

COMPETÊNCIAS
PARA O FUTURO
DO EMPREGO

WORKING PAPER N° 4.1

Adaptable or Stuck? The Dynamics of Vertical and Horizontal Mismatch in Early Graduate Careers

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September, 2022



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This research was financially supported by national funds through the Portuguese Foundation for Science and Technology (FCT), within the scope of the project PTDC/CED-EDG/29726/2017.

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"Adaptable or Stuck? The Dynamics of Vertical and Horizontal Mismatch in Early Graduate Careers"

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September 2022

Abstract

Exploring a longitudinal sample of 15 thousand recent graduates who entered the Portuguese labour market in 2010-2011, this study analyses the effects of educational mismatches on graduates' subsequent job and wage mobility in early career. The data indicate that about 40% of the recent graduates in Portugal are vertically mismatched at entry. Of this total, those who are not able to switch to a well-matched job over the 2010-2018 period, about one-fifth of the newly graduates, experienced a persistent wage penalty of about 12% when compared with their peers continuously matched. This group of graduates are mainly employed in occupations related with clerk and sales tasks. Moreover, the data show that about 44% of the graduates did not change their first employer over the analysed period. In this regard, mismatched graduates at entry do not exhibit a higher propensity to change jobs when compared with their similar counterparts who entered the labour market adequately matched.

1. Introduction

Portugal has chronically suffered from skills and qualifications deficits in its workforce and is actively developing policy measures to readdress them. The country is facing the challenge of making its education system more diversified, responsive to labour-market needs and local specificities and easier to navigate by prospective users (OECD, 2015).

In the last two decades, Portugal has exhibited a sustained improvement in the qualification levels of its population, reshaping the characteristics of the labour supply. This achievement is the result of successive extensions of mandatory schooling and the massification of access to higher education, which led to a remarkable growth in the number of graduate workers (Figueiredo, Biscaia, Rocha & Teixeira, 2017). According to DGEEC, the number of graduates in Portuguese institutions of higher education more than doubled between the academic year of 1996/97 and the academic year of 2019/20, increasing from 42,187 graduates in the former period to 85,799 in the latter period.¹ This increase is particularly remarkable for the 2nd cycle studies of higher education due to the Bologna process that shortened the duration of the 1st cycle for several fields of study, leading to a substantial increase in the supply of master courses.²

Furthermore, during this period, we observe a decreasing trend in the wage premium to higher education for the young cohorts of workers, more pronounced for bachelors (Martins, 2021; Paiva, 2021), and a gradual reshaping of the tasks performed by bachelors and masters with the former increasingly represented in routine cognitive occupations and the latter increasingly represented in non-routine occupations (abstract or interpersonal).

In this new context of a large and heterogenous pool of graduates, further research is needed to assess how recent graduates in Portugal perform in early career and to understand to what extent skills acquired in higher education may be underutilized in low-paying occupations.

The (mis)match of skills acquired in the education system to the skills required in the labour market has been of major concern for several decades among academics, practitioners, and policymakers. Interest on this issue emerged in the 1970's due to a boom in the supply of graduates in the U.S. with Freeman (1976) as one of the first economists to express concern on the potential problem of overinvestment on college education. This discussion became, in recent years, also a topic of concern in European countries, reinforced by the huge massification of higher education enhanced by the Bologna process that favoured the increase in educational attainment (Sarrico, Mcqueen & Samuelson, 2017).

¹ For further information please visit <https://www.dgeec.mec.pt/np4/EstatDiplomados/>.

² In the academic year of 2019/2020 about 31% of the graduates and postgraduates obtained a master's degree or equivalent. In 1996/1997 this same percentage reached a modest 5%.

There is an extensive literature that investigates the effects of educational mismatches on wages and other labour market outcomes (see, for example, Leuven & Oosterbeek, 2011 and McGuinness, Pouliakas & Redmond, 2018 for insightful surveys of the literature). Empirical studies focusing on cohorts of graduates in the 1980s and 1990s showed a higher incidence and persistence of overeducation among recent graduates (see, for example, Dolton & Vignoles, 2000 for the UK; Frenette, 2004 for Canada; Cuttillo & Di Pietro, 2006 for Italy; Clark, Joubert & Maurel, 2017 for the U.S.). These studies also showed that overeducated workers earn less than their peers in graduate jobs.

Several explanations have been presented for the overeducation phenomenon. The first explanation argues that overeducation is a compensation for a lack of other human capital components such as experience or ability (Sicherman, 1991; Robst, 1995; Groot, 1993; 1996). In this framework, overeducation will typically affect the young / recent entrants in the labour market who possess lower levels of on-the-job training (Sicherman, 1991; Groot, 1996).

A second explanation argues that overeducation is part of the career mobility dynamics in early stages of the working life (Sicherman & Gabor, 1990). Workers may temporarily enter jobs for which they are overeducated to acquire the experience and training needed to progress upward during their careers. In this line of reasoning, overeducation is a temporary phenomenon and job mobility the stepping-stone to switch to a well-matched job (Robst, 1995; Baert, Cock & Verhaest, 2013). Accordingly, workers may voluntarily choose jobs below their own level of education to acquire relevant on-the-job training and experience that enhances upward mobility and a fast career progression.

More recent studies have questioned the validity of the career mobility theory and showed that the duration of overeducation is long lasting (e.g., Dolton & Vignoles, 2000; Frenette, 2004; Kiersztyn, 2013; Clark, Joubert & Maurel, 2017; Meroni & Vera-Toscano, 2017; Erdsiek, 2017). As pointed out by Clark, Joubert & Maurel (2017) “Further, low unobserved ability, compensating non-pecuniary job characteristics and career mobility considerations could rationalize apparent overeducation without the implication of a suboptimal schooling choice”.

Focusing on a sample of about 15 thousand recent graduates in the Portuguese labour market over the 2010-2018 period, this study revisits this influential literature by analysing the effects of educational mismatches (vertical or horizontal) at labour market entry on graduates’ subsequent job and wage mobility in early career. For this purpose, we use data from *Quadros de Pessoal* – an administrative longitudinal matched employer-employee dataset – that virtually covers the population of workers employed in the private sector in Portugal.

This research has three objectives: (i) to measure the incidence of educational mismatches in Portugal; (ii) to analyse the job mobility patterns of recent graduates in early career focusing on their mis(match) status at entry; and, finally, (iii) to estimate the effects of educational mismatches on graduate earnings.

Our data indicate that about 40% of the recent graduates in Portugal are vertically mismatched at entry, while around 20% are horizontally mismatched. Regarding job mobility, the empirical data reveal a very low degree of job mobility in young graduates' early career, that was probably exacerbated by the Portuguese debt sovereign crisis of 2010-2013. In fact, we observe that almost half of the graduates who entered the labour market for the first time in 2010 or 2011 did not change their first employer over the analysed period. The econometric analysis shows that workers mismatched at entry do not exhibit a higher probability of changing jobs when compared with their similar counterparts who entered the labour market adequately matched.

Finally, the econometric approach shows that, compared with the control group of the workers continuously vertically well-matched, overeducated graduates suffer a wage penalty that ranges, in the entry year, from about 8% for the initially overeducated to about 12% for the continuously overeducated. This wage gap tends to persist over time, even for the initially overeducated that were able to switch to a well-matched job. We also observe a wage penalty in the first years in the labour market for those individuals horizontally mismatched, even though of a smaller magnitude.

This study is organised as follows. Section 2 presents the data and the measures of educational mismatches. Section 3 evaluates the incidence of educational mismatches, describing who and where are the overeducated graduates and what they do. Section 4 characterises the job mobility patterns of the mismatched workers at entry in comparison with the continuously well-matched, while Section 5 estimates the effects of educational mismatches (vertical and horizontal) on wages. Finally, Section 6 concludes.

2. Data and Methodology

2.1 *Sample Construction*

Our data come from *Quadros de Pessoal* (QP), a large longitudinal matched employer-employee dataset collected by the Portuguese Ministry of Labour, Solidarity, and Social Security. All firms in the private sector employing at least one wage earner are legally obliged to fill in this survey.³

The data include annual information at the firm (e.g., industry, location, employment, ownership) and worker level (e.g., gender, age, education, occupation, qualification, tenure, wages, hours worked). All firms and workers entering the QP dataset have a unique identifying number, which allows us to follow them across all annual waves of data. Furthermore, the worker files include the firm identifying number to which each individual is affiliated in a given year, allowing to match workers with their employers.

Our sample is comprised of two cohorts of recent graduates who entered the Portuguese labour market in 2010 or 2011. To ensure that the individuals we are

³ Civil servants, self-employed workers, and domestic workers are not covered by QP.

following had no previous work experience we used the information from QP for the years between 2005 and 2010. This allowed us to exclude individuals that appeared before and, thus, are not likely to be classified as new labour market entrants. For the same reason, we also kept individuals that at entry were aged between 20 and 30 years old and with tenure less than 12 months in the entry year.⁴

The sample was also restricted to wage earners with at least a bachelor's degree or equivalent level in mainland Portugal.⁵

Then, these individuals were subsequently tracked for seven years after entering the labour market, i. e., the individuals belonging to the cohort of 2010 were followed until 2017, while the individuals belonging to the cohort of 2011 were followed until 2018.

We end up with 98,051 individuals*years observations, corresponding to 15,663 individuals (6,783 males and 8,880 females).

2.2 Measuring educational mismatches

In this paper we will focus on vertical educational mismatches in the Portuguese labour market. A vertical mismatch takes place when the level of education is higher or lower than the one required for the job. Following previous studies, we will rely on a statistical measure based on realised matches (e.g., Oliveira, Santos & Kiker, 2000; Korpi & Tåhlin, 2009).

To measure the vertical educational mismatch, we computed the mode of educational attainment in each 3-digit occupation based on the stock of workers employed in each occupation in a given year. Thus, to compute the mode of education we used all individuals registered in QP files for a given year and occupation. Thus, a graduate or postgraduate is classified as overeducated in a given year if his/her level of education is higher than the mode of education for the stock of employees in his/her 3-digit occupation in the same year. As the proportion of master graduates in 2010 and 2011 is relatively low and to avoid to classify a master's graduate as overeducated, we considered as overeducated those individuals with at least a bachelor's degree which the mode of education of his/her 3-digit occupation is secondary and post-secondary or lower.

Regarding vertical mismatch status and inspired by Frenette (2004), four paths were considered:

⁴ To unambiguously identify job mobility patterns and for estimation purposes, individuals who appeared only once during the analysed period and multiple job holders were also excluded from the analysis.

⁵ PhD holders were excluded since they are mostly represented in the public sector and are not representative in our data. Individuals employed in the 3-digit occupation "Skilled Agricultural, Forestry and Fishery Workers" were dropped as well as individuals employed in a 3-digit occupation that represents less than 0.1% of the employed in a given year. The 1% top and bottom wage earners were also dropped to avoid outliers in wages.

- (i) Continuously over: individuals classified as overeducated in each of the years of the analysed period;
- (ii) Initially over: individuals classified as overeducated in the entry year, but who switched at least once to a vertically well-matched job during the analysed period;
- (iii) Initially matched: individuals classified as vertically well-matched in the entry year, but who switched to a job for which they were overeducated at least once during the analysed period;
- (iv) Continuously matched: individuals classified as vertically well-matched in each of the years of the analysed period (control group).

Even though the focus of our main analysis is the vertical educational mismatch, additionally, we computed a measure of horizontal mismatch. A horizontal mismatch occurs when a worker trained in a particular field-of-study works in another field (Montt, 2017). To define the field required in a given occupation we used the modal field of study for the 3-digit occupations for which the mode of education is to have a tertiary education. Based on the modal field of study we classify an individual as horizontally mismatched if his/her field of study does not coincide with the modal field of study for his/her 3-digit occupation.

With respect to horizontal mismatch status, four paths were considered:

- (i) Continuously horizontally mismatched: individuals classified as horizontally mismatched in each of the years of the analysed period;
- (ii) Initially horizontally mismatched: individuals classified as horizontally mismatched in the entry year, but who switched at least once to a well-matched job during the analysed period;
- (iii) Initially horizontally matched: individuals classified as horizontally well-matched in the entry year, but who switched to a job for which they were horizontally mismatched at least once during the analysed period;
- (iv) Continuously horizontally matched: individuals classified as horizontally well-matched in each of the years of the analysed period (control group).

3. Educational Mismatches in Early Career

3.1 The incidence of overeducation

Table 1 presents the number of observations by data cohort, gender and vertical mismatch status and Table 2 the number of observations by year, gender and vertical mismatch status. Of the total number of observations, about one-third corresponds to individuals classified as overeducated (36.4% for the female sample and 32.8% for the male sample). These figures are in line with Dolton & Vignoles (2000), who found that 38% of 1980 UK graduates were overeducated for their first job or Clark, Joubert & Maurel (2017) who showed that 37.4% of college graduates in the U.S. over the 1982-1994 period were overeducated.

We observe a decrease in the percentage of overeducated within the time span of this study. According to the first row of Table 2, 41.1% of the individuals entered the labour market overeducated. In the last year of the analysed period ($t+7$), of the total number of individuals that remained in the QP files (10,893), 32.3% were employed in a 3-digit occupation for which they were overeducated. In particular, of the 6,441 individuals who entered overeducated 44% persisted in that status in the last year observed in the QP files.

This indicates that there is a large fraction of the overeducated that are stuck in a job for which they possess an education surplus and are not able to switch to a well-matched job. This could be explained by observed and unobserved characteristics of these workers that make them less likely to change status (for example, Greene & McIntosh, 2007; Chevalier & Lindley, 2009 and Araújo & Carneiro, 2022) found evidence that ability and over schooling are negatively correlated).

Table A in the Appendix reports the number of observations by year, gender and horizontal mismatch status for the 9,213 individuals for which it is possible to clearly identify the field of study. Of the total number of observations, about one-fifth corresponds to individuals classified as horizontally mismatched (19.1% for the female sample and 22.4% for the male sample). This percentage remains almost unchanged over the years.

Table 1: Number of observations by cohort, gender and vertical mismatch status

	Overeducated			Well-matched			<i>Total</i>
	Males	Females	All	Males	Females	All	
Cohort 2010	6,882	9,576	16,458	14,465	17,515	31,980	48,438
Cohort 2011	7,249	10,466	17,715	14,447	17,451	31,898	49,613
<i>Total</i>	14,131 (32.8%)	20,042 (36.4%)	34,173 (34.9%)	28,912 (67.2%)	34,966 (63.6%)	63,878 (65.1%)	98,051

Table 2: Number of observations by year, gender and vertical mismatch status

	Overeducated			Well-matched			
	Males	Females	All	Males	Females	All	<i>Total</i>
<i>t</i> (entry year)	2,574	3,867	6,441	4,209	5,013	9,222	15,663
<i>t+1</i>	2,117	3,015	5,132	3,946	4,680	8,626	13,758
<i>t+2</i>	1,743	2,450	4,193	3,708	4,459	8,167	12,360
<i>t+3</i>	1,637	2,289	3,926	3,552	4,270	7,822	11,748
<i>t+4</i>	1,556	2,169	3,725	3,464	4,189	7,653	11,378
<i>t+5</i>	1,530	2,137	3,667	3,385	4,136	7,521	11,188
<i>t+6</i>	1,500	2,067	3,567	3,348	4,148	7,496	11,063
<i>t+7</i>	1,474	2,048	3,522	3,300	4,071	7,371	10,893
<i>Total</i>	14,131	20,042	34,173	28,912	34,966	63,878	98,051

3.2 Who are the overeducated?

Table 3 presents information regarding the socio-demographic characteristics of the graduates by group of vertical mismatch status as defined in Section 2.2. Females, foreigners and bachelors are more predominant in the group of individuals who entered the labour market overeducated (the “Continuously over” or the “Initially over”). Regarding age at entry, those individuals who entered the labour market after the age of 25 are more likely to belong to the “Continuously over” group or to the group of “Initially matched”. This group could correspond to graduates that experienced more difficulties to find their first job due to the 2008-2009 crisis, thus, experiencing a longer unemployment episode before entering the labour market. This should deserve further research as in QP we are not able to accurately identify unemployment episodes.

Table 3: Percentage of observations by socio-demographic characteristics and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially Over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Socio-demographic characteristics					
Gender					
Females	18.77	23.45	9.95	47.84	100.0 (N=55,008)
Males	17.49	19.99	12.00	50.52	100.0 (N=43,043)
Age					
Age entry <= 25	16.28	22.94	10.07	50.71	100.0 (N=59,581)
Age entry > 25	21.20	20.36	12.05	46.39	100.0 (N=38,470)
Nationality					
Portuguese	17.94	21.93	10.89	49.24	100.0 (N=96,469)
Foreign	34.58	21.87	7.96	35.59	100.0 (N=1,582)
Education					
Bachelor	19.36	22.52	10.43	47.68	100.0 (N=84,996)
Master	10.72	18.05	13.54	57.69	100.0 (N=13,055)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

According to Table 4, the fields of study that exhibit a relative higher percentage of continuously overeducated workers are “Humanities and arts”, “Social sciences, business and law”, and “Services”. The fields of study that comprise more than half of the employed continuously matched are: “Education”, “Science, mathematics and computing”, “Engineering, manufacturing and construction”, “Agriculture” and “Health and welfare”. In “Social sciences, business and law”, “Engineering, manufacturing and construction”, “Science, mathematics and computing” and “Agriculture” we also observe a percentage of workers initially matched above the total average.

These results are, in general, consistent with previous literature. Frenette (2004), using data on Canadian graduates, showed that at the bachelor’s level, graduates of arts and humanities, social sciences and agricultural and biological sciences are the most likely to be overeducated.

Table 4: Percentage of observations by field of study and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially Over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Field of Study					
Education	9.56	12.12	9.87	68.45	100.0 (N=3,192)
Humanities and arts	34.07	25.21	9.21	31.50	100.0 (N=3,625)
Social sciences, business and law	27.47	24.49	12.80	35.24	100.0 (N=23,148)
Science, mathematics and computing	12.63	18.42	14.34	54.61	100.0 (N=8,780)
Engineering, manufacturing and construction	13.20	17.25	13.94	55.61	100.0 (N=18,599)
Agriculture	13.92	11.70	13.57	60.82	100.0 (N=855)
Health and welfare	3.74	17.24	4.14	74.88	100.0 (N=21,572)
Services	38.96	29.50	9.97	21.57	100.0 (N=1,173)
Not-known	29.28	32.39	11.95	26.38	100.0 (N=17,107)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

3.3 Where are the overeducated and what they do?

Table 5 presents the distribution of the graduates by NUTSII regions in mainland Portugal. We conclude that the region of the Metropolitan Area of Lisbon employs almost half of the recent graduates in the private sector and exhibits a relative higher proportion of overeducated individuals when compared with the other regions. This may be explained by the fact that the Metropolitan Area of Lisbon offers high employment opportunities and high-paying wages, which may pay off even if the individual is employed in a non-graduate job. In the Algarve, about two-thirds of the employed are continuously well-matched over the period under scrutiny.

According to Table 6, the sectors of “Agriculture, farming of animals, mining and quarrying”, “Manufacturing”, “Wholesale and retail trade; repair of motor vehicles and motorcycles”, “Transportation and storage”, “Accommodation and food service activities”, “Financial and insurance activities”, “Administrative and support services” and “Arts, entertainment, sports and recreation activities” are the ones that show up a percentage of continuously overeducated workers above the total average of 18.21%. On the opposite side, “Electricity, gas, steam, cold, water collection, treatment and

distribution”, “Construction”, “Information and communication activities”, “Consultancy, scientific and technical activities”, “Education”, “Human health and social work activities” and “Other service activities” are the sectors that report a proportion of continuously matched workers above the total average of 49.02%.

Regarding firm size, and comparing to the total average, we observe, in large firms, a slightly higher incidence of continuously matched workers and a slightly lower incidence of continuously overeducated workers (see Table 7). In micro firms, the opposite happens with a slightly higher incidence of continuously overeducated workers and a slightly lower incidence of continuously matched workers. A similar result was found by by Cuttillo & DiPietro (2006) for Italy.

Table 5: Percentage of observations by NUTSII regions and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially Over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Region NUTSII					
Norte	17.37	20.69	10.94	51.00	100.0 (N=29,886)
Centro	18.86	21.99	12.06	47.08	100.0 (N=15,486)
Lisbon Metropolitan Area	19.07	23.25	10.81	46.88	100.0 (N=46,022)
Alentejo	16.61	20.42	9.79	53.19	100.0 (N=3,830)
Algarve	11.60	15.18	5.34	67.88	100.0 (N=2,827)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

Table 6: Percentage of observations by industry (1 digit) and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Industry					
Agriculture, farming of animals, mining and quarrying	19.80	20.48	13.48	46.25	100.0 (N=586)
Manufacturing	28.71	24.08	15.20	32.01	100.0 (N=10,743)
Electricity, gas, steam, cold, water collection, treatment and distribution	16.35	12.13	10.34	61.17	100.0 (N=783)
Construction	13.78	17.25	13.98	55.00	100.0 (N=3,026)
Wholesale and retail trade; repair of motor vehicles and motorcycles	28.38	28.09	11.48	32.05	100.0 (N=13,580)
Transportation and storage	48.19	26.28	9.08	16.45	100.0 (N=1,465)
Accommodation and food service activities	55.02	30.65	6.12	8.21	100.0 (N=2,010)
Information and communication activities	7.54	22.01	13.49	56.95	100.0 (N=10,963)
Financial and insurance activities	41.26	27.22	11.21	20.32	100.0 (N=5,478)
Real estate activities	26.20	36.67	12.76	24.37	100.0 (N=439)
Consultancy, scientific and technical activities	10.24	17.51	14.38	57.86	100.0 (N=13,912)
Administrative and support services	28.36	35.98	10.36	25.31	100.0 (N=5,089)
Education	10.86	13.95	11.52	63.67	100.0 (N=3,325)
Human health and social work activities	4.74	16.44	4.57	74.25	100.0 (N=22,294)
Arts, entertainment, sports and recreation activities	39.40	26.93	12.30	21.36	100.0 (N=1,203)
Other service activities	15.25	18.23	11.98	54.55	100.0 (N=3,155)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

Table 7: Distribution of workers by firm size and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Firm size					
Micro (<10)	19.00	23.20	12.05	45.75	100.0 (N=15,649)
Small (10-49)	18.30	21.34	12.88	47.48	100.0 (N=21,564)
Medium (50-249)	18.00	21.27	12.72	48.01	100.0 (N=23,022)
Large (≥ 250)	17.96	22.14	8.05	51.86	100.0 (N=37,816)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

Table 8 presents the distribution of graduates by type of contract. According to the Table, 38.2% of the graduates held a fixed term contract in the period under scrutiny. This group of workers are more likely to be initially overeducated or initially matched when compared with the group of workers in a permanent contract. The latter are more likely to be continuously matched.

Regarding the distribution of workers by qualification levels (Table 9), as expected graduates in top hierarchical levels are more likely to be continuously matched while graduates in the bottom hierarchical levels are more likely to be continuously overeducated.

Table 8: Percentage of observations by type of contract and vertical mismatch status, average 2010-2018

	Continuously over	Initially over	Initially matched	Continuously matched	Total
Type of contract (%)					
Permanent	18.39	18.95	9.37	53.28	100.0 (N=59,555)
Fixed term	18.04	26.56	13.05	42.35	100.0 (N=37,490)
Non-defined	13.52	25.65	15.81	45.03	100.0 (N=1,006)
Total average	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

Table 9: Percentage of observations by qualification level and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Qualification level					
Top executives	3.30	13.29	10.14	73.27	100.0 (N=26,154)
Intermediary executives	4.68	10.72	7.76	76.84	100.0 (N=23,935)
Supervisors, team leaders, foreman	23.34	35.80	16.64	24.22	100.0 (N=7,597)
High-skilled professionals	22.07	28.24	12.62	13.08	100.0 (N=13,723)
Skilled professionals	41.25	32.28	11.91	14.55	100.0 (N=19,103)
Semi-skilled and non-skilled professionals	48.04	36.67	10.95	4.34	100.0 (N=5,042)
Apprentices, interns, trainees	30.68	33.96	12.09	23.27	100.0 (N=2,497)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

Table 10 presents the distribution of the graduates by 1-digit occupation. As expected, three-fourths of the individuals are employed in occupations corresponding to major groups 1, 2 or 3 – “Managers”, “Professionals” and “Technicians and associate professionals”, respectively. “Professionals” is the occupation that exhibits the highest percentage of the employed continuously matched (79.7% of the total), while “Craft and related trade workers” the occupation that exhibits the highest percentage of the employed continuously overeducated (60.6% of the total).

Finally, Table 11 lists the 10 occupations (3-digit level) that require less than a bachelor’s degree and employ the largest number of observations of overeducated graduates (26,089 observations out of 34,173, i. e., 76.3%). Most of these occupations are related to clerk and sales tasks, corroborating previous findings by, for example, Clark, Joubert & Maurel (2017) for the U.S.

Table 10: Percentage of observations by occupation (1-digit) and vertical mismatch status, average 2010-2018

	Continuously over (%)	Initially over (%)	Initially matched (%)	Continuously matched (%)	Total (%)
Occupation (1-digit)					
Managers	18.55	30.86	15.57	35.02	100.0 (N=1,876)
Professionals	0.001	11.11	9.12	79.71	100.0 (N=56,690)
Technicians and associate professionals	29.02	42.60	15.57	12.81	100.0 (N=17,293)
Clerical support workers	57.72	31.36	10.92	0.0	100.0 (N=14,683)
Service and sales workers	54.93	35.19	9.88	0.0	100.0 (N=6,095)
Craft and related trade workers	60.57	23.66	15.77	0.0	100.0 (N=317)
Elementary occupations	39.93	39.38	20.69	0.0	100.0 (N=1,097)
Total average (%)	18.21 (N=17,853)	21.93 (N=21,501)	10.85 (N=10,636)	49.02 (N=48,061)	100.0 (N=98,051)

Note: no observations were found for the occupation belonging to major group 8 "Plant and machine operators and assemblers".

Table 11: Ten most frequent 3-digit occupations among overeducated graduates, average 2010-2018

Occupation (3-digit)	Required Education	N
311 Physical and Engineering Science Technicians	Secondary	2,666
332 Sales and Purchasing Agents and Brokers	Secondary	1,263
334 Administrative and Specialised Secretaries	Secondary	1,613
351 Information and Communications Technology Operations and User Support Technicians	Secondary	1,926
411 General Office Clerks	Secondary	5,353
421 Tellers, Money Collectors and Related Clerks	Secondary	1,200
422 Client Information Workers	Secondary	2,693
431 Numerical Clerks	Secondary	2,084
441 Other Clerical Support Workers	Secondary	1,871
522 Shop Salespersons	Basic: Third cycle	1,694
524 Other Sales Workers	Basic: Third cycle	2,752
962 Other Elementary Workers	Basic: Third cycle	974
<i>Total</i>		26,089

4. Job Mobility in Early Career

4.1 Who moves?

The aim of this section is to characterise the mobility patterns of recent graduates in the Portuguese labour market. For this purpose, we computed the total number of job changes an individual performed in the analysed period. A job change occurs when a worker changes employer in two subsequent years.

Figure 1.A displays the distribution of the total number of job changes (voluntary or involuntary) during the 2011-2018 for all workers, the group of workers who entered overeducated in the entry year and the group of workers who entered well-matched in the entry year, while Figure 1.B presents the same information for all workers, the group of workers who entered horizontally mismatched in the entry year and the group of workers who entered horizontally matched in the entry year. Overall, of the 15,663 graduates 44.2% did not perform any job change during the 2010-2018 period, 33.6% performed one job change and 15.2% two job changes. These same percentages reach 41.4% (46.5%), 32.8% (32.9%) and 16.9% (14.5%), respectively, for those who entered overeducated (horizontally mismatched) and 46.5% (44.7%), 32.4% (33.7%) and 14.5% (14.8%), respectively, for those who entered well-matched (horizontally matched).

Notice that of the total of individuals who entered overeducated, 55% changed vertical mismatch status at least once through a change in occupation across firms and 29% through a change in occupation within the same firm. Regarding those who entered well-matched, 70.3% changed status at least once via a change in occupation across firms and 26.9% via a change in occupation within the same firm.⁶ Regarding the horizontal mis(matched) at entry, the results are qualitatively similar, with the majority performing a change in status through a change in occupation via a firm change.

These results seem to confirm that the Portuguese labour market is characterised by low job mobility at the beginning of the career, even though they should be interpreted with some caution, as Portugal was hit by the 2008-2009 economic crisis and the 2010-2013 sovereign debt crisis, that led to a massive job destruction and a large fall in job creation (Carneiro, Portugal & Varejão, 2014). However, Araújo (2019), using QP data on two cohorts of recent graduates in Portugal who entered the labour market in 2006 and 2007 obtained a similar conclusion. Topel and Ward (1992), using US data, find evidence that during the first ten years in the labour market a typical worker holds seven jobs, whereas Argaw, Maier & Skriabikova (2017), using data for Germany over the 1992-2013, showed that 63% of the employed during their first seven years did not change jobs voluntarily.

⁶ In the 2010-2018 period, of the 68 (3-digit) occupations included in our sample, 5 occupations changed their mode from secondary or lower to tertiary education, namely: “122 - Sales, marketing and development directors”, “265 - Creative and performing arts artists”, “314 - Life science technicians and related associate professionals”, “321 - Medical and pharmaceutical technicians”, “333 - Business services agents”. These occupations employed 5% of the total number of observations in the analysed period.

Figure 1.A: Distribution of the total number of job changes (2010-2018) by vertical mismatch status at entry

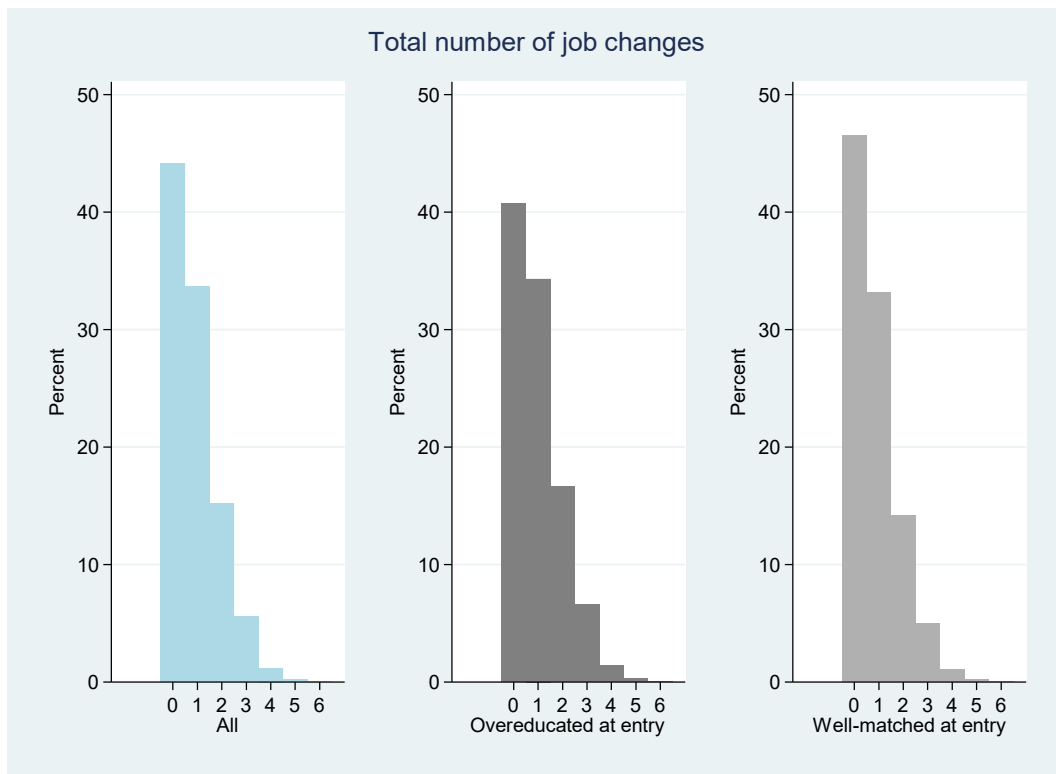
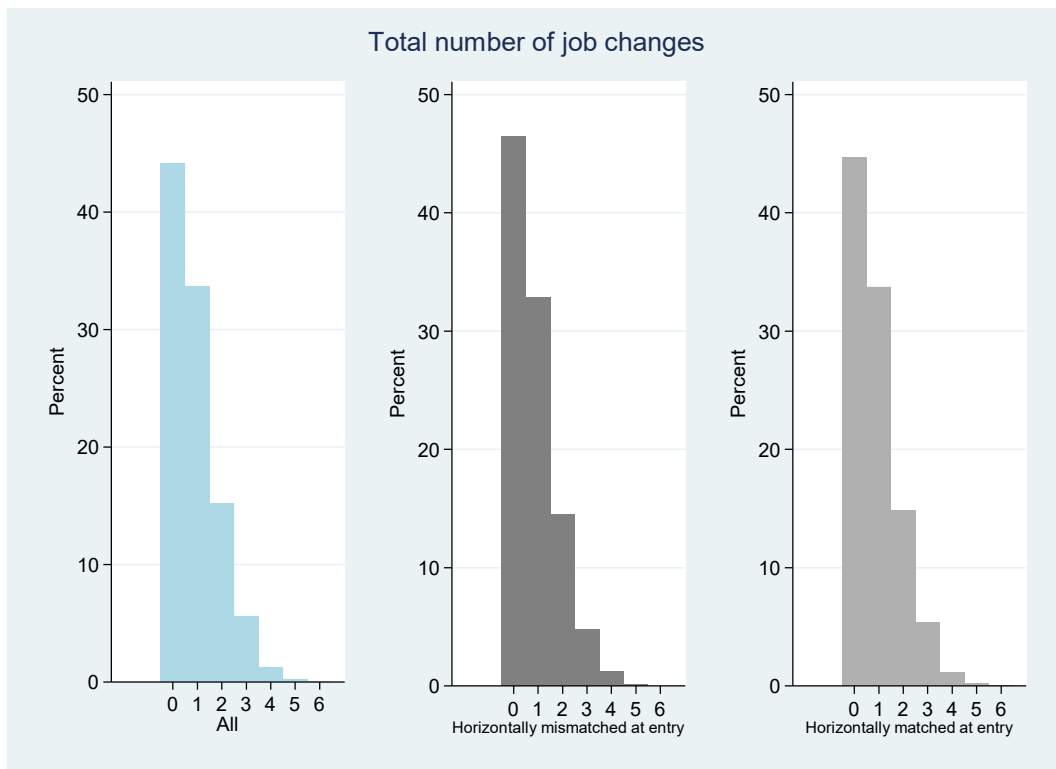


Figure 1.B: Distribution of the total number of job changes (2010-2018) by horizontal mismatch status at entry



4.2 Econometric analysis

The aim of this section is to analyse the determinants of job mobility in early career with a particular focus on horizontal and vertical mismatches at entry. Our variable of interest corresponds to the total number of job changes (voluntary or involuntary) performed by graduates during their first eight years in the labour market (*NJC*). As mentioned before, a job change corresponds to a firm change.

The model for *NJC* writes as:

$$E[NJC_i | \mathbf{X}_i] = \exp(\alpha + \boldsymbol{\beta}\mathbf{X}_i + \delta Mismatched_i) \quad (1)$$

where *NJC* is the total number of job changes that occurred during the analysed period for individual *i*. *Mismatched* is a dummy variable that takes the value one if in the entry year the individual is mismatched. \mathbf{X} is a set of control variables for worker (dummies for gender, nationality, age at entry, education level, field of study and cohort of entry), job (type of contract, qualification level, hourly earnings and wage dispersion) and firm characteristics (dummies for size, region and industry) at entry (2010 or 2011 depending on the cohort)⁷ and α a constant term.

As our dependent variable is a count variable, we estimate a Poisson model with robust standard errors. The results are displayed in Table 12. In specification (1) of column 1 the dummy variable *Mismatched* takes the value one if individual *i* entered the labour market overeducated (zero otherwise), while in specification (2) of column 2 the dummy variable *Mismatched* takes the value one if individual *i* entered the labour market horizontally mismatched (zero otherwise).

The results do not reveal a significant statistical difference in the number of job changes over the analysed period between those who entered mismatched (vertically or horizontally) and those who entered well-matched (vertically or horizontally).

The results also indicate that individuals who entered the labour market after 25 years old, foreigners and master's graduates are less likely to move. Overeducated females are more likely to change jobs. Relative to those with a graduation in the field of "Education", graduates in "Science, mathematics and computing" are more likely to move, while graduates in "Agriculture" are less likely to move.

Individuals with a permanent contract at entry and a higher entry wage are, as expected, less likely to switch job. Individuals employed in a 3-digit occupation that exhibits higher wage dispersion are less likely to change job, even though this coefficient is not statistically significant when we consider the larger sample of graduates in specification (1).

⁷ Hourly earnings correspond to total regular payroll (base wage and regular payments) over normal hours worked, in the reference month, in real euros (2010 constant prices using the Consumer Price Index). Wage dispersion is measured by the standard deviation of real hourly earnings in the 3 digit-occupation as suggested in Argaw, Maier & Skriabikova (2017).

Compared with the Norte region, individuals in Centro, Lisbon metropolitan area, Alentejo and Algarve are, in general, more likely to switch jobs. The magnitude of this effect is particularly significant in the Algarve. Those entering the labour market in 2011 are less likely to change jobs.

Table 12: Poisson results for the number of job changes, 2010-2018

Dependent variable: number of job changes (NJC)

	Vertical Mismatch (N=15,663) (1)	Horizontal Mismatch (N=9,213) (2)
Mismatched at entry	0.000134 (0.0211)	-0.0406 (0.0325)
Female	0.0398** (0.0191)	0.0244 (0.0272)
Age entry > 25	-0.123*** (0.0185)	-0.121*** (0.0258)
Foreign	-0.538*** (0.0749)	-0.629*** (0.139)
Master or equivalent	-0.299*** (0.0376)	-0.243*** (0.0441)
<i>Field of study (omitted: Education)</i>		
Humanities and Arts	-0.0818 (0.0693)	-0.164 (0.103)
Social sciences, business and law	0.0272 (0.0580)	0.0552 (0.0761)
Science, mathematics and computing	0.140** (0.0624)	0.157* (0.0812)
Engineering, manufacturing and construction	0.0624 (0.0603)	0.0691 (0.0801)
Agriculture	-0.242** (0.115)	-0.336** (0.144)
Health and welfare	0.0444 (0.0609)	0.0571 (0.0782)
Services	0.127 (0.0863)	0.187 (0.135)
Not-known	0.0478 (0.0579)	
ln(hourly earnings)	-0.215*** (0.0303)	-0.248*** (0.0460)
Wage dispersion	-0.166 (0.115)	-0.564*** (0.214)
Permanent contract	-0.283*** (0.0205)	-0.255*** (0.0261)
<i>Region NUTSII (omitted: Norte)</i>		
Algarve	0.369*** (0.0465)	0.469*** (0.0541)
Centro	0.128*** (0.0278)	0.117*** (0.0379)
Lisbon Metropolitan Area	0.162*** (0.0228)	0.217*** (0.0311)
Alentejo	0.167*** (0.0525)	0.226*** (0.0671)
Cohort 2011	-0.0765*** (0.0173)	-0.0696*** (0.0238)
Constant	0.274* (0.162)	0.526*** (0.199)

Notes: Worker-cluster robust standard errors in parentheses;

* p < 0.1, ** p < 0.05, *** p < 0.01. The models also include a set of industry and firm size dummies.

5. Wage Mobility in Early Career

5.1 Wages and mismatch status

The main objective of this Section is to characterise wage mobility in early career of young graduates focusing on mismatch status at entry.

Figure 2 shows average monthly real earnings (base wage and regular payments in the reference month) by vertical mismatch status at entry over the analysed period. Monthly earnings of new labour market entrants exhibit an increasing trend in the 2010-2018 period, despite the debt sovereign crisis of 2010-2013. We observe that among the four groups considered, continuously well-matched graduates are the group with high-paying jobs, while the continuously overeducated are the group with the lowest-paying jobs. At entry a female continuously well-matched earns about 1,058 euros, while a male about 1,116 euros. A female continuously overeducated earns at the start of the career 777 euros, while a male 905 euros. Graduates who entered the labour market overeducated and then switched to a well-matched job, earn, at entry, slightly more than those who remained continuously overeducated. In the first job, a female initially overeducated earns 797 euros and a male 926 euros. For males this difference tends to deepen over the years. Finally, a female initially matched earns, at entry, 920 euros while a male earns 990 euros.

Figure 3 presents the same statistics by horizontal mismatch status at entry. For females, the group of continuously well-matched are the ones that exhibit higher wages, while the continuously horizontal mismatched are the ones that display the lowest monthly earnings. The initial over and the initial matched present a very similar wage pattern, especially in the latter years of the analysed period.

For males, we observe the highest wages for the group of initially well-matched, and, surprisingly, the lowest wages are observed for the continuously well-matched, with the monthly earnings gap between the former and the latter tending to deepen as time goes on.

In any case, whether well-matched, vertically or horizontally mismatched, female wages grew at a lower rate during the analysed period than male wages.

Figure 4 reports the average real monthly earnings (in euros) by field of study and year. Individuals with a tertiary education degree in “Engineering, manufacturing and construction” and “Sciences, mathematics and computing” are the ones who exhibit, on average and unconditionally, higher earnings at entry and a higher wage growth. On the opposite side, individuals with a tertiary degree in “Education” and “Humanities and arts” present the lowest earnings at entry and a lower wage growth in the 2010-2018 period. Notice that even though graduates in “Health and welfare” present the highest earnings at entry, as their earnings almost stagnated in the subsequent years, they end up lagging behind the graduates in “Engineering, manufacturing and construction”, “Science, mathematics and computing” and “Social sciences, business and law”.

Figure 2: Monthly real earnings (in euros) by vertical mismatch status at entry, 2010-2018

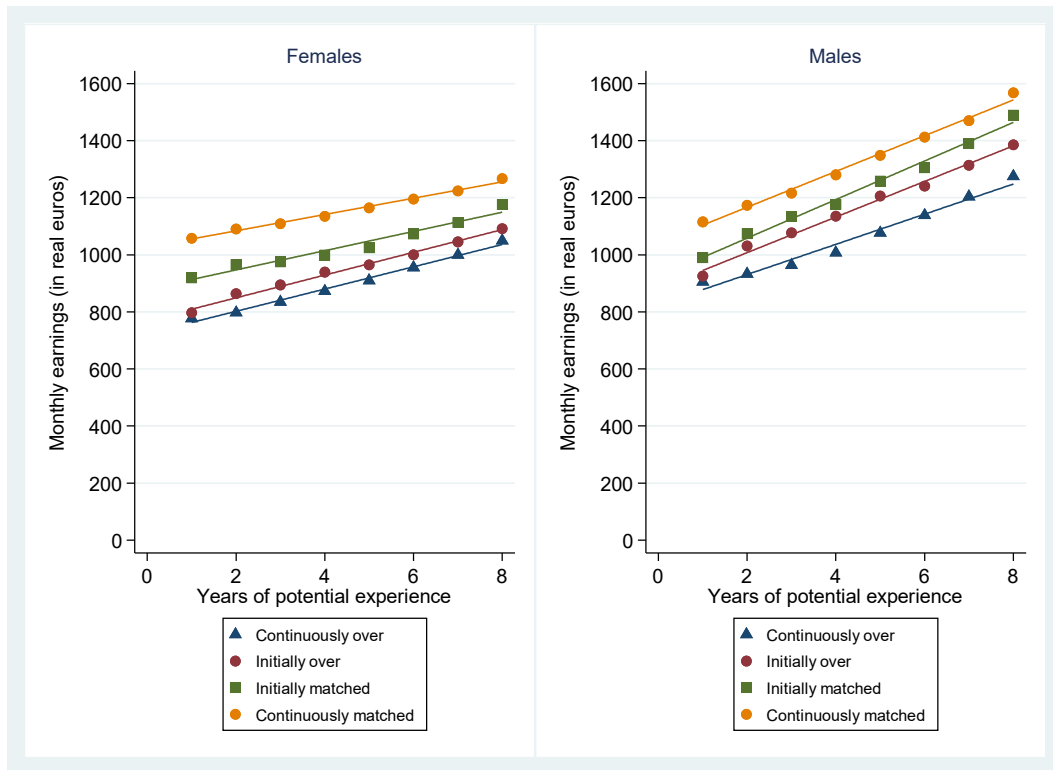


Figure 3: Monthly real earnings (in euros) by horizontal mismatch status at entry, 2010-2018

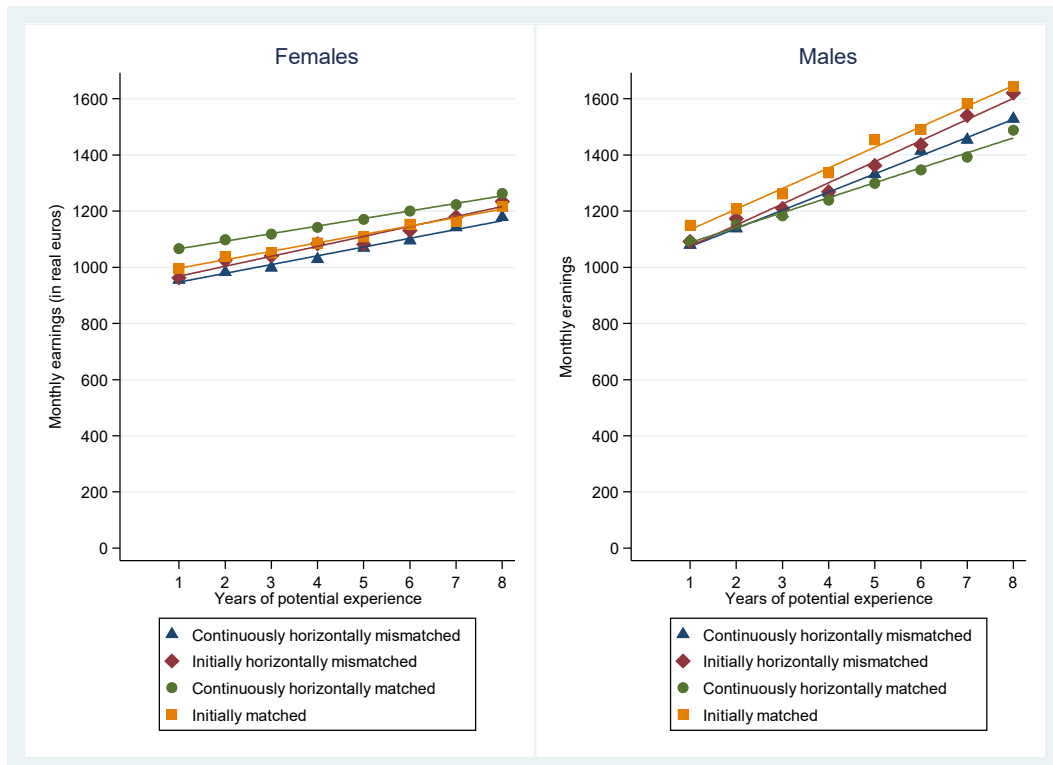
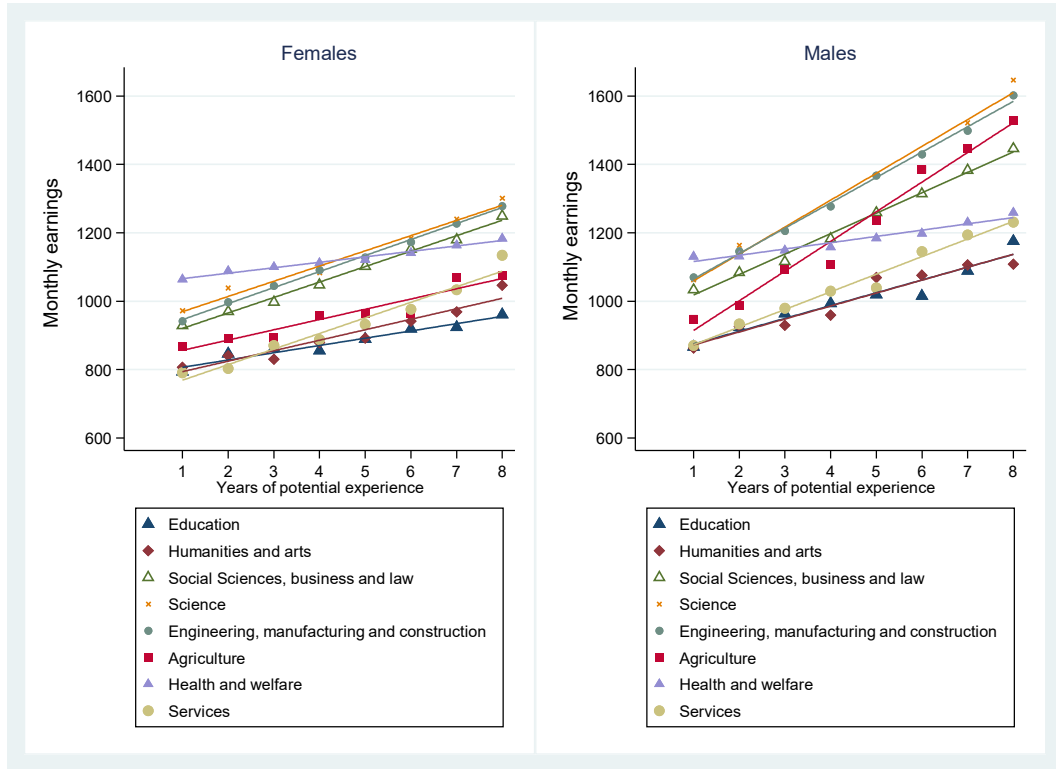


Figure 4: Monthly real earnings (in euros) by field of study, 2010-2018



5.2 Econometric analysis

To estimate the differences in earnings between the overeducated and the continuously matched workers conditionally on an extensive set of covariates, we estimate a standard Mincerian wage equation. The model, inspired by Verdugo & Verdugo (1989), writes as follows:

$$\begin{aligned}
 \ln w_{it} = & \alpha + \gamma_t + \beta X_{it} + \sum_{k=0}^7 \delta_k \text{Continuously over}_{it}^k + \sum_{k=0}^7 \lambda_k \text{Initially over}_{it}^k \\
 & + \sum_{k=0}^7 \theta_k \text{Initially matched}_{it}^k + \varepsilon_{it} \quad (2)
 \end{aligned}$$

where w_{it} represents the real hourly earnings for each individual i , in year t . α is a constant term and γ_t a time fixed effect.

Following Raposo, Portugal & Carneiro (2021), $\text{Continuously over}_{it}^k$, $\text{Initially over}_{it}^k$, $\text{Initially matched}_{it}^k$ are dummy variables for the treated groups (the continuously over, the initially over and the initially matched,

respectively) that take the value one if at time t , worker i is k years ($k \in [0,7]$) after entering the labour market. This procedure allows us to estimate the immediate and medium-run effects of overeducation on wages. The estimates of the coefficients of the mismatch dummies give us the difference in hourly earnings in period t between an individual belonging to the corresponding treated group and a similar individual belonging to the control group.

Vector X_{it} includes tenure (in years) and a set of dummies for education, gender, nationality, qualification level, type of contract, firm size, region (NUTSII level) and industry (1-digit level). ε_{it} is a random error term assumed to be uncorrelated with the regressors.

Table 13 presents the OLS estimates of the coefficients of interest, i. e., the wage differential between the corresponding treated group and the control group (the workers continuously well-matched) in a given year.⁸ Holding other variables constant, the results show a negative wage differential between the treated groups and the control group, more significant for continuously overeducated workers. For this group the wage gap ranges between -11.5% in the entry year to -12.5% in the last year of the period under scrutiny. For the initially overeducated, the wage gap ranges from -7.9% in the entry year to -10.3% in the last year. For the initially well-matched these percentages range from -7.2% and -4.2%, respectively.

These results are consistent with previous literature that showed that overeducated workers earned less than their similar peers with the same years of schooling in graduates jobs (e.g., Frenette, 2004, Cutillo & Di Pietro, 2006, Clark, Joubert & Maurel, 2017). Frenette (2004) shows that the earnings of overeducated Canadian college graduates that switched to a well-matched job grew more than the earnings of overeducated Canadian graduates that remain overeducated. They also found a wage penalty for bachelor's graduates who became overeducated in comparison with those who remained continuously well-matched, even though at a smaller magnitude.

Equation (2) was re-estimated by replacing the dummy variables for vertical mismatches with the dummy variables for horizontal mismatches. The OLS estimates of the coefficients of the horizontal mismatch dummies are reported in Table 14.⁹

The results indicate that the continuously horizontally mismatched suffered a penalty in hourly earnings in the first four years in the labour market when compared with similar workers continuously matched, that range between 5% in the entry year to 2.5% three years afterwards. For the initially horizontally mismatched and the initially matched, we

⁸ To save space we only include the estimates of the coefficients of the dummy variables for the treated groups. The estimates of the coefficients of the control variables have the expected signs Full results available upon request.

⁹ Notice that due to the large number of individuals with an unknown field of study and the individuals in occupations for which the mode of education is not a tertiary degree, the number of observations used in this estimation reduced remarkably.

observe a wage penalty in the entry year of about 3%, that tends to vanish over the years and even becomes positive in the final years of the analysed period.¹⁰

Overall, these results seem to suggest that vertical mismatches play a more important role in explaining wage mobility in early career than horizontal mismatches. In fact, the wage penalty for the overeducated is large in magnitude and tends to persist for a long period of time, when compared with the penalty associated with a horizontal mismatch. However, the empirical literature on the effects of horizontal mismatches on wages is scant and this issue should deserve further investigation in the future.

Table 13: OLS estimates of the wage gap between the overeducated and the well-matched graduates, 2010-2018 (N=98,051)

Dependent variable: real hourly earnings			
	Continuously Over	Initially Over	Initially Matched
	(1)	(2)	(3)
<i>t</i> (entry year)	-0.115*** (0.0073)	-0.079*** (0.0065)	-0.072*** (0.0077)
<i>t+1</i>	-0.113*** (0.0071)	-0.070*** (0.0064)	-0.043*** (0.0081)
<i>t+2</i>	-0.120*** (0.0074)	-0.081*** (0.0066)	-0.048*** (0.0085)
<i>t+3</i>	-0.125*** (0.0078)	-0.077*** (0.0069)	-0.045*** (0.0089)
<i>t+4</i>	-0.121*** (0.0082)	-0.084*** (0.0071)	-0.045*** (0.0094)
<i>t+5</i>	-0.113*** (0.0085)	-0.087*** (0.0071)	-0.035*** (0.0095)
<i>t+6</i>	-0.107*** (0.0089)	-0.089*** (0.0073)	-0.027*** (0.0099)
<i>t+7</i>	-0.125*** (0.0094)	-0.103*** (0.0076)	-0.042*** (0.0104)

Notes: Worker-cluster robust standard errors in parentheses;
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

¹⁰ Notice that the wage penalty survives to the inclusion of interaction terms between the horizontal mismatch dummies and a dummy for overeducation in any given year, contradicting the findings of Montt (2017) who, using PIAAC data, found that horizontally mismatched individuals only suffer a wage penalty if they are also overeducated.

Table 14: OLS estimates of the wage gap between the horizontally mismatched and the well-matched graduates, 2010-2018 (N=59,601)

Dependent variable: real hourly earnings			
	Continuously horizontally mismatched	Initially horizontally mismatched	Initially horizontally matched
	(1)	(2)	(3)
<i>t</i> (entry year)	-0.0502*** (0.0094)	-0.0348*** (0.0118)	-0.0321*** (0.0088)
<i>t+1</i>	-0.0388*** (0.0095)	-0.0028 (0.0106)	-0.0141* (0.0083)
<i>t+2</i>	-0.0409*** (0.0098)	-0.0018 (0.0108)	-0.0131 (0.0082)
<i>t+3</i>	-0.0253** (0.0103)	-0.0023 (0.0108)	0.0070 (0.0084)
<i>t+4</i>	-0.0186 (0.0113)	0.0064 (0.0113)	0.0167* (0.0090)
<i>t+5</i>	-0.0137 (0.0119)	0.0144 (0.0117)	0.0275*** (0.0090)
<i>t+6</i>	-0.0174 (0.0120)	0.0263** (0.0119)	0.0207** (0.0088)
<i>t+7</i>	-0.0394*** (0.0130)	0.0188 (0.0125)	0.0008 (0.0092)

Notes: Worker-cluster robust standard errors in parentheses;
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

6. Conclusions

Using Portuguese administrative data that virtually covers the population of wage-earners in the private sector and focusing on mismatch status at entry, this study provides a comprehensive analysis of employment and wage mobility patterns in early career of graduates who entered the labour market in 2010 or 2011. The main conclusions that emerge from this exercise are five-fold.

First, regarding the incidence of overeducation, about 40% of the graduates entered the labour market overeducated. Of this total, about 44% remained overeducated in the last year observed in QP. Females, foreigners, bachelor holders, individuals entering the labour market after age of 25 and employed in Lisbon Metropolitan Area were the most represented in the group of continuously overeducated, as well as graduates in the fields of “Humanities and arts”, “Social sciences, business and law” and “Services”.

Second, regarding the characteristics of the job where the graduates were employed, we observed a huge heterogeneity between the continuously overeducated and the continuously matched in what regards the hierarchical level they appeared in terms of the qualification level. In fact, about 75% of the top executives and intermediary executives belong to the group of continuously matched, while solely 3% to 5% of the continuously overeducated achieved this hierarchical level. Most of the overeducated were in occupations related with clerk and sales tasks such as “General office clerks” or “Other sales workers”.

Third, the data indicate a very low degree of job mobility in young graduates’ early career. In fact, 44% of the graduates did not perform any job change during the 2010-2018 period. This same percentage reached 41.4% for those who entered overeducated and 46.5% for those who entered well-matched. In any case, the econometric analysis did not show a significant difference in the job mobility patterns between those who entered overeducated and those who entered adequately educated. The same conclusion applies when we compare the job mobility patterns of the individuals horizontally mismatched at entry and those horizontally matched at entry.

Fourth, and regarding wage mobility in early career, we observe that graduates in “Engineering, manufacturing and construction”, “Science, mathematics and computing” and “Social science, business and law” were those who, unconditionally, exhibited a higher wage growth over the 2010-2018 period. The wage growth was much more pronounced for males than for females.

Fifth, the econometric analysis for wages showed that, compared to the control group of the continuously vertically well-matched, overeducated graduates experienced a wage penalty that ranged in the entry year, from about 12% for the continuously overeducated to about 7% for the initially over or initially matched. This wage differential tended to persist over time for those who entered overeducated. We also find a wage penalty in the first years in the labour market for those individuals horizontally mismatched, even though of a smaller magnitude. In the entry year, the wage penalty for the treated groups ranged between 3 and 5% when compared with

their similar counterparts horizontally well-matched. This penalty tended to erode over the years.

These differences among the graduates could also be attributed to selection on unobservables and further research is needed in this regard. Actually, those who were employed in the private sector in Portugal in 2010 and 2011 could not correspond to a random sample of the graduates. Thus, further investigation is needed to account for the unemployed graduates and those who emigrated to find better career prospects abroad (European Commission, 2017).

In sum, there are some important conclusions from this study that policy makers should pay attention. First, our results indicate that the pool of recent graduates is very heterogenous and those vertically mismatched who are not able to switch to a well-matched job in early career, about one-fifth of the newly graduates, are the most affected in terms of subsequent wages. This group of graduates are mainly employed in occupations related with clerk and sales tasks and at the middle/bottom hierarchical levels of qualifications that are associated, on average, with low-paying wages. Second, contrary to what should be expected according to the career mobility theory, those who entered mismatched did not show a higher probability to switch jobs when compared with similar graduates who entered adequately matched.

This raises the question to what extent Higher Education System are equipping all graduates with the appropriate competencies required at work and to what extent the industrial/occupational structure of graduate employment in Portugal values such competencies.

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APPENDIX

Table A: Number of observations by year, gender and horizontal mismatch status

	Horizontal mismatched			Well-matched			
	Males	Females	Total	Males	Females	Total	<i>Total</i>
<i>t</i>	976	1,034	2,010	3,170	4,033	7,203	9,213
<i>t+1</i>	877	889	1,766	2,912	3,697	6,609	8,375
<i>t+2</i>	795	802	1,597	2,684	3,387	6,071	7,668
<i>t+3</i>	720	734	1,454	2,564	3,258	5,822	7,276
<i>t+4</i>	695	713	1,408	2,463	3,113	5,576	6,984
<i>t+5</i>	666	695	1,361	2,389	3,027	5,416	6,777
<i>t+6</i>	645	711	1,356	2,369	3,002	5,371	6,727
<i>t+7</i>	653	684	1,337	2,312	2,932	5,244	6,581
<i>Total</i>	6,027 (22.4%)	6,262 (19.1%)	12,289 (20.6%)	20,863 (77.6%)	26,449 (80.9%)	47,312 (79.4%)	59,601

Acknowledgments: The authors are grateful for helpful comments and suggestions from Ricardo Biscaia. We also acknowledge Gabinete de Estratégia e Planeamento do Ministério do Trabalho, Solidariedade e Segurança Social (GEP/MTSSS) for allowing the use of Quadros de Pessoal dataset. This research has been financed by Portuguese public funds through FCT - Fundação para a Ciência e a Tecnologia, I.P., in the framework of the projects with references PTDC/CED-EDG/29726/2017, UIDB/04005/2020, and UIDB/04105/2020.

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