest that overqualification might be persistent because observing human capital is impossible for employers, which leads to an imperfect information scenario.

This debate regarding whether overqualification is a persistent or temporary issue is still part of the recent empirical literature, where we have found mixed results, although most of the recent evidence suggests that persistence should be considered as a persistent phenomenon, especially for recent graduates. In this line, Verhaest and Velden (2013) analyse overqualification in the first five years of the career cycle of college graduates in 13 European countries and Japan and find that among graduates overqualified in their job six months after graduation in 2000, 43.3% remained overqualified five years later. However, an important heterogeneity across countries has been found, regarding the persistence of overqualification. For instance, The Netherlands is the country with the lowest persistence rate (30%), while Japan has the highest one (66%) and Spain also presents a persistence rate over the mean, with 48.7%. Other examples are Meroni and Vera-Toscano (2017), for graduates in fourteen European countries, using the 2005

REFLEX data, or Frenette(2004), that focuses on Canadian graduates. Even though most of the evidence is in line with persistent theories regarding overqualification, other works have obtained contrary results. This is the case of Frei and Sousa-Poza (2012), who used a Swiss panel dataset, and concluded that overqualification is a transitory phenomenon, since 90% of workers escaped overqualification in the next four years after being overqualified.

Literature regarding the Spanish case states that overqualification seems to be a persistent phenomenon (Alba-Ramírez and Blázquez, 2002; Congregado et al, 2016; Montalvo, 2013; Rivera Garrido, 2019; Sánchez-Sánchez and Puente, 2020). This is also supported by Ramos (2017), who obtains in her study an incidence of 38% of overqualified graduates in their first job after leaving university and a 25,2% in their job four years after graduation. Although there are some studies that state the transitory nature of overqualification (Alba-Ramírez, 1993), most of the recent literature concerning the Spanish case seems to agree on the persistence of overqualification. Moreover, Sánchez-Sánchez and Puente (2020) state that overqualification is more persistent in recession periods.

Throughout this paper we will also analyse some of the determinants of overeducation and how the economic recovery period might have affected them. Overeducation determinants have been widely studied in the existing literature, as in Erdsiek (2017), Battu, et al. (1999), Verhaest and Omeij (2010), Brunello and Cappellari (2008) or Kucel and Byrne (2008). A general pattern can be stated in the factors that raise or lower the risk of overeducation Regarding university graduates, those with a temporary contract, graduates from public institutions or with a Humanities and Arts degree or a Social Sciences degree suffer a higher risk of overqualification in the recent years after graduation. On the contrary, those who obtained a degree in the field of Health Sciences are usually the less affected ones. Many other factors such as the family background (Erdsiek, 2016) or the role of gender are also frequently studied in the literature, however, the results are not always homogenous, mainly due to the different datasets and type of measures used (Verhaest and Omeij, 2010). For instance, while some authors find that women have a higher risk of overqualification (Büchel and Battu, 2003), others do not find conclusive evidence (Frei and Sousa-Poza, 2012; Montalvo, 2013; McGoldrick and Robst,1996; Albert and Davia, 2018).

Focusing on the Spanish case, the first study on overeducation was Alba-Ramirez (1993), who, concluded that overeducated individuals tend to be young individuals, highly educated and with few labour experience. More recent studies, as Albert and Davia (2018) obtained interesting results regarding job-education mismatches for recent graduates in Spain. They studied the mismatches from three different perspectives: vertical, horizontal and skill or knowledge mismatches. They obtained no gender differences in the probability of being overeducated in the first job after graduation. Other relevant results of the latter authors find that having good IT or English skills, having studied abroad, or receiving excellence or collaboration grants, which are related with high marks, reduce the probability of suffering

overqualification. Additional recent studies focused on Spain, such as Albert et al. (2018, 2021) or Acosta-Ballesteros et al. (2018) obtain similar results.

The main relevant aspect of our analysis arises in the role of the economic recovery period that took place in Spain from 2014 to 2019 on both the incidence and persistence of job-education mismatches (vertical and horizontal mismatch). For instance, Cedefop (2015) shows that the probability of being overqualified in the UE-28 rose from 17% in the pre-crisis graduates (2001-2007) to 28% for the 2008-2014 graduates, possibly implying a strong effect of the 2008-2014 recession period. Both supply and demand reasons explain these figures. First, from the supply side, it is likely that during the recession period, which ended in 2014, the high unemployment rates in Spanish economy forced university graduates to accept jobs that did not match their educational attainments (Wolbers, 2003). Second, from the demand side, employers would prefer to fire underqualified or adequately qualified individuals rather than overqualified, which is known as the skill bumping assumption (Cedefop, 2010; Muysken and Ter Weel, 2000). However, no clear inference should be made from Cedefop (2015), since the evidence is only descriptive.

As mentioned before, to the best of our knowledge the existing literature that analyses the effect of business cycle on overeducation is scarce. We can cite Croce and Ghignoni (2012) and Verhaest and Van der Velden (2013). They find that business cycle affects the incidence of overeducation and the probability of being overeducated five years later. However, they do not study how business cycle may affect to the magnitude and relevance of other determinants of overeducation. Moreover, the data used in these papers refer to a time span before the Great Recession. Some other authors put the attention of overeducation persistence (see Koppera (2016) and Rubb (2020) for the U.S. or Sánchez-Sánchez and Puente (2020) and Bartual-Figueras et. Al. (2017) for Spain, but the latter with a descriptive approach and limited to Catalonia). No evidence regarding the effect of a recovery period has been found apart from a work for the Poland case (Kiersztyn, 2013), which defends that the incidence of overeducation was higher in economic recovery periods than in recessions. This result seems surprising and contrary to what should be expected, which reinforces the need to analyse this issue. Moreover, due to the high incidence of overqualification in young tertiary educated individuals, our focus in recent university graduates seems especially convenient.

3. Data and methods

3.1. The data

The empirical analysis of this study is based on the Labour Insertion Survey for Recent University Graduates (EILU) in Spain, performed by the National Statistics Institute (INE). We have used the two available waves of this survey, conducted in 2014 and 2019, respectively. The first wave includes a sample of 30,379 university graduates who finished their bachelor's degree in the 2009/2010 academic year and were interviewed between September 2014 and February 2015. The second wave comprises 31,651 individuals who finished their college studies in 2013/2014 and were interviewed between July and December 2019. Thus, the periods in which both waves complete graduate studies and answer the interview are very different in terms of the economic cycle.

This survey has several advantages. First, since it contains information in 2014 and 2019 for graduates in 2010 and 2014 respectively, it allows to study the impact of the economic recovery on the incidence of overeducation. Second, the survey asks if individuals felt overeducated in the first job after graduation as well as in the job occupied four years later, thus permitting to analyse the persistence of such mismatches. Although we do not have precise details on when the first job was found by the individuals, we do have sufficient information to determine that this first job is obtained during the first year after graduation by the 73.7% of our sample. Therefore, the persistence measure for most of our sample will be related to persistence of job-education mismatches in the three to four years after their first job. Due to the periods when the different waves of this survey were performed, we can study the impact of the recovery period in the persistence of overeducation. Finally, the dataset contains rich information to examine the determinant factors in the probability of being overeducated, both individual and job characteristics. We pay special attention to a well-known factor in the literature, the field of study.

There are other works in the literature that have used this survey, but only exploiting the 2014 wave (Rodríguez-Esteban et al. 2019; Albert et al., 2018, 2021; Albert and Davia, 2018). Up to our knowledge, our work is the first one using the 2014 and 2019 waves simultaneously. This has involved an important effort in harmonizing the data, as in many cases the variables in both waves were not equally defined. Using both waves implied an important refinement insofar as it allows us to compare two different business cycle periods.

Apart from the main variables of interest in our analysis, i.e., those related to job-education mismatches variables, we also consider different groups of variables regarding individual characteristics, studies related variables, job characteristics and other social and economic characteristics (see Table 1 for a description of these variables).

Table 1. Variables definition

A. Job-education mismatches related variables	
<i>Variable</i>	<i>Definition</i>
Overeducation in the first job	Self-perceived overeducation in first job after graduation: the worker reports that the level of education required for his/her job is lower than Bachelor's degree. Binary indicator (1=yes, 0=no).
Overeducation in the current job	Self-perceived overeducation in the job at the time of the interview. Binary indicator (1=yes, 0=no).
B. Individual characteristics	
<i>Variable</i>	<i>Definition</i>
Male	1 if male, 0 otherwise
Age	Different groups of age (under 30 years old, between 30 and 34 years old, 35 years old or older)
Spanish	1 if Spanish, 0 otherwise
ICT	ICT knowledge (Basic, Advanced, Expert)
Languages spoken	1 if individual speaks two or more languages, 0 otherwise.
C. Study related variables	
<i>Variable</i>	<i>Definition</i>
Studied abroad	1 if the graduate has studied abroad, 0 otherwise
Collaboration or excellence grant	1 if the graduate has obtained an excellence or collaboration grant during the degree, 0 otherwise
Private university	1 if university of origin is a private university, 0 if public
Field of study	Field of study (Arts and Humanities, Social and Legal science, Science, Engineering and Architecture, Health sciences)
Internship outside the degree plan	1 if the graduate has done an internship outside the degree plan, 0 otherwise
Postgraduate degree	1 if the graduate has a postgraduate degree, 0 otherwise

Table 1. Variables definition (cont.)

D. Job related variables	
<i>Variable</i>	<i>Definition</i>
Type of journey	Type of journey in individual's job (Full-time, Part-time)
Occupation (ISCO)	Type of occupation in individual's job, following ISCO-08 classification (9 categories: Managers; Professional; Technicians and associate professionals; Clerical support workers; Service and sales workers; Skilled agricultural, forestry and fishery workers; Craft and related trades workers; Plant and machine operators, and assemblers; Elementary occupations)
Autonomous region or country	Autonomous Region or country of the individual's job
Professional situation	Professional situation in the individual's job (Trainee, Permanent contract, Fixed contract, Independent worker)
Experience years	1 if the graduate has 2 or more years of professional experience at the time of the interview, 0 otherwise
Number of employers	1 if the graduate has had 2 or more employers at the time of the interview , 0 otherwise
Theoretical skills	Relevance of theoretical skills to obtain their current job (Not important, Slightly important, Moderately important, Important, Very important)
Practical skills	Relevance of practical skills to obtain their current job (Not important, Slightly important, Moderately important, Important, Very important)
Language skills	Relevance of language skills to obtain their current job (Not important, Slightly important, Moderately important, Important, Very important)
IT skills	Relevance of IT skills to obtain their current job (Not important, Slightly important, Moderately important, Important, Very important)
Social skills	Relevance of social skills to obtain their current job (Not important, Slightly important, Moderately important, Important, Very important)
Management skills	Relevance of management skills to obtain their current job (Not important, Slightly important, Moderately important, Important, Very important)
E. Other social or economic variables	
<i>Variable</i>	<i>Definition</i>
Unemployment of the country of residence	Unemployment in the Autonomous Region or country of residence of the graduate. Due to the lack of information of the region of residence in the 2014 wave, it was built by combining information on the University region for those who did not move since getting the Degree, and information about the region they moved to for those who did.
Household type	Type of household (Unipersonal, Household with children under 25 years old, Other type of household)
Year (Wave)	It indicates whether the data come from the 2014 wave (Year=0) or the 2019 wave (Year=1).

There are some aspects of the dataset that are worth mentioning. First, almost all the interviewed individuals (almost 95.5% of the sample) have worked at least once in their lifetime, while around 79.0% are working at the time of the interview. The percentage is quite different for individuals interviewed in

2014 (73.1%) and in 2019 (84,8%). Second, due to the nature of our survey, we cannot study overeducation for postgraduates who work as graduates, since there is not sufficient information to do that distinction in both waves.¹ Third, we have excluded individuals with military occupations, independent workers, individuals who work helping in a family business and those whose current or first job is outside the European Union, except for the United Kingdom. This represents a 13.28% (8236 observations) of the sample. After excluding missing observations for the variables involved in the analysis, we end up with a sample of 53805 observations, 79.04% of them corresponding to employed individuals at the time of the interview. Table 2 offers a summary of descriptive statistics for the variables used in this work, considering whether they are available in the first job, in the job at the time of the interview or in both.

Table 2. Descriptive statistics summary

A. Job-education mismatches related variables				
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>	<i>First job/Current job</i>
Overeducation in the first job	.309	.462	{0,1}	First
Overeducation in the current job	.174	.379	{0,1}	Current
B. Individual characteristics				
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>	<i>First job/Current job</i>
Male	.402	.490	{0,1}	Both
Age ^(a)	-	-	{1,2,3}	Both
Spanish	.992	.090	{0,1}	Both
ICT ^(a)	-	-	{1,2,3}	Current
Languages spoken by the individual	.942	.234		Current
C. Study related variables				
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>	<i>First job/Current job</i>
Studied abroad	.153	.360	{0,1}	Both
Excellence or collab. Grant	.071	.256	{0,1}	Both
Private university	0.138	.345	{0,1}	Both
Field of study ^(a)	-	-	{1,2,3,4,5}	Both
Internship outside degree plan	.299	.458	{0,1}	Both
Postgraduate degree	.420	.493	{0,1}	Both
D. Job and job search related variables				
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>	<i>First job/Current job</i>
Theoretical skills ^(a)	-	-	{1,2,3,4,5}	Current
Practical skills ^(a)	-	-	{1,2,3,4,5}	Current
Language skills ^(a)	-	-	{1,2,3,4,5}	Current
IT skills ^(a)	-	-	{1,2,3,4,5}	Current
Social skills ^(a)	-	-	{1,2,3,4,5}	Current
Management skills ^(a)	-	-	{1,2,3,4,5}	Current
Experience years	.786	.410	{0,1}	Current
Number of employers	.704	.456	{0,1}	Current
Type of journey in the current job	.182	.386	{0,1}	Current
Type of journey in the first job	.182	.386	{0,1}	First
Occupation (ISCO) of the current job ^(a)	-	-	9 categories	Current
Occupation (ISCO) of the first job ^(a)	-	-		First
Region or country of the current job ^(a)	-	-	23 categories	Current
Region or country of the first job ^(a)	-	-		
Professional sit. of the current job ^(a)	-	-	{1,2,3}	Both
Professional sit. of the first job ^(a)	-	-	{1,2,3}	Both

¹ The Spanish Statistical Office conducted in 2019 an additional survey, specific for Master graduates. It is part of our future research agenda to analyze job-education mismatches at the Master level. Unfortunately, this additional survey was not conducted in 2014.

Table 2. Descriptive statistics summary (cont.)

E. Other social or economic variables				
<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Range</i>	<i>First job/Current job</i>
Unemployment resid.	15.000	5.376	[3.15-28.6]	Current
Household type ^(a)	-	-	{1,2,3}	Current
Year (Wave)	.509	.500	{0,1}	Both

Notes: ^(a)Categorical variable with more than two categories. Frequency table reported in Table A1 in the Appendix.

According to the figures in Table 2 and those in Table A1 in the Appendix, almost all the individuals are Spanish and 59.8% are women. Regarding age, 55.0% were younger than 30 years old at the time of the interview, 26.1% aged between 30 and 34 years old and 18.9% were older than 34 years old. Concerning the field of study, 10.1% studied Arts and Humanities and almost the same proportion studied Science (9.5%), while Social and Legal Sciences was the chosen field by 45.7 % of individuals, 21.2% studied Engineering and Architecture and 13.5% studied Health Sciences. Interestingly, there are gender differences in the choice of field of study. The presence of women is much higher than men in all fields expect in Engineering and Architecture: around 60.5% of women in Science studies, 64.7% in Arts and Humanities and in Social and Legal Sciences and 75.3% in Health Sciences, where only 31.6% studied Engineering and Architecture. Regarding the university, only 13.5% of individuals got the Degree in a private one, 15.0% studied abroad and 6.8% got an excellence grant.

Focusing on the variables indicating the job-education mismatches, around 31.1% of the individuals perceived to be overeducated in the first job. However, in the current job the figures are of 17.9%, although we should keep in mind that the samples employed for the first and current job differ, since in the latter one we only include individuals who are currently working, while in the first one we include every individual who has ever had a job (and answered the question).

Focusing on the employed individuals at the time of the interview, we find that the proportions are similar as the previously mentioned for the different samples. Table 3 offers the incidence of overeducation for graduates of each wave.

**Table 3. Incidence of overeducation
(Employed individuals at the time of the interview)**

<i>2014 wave (Graduates in 2010)</i>	
First Job	34.57%
Current job	26.19%
Diff. current and first job	-8.38 pp
<i>2019 wave (Graduates in 2014)</i>	
First Job	24.33%
Current job	11.18%
Diff. current and first job	-13.15 pp

34.6% of the individuals who graduated in 2010 and were employed at the time of the interview reported to have been overeducated in their first job, while it was only the case for 24.3% of those who graduated in 2014. Regarding overeducation in their job at the time of the interview, approximately four years after graduation, 26.2% of those who graduated in 2010 perceive themselves as overeducated, while the figure for those graduated in 2014 is only 11.2%. The reduction between the first and current job overeducation

incidence is more important for 2014 graduates than for those who graduated in 2010 (13.15 pp vs. 8.38 pp), which might suggest that persistence in overeducation could be stronger for the latter. This may be related with the economic recovery period experienced in Spain from 2014 to 2019, which could allow not only better matching opportunities in the labour market but also better chances to improve that matching in the early career.

As stated previously, traditionally one of the most relevant determinants of overeducation in the literature is the field of study. Table 4 shows the incidence of overeducation in the job at the time of interview across education fields. Although the dataset allows a very disaggregated classification of fields and subfields, for the sake of comparison with other works, we consider five broad categories. To check that we present the incidence of overeducation in the current job by field of study in Table 4.

Table 4. Incidence of overeducation in the current job by field of study

Wave	Arts and Humanities	Science	Social and Legal Sciences	Engineering and Architecture	Health Sciences
2014	30.91%	21.98%	33.76%	20.11%	7.08%
2019	20.65%	9.94%	14.56%	5.79%	3.95%

As expected, in both years we observe that Health Sciences graduates are those with the lowest incidence of overeducation, while graduates in Arts and Humanities and Social Sciences are the ones with the highest incidence. We also observe a clear difference between waves, in 2019 individuals have a remarkable lower incidence of overeducation than in 2014. The highest difference between waves is observed among Engineering and Architecture graduates, followed by those graduated in Science. On the contrary, for those with Arts and Humanities degrees, the decrease in the incidence of overeducation is the lowest one in relative terms.

3.2. Methods and model specification

In the next section we will employ econometric methods to measure the incidence and persistence of overeducation, focusing on the relevance of the economic cycle on both. As we saw in Table 1, we measure overeducation through a binary indicator that takes the value 1 if the individual is overeducated. This suggests the use of binary response models. This type of models is very well known and have been used in the literature in many different contexts.

In our analysis, the dependent variables of interest (overeducation) is only observed for those individuals who are working. If we are interested in the probability of being mismatched in the labour market given the individual's characteristics and other factors, there is a potential bias which comes from the selection of individuals into employment. The importance of this bias depends, among other factors, on the proportion of selected observations. In our specific case, if employed individuals represent a very high proportion of the sample, the selection bias will not be an issue to control for. However, if there is a non-negligible proportion of individuals who do not work, which is our case, the sample selection must be accounted for. Moreover, since we will include the binary indicator of overeducation in the first job after graduation as an explanatory variable for overeducation in the current job, to measure overeducation persistence, we may also face endogeneity problems. The latter is clear, since many unobserved features, such as personality traits or abilities, can affect the probability of suffering overeducation in the first job after graduation, which are possibly also correlated with unobserved features of the probability of overeducation in the current job, causing bias in our estimators if we do not take it into account.

Therefore, we need to consider the possibility of both potential sources of endogeneity: a potential sample selection bias and the inclusion of overeducation in the first job as an explanatory variable, due to the recursive nature of our model of interest. Consequently, we implement a system of three equations, which would be estimated simultaneously by employing simulated likelihood methods, due to the complicated estimation of integrals of multivariate normal distributions of dimension 3. To do so we use the Stata conditional mixed process estimator (cmp), developed by Roodman (2011), who employs the GHK algorithm (Geweke 1989; Hajivassiliou and McFadden 1998; and Keane 1994), to estimate the cumulative probability. The dependent model to be estimated would be the overeducation in the current job y_2 , conditioned on being employed in the current job ($E=1$) and having overeducation in the first job (y_1) as an explanatory variable. The model would have the following structure:

$$\begin{aligned}y_1^* &= \lambda x_1 + u_1 \\y_2^* &= \alpha_1 y_1 + \beta x_2 + u_2 \\E^* &= \gamma_3 x_3 + u_3\end{aligned}$$

Where the observed variable (y_1, y_2, E) would take value one when their latent one (y_1^*, y_2^*, E^*) is superior to 0. The employment equation is the selection equation, meaning that y_2 , would only be observed if E is equal to 1.

In the selection equation into employment, we consider the exclusion restriction. For instance, we include the unemployment rate in the Autonomous Region or overseas country the individual lives in and the type of household, mainly whether the individual lives alone. This type of instruments has been used in the literature that analyses labour outcomes accounting for endogeneity issues (Angrist and Evans, 1998; Carrasco, 2001; Arkes, 2010).

However, we do not find evidence of sample selection bias and we decide to simplify our case, estimating a bivariate probit model. This would solve the endogeneity problem caused by including overeducation in the first job as an explanatory variable of the probability of overeducation in the current job. In order to secure identification of our parameters, we also consider exclusion restriction in this case, regardless that part of the literature suggests that there is no need for it (Wilde, 2000), since later works declare that it would be preferred to ensure point identification (Mourifié and Méango, 2014). The final bivariate probit model estimated would be formulated as follows:

$$\begin{aligned} y_1^* &= \lambda x_1 + u_1 \\ y_2^* &= \alpha_1 y_1 + \beta x_2 + u_2 \end{aligned}$$

where x'_1 and x'_2 are two sets of explanatory variables and λ and β are parameter vectors to estimate.

The observability rule for the binary indicators y_1 and y_2 is given by:

$$\begin{aligned} y_1 &= 1(y_1^* > 0) \\ y_2 &= 1(y_2^* > 0) \end{aligned}$$

In our case, y_1 is the binary indicator for overeducation in the first job and y_2 the binary indicator for overeducation in the current job. The error terms u_1 and u_2 of both equations are assumed to be independent of (x_1, x_2) and to follow this conditional bivariate normal distribution, where ρ would be the correlation coefficient between the error terms of both equations. The model is estimated by Maximum Likelihood and ρ informs us about how unobservable factors affecting both observed outcomes are correlated. Since ρ is significantly different from 0, we have evidence of endogeneity, which is now controlled under this bivariate probit estimation.

As in all nonlinear models, the estimated coefficients do not inform about the magnitude of the effect of a change in one explanatory variable. The partial effects are not constant. They are a nonlinear function of all the explanatory variables and all the parameters. Thus, a partial effect can be estimated for each observation. The estimated average partial effect is simply the sample average across observations of these estimated effects. Alternatively, we can compute partial effects at specific values of the explanatory variables. Given the nonlinearity of the partial effects, the standard errors can be computed through the Delta method once the variance-covariance matrix of the estimated coefficients is obtained.

To better understand the future sections of our work, a more extensive specification of our bivariate model would be the following:

$$y_1^* = \lambda_0 + \lambda_1' IC_i + \lambda_2' SV_i + \lambda_3' JV_{i,fj} + \lambda_4 year_i + \lambda_5' FoS_i + \lambda_6' (year * FoS)_i + u_1$$

$$y_2^* = \beta_0 + \alpha_1 y_{1i} + \beta_1' IC_i + \beta_2' SV_i + \beta_3' JV_{i,cj} + \beta_4 year_i + \beta_5' FoS_i + \beta_6' (year * y_1)_i + \beta_7' (year * FoS)_i + \beta_8' (y_1 * FoS)_i + u_2$$

Where y_1 is the observed binary indicator for overeducation in the current job, IC is a set of individual characteristics, SV the set of study variables, JV_{cj} the set of job related variables for the current job, FoS represent a set of dummy variables for each field of study, finally the variable $year$, takes value 1 if the individual is from the 2019 wave and 0 when he is from the 2014 one.

The later indicator, $year$, will let us analyse the impact of the recovery period. The y_1 variable of whether the individual was overeducated in the first job, allows us to study the persistence of overeducation. The interaction $year * y_1$ facilitates the analysis of persistence between waves, understanding the relevance of the recovery period. We also include an interaction between the variable $year$ and the field of study (FoS), trying to understand how the recovery period shapes the effect of each field in the probability of overeducation. Finally, we have added an interaction between the field of study and the indicator of whether the individual was overeducated in the first job ($y_1 * FoS$), to better capture the differences in the persistence across fields of study. We will also analyse the latter considering the difference between waves.

4. Estimation results

In this section we present the estimation results of our standard probit model for the probability of suffering overeducation at the graduates' current job. This will allow us to evaluate the impact of a recovery period on the incidence and persistence of overeducation, while controlling for multiple factors. For the considered model, we have estimated several specifications including different groups of variables to check the explanatory power of each group. Throughout this section, we report the results of the estimation including all the explanatory variables described in the model specification.

In the following Table 5 we observe the average partial effects obtained for almost all the variables included in our model.

**Table 5. Estimated average partial effects for overeducation in the current job
(Bivariate probit model)**

2019	-0.110***(0.003)	<i>Occupation (ISCO-08) (ref: managers)</i>	
		Professionals	-0.019**(0.008)
<i>Overq. in first job</i>	0.082***(0.005)	Technicians & assoc. prof.	0.115***(0.009)
Individual characteristics			
<i>Male</i>	-0.006**(0.003)	Clerical support workers	0.205***(0.010)
<i>Spanish</i>	0.023 (0.013)	Service and sales workers	0.393***(0.013)
<i>Age intervals (ref: <30 years)</i>		Skilled agric/forest/fish workers	0.156***(0.046)
30-34 years old	0.005*(0.003)	Craft and related trades workers	0.243***(0.026)
>34 years old	0.026***(0.004)	Plant and machine operators	0.335***(0.034)
<i>IT knowledge (ref: basic)</i>		Elementary occupations	0.375***(0.022)
Advanced	-0.003(0.004)	<i>Theoretical skills (ref: None)</i>	
Expert	-0.006(0.006)	Moderately important	-0.071***(0.007)
<i>Languages spoken (ref: one)</i>	0.001(0.005)	Very important	-0.115***(0.007)
Study-related variables			
<i>Studied abroad</i>	-0.011***(0.004)	<i>Practical skills (ref:None)</i>	
<i>Coll. or excellence grant</i>	-0.007(0.006)	Moderately important	-0.019*(0.006)
<i>Private university</i>	-0.011***(0.004)	Very important	-0.041***(0.006)
<i>Field of study (Ref: Arts and Humanities)</i>		<i>Languages skills (ref:None)</i>	
Science	-0.015***(0.007)	Moderately important	-0.019***(0.004)
Soc. and Legal sc.	-0.011***(0.005)	Very important	-0.050***(0.004)
Eng.and Architecture	-0.031****(0.006)	<i>IT skills (ref:None)</i>	
Health sciences	-0.060****(0.007)	Moderately important	-0.022****(0.005)
<i>Internship outside degree</i>	-0.004(0.003)	Very important	-0.025****(0.006)
<i>Postgraduate studies</i>	-0.016****(0.003)	<i>Soc skills (ref:None)</i>	
		Moderately important	0.020****(0.007)
		Very important	0.018***(0.007)
Job-related variables			
<i>Part-time job</i>	0.045****(0.004)	<i>Management skills (ref:None)</i>	
<i>Type of contract (ref: trainee)</i>		Moderately important	-0.010(0.007)
Permanent contract	0.015****(0.005)	Very important	-0.040****(0.008)
Fixed-term contract	0.031****(0.005)	<i>N. of employers (ref: less than 2)</i>	-0.145****(0.003)
		<i>Experience years (ref: less than 2)</i>	-0.019****(0.004)
Observations			38327

Notes: In parentheses, robust standard errors for the average partial effects obtained from the Delta method. Region and types of job search dummies included in the model; *** p<0.01, ** p<0.05, * p<0.1

From the table above we can state that many variables should be considered as determinants of overeducation. However, some of the individual and study variables do not seem to have a significant effect on the probability of suffering overeducation in the graduates' job four years after graduation. From those group of variables, we can highlight that being over 34 years old (compared to individuals under 30 years old) increases the probability of suffering overeducation, while having studied abroad, in a private university or having postgraduate studies reduces it. The latter is consistent with what Barone and Ortiz (2011) state. Moreover, Capsada-Munsech, (2017) indicates that having a master's degree reduces the probability of overeducation by demonstrating more skills and a higher specificity of them, better signalling the employer what the worker is able to do. This author also states that the role of postgraduate studies is especially relevant in countries such as Spain, where there is a high percentage of tertiary educated individuals. The effect of the different fields of study, compared to Arts and Humanities, seem to be relevant for almost all the categories and in line with the literature (Erdisek, 2017; Blázquez and Mora, 2010; Albert and Davia, 2018; Dolton and Vignoles, 2010; Verhaest and Omey, 2010), since having studied a Health Sciences degree reduces the probability of overeducation the most. However, this will be analysed in depth later on this section. We also obtain that men have a 0.6pp lower probability of being overeducated than women, which is in line with part of the literature (Büchel and Battu, 2003) but, as stated previously, this is not a shared result by many other authors (Frei and Sousa-Poza, 2012; Montalvo, 2013; McGoldrick and Robst, 1996; Albert and Davia, 2018). Although we obtain a significant result regarding gender, its magnitude is small, so we cannot state that there are especially relevant differences between women and men in the probability of overeducation.

In fact, the variables related to the job characteristics seem to concentrate the explanatory power. For instance, we observe that the work schedule, the professional situation, the current occupation or the region or country² of the current job have a significant effect. We get that working part-time (with respect of full-time) increases the probability of being overeducated by 4.5 pp, which is in line with the evidence obtained by previous authors in the literature. Trainees have a lower probability of being overeducated than those with a permanent or fixed-term contract. The latter result, that is in line with Erdisek (2017), seems reasonable since internships usually are more related with individuals' education. As expected, we also observe that the lower the occupation category of the individual is, the higher is the probability of being overeducated.

Although these results are relevant and in line with the findings of the traditional literature on the overeducation determinant, we will focus our discussion on the persistence of overeducation and the impact of the recovery period on the incidence of overeducation and its persistence. We will also pay special attention to the differences across fields of study, regarding the incidence, the persistence, and the

² Results regarding the region or country of the current job are not displayed in the presented tables for space optimization reasons. They can be provided by the authors under request.

impact of the recovery period. This will be illustrated by the Average Marginal Effects (AME) of different results presented in the following figures.

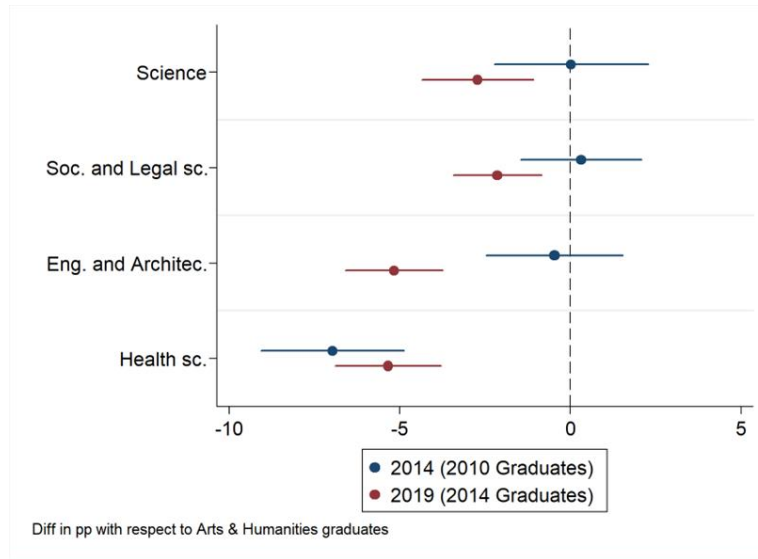
For instance, in Figure 1, we observe the difference between each field of study and wave in the probability of being overeducated, compared to our reference category (Arts & Humanities). Although in Table 5, we obtained a result for both waves considered jointly, we can now notice the differences between waves. In 2014 we get that 2010 graduates in Science, Social and Legal Sciences and Engineering and Architecture have no significant differences with Arts and Humanities, while in 2019 we obtain that 2014 graduates present an statistically significant lower risk of being overeducated in their current job than Arts and Humanities graduates. In both years we clearly observe that Health Science graduates have a lower probability of overeducation than Art and Humanities graduates, which is a differentiating aspect in 2014, when the rest of fields do not seem to have a differential effect.

In 2019 we clearly get that Engineering and Architecture, and Health Sciences graduates present the lowest risk of being overeducated in their current job, -5.1pp and -5.3 pp less probability than Arts and Humanities graduates. Science and Social Science graduates also have significantly lower chances of overeducation in the current job than Arts and Humanities in 2019, but of lower magnitude. This is in line with most of the literature, for example, Ortiz and Kucel (2008), Capsada-Munsech, (2017), Carroll and Tani (2013), or Edisek (2017) state that technical or scientific fields such as Health Sciences or Engineering are aimed at very specific occupations with discipline-specific skills needed, while Art and Humanities or Social Sciences have a wider scope, therefore having higher chances of suffering overeducation.

The change experienced by Engineering graduates from one period to the other is especially relevant. This may imply that the Spanish labour market in 2014 was not able to offer adequate job positions for Engineering graduates, while it was in 2019. In 2014 Engineering and Architecture graduates might have been forced to accept job positions for which they were overeducated to avoid unemployment, as Wolbers (2003) suggests for a more general case. To better understand the differences during the business cycles between graduates of distinct field of studies, it might be interesting to perform a deeper analysis. This could allow us to understand if a significant change structural change happened in the labour market between periods. This could be especially relevant in countries such as Spain, which usually experiments a high volatility of unemployment fluctuations over the business cycles (Camacho et. al , 2017).

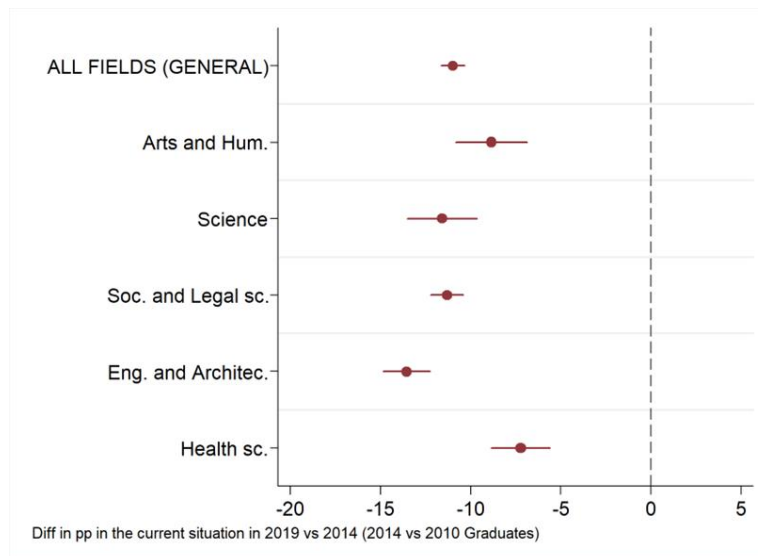
Moreover, our results regarding Health Sciences graduates are different from the rest, since the difference with Art and Humanities graduates is similar in both years, even greater in 2014 than in 2019, which may imply that those graduates tend to suffer less the impact of the economic cycle, regarding this type of job-education mismatch. This might be related with the fact that most of the Health Sciences job positions in Spain tend to be offered by the public sector, which, at least regarding healthcare positions, tend to be stable job positions with smoother unemployment fluctuations. This could explain the lower volatility across periods of the impact of having a degree on this field of study, compared with the rest.

Figure 1: Impact of the different fields of study on the probability of overeducation in the current job (AME)



In Figure 2 we observe the impact of the recovery period, measured by the variable *year*, on the probability of suffering overeducation in the current job. For instance, individuals who graduated in 2014 present 11.0 percentage points less probability of suffering overeducation four years after (2019) than those who graduated in 2010. This would imply that the recovery period clearly reduced the probability of being overeducated. This is done after controlling for multiple factors, as we stated previously, so that the obtained effect is not associated to other factors. We can also observe the differences across fields of study, where we obtain that Engineering and Architecture graduates seem to be the ones who benefited the most by this recovery period, while Health Science graduates were the ones who had the smallest decrease in their probability of overeducation, followed by Art and Humanities graduates. Although both seem to be the less affected by economic performance, in the case of Health Science it would be due to a good matching situation regardless of the economic cycle, as observed previously in Figure 1, while it would be the contrary in the Art and Humanities case.

Figure 2: Impact of the recovery period on the probability of overeducation in the current job (AME)



Finally, Figure 3 illustrates our results regarding overeducation persistence. As stated previously, including the binary variable indicating whether graduates suffered overeducation in their first job, gives us information about the persistence of overeducation. In Table 5, we obtained that those who were overeducated in the first job have 8.2pp higher probability of being overeducated in their job four years after graduation. This shows that overeducation is persistent among recent graduates in Spain, which is consistent with most of the literature regarding the Spanish scenario (Alba-Ramírez and Blázquez, 2002; Congregado et al, 2016; Montalvo, 2013; Acosta-Ballesteros et al., 2018; Rivera Garrido, 2019; Sánchez-Sánchez and Puente, 2020). This would support the trap hypothesis, which suggests that overeducation is not a transitory problem. Nevertheless, increasing the number of employers and job experience reduce the probability of overeducation, which would suggest that overeducation might also be a strategic transitory state to have a better future match, as some stated job mobility theories in the literature review suggest. We then find mixed evidence, suggesting there is persistence in overeducation, but job mobility is also playing a role, and therefore some strategic behaviour might be also occurring. Those results would be in line with the work of Albert et al, (2021), who focused on job mobility.

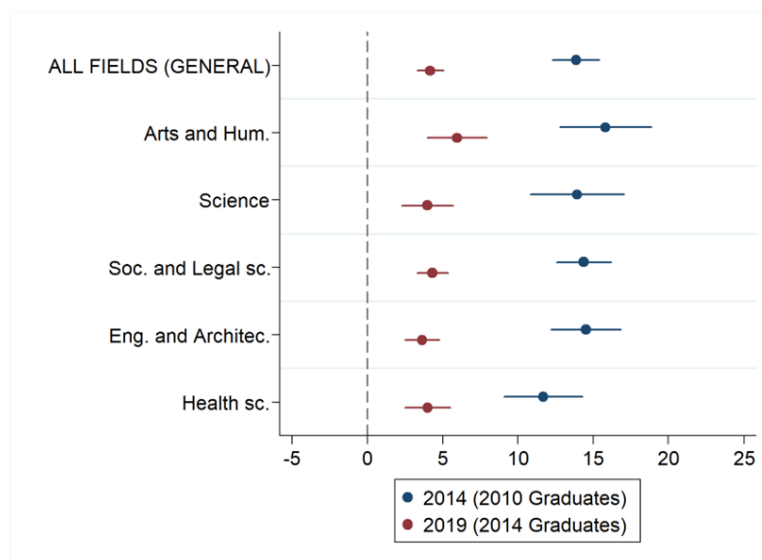
Focusing on the economic cycle effect, we can observe in Figure 3 that persistence is quite different between waves. For instance, individuals in 2014 who were overeducated in the first job see their current job overeducation probability increase in 13.9pp, while those in 2019 only suffer an increase of 4.2pp. The latter results would imply that not only the recovery period reduced the probability of being overeducated, which was derived from the *year* variable results, but it also reduced the probability of remaining so. Therefore, during recovery periods overeducation would be less persistent, somehow in line with Sánchez-Sánchez and Puente (2020), who stated that overqualification is more persistent in recession periods. Therefore, our results indicate that overeducation persistence is significantly relevant for the whole sample, but its impact is lower for individuals who graduated in the recovery period. A similar intuition is given by Verhaest and Van der Velden (2013), referring to the business cycle for a conglomerate of countries and a different period of time, thus, reinforcing our statement regarding the impact of the recovery period among recent graduates' scenario in Spain.

Moreover, Figure 3 allows us to discuss about the differences in persistence across fields of study. In 2014 we can see that the impact of being overeducated in the first job in the probability of being overeducated in the current job is almost the same in all fields of study, except for Health Sciences, where it is clearly lower. For instance, Health Sciences graduates who were overeducated in their first job would only have a 11.7pp higher probability of being overeducated in their current job in 2014 than those Health Sciences graduates who were not overeducated in their first job, while this marginal effect is clearly higher for the rest of fields of studies (15.8pp for Arts and Humanities, 14.5pp for Engineering and Architecture, , 14.4pp for Science and 13.9pp for Social Sciences). In 2019, the persistence is no longer the lowest among Health Science graduates (4.0pp), since Engineering and Architecture or Social Sciences graduates

seem to suffer slightly less persistence (3.6pp and 4.0pp). Nevertheless, the differences are not very relevant among those three cases or even compared with Science graduates (4.3 pp). However, suffering overeducation in their first job still increases in 6.0pp the probability of overeducation in the current job for Arts and Humanities graduates, being a significantly different effect from the rest of field of study graduates.

Therefore, we obtain evidence for the need to control for the economic cycle when analysing job-education mismatches, at least for procyclical economies such as Spain, since the persistence conclusions across fields of study would differ depending on the analysed year. Therefore, while in 2014 we would state that Health Sciences is clearly the field of study who suffers less overeducation persistence, the conclusion would not be the same in 2019, when its persistence is very similar to Engineering and Social Sciences graduates. We do find that regardless of the year, Arts and Humanities graduates suffer the highest persistence of overeducation, which is consistent with the scarce literature found on the topic of overeducation persistence across fields of study, obtaining that Humanities graduates are more likely to remain overeducated than the rest (Meroni and Vera-Toscano, 2017).

Figure 3: Impact of being overeducated in the first job on the probability of overeducation in the current job (AME)



5. Conclusions

In this paper we have analysed the incidence and persistence on overeducation among university graduates in the Spanish labour market. The aim of our analysis has been to understand how the economic cycle experienced in Spain after the Great Recession could have affected them. For this analysis we have used the Labour Insertion Survey for Recent University Graduates (EILU) in Spain, performed by the National Statistics Institute (INE) for years 2014 and 2019. The methodology employed allows to consider initial mismatches without facing endogeneity problems. We also considered the possibility of suffering sample selection bias, which was rejected.

Looking at our results, we obtain a clear outcome; the economic recovery reduces the chances of individuals of being overeducated. We find that graduates in 2014 have lower probabilities of being vertically mismatched than those who graduated in 2010, but we also get that graduates in 2014 seem to have suffered less persistence. Therefore, the recovery period decreased the probability of overeducation and its persistence for university graduates in Spain.

Moreover, we have also found that the field of study, which is a relevant factor of overqualification, is also affected by the economic performance. For instance, we get that there are no significant differences on the probability of suffering overeducation in 2014 between graduates who studied Engineering, Social Sciences or Science compared to Arts and Humanities graduates, while there are in 2019. This informs us that in the Spanish case, studying Health Science seems to reduce the chances of overeducation regardless of the economic performance, which is not obtained for any other field of education. The persistence of overeducation across fields of study also differs depending on the economic performance.

Those findings suggest that the impact of overeducation determinants can be affected by the economic performance, which is not usually discussed on the literature and should be taken into consideration, especially for procyclical economies, such as Spain, to avoid having incorrect estimates.

As stated in Verhaest et. al (2017), policy makers should try to combine education, labour and economic measures to reduce job-education mismatches. Some of those measures might include a better guidance for students to better understand the demand on the labour market or invest to favour the demand for high-educated workers. Other policies that help graduates improve their skills to find a suitable job and overcome difficulties such as geographic mobility, would foster an equilibrium between supply and demand of highly educated individuals, avoiding job-education mismatches. However, knowing that economic cycles affect overeducation incidence and persistence, especially in countries as Spain, might be relevant for policy makers to decide when to implement a policy. Possibly, additional measures should be considered to avoid the dismantling of the obtained results when a recession takes place.

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Appendix

Table A1. Frequency table of categorical variables with more than two categories

Individual characteristics:

<i>Age group</i>	<i>Freq.</i>	<i>Percent</i>
<30 years old	29612	55.04%
30-34 years old	14015	26.05%
>34 years old	10178	18.92%
TOTAL	53805	

<i>Information and communications technology</i>	<i>Freq.</i>	<i>Percent</i>
ICT knowledge: Basic	8221	15.64%
ICT knowledge: Advanced	34733	66.07%
ICT knowledge: Expert	9617	18.29%
TOTAL	52571	

<i>Languages spoken by the individual</i>	<i>Freq.</i>	<i>Percent</i>
Speaks a unique language	3233	6.24%
Speaks two or more languages	48549	93.76%
TOTAL	51782	

Study related variables:

<i>Field of study</i>	<i>Freq.</i>	<i>Percent</i>
Arts and humanities	5456	10.14%
Science	5111	9.50%
Social and Legal sciences	24603	45.73%
Engineering and Architecture	11378	21.15%
Health sciences	7257	13.49%
TOTAL	53805	

Table A1. Frequency table of categorical variables with more than two categories (cont.)**Job-related variables (first job):**

<i>Occupation in the first job ISCO 08</i>	<i>Freq.</i>	<i>Percent</i>
Managers	754	1.47%
Professional	25575	49.81%
Technicians and associate professionals	8051	15.68%
Clerical support workers	6215	12.10%
Service and sales workers	8053	15.68%
Skilled agricultural, forestry and fish	129	0.25%
Craft and related trades workers	379	0.74%
Plant and machine operators, and assemb	355	0.69%
Elementary occupations	1833	3.57%
TOTAL	51344	

<i>Professional situation in first job</i>	<i>Freq.</i>	<i>Percent</i>
Trainee	10604	20.80%
Permanent contract	16456	32.28%
Fixed-term contract	23924	46.92%
TOTAL	50984	

Table A1. Frequency table of categorical variables with more than two categories (cont.)**Job-related variables (current job):**

<i>Theoretical skills</i>	<i>Freq.</i>	<i>Percent</i>
None	4293	10.61%
Low	4564	11.28%
Moderate	7399	18.29%
Good	11989	29.64%
Excellent	12205	30.17%
TOTAL	40450	

<i>Practical skills</i>	<i>Freq.</i>	<i>Percent</i>
None	3687	9.12%
Low	3419	8.46%
Moderate	5657	14.00%
Good	11426	28.28%
Excellent	16219	40.14%
TOTAL	40408	

<i>Languages</i>	<i>Freq.</i>	<i>Percent</i>
None	10121	25.14%
Low	7335	18.22%
Moderate	7134	17.72%
Good	6728	16.71%
Excellent	8947	22.22%
TOTAL	40265	

<i>IT skills</i>	<i>Freq.</i>	<i>Percent</i>
None	5496	13.65%
Low	5813	14.43%
Moderate	9229	22.93%
Good	11505	28.58%
Excellent	8206	20.39%
TOTAL	40249	

<i>Social skills</i>	<i>Freq.</i>	<i>Percent</i>
None	2156	5.34%
Low	1726	4.27%
Moderate	4286	10.62%
Good	12690	31.43%
Excellent	19517	48.34%
TOTAL	40375	

Table A1. Frequency table of categorical variables with more than two categories (cont.)

<i>Management skills</i>	<i>Freq.</i>	<i>Percent</i>
None	2862	7.10%
Low	2886	7.16%
Moderate	6167	15.30%
Good	13488	33.45%
Excellent	14915	36.99%
TOTAL	40318	

<i>Occupation in the current job ISCO 08</i>	<i>Freq.</i>	<i>Percent</i>
Managers	1231	2.90%
Professional	25854	60.83%
Technicians and associate professionals	5992	14.10%
Clerical support workers	4834	11.37%
Service and sales workers	3408	8.02%
Skilled agricultural, forestry and fish	62	0.15%
Craft and related trades workers	234	0.55%
Plant and machine operators, and assemb	234	0.55%
Elementary occupations	652	1.53%
TOTAL	42501	

<i>Professional situation in current job</i>	<i>Freq.</i>	<i>Percent</i>
Trainee	4252	10.07%
Permanent contract	23497	55.67%
Fixed-term contract	14455	34.25%
TOTAL	42204	

Other variables:

<i>House type</i>	<i>Freq.</i>	<i>Percent</i>
Unipersonal	7725	18.87%
With children <25 y.o.	10681	26.09%
Other type of households	22540	55.05%
TOTAL	40946	