

JOB SEARCH STRATEGIES AND UNDEREMPLOYMENT IN RECENT GRADUATES FIRST JOBS IN SPAIN

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In this paper the impact of different job search strategies on underemployment (measured as overeducation, skills/knowledge underutilization and mismatch in the field of education) in Spanish recent graduates is estimated on a sample of recent graduates drawn from the University Graduate Job Placement Survey 2014. Our results show the advantages of institutionally supported job search strategies through public employment services or university career services as well as internship programmes over individual-driven strategies, both formal and informal. Similarly, being contacted by the employer –presumably through university career services– are also related to better job match. The use of temporary work agencies is related to the worst outcomes. Reviewing ads in the media and on-line as well as contacting employers –either directly or using informal networks– are also related with higher underemployment risks.

Key words: underemployment, overeducation, job search, university graduates.

JEL classification: J24, I23, I26.

Underemployment is a broad concept describing the multiple dimensions in which employment outcomes –occupational status, wages and contractual status– do not reach the expectations, this is, the expected return according one’s qualification and skills. It also applies to the quality of match between workers’ qualifications and skills and the ones needed in their job [Scurry and Blenkinsopp (2011)]. When it affects recent graduates, it receives particular attention by academics, university boards, labour market policy makers, and even tax payers because of the high (and increasing) levels of public and private resources they benefit from. This is particularly the case in countries where universities are publicly funded, as graduates’ underemployment threatens returns to public resources assorted to higher education. Reducing the incidence of recent graduates underemployment is a relevant target for labour market policy makers if underemployment becomes a trap rather than a stepping stone towards high quality professional careers [Verhaest, Schatteman, & Van Trier (2015); Acosta-Ballesteros, Rosal & Rodríguez-Rodríguez (2017); Meroni and Vera-Toscano (2017)].

Discrepancies between employment outcomes and individual attainments have diverse sources: the most relevant one is the gap between supply and demand for highly qualified workers as the provision for higher education –and, subsequently, the number of graduates– often expands faster than the number of graduate jobs [Dolton & Vignoles (2000)]; relative demand for graduate labour force is one of the most sound predictors for the level of graduate underemployment in OECD countries [Green and Helsenke (2016)]. Still, many approaches to underemployment focus on the supply side of the labour market. They explore unobserved heterogeneity in graduates' skills and abilities as well as imperfect information about both one's productivity and the available vacancies as relevant drivers for underemployment. Moreover, the increasing share of graduates in the labour force entail a higher diversity of their skills and other personal and job features that may blur the boundary between graduate and non-graduate jobs [Scurry and Blenkinsopp (2011)].

The explanations of education and/or skill mismatches via information asymmetries between prospective employers and graduate jobs seekers assign job search methods and routes of entry into employment a prominent role in preventing them [Carroll and Tani (2015); McGuinness, Whelan & Bergin (2016)]. Namely, the intermediating function of both universities' career / job placement services and public employment services may contribute to smooth the first transition into the labour market. Assessing the impact of institutionally assisted modes of entry into the labour market is therefore very useful to putting forward higher education policy proposals to reduce educational mismatches at the beginning of the employment career. Young graduates may also deploy informal job search methods (direct contacts with employers or via relatives and friend networks) to look for an adequate match in the graduate labour market.

This paper is aimed to analyse the impact of different job search strategies on underemployment risk in Spanish recent graduates upon graduation. We will distinguish between (a) institutionally assisted job search strategies – university careers / job placement services, internships while in education, public employment services and being contacted by employers (presumably via university careers services) and (b) non-institutionally assisted strategies, entailing both formal (browsing ads in mass media and the Internet, taking part in public examinations, using temporary work agencies) and informal methods (contacting the employer directly or via personal networks, like relatives or friends, as well as other ones, difficult to classify, such as starting one's own business).

A sample of recent graduates in Spanish universities has been drawn from the University Graduate Job Placement Survey 2014 (*Encuesta de Inserción Laboral de los Titulados Universitarios*, EILU 2014). In a set of simple, straightforward multivariate analyses, the risk of different types of underemployment (overeducation, skills/knowledge underutilization and mismatch in the field of education) will be estimated.

Our analysis contributes to the literature in several ways: first, our dataset allows to identify three different measures of underemployment, namely, overeducation, skills / knowledge underutilization and field of education mismatch. To our knowledge, no prior pieces of evidence provide such an exhaustive description of the phenomenon, with most analyses combining, at most, overeducation and skills mismatches within the same analysis [see McGuinness, Whelan & Bergin (2016)]. Second, we distinguish between standard (age at graduation below 30) and non-standard (being 30 years old or more at graduation) recent university graduates. This dis-

tion, though uncommon in the literature [see Carroll and Tani (2015) for an example], is very relevant for our purpose as we expect institutionally assisted job search methods to reduce young graduates' underemployment risks more than non-standard adult ones'. Our third contribution is the very exhaustive array of job search strategies as well as control variables on graduates' human capital and skills endowments, some of which are also rare in prior research.

The Spanish graduate labour market is interesting case because of several reasons: first, the intensive¹ higher education expansion: despite its late start, by 2007 Spain had already achieved the Europe 2020 target level regarding youth with higher education attainment (40% of the population aged 30-34) and is currently at the OECD average; second, more the half of the university education system is publicly funded²; third, the Spanish graduate labour market is featured by high unemployment and overeducation rates, in line with the rest of the labour market [Davia, McGuinness, & O'Connell (2017); McGuinness, Pouliakas, & Redmond, (2017)]. There is evidence of graduate overeducation overlapping with overskilling Spanish graduates [McGuinness, Whelan, & Bergin (2016)] but this depends on the data at hand (Flisi, Goglio, Meroni, Rodrigues, and Vera-Toscano (2014) found the opposite, while in Spain Nieto & Ramos (2017) find a large overlap in well matched individuals but not so large amongst those who are mismatched, either under-educated and under-skilled or over-educated and over-skilled).

The outstanding levels of graduate educational mismatch in Spain have been traditionally explained from the high enrolment in tertiary education combined with also high youth unemployment rates³: Overeducation is higher in high unemployment contexts [Frenette (2004); Carroll and Tani (2013); Ghignoni and Verashchagina (2014)]: as a result of weak demand for labour and the abovementioned higher education expansion, young and qualified workers displace their elder, less qualified counterparts [Dolado, Jansen, & Jimeno (2009)], thus confirming the higher overeducation risks in high unemployment contexts.

Our results are quite relevant for both recent graduates and higher education institutions in Spain. For the former, they show the advantages of institutionally supported job search strategies through public employment services or career services in their universities over individual-driven strategies and private arrangements, like temporary work agencies. For the latter, they point at the need for higher education institutions to promote career services and internship programmes to improve job matches between graduates and employers.

The rest of the paper is structured as follows. In Section 1, the standard theoretical background and a selection of empirical evidence are displayed; Section 2 de-

(1) The share of university graduates within the 25-34 age group arose from 9.8% in 1981 to 41% in 2016.

(2) The budgetary effort on tertiary education in Spain is about 2.2% of the overall government budget, which means about one p.p. less than the OECD average (3.1%) [OECD, Education at a Glance (2017), pp 209]. It covers 68% of overall –public and private– expenditure on higher education [OECD, Education at a Glance (2017), pp 198].

(3) Spain registers one of the highest youth (16-24 years old) unemployment rate in the EU, 44.4% (31.7% for young university graduates) in 2016, only below Greece (47.3%).

scribes the data-set, the sample –with particular attention to the distribution of endogenous and exogenous variables– and the econometric specifications of the models describing the profile of graduates affected by different types of underemployment. In Section 3, the results for those multivariate models are discussed and Section 4 concludes.

1. BACKGROUND AND HYPOTHESES

Overeducation has been the most common measure of graduate underemployment in the Labour Economics and Higher Education literature. Its determinants and consequences have been extensively analysed in developed countries.

Many theoretical explanations for overeducation stem from imperfect information and information asymmetries in the labour market [Stigler (1962)]: lacking good information on job candidates' productivity, employers use their credentials to screen them [Spence (1973)]. Accordingly, workers invest resources on signalling their abilities. Young, non-experienced candidates productivity signals are weaker than experienced ones' [Voßemer and Schuck (2016)] and may, as a result, have incentives to accept jobs for which they are overeducated in order to better signal their skills [Allen and van der Velden (2001); Baert, Cockx, & Verhaest (2013); Hartog (2000)]. Similarly, as workers may show their true productivity to their employers much better once in the organization, overeducation in the first job(s) would also be the price to pay to climb up the occupational ladder in professional careers [Sicherman and Galor (1990)].

One of the corollaries of the information asymmetries hypotheses is that the field of studies is quite relevant in signalling knowledge and skills [Kucel and Byrne (2008)]. Some fields of study, namely STEM (science, technology, engineering and maths) and health related studies generate more reliable labour market signals –more clearly defined professional market– than social sciences, humanities and arts. Indeed, the field of studies proves one of the most prominent correlates of overeducation, with engineering, mathematics, sciences, law and medicine graduates being particularly protected from it [Battu, Belfield, & Sloane (1999); Verhaest and Omeij (2010)].

The second corollary of the informational asymmetries hypotheses is that job search strategies influence the quality of the match: some job search methods mitigate the risk of underemployment over others are particularly suitable for certain graduates. In the relevant literature formal (via public institutions, private firms, mass media, etc.) and informal (social networks) search methods are considered. The latter are quite useful for signalling skills to prospective employers, particularly for graduates from certain fields of study (humanities, arts and social sciences) and with no labour market experience. As for the former, the evidence is quite disperse, partly because the sets of job search methods differ across datasets: Franzen and Hangartner (2006) found better matches amongst graduates who had found their jobs through contact networks or direct employer contact than amongst those who had accessed their jobs through formal search methods in Swiss Graduates in 2001. Later on, Kucel and Byrne (2008) obtained quite different results in the UK over the period 2003-2005: state employment offices and contact networks were more related to poor quality matches than responding to advertisements or using private employment agencies.

In Blázquez and Mora (2010) overeducation along the first years after graduation in Catalonia in the early 2000s is analysed and the greatest overeducation risks are found in graduates who entered their first job via private employment agencies and public entry examinations. The use of personal networks and advertisements were related to higher overeducation risks. Consistently with the role of university careers in reducing information asymmetries and improving job match quality between graduates and their prospective employers, those who found their jobs through a university careers office achieved the best quality matches. Similar results are found in a recent piece of research about in Australian recent graduates market [Carroll and Tani (2015)]. Interestingly, university-based job search methods improve underemployment risks for both young, standard graduates and elder, non-standard ones, who might be expected to take less advantage of these university services.

In McGuinness, Whelan and Bergin (2016) a sub-sample of graduates from 11 EU countries⁴ is drawn from the REFLEX (Flexible Professional in the Knowledge Society) dataset to assess the ability of different modes of entry into the labour market to reduce skill and education mismatches in the first job. The authors find that, compared to graduates who contacted employers themselves (as the reference category), those who entered their first job with via a private employment agency were particularly prone to both overeducation and overskilling, while those entering their first job assisted by university work placement or career orientation services were more protected against them. Employers cherry-picking behaviour is also confirmed, inasmuch graduates who were approached by their first employer were much less prone to suffer any mismatch than those who contacted employers themselves.

Our hypotheses stem from the framework developed in Carroll and Tani (2015): we expect graduates using public or higher education institutions placement and career services to be less affected by underemployment because of the information they provide about prospective employers and the fact that employers often use them to “cream” the best graduates. In accordance, those candidates contacted by employers –presumably via university career services– will be well sheltered from underemployment. Similarly, if the first graduates’ job is an extension of the internship held at the moment of graduation, will be a relatively good match. All the abovementioned job search strategies will be labelled “institutionally supported” and are expected to be particularly more useful for young recent graduates than for adult ones. Unobserved heterogeneity concerning previous studies or former employment experience would instead improve returns to non-institutionally supported job search strategies and reduce the relative advantage institutionally supported in adult graduates.

Individuals who do not enjoy institutional support in their first job search may develop a number of formal (addressing the employer personally, answering to posted ads, using temporary work agencies) and informal job search strategies (using social networks to reach prospective employers), to be explained in the next section. They deliver disperse returns in overeducation risk reduction but will be less scarring for adult graduates than for young, non-experienced ones.

(4) Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Norway, Portugal, Spain and the United Kingdom.

2. DATA AND METHODS

2.1. Dataset and sample selection

The University Graduate Job Placement Survey 2014 (its Spanish nomenclature, EILU 2014, stands for *Encuesta de Inserción Laboral de los Titulados Universitarios*) is a unique dataset provided by the National Statistical Office in Spain (*Instituto Nacional de Estadística*, INE). It is representative of all individuals graduating during the academic year 2009/2010 in both short and long-cycle⁵ programmes in Spanish universities. This needs to be taken into account when interpreting the results, as there was a considerable escalation in unemployment between 2008 and 2009 in Spain, and it kept increasing in 2010 and 2011. Such unfavourable context will necessarily affect the observed incidence of underemployment in our sample. The dataset is built from five different sources: the Integrated University Information System (SIIU)⁶, the census, the Social Security records, the National Public Employment Service and an ad-hoc questionnaire. The field work took place between September 2014 and February 2015 to allow for at least three years to elapse from the moment of graduation. A one-stage, equal probability random sampling with no reposition was implemented by region (17 autonomous communities) and type of programme (short cycle and long cycle). A detailed description of the dataset is provided in the INE methodological guidelines [INE (2016)].

The sample is made by 30,379 cases, representing nearly 200,000 graduates, 46.26% of which undertook long-cycle –five years long– programmes, 30.74% studied short-cycle –three years long– academic programmes. Nearly 20% were engineers or architects from either short-cycle (12.18%) or long-cycle (7.74%) programmes. For the sake of institutional homogeneity, we have excluded graduates from degrees following the Bologna system (2.9%) and other, undefined graduates (0.18%) from the analysis⁷. Moreover, the selected sample only entail observations of graduates who have had at least one first job since graduation, leaving out 5.99% of the sample. After excluding the abovementioned graduates, the final sample is made by 27,680 observations.

In a similar way to Carroll and Tani (2015), we split the sample into two groups: young/standard graduates –who graduated before the age of 30 (16,515 observations, accounting for 60% of the overall sample)– and non-standard / adult graduates –who were 30 years old or elder upon graduation in 2009/2010 (11,165 observations)–. We think this is a very relevant distinction as we expect the latter differing from former in terms of their previous work experience and professional maturity and this may affect the relative success of different job search methods.

The average values of all the variables (both dependent and explanatory) deployed in the multivariate analysis are displayed in Table A.1. (in the Appendix) for young and adult graduates.

(5) At the moment of fieldwork most university graduates had undertaking either short (three years long) or long-cycle (five years long, except Medicine and Architecture – six years).

(6) It is an on-line platform for the collection, processing, analysis and dissemination of information about Spanish University System that combines resources from all the institutions taking part in it.

(7) Although the four years long degrees designed to comply with the Bologna process and the European Higher Education Area had already come into force in 2010, the graduates at that time came either from pilot programmes or from bridge programmes.

2.2. Main variables and underemployment indicators

Three types of discrepancies between workers' qualification and skills and jobs requirements will be here taken as measures for underemployment. All of them refer to the first job upon graduation:

1. *Overeducation (vertical mismatch)*: interviewees were asked about the most appropriate level of education to perform their first job. Answers were re-coded into five categories: PhD (0.9%); university degree (62.18%); Non university (vocational) tertiary education (13.86%); Higher-secondary post-compulsory education –either vocational or general programmes– (10.03%) and Compulsory education or less (13.04%). Interviewees were classified as overeducated in their first job if the required education attainment for that job was below university degree (37% of interviewees).
2. *Skills/knowledge underutilization*: interviewees were asked whether in their first job upon graduation they used knowledge and/or skills obtained at university: 30.75% of the sample reported not having used them. Skills underutilization do not necessarily overlap with over-education: graduates may lack skills they do not acquire in the education system while some job seekers with no formal certification may acquire certain skills in the labour market [McGuinness and Wooden (2009)]. Paying attention to skills is also interesting as self-reported skills under-utilization will often predict certain labour market penalties in graduates mismatched with their jobs than strict educational underemployment [Quintini (2011)]. For instance, evidence for wage penalties in Spain dealing with overeducation and overskilling can be found in Nieto & Ramos (2017) and Mateos-Romero & Salinas-Jiménez (2017).
3. *Field of study mismatch (horizontal mismatch)*: interviewees were asked which was the most appropriate field of education for their first job upon graduation. Answers ranged from “solely my own field of study” (25.68%) and “either my own field of study or some related one” (44.23%) to “a completely different field of study” (14.66%) and “no particular field” (15.44%). Mismatch in the field of study that was identified when interviewees reported that either “no particular field of education” or “a completely different field” would have been adequate for their first jobs. According to this definition, 30% of the sample would have experienced field of study mismatch in their first jobs.

The three underemployment indicators cover an array of situations (see relative frequencies in Table A.1): overall, 47 % of the sample was affected by some sort of underemployment. There is also some overlapping across the three measures, as 10 % were mismatched in two different dimensions and 20 % were affected by the three of them. This means that more than 40 % of those suffering from underemployment combined all three dimensions. Still, we are confident that the measures capture different scenarios and specificities in each underemployment dimension will be addressed in the multivariate analysis. As a matter of fact, recent evidence on workers from different education attainment in Spain, and not only university graduates, does not find significant levels of correlation across overeducation and over-skilling [Nieto & Ramos (2017)].

As for the –non-mutually exclusive⁸– job search strategies displayed in the questionnaire, they have been classified as follows:

1. Institutionally supported job search strategies: (a) through public employment services or career services in their universities; (b) continuing the internship the interviewee was undertaking while in education; (c) being contacted by the employer.
2. Non-institutionally supported strategies:
 - a. Formal job search methods: (d) through temporary work agencies; (e) browsing job advertisements in Internet or mass media; (f) taking part in public entry exams.
 - b. Informal methods: (g) contacting directly employers or via personal contacts (relatives or friends).
 - c. Other job search strategies: (h) starting his/her own business and (i) other ways of access to the first job.

The distribution of job search strategies across age groups is displayed in Table A.1, in the Appendix. The most common search methods / strategies are Internet and mass media, followed by personal contacts or direct contact with the employer, accounting for 33 and 38 % of the sample, respectively. Nearly one in four graduates report having used either public or university based employment services. Interestingly, adult graduates declare more often undertaking public examinations and starting up their own businesses, while young graduates report a higher incidence of contacts with employers either directly or via relatives or friends.

Table 1 displays the shares of mismatch according to the set of search strategies displayed in the questionnaire. Overall, overeducation and educational horizontal mismatches in the first job upon graduation were slightly more frequent, in average, among adult graduates than in their young counterparts. This is an interesting result in itself and may be due to differences in self-perception of mismatch or to different signals of productivity for potential employers in adult graduates. Maybe they have lower grades or their prior labour market experience does not contribute to improve their performance in the jobs they are applying to.

Concerning first job search strategies, mismatches are significantly less likely when graduates continued the internship held at graduation and much more common than the average in graduates using temporary employment agencies. Interesting differences between young and adult graduates arise: using mass media or the Internet apparently increased the risk of underemployment for both young and adult graduates although in the adults sub-sample the incidence in skills and field of education mismatch is nearly negligible; public examinations is a particularly successful strategy in reducing mismatch risks only in young graduates. Adult graduates were particularly prone to be mismatched regarding field of study if they took part in public examinations prior to their first graduate job while protected from underemployment if they started up their own business.

(8) The precise wording of the question is “how did you find your first job?”. Interviewees may select as many search options as they wish. This way of gathering the information differs from previous datasets – for example, in REFLEX the modes of entry are mutually exclusive and the researchers may not know which search methods were used regardless how much they contributed to successful job placement.

Table 1: DIFFERENT MISMATCH RATES IN THE FIRST JOB, BY JOB SEARCH STRATEGY (IN %)

Job search strategies	Young graduates			Adult graduates		
	Over-education	Skill/knowledge	Field of study	Over-education	Skill/knowledge	Field of study
<i>Institutionally supported</i>						
Public employment services, University job placement service	33.9	25.2	24.7	39.1	29.9	32.1
Remained in the internship s/he was working at graduation	22.7	17.3	12.2	27.4	19.2	16.7
Contacted by the employer	33.2	24.4	22.0	34.5	27.6	28.3
Individual – driven strategies						
<i>Formal job search methods</i>						
Temporary work agencies	59.7	48.2	47.0	58.0	46.2	45.8
Advertisements in newspapers and the Internet	45.3	37.4	35.1	42.8	34.6	33.3
Prepared a public examination	27.9	21.7	21.8	37.2	34.9	42.9
<i>Informal job search methods</i>						
Directly contacted the employer or addressed relatives, friends...	42.0	33.0	32.2	42.8	33.7	34.4
<i>Other job search methods</i>						
Started up his/her own business	34.6	28.4	27.6	29.4	25.6	29.1
Other ways of job search	34.9	31.8	30.0	39.9	35.2	37.2
<i>Total</i>	36.2	29.8	27.7	38.0	32.2	33.5
<i>Sample sizes</i>	16,515			11,165		

Source: University Graduate Job Placement Survey 2014 (INE).

2.3. *Econometric model*

Our multivariate strategy will be a set of binary probit models estimating the risks of each underemployment dimension: (a) overeducation, (b) skills/knowledge underutilization and (c) field of education mismatch. Following the same specification, the risk of underemployment will be explained from the above mentioned first job search strategies as well as a wide set of explanatory variables entailing personal and academic features together with skills and human capital endowments. Finally, some first job characteristics are controlled for to capture the heterogeneity driven by the demand side of the labour market.

We may start from a latent dependent variable model, in a similar approach to McGuinness, Whelan, and Bergin (2016): let us define a latent variable, U^* , denoting the probability of experiencing a given type of underemployment in the first job:

$$U^* = \beta_1 D_i^S + \beta_2 X_i^P + \beta_3 X_i^J + \varepsilon_i \quad [1]$$

The first set of dummy variables, D^S , refers to the job search strategies followed by the interviewees during and after their university studies as undergraduates –already explained–. X^P is a vector of explanatory variables capturing personal (gender) and academic features, namely, the type of education attended (field of study and type of university) and skills endowments that may contribute to the individual’s differentiation / productivity signalling to prospective employers: studying abroad before graduation; obtaining excellence- or collaboration-grants as an undergraduate; reporting a high level of English and reporting high computing skills⁹. Also as part of the personal strategy or circumstances around the first job search upon graduation, the time elapsed since graduation to the beginning of the first job will be also controlled for.

The set of controls is completed with a final set of variables featuring of the first job upon graduation, X^J , capturing information on: job status (dependent positions –and type of contract– *versus* self-employment); working time (part-time *versus* full-time) and, finally, a categorical variable capturing whether the first job was abroad and, in case it was found in Spain, the autonomous community where it was based. Additional controls are included to account for heterogeneity due to jobs held prior to graduation: having taken part in job placement or internship programmes and having worked for pay in (non-)sporadic, (non-)related, (part-)full-time jobs. Finally, ε_i is an *iid* error term.

3. RESULTS AND DISCUSSION

Table 2 displays the results –expressed as average marginal effects (AME)– for the binary probit models estimating the risks for the three types of underemployment in young and adult graduates. For space reasons, in Table 2 the explanatory variables describing the first jobs both before and after graduation are omitted but available from the authors upon request.

(9) Computing skills are self-reported via a Likert scale variable taking values 1 (basic), 2 (advanced) and 3 (expert level). As they are correlated with the field of education, being particularly high amongst STEM graduates, the relevant variable has been recoded as: below the field of study specific median, coinciding with the median value or beyond the median value.

Table 2: EDUCATION AND SKILL MISMATCHES, YOUNG AND ADULT GRADUATES. BINARY PROBIT MODELS (MARGINAL EFFECTS)

	Young graduates			Adult graduates		
	Over-education	Skill/knowledge	Field of study	Over-education	Skill/knowledge	Field of study
<i>Institutionally supported job search strategies</i>						
PES, university job placement	-0.0509*** (0.0090)	-0.0666*** (0.0090)	-0.0473*** (0.0085)	-0.0386*** (0.0123)	-0.0473*** (0.0117)	-0.0228** (0.0113)
Remained in the same internship	-0.0829*** (0.0135)	-0.0868*** (0.0137)	-0.1090*** (0.0139)	-0.0653*** (0.0191)	-0.0668*** (0.0185)	-0.0836*** (0.0185)
Contacted by the employer	-0.0377*** (0.0100)	-0.0552*** (0.0099)	-0.0624*** (0.0096)	-0.0408*** (0.0142)	-0.0342** (0.0134)	-0.0303** (0.0131)
<i>Non-institutionally supported, formal job search methods</i>						
Temporary work agencies	0.1299*** (0.0121)	0.1088*** (0.0118)	0.1037*** (0.0109)	0.1406*** (0.0165)	0.0974*** (0.0155)	0.0887*** (0.0148)
Ads in newspapers and the Internet	0.0709*** (0.0079)	0.0535*** (0.0078)	0.0508*** (0.0074)	0.0318*** (0.0109)	0.0160 (0.0103)	0.0012 (0.0100)
Prepared a public examination	-0.0813*** (0.0138)	-0.0477*** (0.0139)	-0.0380*** (0.0129)	-0.0290** (0.0146)	-0.0280** (0.0139)	0.0297** (0.0131)
<i>Informal job search methods</i>						
Contacted employer or relatives, friends	0.0337*** (0.0075)	0.0132* (0.0075)	0.0245*** (0.0071)	0.0421*** (0.0103)	0.0143 (0.0097)	0.0194** (0.0094)
<i>Other job search methods</i>						
Started up his/her own business	0.0092 (0.0201)	0.0161 (0.0201)	0.0077 (0.0189)	-0.0307 (0.0225)	-0.0095 (0.0214)	-0.0170 (0.0202)
Other ways of job search	0.0025 (0.0110)	0.0181* (0.0108)	0.0309*** (0.0101)	0.0331** (0.0146)	0.0191 (0.0138)	0.0430*** (0.0131)
Gender (ref: men)	-0.0019 (0.0080)	0.0082 (0.0078)	0.0017 (0.0074)	-0.0154 (0.0101)	0.0091 (0.0095)	-0.0039 (0.0092)
Type of instit. (ref: private)	0.0200* (0.0109)	0.0364*** (0.0109)	0.0136 (0.0104)	0.0740*** (0.0156)	0.0516*** (0.0148)	0.0444*** (0.0143)

Table 2: EDUCATION AND SKILL MISMATCHES, YOUNG AND ADULT GRADUATES.
BINARY PROBIT MODELS (MARGINAL EFFECTS) (continuation)

	Young graduates			Adult graduates		
	Over-education	Skill/knowledge	Field of study	Over-education	Skill/knowledge	Field of study
Engineer/architect (long-cycle)	-0.0820*** (0.0199)	-0.0825*** (0.0194)	-0.1378*** (0.0189)	-0.0477** (0.0206)	-0.1123*** (0.0190)	-0.1704*** (0.0185)
Engineer/architect (short-cycle)	-0.0027 (0.0162)	-0.0153 (0.0158)	-0.0648*** (0.0148)	0.0323* (0.0191)	-0.0657*** (0.0176)	-0.1206*** (0.0170)
Long-cycle: Sciences	-0.0471*** (0.0167)	-0.0372** (0.0161)	-0.0879*** (0.0152)	0.0240 (0.0208)	-0.0111 (0.0190)	-0.0475*** (0.0184)
Long-cycle: Social Sciences and Law	0.0279** (0.0140)	-0.0046 (0.0136)	-0.0470*** (0.0128)	0.0238 (0.0175)	-0.0490*** (0.0159)	-0.0757*** (0.0154)
Long-cycle: Health	-0.2598*** (0.0241)	-0.2745*** (0.0240)	-0.2786*** (0.0230)	-0.3004*** (0.0359)	-0.3002*** (0.0342)	-0.3560*** (0.0342)
Short-cycle: Social Sciences and Law	0.1197*** (0.0163)	0.0489*** (0.0159)	-0.0250* (0.0149)	0.1395*** (0.0202)	-0.0193 (0.0187)	-0.0485*** (0.0181)
Short-cycle: Education	0.0224 (0.0165)	-0.0580*** (0.0162)	-0.1143*** (0.0151)	-0.0067 (0.0223)	-0.0794*** (0.0205)	-0.1363*** (0.0198)
Short-cycle programmes: Health	-0.2720*** (0.0178)	-0.2616*** (0.0179)	-0.2921*** (0.0167)	-0.1302*** (0.0253)	-0.2126*** (0.0246)	-0.2122*** (0.0229)
Graduate education (ref: no graduate studies)	-0.0273*** (0.0079)	-0.0192** (0.0078)	-0.0178** (0.0074)	-0.0544*** (0.0110)	-0.0415*** (0.0103)	-0.0378*** (0.0100)
Graduate studies abroad	-0.0566** (0.0247)	-0.0002 (0.0232)	0.0050 (0.0220)	0.0444 (0.0472)	-0.0378 (0.0448)	0.0189 (0.0436)
Does not speak English very well	0.0038 (0.0120)	-0.0153 (0.0118)	-0.0049 (0.0111)	-0.0239* (0.0127)	-0.0180 (0.0121)	-0.0031 (0.0117)
English-speaking skills (ref: none)	-0.0582*** (0.0127)	-0.0456*** (0.0125)	-0.0431*** (0.0118)	-0.0601*** (0.0146)	-0.0225 (0.0137)	-0.0151 (0.0133)

Table 2: EDUCATION AND SKILL MISMATCHES, YOUNG AND ADULT GRADUATES.
BINARY PROBIT MODELS (MARGINAL EFFECTS) (continuation)

	Young graduates				Adult graduates				
	Over-education	Skill/knowledge	Field of study	Over-education	Skill/knowledge	Field of study	Over-education	Skill/knowledge	Field of study
Computing skills within field of study (ref: below median)	-0.0274*** (0.0094)	-0.0132 (0.0093)	-0.0117 (0.0088)	0.0180 (0.0122)	-0.0022 (0.0115)	0.0163 (0.0110)			
Above the median in his/her field of study	-0.0255* (0.0134)	-0.0134 (0.0131)	0.0139 (0.0123)	-0.0239 (0.0157)	-0.0104 (0.0147)	0.0163 (0.0142)			
Studied abroad as an undergraduate (ref: never)	-0.0388** (0.0168)	-0.0028 (0.0165)	-0.0185 (0.0158)	-0.0194 (0.0290)	0.0082 (0.0268)	0.0098 (0.0263)			
More than 6 months abroad	-0.0448*** (0.0159)	-0.0024 (0.0153)	-0.0254* (0.0149)	-0.0187 (0.0243)	0.0057 (0.0226)	-0.0126 (0.0222)			
Excellence or collaboration grants (ref: no)	-0.0370*** (0.0140)	-0.0110 (0.0136)	0.0107 (0.0129)	-0.0120 (0.0233)	-0.0175 (0.0224)	-0.0408* (0.0223)			
Grants to study abroad or internship (ref: no)	0.0183 (0.0142)	-0.0073 (0.0139)	0.0012 (0.0134)	0.0272 (0.0224)	0.0090 (0.0209)	0.0098 (0.0205)			
Number of observations	14,699	14,424	14,653	9,671	9,490	9,644			
Log likelihood	-7,746	-7,290	-6856	-5722	-5003	-4909			
Pseudo R2	0.19	0.17	0.20	0.11	0.16	0.20			

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; Additional control variables (available upon request): (a) job status and type of contract for employees; (b) part-time versus full-time jobs (c) the first job was found abroad; (d) having taken part in job placement or internship programmes; (e) having worked for pay before graduation in (non-)sporadic, (non-)related, (part-)full-time jobs; (f) the first job was found Andalusia and (g) time elapsed since graduation to the beginning of the first job.

Source: University Graduate Job Placement Survey 2014 (INE).

We distinguish across formal, informal and other non-institutionally supported job search strategies:

- Deploying temporary work agencies to find the first job increases most the risk of all sorts of underemployment, in line with McGuinness, Whelan, and Bergin (2016). This not only responds to private job agencies prioritizing speed to quality of match when placing graduates but also to relatively low quality of the jobs offers via temporary employment in Spain.
- In line with previous evidence [Blázquez and Mora (2010); Carroll and Tani (2015); Kucel and Byrne (2008); McGuinness, Whelan, & Bergin (2016)] using mass media and the Internet is positively related with all sorts of mismatch in young graduates, while with only overeducation in adult ones. The latter's deeper knowledge of the labour market may help them to better disentangle the required skills for certain advertised positions.
- Young graduates who took part in public examinations report lower levels of underemployment in their first job than the rest, while adult graduates preparing public examinations do not seem protected against mismatch with the field of education. This results from the different profile of individuals undertaking public examinations across age groups: 60 % of young graduates taking part in public exams-descriptive analysis not shown for space reasons –had studied either health- or education-related degrees; the type of jobs public exams will give access to will perfectly match their education, skills and knowledge. Instead, 60 % of adult graduates reporting having undertaken public examinations had studied arts and humanities or social sciences; they may well have prepared exams giving access to jobs below their level of education and skills, even differing their field of studies. For these graduates public examinations may be one strategy for achieving job security, even at the expense of low match quality [as explained in Blázquez and Mora (2010)]¹⁰.
- Interestingly, informal job search methods –direct contact with the employer or via personal contacts– are positively correlated with the risks of overeducation and mismatch regarding field of studies but not with the risk of skill/knowledge underutilization in none of the subsamples. Direct contacts are expected to improve employer's knowledge about candidates' skills. They are particularly useful to fill transversal positions / occupations, where qualifications/technical knowledge are as relevant as personal/personality features. Although non directly comparable, this result somehow differs from Franzen and Hangartner (2006), who reported a higher risk of job mismatch for graduates who found their jobs through contact networks or direct employer contact compared to those who found them through formal search methods.
- Finally, individuals who started their own business were not protected against mismatch relative to those who did not use that strategy¹¹.

(10) We do not know the outcome of those exams and therefore our results are not strictly comparable to those in Blázquez and Mora (2010), where, graduates who had accessed their first job via public examinations were much more affected by overeducation than those using university placement services.

(11) Still, self-employed in the first graduate job report a significantly lower incidence of underemployment than interns / trainees (relevant AMEs not shown for space reasons but available upon request).

The above explained correlations between job search strategies and underemployment is observed in the presence of an exhaustive set of explanatory variables describing, overall, the academic profile of the interviewees and their skills endowments: Female recent graduates are not more likely than men to experience underemployment in their first jobs [Carroll and Tani (2015); Kucel and Byrne (2008)]. In line with Brunello and Cappellari (2008) in Italy, graduates from public education institutions are more likely to report underemployment. Still, differences across public and private university graduates strongly depend on their academic and socio-demographic composition as well as institutional factors, which are quite country-specific.

Our results confirm previous evidence concerning field of study [Battu, Belfield, & Sloane (1999); Verhaest and Omey (2010); Kucel and Byrne (2008)]: overeducation, skill underutilization and working outside one's field of study are less likely in programmes with strong labour market signals, which are focused on particular occupational markets (Health-related, Engineering, even teacher training (Education) programmes). Compared to Humanities and Arts, only graduates in short (ie, three years long) programmes in Social Sciences are more likely to experience overeducation and skill underutilization. Some interesting nuances in the profiles of underemployment arise across fields: compared to Arts and Humanities, studying short-cycle engineering and long-cycle social sciences and Law do not protect neither against overeducation—as a matter of fact, the latter is positively related with overeducation in the young graduates sub-sample—nor against skills underutilization in young graduates, but they still protect against field of education mismatch. Graduates in short-cycle degrees on Education, which were trained to become primary school teachers, were not less likely than graduates in Arts and Humanities to end up overeducated but they were effectively less likely to suffer the other two dimensions of underemployment.

Having studied abroad is correlated with lower underemployment risks, confirming the particularly positive returns to transnational educational mobility in countries featured by high youth unemployment and low employability amongst youths, including university graduates [Waibel *et al.* (2017)]. In the same way, having received excellence or collaboration grants as an undergraduate is correlated with lower risks of underemployment, most likely because of their correlation with high marks [Blázquez and Mora (2010); Verhaest and Omey (2010)]. There are also positive returns to good English skills in all underemployment indicators while relatively good computing skills—ie, compared with the median level in one's field of study—only contribute to reduce the risk of overeducation in young graduates¹². Undertaking

(12) In order to test whether competence levels may alter effectiveness in job search methods, we have estimated interactions between job search methods and competence levels in subsequent specifications, each time interacting one job search method with competences in English and computing skills respectively. The relevant interacted terms are hardly ever significant. If any, speaking English very well contributes to reducing underemployment risks amongst young graduates who prepared a public examination. English skills may improve the overall score / success rates in the public competition they attend and, if they are successful, the type of jobs they will achieve will most likely match quite well their skills and field of study. At the same time, the inclusion of interaction term does not alter the coefficients of the components (namely, job search methods and English skills and computing skills, respectively). In the case of computing skills no interaction term has been found to be significant. The consistency checks and cross-variable correlations are available upon request.

graduate studies in Spain seems to slightly reduce –about three percentage points– the risk of underemployment; the non-significant impact of undertaking graduate studies abroad to reduce skills underutilization and field of education mismatch may well be explained by the positive returns to a very good level of English¹³.

4. CONCLUSIONS

The present piece of research has explored the relation between job search strategies followed by recent university graduates in Spain and underemployment in their first jobs upon graduation. Underemployment has been operationalised as overeducation, skills/knowledge underutilization and field of education mismatch. Institutionally supported search strategies have been compared to individual-driven ones, in the presence of observed heterogeneity in individual academic features, skills endowments and first job characteristics.

Our main results confirm some of the previous evidence as regards job search strategies, despite their limited comparability: using public employment services and university career services reduce underemployment risks. Similarly, continuing an internship programme and being contacted by the employer –presumably through university career services– are also related to better job match. University careers and job placement services are therefore effective in smoothing the school to work transition for university graduates. As regards non-institutionally supported strategies, the use of temporary work agencies is related to the worst –by far– outcomes, both for young and adult graduates. Reviewing ads and browsing the Internet are also related with higher underemployment risks, particularly amongst young graduates. Similar outcomes are observed for those who contacted employers either directly or using informal networks. Finally, interesting results are found for those who prepared public exams or set up their own business.

Despite our contributions to the literature, explained in the introduction, we acknowledge some limitations of our study: firstly, potential self-selection into job search strategies is not controlled for. Still, in McGuinness, Whelan, and Bergin (2016) this is done via propensity score matching estimators and results do not significantly vary from those obtained from simple binary probit analyses. Secondly, self-selection into employment is not attended either, but the width of the observation window (ie, the elapsed time from graduation to the fieldwork, more than three years long) allows for more than 90% of the sample members having had at least one job upon graduation, making the potential self-selection into employment bias negligible.

The policy recommendations from our analysis are in line with those in Quintini (2011): it is necessary to improve information and guidance to young graduates while improving their skills. Still, Green and Henseke (2016) propose a wider set of measures to combat the imbalance between the supply and demand for graduate labour: the de-

(13) There is a certain degree of correlation between some of the independent variables, particularly between good command in English and experience abroad. It is statistically significant but quite low in most cases. Consistency checks have been performed by subsequently excluding –one at a time– the potentially correlated variables and the impact of each of them is not altered in the absence of any of the other from the specification. They are available for the interested reader upon request.

mand side of the market might also be addressed through structural reforms and technological and industrial policies to enhance job creation in the knowledge Economy. Also the authors remind that higher educational objectives need to move beyond employability, given its outstanding social returns, and become a key component of policies addressing social inclusion. The study of graduate underemployment, its growth and distribution, and its effects on employment outcomes is useful and relevant, as it implies that private returns to higher education are below what could be desirable/expected, but the social returns to higher education are very relevant as well, and the policy proposals stemming from analyses of graduate underemployment should not be, at any rate, an argument to cutbacks on public efforts on higher education.

APPENDIX

Table A.1.: AVERAGE VALUES OF DEPENDENT AND INDEPENDENT VARIABLES IN MULTIVARIATE ANALYSES

Dependent variables: mismatch in the first job		Young graduates	Adult graduates	Total
Underemployment measures	Overeducated	0.36	0.38	0.37
	Skill/knowledge underutilization	0.30	0.32	0.31
	Field of study mismatch	0.28	0.33	0.30
Combinations of underemployment measures	Underemployed in any dimension	0.44	0.51	0.47
	Underemployed in just one dimension	0.15	0.19	0.17
	Underemployed in two dimensions	0.09	0.12	0.10
	Underemployed all three dimensions	0.20	0.20	0.20
Independent variables				
<i>Institutionally supported job search strategies</i>	PES, university job placement	0.23	0.21	0.22
	Remained in the same internship	0.09	0.07	0.08
	Contacted by the employer	0.14	0.12	0.14
<i>Formal job search methods</i>	Temporary work agencies	0.11	0.10	0.11
	Ads in newspapers and the Internet	0.34	0.32	0.33
	Prepared a public examination	0.10	0.15	0.12
<i>Informal job search methods</i>	Contacted employer or relatives, friends	0.39	0.36	0.38
<i>Other job search methods</i>	Started up his/her own business	0.03	0.06	0.05
	Other ways of job search	0.15	0.14	0.14
Gender	Women	0.66	0.52	0.60
Type of institution	Public university	0.86	0.88	0.87

Table A.1.: AVERAGE VALUES OF DEPENDENT AND INDEPENDENT VARIABLES IN MULTIVARIATE ANALYSES (continuation)

Dependent variables: mismatch in the first job		Young graduates	Adult graduates	Total
Type of academic programme – duration and field of study (ref: Long-cycle: Arts and Humanities)	Engineer/architect (long-cycle)	0.06	0.13	0.09
	Engineer/architect (short-cycle)	0.11	0.16	0.13
	Long-cycle: Arts-Humanities	0.09	0.12	0.10
	Long-cycle: Sciences	0.09	0.09	0.09
	Long-cycle: Social Sciences and Law	0.23	0.22	0.23
	Long-cycle: Health	0.06	0.03	0.05
	Short-cycle: Social Sciences and Law	0.11	0.11	0.11
	Short-cycle: Education	0.13	0.09	0.11
	Short-cycle: Health	0.12	0.06	0.10
Graduate education (ref: no graduate studies)	Did not pursue graduate studies	0.62	0.73	0.67
	Graduate studies in Spain	0.36	0.26	0.32
	Graduate studies abroad	0.02	0.01	0.02
English-speaking skills	Does not speak English	0.15	0.22	0.18
	Speaks English, but not very well	0.46	0.49	0.47
	Speaks English very well	0.39	0.29	0.35
Computing skills related to the field of studies	Below the median in his/her field of study	0.74	0.70	0.72
	At the median in his/her field of study	0.18	0.21	0.19
	Above the median in his/her field of study	0.07	0.10	0.08
Studied abroad as an study undergraduate	Never (ref.)	0.83	0.89	0.86
	Between 1 and 6 months abroad	0.07	0.04	0.05
	More than 6 months abroad	0.10	0.07	0.09
Excellence or collaboration grants	Awarded while in undergraduate education	0.08	0.04	0.06
	Non-awarded (ref.)	0.92	0.96	0.94
Grants for studying abroad or taking part in an internship	Awarded while in undergraduate education	0.14	0.10	0.12
	Non awarded (ref.)	0.86	0.90	0.88

Source: University Graduate Job Placement Survey 2014 (INE).



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RESUMEN

Este trabajo estima el efecto de diferentes estrategias en la búsqueda de empleo sobre el subempleo (medido como sobreeducación, infrautilización de los conocimientos y habilidades adquiridos durante la carrera y desajuste en el área de estudio) de los recién titulados universitarios en España, a partir de la Encuesta de Inserción Laboral de los Titulados Universitarios 2014. Los resultados muestran que las estrategias de búsqueda de empleo respaldadas institucionalmente a través de los servicios públicos de empleo o de las universidades, así como continuar con las prácticas en empresas realizadas durante la carrera, reducen el riesgo de subempleo en el primer empleo. Del mismo modo, ser contactado por el empleador, presumiblemente a través de la universidad, también está relacionado con un mejor ajuste. El uso de agencias de trabajo temporal está relacionado con los peores resultados. Buscar el primer empleo a través de anuncios en el periódico o internet, así como contactar con el empleador por iniciativa propia o utilizar contactos personales como familiares o amigos aumenta el riesgo de subempleo.

Palabras clave: subempleo, desajuste educativo, búsqueda de empleo, titulados universitarios.

Clasificación JEL: J24, I23, I26.

