

**TEMPORARY OR PERMANENT OVERQUALIFICATION?  
EVIDENCE FROM YOUNG WORKERS IN THE SPANISH LABOR MARKET<sup>1</sup>**

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The Spanish economy displays high levels of unemployment, in general, and record levels of youth unemployment, in particular. In addition the level of overqualification of Spanish workers is double the average of the OECD. This paper analyzes the determinants of youth overqualification with special emphasis on its duration. We use the Spanish School to Work Transition database to study these questions. This database is particularly well-suited to analyze the duration of overqualification among young workers since it covers the whole employment history of individuals since the initial transition from the school to the labor market. In particular, there is a long list of the characteristics of each job, including a self-assessment of the quality of the match between education and job skills required for the job, and a detailed definition of each occupation. The sample covers a long time period with surveys taking place every three years, which adds up to six waves of data collection. The average proportion of objective overqualification among young workers is 40.7%. Overqualification is a very absorbing state since transition matrices show that the probability to continue overqualified after moving to a new job is 76.3%. We find that the number of past jobs is not statistically significant in the explanation of the current situation with respect to the education-job match. These results are robust to alternative definitions of overqualification and statistical models for duration. The mean duration of overqualification ranges between 6.5 and 9 years. Therefore, overqualification among Spanish young workers seems to be a very persistent situation.

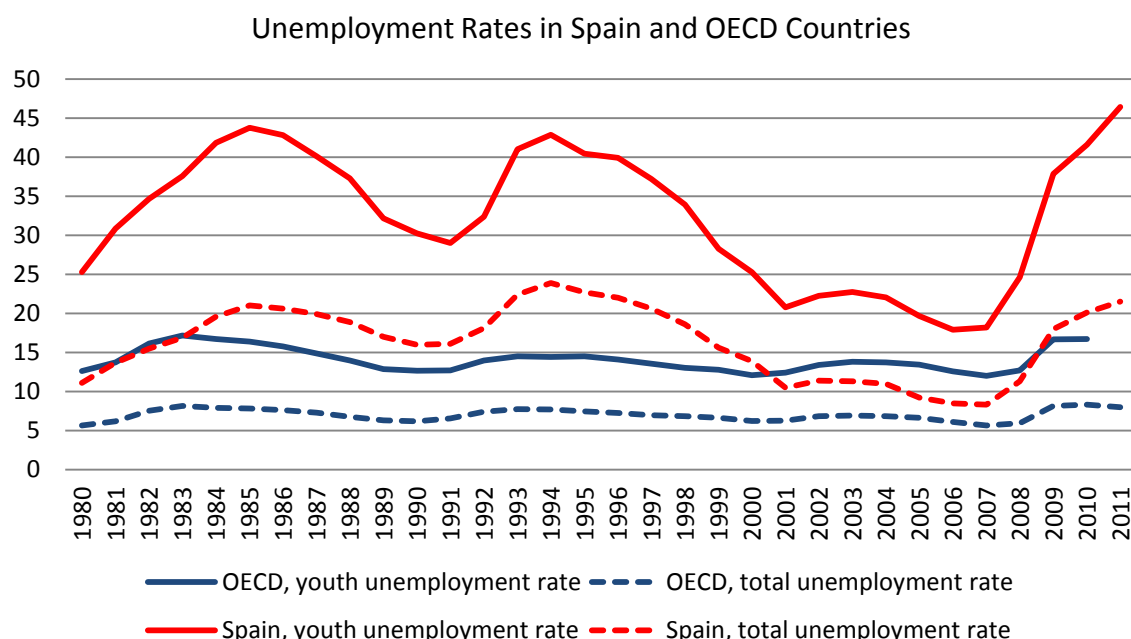
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## 1. Introduction

The recent economic and financial crisis in Spain has a severe negative impact on the Spanish labor market. While the Spanish unemployment rate decreased steadily for a decade from the mid 1990s onwards, the unemployment rate increased sharply after the burst of the housing boom in 2008, and the resulting economic crisis in 2009. In 2012, the national unemployment rate reached 26.2% which is close to the peak levels of unemployment before the years of economic expansion in the 1990s. Irrespective of the recent business cycle, Spanish unemployment persistently exceeded OECD average levels of unemployment for decades (Figure 1). This difference has been particularly pronounced for unemployment among young people. However, Spanish youth unemployment also decreased rapidly before the current crisis, and thus the gap between Spanish and OECD average unemployment rates was diminished considerably. In the course of the recent crisis, youth unemployment rates have risen again to previous record levels of more than 50%.

Figure 1: Unemployment rates, Spain and OECD

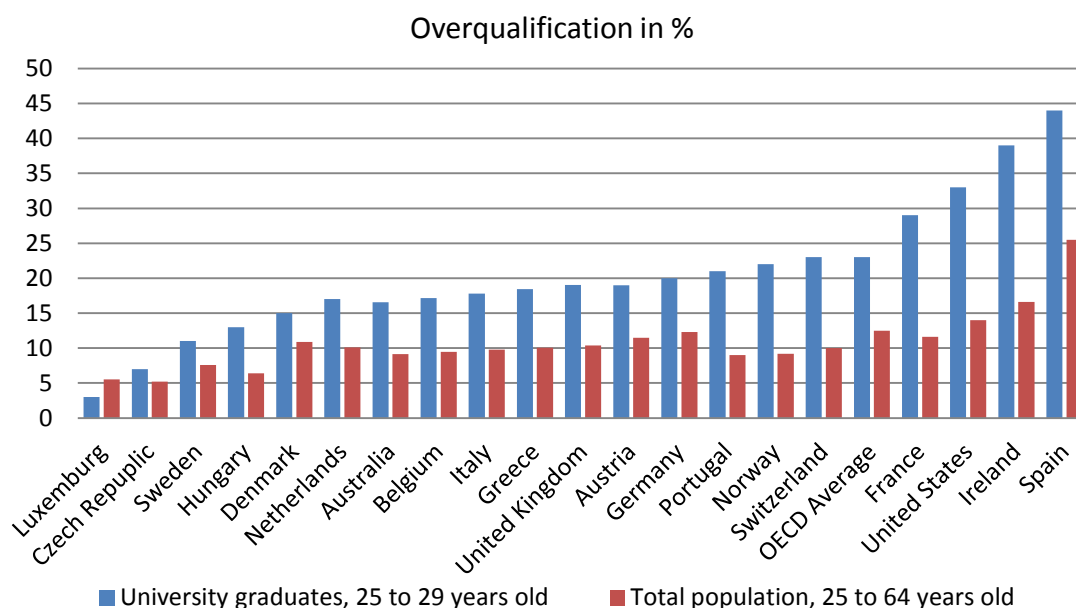


Source: OECD, 2012.

Besides unemployment rates, the matching process in the labor market can be assessed in terms of the matching between qualifications of workers and required qualifications for their jobs. There are huge differences across OECD member countries

in the extent to which the level of education obtained by workers exceeds the level of education which is required for their respective jobs. In fact, Spain has the highest proportion of overqualified workers among all OECD countries (OECD, 2007)<sup>2</sup>. Estimates show that 26% of the Spanish labor force is overqualified for their job, which is more than twice the average proportion of workers in overqualification for all OECD countries (12.5%). Again, the proportion of overqualification<sup>3</sup> is even higher for young people in Spain. The OECD (2010) estimates that 44% of Spanish university graduates of age 25 to 29 are overqualified while the OECD average is 23%. This phenomenon must be understood in the context of a rapid increase in the participation rate in higher education in Spain during the last 30 years. The Spanish labor market could not keep up with this trend and failed to offer a sufficient amount of high skilled jobs to recent generations of graduates.

Figure 2: Overqualification in OECD countries



Source: OECD International Migration Report 2007, OECD Education at a Glance 2010

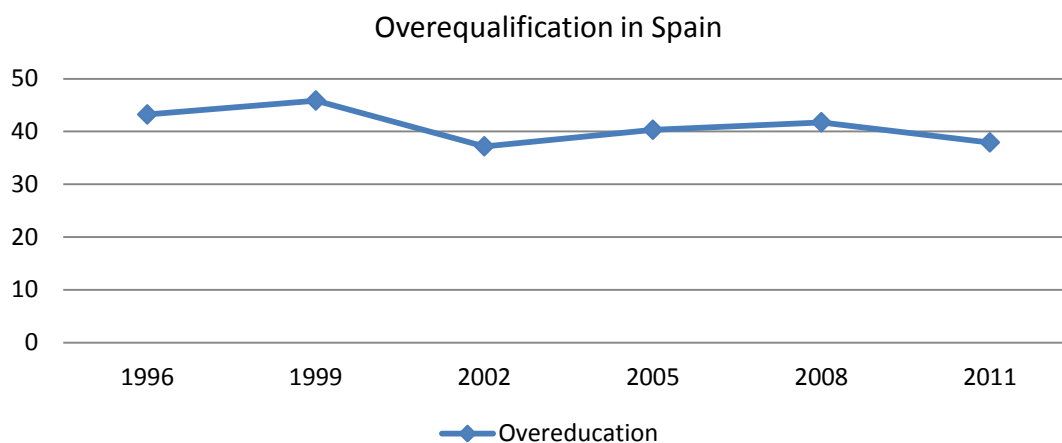
The phenomenon of high rates of overqualification among young Spanish workers has been documented for many years. The Spanish School-to-Work Transition

<sup>2</sup> Notice that the operational measure of overqualification used by the OECD is not directly comparable with the measure we use in this paper.

<sup>3</sup> Although most of the literature uses the term overeducation, we prefer the word overqualification to describe the mismatch between the acquired level of education, and/or skills, and the required level by the actual occupation of the worker.

Observatory (SWTO)<sup>4</sup> has been collecting data on the transition of young people from education to the Spanish labor market every three years since 1996. Figure 3 shows the evolution of overqualification across different waves of the survey<sup>5</sup>. High rates of overqualification persist throughout all realizations of the survey which covers the period 1996-2011. The Spanish phenomenon of persistently high levels of overqualification is incompatible with human capital theory. Human capital theory states that productivity, and thus also wages, increase in a worker's level of education. If the supply of highly educated workers increases, as was the case in Spain in the last thirty years, the wage premium of high skilled jobs decreases. In anticipation of lower returns to education, people will invest less in education. In the long run, any excess supply of highly educated entrants to the labor market will be reduced and the proportion of overqualified workers decreases. The fact that the extent of overqualification in Spain was not reduced in the last 20 years seems to suggest that human capital theory fails to account for the Spanish phenomenon of permanent overqualification at the aggregate level.

Figure 3: Overqualification in Spain across survey waves (before 2014)



Source: STW Observatory

Alternative theories postulate that mismatches between obtained and required education levels arise due to imperfections of the matching process in the labor market

<sup>4</sup> This is a statistical operation that takes place every three years. The survey is based on a questionnaire developed by a team of economists, psychologist and labor market experts. It is supported financially by the Bancaja Foundation.

<sup>5</sup> The survey contains two different measures of overqualification. Figure 3 is based on the measure of objective overqualification which is calculated as the difference between obtained and required years of education.

and due to the existence of internal markets. Signaling theory assumes that employers cannot perfectly observe the ability of potential new workers. Hence, workers have an incentive to acquire higher degrees of education than necessary for the job in order to signal their abilities and motivation. After the employment started, the information asymmetries between employer and worker are reduced and highly qualified workers are promoted to positions more adequate for their level of education (Sicherman and Galor, 1990). Johnson (1978) and Jovanovic (1979) argue that workers temporarily accept jobs below their qualification due to labor market frictions. These theories of imperfect labor markets imply that overqualification is a permanent phenomenon on the aggregate level, but individual workers are expected to move out of overqualification quickly.

Only a few empirical studies have analyzed the persistency or mobility of the status of overqualified workers so far. Dorn and Sousa-Poza (2005) analyze a household panel data set from Switzerland for the years 1999 to 2003 by means of transition matrices and logit regressions of the probability to move from over- to adequate job qualification. The authors conclude that subjective overqualification is a transitory phenomenon since 50% of individuals overqualified in a given year find an adequate job in the following year. More recently, Frei and Sousa-Poza (2012) exploit eight waves of the Swiss Household Panel between 1999 and 2006 to analyze whether overqualification is a transitory or permanent phenomenon. In light of finding relatively short spells of overqualification, the authors cast doubt on whether overqualification is an important determinant for permanent job mismatches. Blázquez and Budría (2012) only find a moderate effect of individual state dependence when analyzing overeducation transitions for Germany using the 2000-2008 waves from the German Socioeconomic panel. They attribute about 18% of the current overeducation risk to the individuals' fate of being overeducated in the previous year.

Based on the Personal Study of Dynamic Incomes survey in the United States Robst (1995) shows, however, that 60% of workers who were overqualified in 1976 remain overqualified in 1985. Similarly, Rubb (2003) analyzes data from Current Population Surveys for the years 1992 and 1999 and finds that 75% of workers overqualified in a given year remain overqualified in the next year. Dolton and Vignoles (2000) study the phenomenon of overqualification for graduates in the UK labor market using the 1980 National Survey of Graduates and Diplomats. Their results show that 38% of graduates

were overqualified in their first job, while 30% were still overqualified six years later. Closely related, Mavromaras and McGuinness (2012) investigate the persistence of overskilling by exploiting the Australian Household Income and Labour Dynamics survey dataset. Applying a random effects probit estimation technique, they find that overskilling is a persistent phenomenon, which is more pronounced among higher degree graduates than among vocationally qualified workers.<sup>6</sup> Carroll and Tani (2013) analyze also the Australian case and conclude that although overeducation is less common three years after completing the higher education, a nontrivial proportion of graduates remain overeducated for long periods of time.

Alba-Ramirez (1993) is the first study on overqualification in the Spanish case. He uses a cross-section household data set from 1985 in order to estimate a multinomial logit model of the determinants of overqualification. Alba-Ramirez (1993) concludes that overqualified workers tend to be younger, more educated and less experienced interpreting his results as evidence for the mobility and temporary nature of the status of overqualification. Blázquez Cuesta (2005) uses the Labour Force Survey to investigate the transition from school to work for young Spanish workers. She finds a negative association between employment duration and overeducation for the first significant job. Exploiting the same dataset, Fernández and Ortega (2008) analyze the persistence of overeducation of immigrants in Spain relative to natives. The authors find that immigrants' incidence of overeducation is not only relatively high at their arrival, but does not decline 5 years afterwards.

In this paper we study the question of whether overqualification is a permanent or transitory state using young Spanish workers entering the labor market. We use a unique data set constructed from a household survey, the Spanish School-to-Work Transition Observatory (SWTO), which covers six waves of the survey (1996, 1999, 2002, 2005, 2008 and 2011) capturing some trends, like the increasing participation rates in tertiary education in Spain, and two economic cycles<sup>7</sup>. The survey includes retrospective questions that cover the whole labor history since the first contact with the labor market of young people aged 16-30<sup>8</sup>. In particular, it includes two questions to

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<sup>6</sup> Recent surveys on overeducation include McGuinness (2006) and Leuven and Oosterbeek (2011).

<sup>7</sup> Montalvo and Peiro (2012) analyze the evolution of overqualification over the business cycle and the changing role of its main determinants.

<sup>8</sup> Since it is partly a rotating panel, the age of the some respondents can go over 30 in waves after the first one.

measure overqualification for each job since the first access to the labor market. We cover a long period of time, and try to overcome some limitations of previous empirical studies presenting a formal duration model for the time until finding a job adequate for their qualification. Since overqualification can be measured in different ways, we use two alternative indicators to run the duration model and confirm the consistency of the results. We go beyond a merely descriptive analysis of overqualification in terms of transition matrices and we present a formal duration analysis of individual spells of overqualification. As previously mentioned, the survey does not only contain information on individuals' current employment but it covers the whole history of employments since entry into the labor market. This chronological history of employments allows us to conduct more insightful tests of the predictions of dynamic theories of young worker's transition into the labor market such as theories based on internal markets and market imperfections.

In contrast to some previous empirical studies, we find that Spanish overqualification is a mostly a persistent phenomenon at the individual level, at least during the period of study. Our estimate of the median duration of objective overqualification for young Spanish workers who entered the labor market as overqualified is approximately 6 years while the mean duration is approximately 10 years<sup>9</sup>. More importantly, the hazard rate of exiting the state of subjective and objective overqualification is decreasing over time; the longer a worker is overqualified, the less likely she is to change to an adequate job in the future. Finally, the number of previous positions is shown to be unrelated with the probability of finding an adequate job. These results suggest that existing theories of imperfect labor markets and internal markets are not able to account for the phenomenon of persistent Spanish overqualification.

The rest of the paper proceeds as follows. Section two describes the data and explains the structure of the underlying survey. Section three presents a descriptive analysis of individual spells of overqualification across employments based on transition matrices. Section four conducts a duration analysis of individual durations of overqualification. Section five provides some concluding remarks.

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<sup>9</sup> These estimates refer to the time it takes overqualified entrants to the Spanish labor market to find an adequate job. Due to missing data, time spent searching for their first job is excluded. However, periods of unemployment between subsequent jobs are included in the estimation.

## 2. DATA

The data set is the Spanish School-to-Work Transition Observatory<sup>10</sup>. The survey is targeted at new entrants to the Spanish labor market aged between 16 and 30 years. The unique feature of the survey is that it does not only contain information on the current employment of an individual at the point of time when the survey is conducted, but it covers the whole history of employments since entry into the labor market, including questions to measure the adequacy of the job to the education level for each job. The data set consists of six survey waves of data collection conducted every three years from 1996 to 2011. In total, the data set comprises 7,868 individuals and 16,676 employments/positions.

Table 1: Sample size across survey data collection waves

Survey Year	Number of subjects	Number of Employments	Mean of Employments per Subject
1996	638	1269	1.99
1999	1060	1965	1.85
2002	1276	2448	1.92
2005	1215	2360	1.94
2008	2521	5499	2.18
2011	1522	3135	2.06
<b>Total</b>	7868*	16676	2.12

\* The sum of subjects across surveys is not equal to the total number of subjects because the survey was conducted as a panel during many years.

Source: Spanish SWT Observatory

Table 2 presents an overview of demographic characteristics of the survey sample. There are slightly more women than men (54% vs 46%) in the survey sample. As the survey is targeted exclusively at young entrants to the labor market, the majority of subjects surveyed are between 20 and 30 years old. Spanish degrees of education are classified under three main categories: compulsory education, non-compulsory secondary education and tertiary education<sup>11</sup>.

<sup>10</sup> For a detailed exposition of the sampling strategy and the questionnaire see Montalvo et al. (1997).

<sup>11</sup> For the definition of overqualification we use a detailed list of levels of education.



Table 2: Demographic Characteristics (pooled over time)

	Frequency	Percentages
<b>Gender</b>		
Male	7662	46%
Female	9014	54%
<b>Age Groups</b>		
16 - 19	2758	17%
20 - 24	7973	48%
25 - 29	5133	31%
> 29*	812	4%
<b>Education</b>		
Only compulsory	4856	29%
Non-compulsory secondary	7947	48%
Tertiary	3811	23%

Source: Spanish SWT Observatory

\*Due to the panel structure of surveys, some individuals are older than the initial target group of below 30 year olds when they are surveyed in subsequent surveys.

This study uses two measures of overqualification<sup>12</sup>. First, we use the workers' self-assessment to obtain an indicator that we call subjective overqualification. Second, we calculate the difference between the level of education of the individual and the level of education required by the job description provided by the worker. We call this indicator objective overqualification<sup>13</sup>. An individual is considered to be objectively overqualified if the difference between the years of her education and the years of education required to get an appropriate qualification for the job are more than 2, and she is infraqualified if that difference is smaller than -2. The individual is assumed to be adequately qualified for the job if the difference between required and obtained years of education is less than two years<sup>14</sup>.

<sup>12</sup> The use of these two alternative indicators of overqualification allows the analysis of the robustness of the results to different measures. For a discussion on alternative measures of overqualification see Chevalier (2003). For the effect of different measures on the determinants of overeducation see Verhaest and Omey (2010).

<sup>13</sup> This terminology is only used to simplify the reference to each indicator of overqualification in the rest of the paper.

<sup>14</sup> The results are qualitatively robust if we change the difference of year to 3 (-3) or to 1 (-1).

Table 3: Overqualification across data collection waves

<b>Subjective Measure</b>				
<b>Survey Year</b>	<b>Overqualified</b>	<b>Adequately qualified</b>	<b>Underqualified</b>	
<b>1996</b>	34.2	63.36		2.44
<b>1999</b>	35.15	63.05		1.8
<b>2002</b>	35.39	62.35		2.26
<b>2005</b>	38.41	59.53		2.07
<b>2008</b>	32.69	63.97		3.34
<b>2011</b>	28.27	68.17		3.55
<b>Total</b>	33.46	63.75		2.79

<b>Objective Measure</b>				
<b>Survey Year</b>	<b>Overqualified</b>	<b>Adequately qualified</b>	<b>Underqualified</b>	
<b>1996</b>	43.22	52.97		3.81
<b>1999</b>	45.86	50.36		3.78
<b>2002</b>	37.19	56.38		6.43
<b>2005</b>	40.32	54.25		5.43
<b>2008</b>	41.75	53.89		4.36
<b>2011</b>	37.93	59.14		2.92
<b>Total</b>	40.71	54.88		4.41

Source: Spanish SWT Observatory

The proportion of overqualified workers is higher for the objective measure than for the subjective measure throughout all survey years. According to Sicherman (1991) and Groot (1993), young workers could accept entry-level jobs below their level of education in order to gain experience. Furthermore, overqualified workers tend to have less work experience. This suggests that there may be differences between our measures of subjective and objective overqualification. In so far as the subjective measure of overqualification not only refers to a mismatch between obtained and required education, but also considers individual's experience, the proportion of subjectively overqualified workers is expected to be lower than the proportion of objectively overqualified workers. This follows from the negative correlations between work experience and the level of education for young workers.

Furthermore, the shares of both subjective and objective overqualification range between 28% and 45% at persistently high levels. This persistency of overqualification at the aggregate level is inconsistent with human capital theory. It is also noteworthy that the proportion of overqualified workers does not show cyclical behavior. In contrast to unemployment, the share of overqualified workers does not vary with the business cycle.

### 3. AN ANALYSIS BASED ON TRANSITION MATRICES

This section presents a brief description of the main characteristics of the sample and an analysis of transition matrices between states (overqualification, adequately qualified and infraqualification) conditional to characteristics of individuals and jobs. Table 4 displays sample proportions of subjectively and objectively overqualified workers conditional on demographic characteristics. While women show a higher share of subjective overqualification than men, the share of objective overqualification is slightly lower for women. A much clearer picture arises for different levels of education. Both, subjective and objective overqualification, increase in the level of education. The share of overqualified workers is twice as high among university graduates as among workers with only compulsory education (41.1% and 19.4%). The share of subjective overqualified workers is almost constant over different age groups while objective overqualification decreases in age. These statistics are in line with Alba-Ramírez (1993) who finds that the likelihood of being overqualified is higher for younger and more educated workers.

Table 4: Overqualification by Demographic Characteristics

	Subjective Overqualification in %	Objective Overqualification in %
<b>Gender:</b>		
Male	31	41.5
Female	35.6	40.1
<b>Education:</b>		
Compulsory Education	19.4	27.9
Upper Secondary Education	38.5	41.9
Tertiary Education	41.1	54.3
<b>Age Group:</b>		
16 – 19	33.8	44.1
20 – 24	34.3	40.4
25 – 29	30	35.1
> 29	33.9	34.8

Source: Spanish SWT Observatory

Table 5 shows overqualification figures for different employment-specific characteristics. Remarkably, the proportion of subjectively and objectively overqualified workers is roughly constant over the number of employment. A worker in his fifth job is not significantly less likely to be overqualified than a worker who just entered the labor market and started his first job. This is preliminary evidence for the hypothesis of this

study that overqualification is a permanent phenomenon at the individual level in Spain. Furthermore, the share of overqualified workers is higher for workers with temporary contracts or without contracts than for workers with permanent contracts. This can be explained by the fact that jobs with temporary contracts and without contracts tend to be low-skilled jobs which workers accept as intermediate jobs before they find a job adequate for their qualification.

Table 5: Overqualification by Employment-Specific Characteristics

	Subjective Overqualification in %	Objective Overqualification in %
<b>Number of Employment:</b>		
First	34,4	41,7
Second	33,4	41,0
Third	31,9	38,4
Fourth	33,2	40,7
Fifth	30,8	38,5
<b>Type of Contract:</b>		
Temporary Contract	35,4	41,7
Permanent Contract	23,4	31,0
Without Contract	42,9	52,1

Source: Spanish SWT Observatory

So far, we looked at how many workers were overqualified at a certain point in time conditional on demographic and employment-specific characteristics. In order to investigate if overqualification is a permanent or transitory status, it is more informative to consider transition matrices. Transition matrices capture the probabilities of transition from a given state in job  $t$  to any state in job  $t+1$  conditional on being in a given state in job  $t$  and conditional on a job change. Table 6 displays transition matrices for the whole survey sample for subjective and objective overqualification. Two out of three workers who are subjectively overqualified in their current job remain overqualified in their next job. This persistency is even more pronounced for the objective measure of overqualification. Only one out of five overqualified workers manages to find an adequate job in the next job match. Almost 90% of workers adequately qualified for their current job remain adequately qualified after they changed to another job. This shows that there is considerable persistency in the status of the job match across jobs

and there is little upward mobility for young workers who enter the labor market as overqualified workers<sup>15</sup>.

Table 6: Transition Matrices, total

		Current Job			Observations
		Adequately qualified	Underqualified	Overqualified	
Subjective Measure	Previous Job				
		Adequately qualified	86,97	1,67	11,37
	Underqualified	39,29	48,66	12,05	224
	Overqualified	29,62	1,95	68,43	3174
Objective Measure	Previous Job				
	Adequately qualified	88,9	2,3	8,8	3930
	Underqualified	20,6	73,0	6,4	281
	Overqualified	21,8	1,8	76,3	3638

Source: Spanish SWT Observatory

Table 7 shows transition matrices conditional on demographic characteristics. There is no clear gender pattern. While overqualified women are slightly less likely than men to find an adequate job in their next job match, the reverse is true for women and men in objective overqualification. There is also no obvious relation between transition probabilities and different levels of education. For the subjective measure of overqualification, the probability of transition from a job in overqualification to an adequate job is approximately eight percentage points lower for workers with only compulsory education than for workers with non-compulsory secondary education or university education. However, this pattern is reversed for objective overqualification. Workers with only compulsory education are six percentage points more likely to change from a job in overqualification to an adequate job than workers with higher degrees of education. For both indicators of the job match, there are no significant differences in the transition probabilities between workers with non-compulsory secondary education and university education. What is more, the probability of moving out of overqualification decreases in age groups. For both subjective and objective overqualification and overqualification, the probability of transition to an adequate job

<sup>15</sup> Caroll and Tani (2013) present also transition matrices for the three states but they take two jobs separated by 3 years (2007 versus 2010). We consider all the jobs meaning that a worker who held six jobs during the period of study counts as five transitions.

is approximately 15 percentage points higher for the workers aged below 20 than for the age group of 25 to 29 year olds<sup>16</sup>.

Table 8 displays transition matrices conditional on employment-specific characteristics. Workers who are overqualified in their current job with a permanent contract are almost 10 percentage points more likely to change to an adequate job in their next job change than overqualified workers with temporary contracts<sup>17</sup>. More importantly, the probability of transition out of overqualification is constant over the sequence of employments. A worker who is, for instance, currently overqualified in his third job is not more likely to change to an adequate job in his next job change than a worker who is currently overqualified in his first job. This result is robust to the specification of the overqualification measure. Even though there is a difference in the levels of transition probabilities between the subjective and objective measure of overqualification, the probabilities of transition to an adequate job remain constant over the sequence of employments for both measures. Again, this result is at odds with common theories of young workers' integration into the labor market. In Spain, the prediction that young workers move out of overqualification as they gain work experience and reveal their abilities to the employer is rejected by the data.

Table 7: Transition Matrices by Demographic Characteristics, Subjective Measure

		subjective (objective) measure			# Observations
		Current Job			
subj. (obj.) measure Previous Job		Adequately qualified	Underqualified	Overqualified	
<b>Gender:</b>					
Male	Adequately qualified	87,8 (89,0)	1,8 (2,5)	10,3 (8,5)	2387 (1730)
	Underqualified	40,7 (21,7)	48,9 (72,4)	10,4 (5,9)	135 (152)
	Overqualified	30,7 (20,8)	2,5 (2,0)	66,9 (77,2)	1379 (1732)
Female	Adequately qualified	86,2 (88,9)	1,5 (2,1)	12,3 (9,0)	2716 (2200)
	Underqualified	37,1 (19,4)	48,3 (73,6)	14,6 (7,0)	89 (129)
	Overqualified	28,8 (22,7)	1,6 (1,7)	69,6 (75,6)	1794 (1906)
<b>Education:</b>					
Compulsory Education	Adequately qualified	92,0 (93,8)	1,6 (2,9)	6,4 (3,3)	1861 (1433)

<sup>16</sup> Caroll and Tani (2013) also find that the probability of transition from overeducation to a not overeducated job is much higher in young males (25 or under) than in older males, although this effect is not observed in young females.

<sup>17</sup> Blázquez Cuesta and Mora (2010) also find that workers with a higher proportion of permanent contracts in the past had a lower probability of overeducation in the current job.

	Underqualified	40,3 (19,0)	49,4 (76,7)	10,4 (4,30)	77 (163)
	Overqualified	34,3 (14,8)	3,2 (2,5)	62,6 (82,7)	537 (684)
Non-Compulsory Secondary Education					
	Adequately qualified	85,0 (87,5)	1,9 (2,5)	13,1 (9,9)	2189 (1813)
	Underqualified	32,7 (20,9)	53,3 (70)	14,0 (9,1)	107 (110)
	Overqualified	27,8 (22,9)	1,8 (2,8)	70,4 (74,3)	1693 (1746)
Tertiary Education					
	Adequately qualified	82,6 (83,3)	1,4 (0,2)	16,0 (16,6)	1001 (663)
	Underqualified	55 (0)	35,0 (100)	10 (0)	40 (3)
	Overqualified	29,4 (23,8)	1,3 (0,1)	69,3 (76,1)	906 (1180)
Age Groups:					
< 20	Adequately qualified	89,3 (90,8)	1,9 (2,1)	8,8 (7,1)	1533(1114)
	Underqualified	33,8 (26,5)	47,3 (65,3)	18,9 (8,2)	74 (98)
	Overqualified	22,9 (14,0)	1,5 (1,8)	75,6 (82,9)	881 (1094)
20 - 24	Adequately qualified	86,3 (88,2)	1,7 (2,6)	12,0 (9,2)	2261 (1751)
	Underqualified	39,8 (15)	50 (78,7)	10,2 (6,3)	98 (127)
	Overqualified	29,9 (23,0)	2,1 (2,0)	68,0 (75,0)	1540 (1719)
25 - 29	Adequately qualified	85,6 (89,3)	1,4 (1,3)	13,1 (9,4)	950 (776)
	Underqualified	39,5 (14,7)	57,9 (82,4)	2,6 (2,9)	38 (34)
	Overqualified	36,8 (30,4)	2,9 (1,2)	60,3 (68,5)	519 (603)
> 29	Adequately qualified	84,7 (84,8)	1,2 (4,2)	14,2 (11,1)	339 (289)
	Underqualified	64,3 (36,4)	21,4 (59,1)	14,3 (4,6)	14 (22)
	Overqualified	36,9 (28,4)	0,9 (2,7)	62,2 (68,9)	233 (222)

Source: Spanish SWT Observatory

Table 8: Transition Matrices by employment-specific characteristics, subjective and objective measure

		subjective (objective) measure			
		Current Job			# Observations
		Adequately qualified	Underqualified	Overqualified	
		subj. (obj.)			
		Previous Job			
<b>Employment:</b>					
From 1 to 2	Adequately qualified	86,2 (88,8)	1,8 (2,2)	12 (8,9)	2536 (1960)
	Underqualified	44,9 (23,8)	44,9 (67,5)	10,2 (8,7)	98 (126)
	<b>Overqualified</b>	<b>29,3 (20,9)</b>	<b>1,6 (1,9)</b>	<b>69,1 (77,2)</b>	<b>1605 (1849)</b>
From 2 to 3	Adequately qualified	87,8 (89,83)	1,6 (2,6)	10,7 (7,6)	1398 (1091)
	Underqualified	38,6 (20,7)	48,6 (76,8)	12,9 (2,4)	70 (82)
	<b>Overqualified</b>	<b>30,3 (22,1)</b>	<b>1,7 (2,1)</b>	<b>67,9 (75,8)</b>	<b>867 (997)</b>
From 3 to 4:	Adequately qualified	86,9 (88,6)	1,6 (2,4)	11,5 (9,0)	670 (510)

	Underqualified	28,6 (13,3)	64,3 (80)	7,1 (6,7)	28 (45)
	<b>Overqualified</b>	<b>25,3 (19,7)</b>	<b>3,4 (1,9)</b>	<b>71,3 (78,4)</b>	<b>442 (473)</b>
From 4 to 5:	Adequately qualified	89,2 (87,7)	1,2 (1,9)	9,6 (11,1)	334 (253)
	Underqualified	22,7 (21,7)	54,5 (78,3)	22,7 (0)	22 (23)
	<b>Overqualified</b>	<b>29,2 (25,7)</b>	<b>2,5 (0,4)</b>	<b>68,3 (73,9)</b>	<b>202 (230)</b>
<b>Type of Contract:</b>					
Temporary Contract	Adequately qualified	87,0 (89,2)	1,6 (2,1)	11,4 (8,7)	3594 (2855)
	Underqualified	40,3 (21,3)	48,1 (72,9)	11,7 (5,9)	154 (188)
	<b>Overqualified</b>	<b>29,4 (21,7)</b>	<b>2,1 (1,8)</b>	<b>68,6 (76,4)</b>	<b>2237 (2512)</b>
Permanent Contract	Adequately qualified	87,2 (90,2)	1,7 (3,0)	11,1 (6,7)	666 (492)
	Underqualified	37,0 (10,3)	51,9 (84,6)	11,1 (5,1)	27 (39)
	<b>Overqualified</b>	<b>39,2 (26,6)</b>	<b>1,7 (0)</b>	<b>59,1 (73,4)</b>	<b>286 (364)</b>
Without Contract	Adequately qualified	87,5 (86,8)	1,7 (2,9)	10,9 (10,2)	725 (509)
	Underqualified	36,1 (28,3)	50 (63)	13,9 (8,7)	36 (46)
	<b>Overqualified</b>	<b>25,6 (19,7)</b>	<b>1,7 (3,1)</b>	<b>72,7 (77,3)</b>	<b>601 (687)</b>

Source: Spanish SWT Observatory

#### 4. DURATION ANALYSIS

This section presents a duration analysis of individual spells of overqualification. This duration analysis allows us to address more directly the question of the temporary or permanent character of individual overqualification in Spain. Transition matrices show the probability of moving out of overqualification conditional on a job change. A duration model, in contrast, estimates how demographic and employment specific variables affect the probability of exiting overqualification at any point in time. The estimated baseline hazard indicates how the probability of exiting varies with time. This is precisely the question we try to address in this paper. It is to be tested if the theoretical prediction of positive duration dependence is supported by the data.

Table 9 summarizes the survival data set. In total, the data set comprises 4,224 employments in subjective overqualification from 2,484 individuals. This data set is much smaller than the original survey data set because we do only consider individuals who were overqualified in their first job. Furthermore, this data set contains only consecutive employments in overqualification. If, for instance, an individual is



overqualified in her first job, then adequately qualified for her second job and then overqualified for her third job, the sequence of employments is cut after the first job and only the first job is included in the survival data set. We intend to model the duration until an individual who enters the labor market as overqualified moves out of overqualification. A completed spell is thus defined as a sequence of consecutive employments in overqualification which ends with a job for which the individual is adequately qualified or underqualified<sup>18</sup>.

Spells are censored if the individual is still overqualified in her last job reported in the survey. If an individual is unemployed between two employments, the time of unemployment is excluded from the total spell of overqualification.

Table 9: Summary of Survival Data

	Subjective Overqualification	Objective Overqualification
Individuals:	2484	2859
Employments in Overqualification:	4224	5312
Completed Spells	839	773
Average of Employments in Overqualification per individual:	1,7	1,86
Mean Time in Overqualification:	446	506
Median Time in Overqualification	258	333

Source: Spanish SWT Observatory

For preliminary analysis, we apply a non-parametric Kaplan-Meier estimation to our data. Figure 4 shows the survival functions and cumulative hazard functions for both the subjective and objective measure of overqualification. The graphs display a slightly concave curvature which indicates negative duration dependence. In contrast to

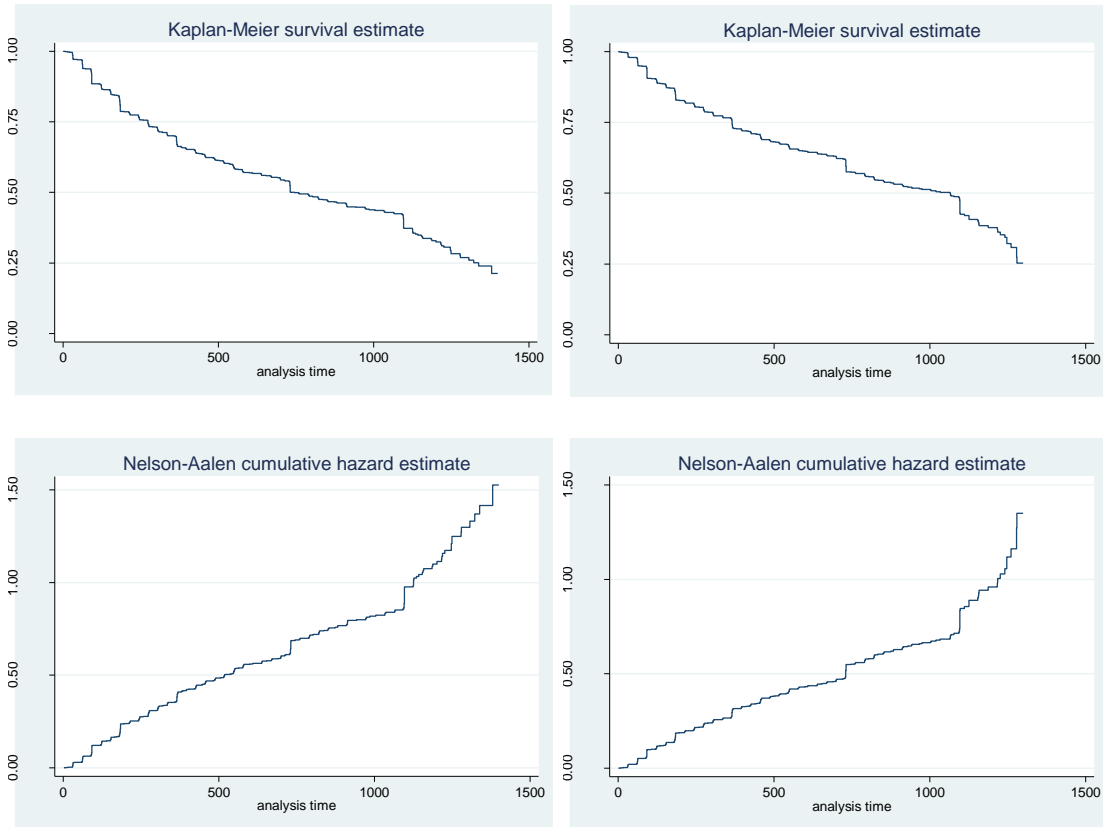
<sup>18</sup> Spells of unemployment between jobs are ignored in the estimation of our duration model which means that spells of unemployment are deleted from the data set and the total spell of any individual collapses into spells of overqualified employment. If, for instance, an individual is overqualified in his first job from January 1<sup>st</sup> to June 30<sup>th</sup>, is then unemployed from July 1<sup>st</sup> to July 31<sup>st</sup> and finds another job in overqualification starting August 1<sup>st</sup> and ending December 31<sup>st</sup> after which he finds immediately a job adequate for her level of qualification, the total duration of overqualification is nine months. Furthermore, it is taken into account that individual- and employment-specific characteristics may change between the first and second month (job) in overqualification.

theory, the probability to exit the state of interest, overqualification, decreases as its duration increases.

**Figure 4. Kaplan-Meier survival estimates**

Subjective Overqualification (days)

Objective Overqualification (days)



Besides graphical intuition, further evidence for negative duration dependence is delivered by the estimation of a basic Weibull duration model. We estimate a Weibull duration model without explanatory variables for both overqualification and overqualification. The estimate of exponent  $\alpha$  in the Weibull hazard function which is given by:

$$(1) \lambda(t) = \gamma\alpha t^{\alpha-1}$$

is below 1 for both specifications. This implies negative duration dependence. For subjective overqualification, the estimate of  $\alpha$  is 0.90 with a 95% confidence interval between 0.865 and 0.939. Similarly, the estimate for objective overqualification is 0.86 with a confidence interval ranging from 0.828 to 0.903. Even though this estimation rests on the assumption that the data are approximately distributed as a Weibull

distribution, these results can be interpreted as further preliminary evidence for the hypothesis that the probability of exiting overqualification does not increase over time, but decreases instead.

#### **4.1. Cox Proportional Hazard Model**

We estimate a Cox Proportional Hazard model in order to measure the effects of personal and employment specific characteristics on the probability of exiting overqualification. The Cox model assumes that explanatory variables affect the probability of exiting the state of interest by multiplying the baseline hazard by a scaling factor and thus shift the baseline hazard along the vertical axis.

In our first specification, we only include demographic characteristics as explanatory variables. Tables 10 and 11 show the duration model results for both subjective and objective overqualification. In line with the descriptive analysis above, women are estimated to have a lower probability of moving out of subjective overqualification at any point in time. In particular, the probability of finding an adequate job is 15 percentage points lower for women at any point in time. This gender effect, however, does not apply for the probability of moving out of objective overqualification. For both subjective and objective overqualification, the probability of finding an adequate job is decreasing in age. However, there is no significant difference in hazard rates between the base group of below 20 year olds and the age group of workers between 20 and 24 years. Workers above the age of 24 are estimated to have a 31% (27%) lower probability of exiting overqualification than the base group. This effect is statistically significant at 1% significance level for subjective overqualification and at 5% significance level for objective overqualification. For objective overqualification, a statistically and economically significant increase of the probability of exiting overqualification can be observed for workers with non-compulsory secondary education (66 percentage points) and tertiary education (93 percentage points) compared to the base group of workers with only compulsory levels of education.

Specifications (2) to (4) include only employment-specific explanatory variables. In particular, dummy variables for the number of employment and the type of

contract are included. The results for specification (2) indicate that there is no significant effect of the number of employment on the probability of moving out of subjective or objective overqualification if dummies for the type of contract are included in the specification. This result is robust to the specification of the dummy variables for the number of employment. The results for specification (3) reveal that there is no significant difference in the probability of exiting overqualification between jobs one to three and jobs four to eight. Only if dummies for the type of contract are excluded from the regression, the probability of finding an adequate job is increasing in the number of employment. This effect is statistically significant only for objective overqualification.

Specification (5) is our main specification and includes both demographic control variables and employment-specific explanatory variables. The effects of the demographic explanatory variables do not change qualitatively compared to specification (1) and remain statistically significant. However, the positive effect of the number of employment on the probability of exiting overqualification vanishes. For both subjective and objective overqualification, none of the coefficient for the number of job is significantly different from one. Further, the dummies for the number of jobs since the transition to the labor market are jointly insignificant for both subjective and objective overqualification (P-Values 0.869 and 0.123 respectively). These results suggest that the effect of the number of job on the probability of exiting overqualification identified by specification (4) arises due to the omission of relevant explanatory variables. In conclusion, there is no relation between the number of job and the probability of moving out of overqualification. This must be interpreted as strong evidence in favor of the hypothesis that overqualification is a permanent phenomenon at the individual level.

Irrespective of the specification of the duration model, workers with a permanent contract are 70% less likely to move out of overqualification or overqualification than the base group of workers with temporary contracts. This result is in line with our expectations since having a permanent contract makes a job change less likely. In fact, the median sample duration of permanent jobs in overqualification is 456 days, while it is only 92 days for jobs with temporary contracts. Workers without contracts are estimated to have an approximately 30% lower probability of exiting overqualification and overqualification at any point in time.

**Table 10: Cox Proportional Hazard Estimation Results SUBJECTIVE OVERQUALIFICATION**

	(1) Personal Characteristics	(2) Employment Specific Characteristics 1	(3) Employment Specific Characteristics 2	(4) Employment Specific Characteristics 3	(5) Personal + Employment Specific
<b>Gender:</b>					
Female	0.85 (0.021)	-	-	-	0.84 (0.013)
<b>Age:</b>					
(Base group: < 20)					
20 to 24	0.91 (0.247)	-	-	-	0.96 (0.570)
>24	0.69 (0.003)	-	-	-	0.75 (0.022)
<b>Education:</b>					
(Base Group: compulsory education)					
Non-Compulsory					
Secondary Educ.	0.77 (0.005)	-	-	-	0.80 (0.015)
Tertiary Education	0.91 (0.462)	-	-	-	0.92 (0.365)
<b>Number of Employment:</b>					
(Base Group Job 1)					
Job 2	-	1.09 (0.247)	-	1.21 (0.027)	1.09 (0.330)
Job 3	-	1.08 (0.560)	-	1.23 (0.117)	1.08 (0.518)
Job 4	-	1.06 (0.775)	-	1.21 (0.340)	1.06 (0.746)
Job 5 / 6 / 7 / 8	-	1.10 (0.729)	-	1.46 (0.154)	1.11 (0.652)
Job 4 / 5 / 6 / 7 / 8	-	-	1.03 (0.842)	-	-
<b>Type of Contract:</b>					
(Base Group Temp. Contract)					
Permanent Contract	-	0.35 (0.000)	0.35 (0.000)	-	0.36 (0.000)
Without Contract	-	0.68(0.000)	0.68 (0.000)	-	0.68 (0.000)

P-Values in Brackets.

Source: Spanish SWT Observatory

**Table 11: Cox Proportional Hazard Estimation Results - OBJECTIVE OVERQUALIFICATION**

	(1) Personal Characteristics	(2) Employment Specific Characteristics 1	(3) Employment Specific Characteristics 2	(4) Employment Specific Characteristics 3	(5) Personal + Employment Specific
<b>Gender:</b>					
Female	1.04 (0.593)	-	-	-	0.99 (0.935)
<b>Age:</b>					
(Base Group: <20)					
20 to 24	0.93 (0.369)	-	-	-	0.95 (0.519)
> 24	0.73 (0.012)	-	-	-	0.78 (0.055)
<b>Education:</b>					
(Base Group: Compulsory Educ)					
Non-Compulsory					
Secondary Education	1.66 (0.000)	-	-	-	1.62 (0.000)
Tertiary Education	1.93 (0.000)	-	-	-	1.80 (0.000)
<b>Number of Employment:</b>					
(Base Group: Job 1)					
Job 2	-	1.18 (0.063)	-	1.32 (0.002)	1.17 (0.080)
Job 3	-	1.08 (0.566)	-	1.26 (0.082)	1.08 (0.080)
Job 4	-	1.41 (0.049)	-	1.82 (0.000)	1.43 (0.040)
Job 5 / 6 / 7 / 8	-	1.43 (0.154)	-	1.99 (0.006)	1.40 (0.177)
Job 4 / 5 / 6 / 7 / 8	-	-	1.32 (0.058)	-	-
<b>Type of Contract:</b>					
(Base Group: Temp. Contract)					
Permanent Contract	-	0.29 (0.000)	0.29 (0.000)	-	0.30 (0.000)
Without Contract	-	0.71 (0.000)	0.70 (0.000)	-	0.74 (0.002)

P-Values in Brackets.

Source: Spanish SWT Observatory

#### 4.2. Robustness Check: running a Weibull Model

In order to illustrate the robustness of the results of the Cox proportional hazard model, this section presents the results of a parametric Weibull duration model. Furthermore, the Weibull model allows us to assess the question of permanent versus temporary overqualification by means of the estimated baseline hazard. Tables 12 and 13 show the estimation results for the same specifications used for the Cox model above. The results do not change qualitatively. In particular, the probability of moving out of overqualification tends to decrease in age groups, even though this effect is again not significant. There is no significant relation between the number of employment and the probability to move out of subjective overqualification. For the main specification including both personal and employment-specific characteristics, the probability of

finding an adequate job is slightly decreasing in the number of employment. This is at odds with the theoretical prediction that workers change to adequate jobs as they gain working experience and reveal their capabilities to their employers.

As a robustness test we have run a discrete time proportional hazard model with random effects to estimate how the probability of transitioning across states is determined by youths' recent labor market outcomes<sup>19</sup>. Los resultados muestran escasas diferencias con los coeficientes estimados en la table 12.

**Table 12: Cox Proportional Hazard Estimation Results - SUBJECTIVE OVERQUALIFICATION**

	(1) Personal Characteristics	(2) Employment Specific Characteristics 1	(3) Employment Specific Characteristics 2	(4) Employment Specific Characteristics 3	(5) Personal + Employment Specific
<b>Gender:</b>					
Female	0.84 (0.014)	-	-	-	0.82 (0.008)
<b>Age:</b>					
(Base Group: <20)					
20 to 24	0.88 (0.107)	-	-	-	0.92 (0.309)
> 24	0.65 (0.001)	-	-	-	0.69 (0.005)
<b>Education:</b>					
(Base Group: Compulsory Educ)					
Non-Compulsory Secondary Education	0.78 (0.010)	-	-	-	0.81 (0.032)
Tertiary Education	0.95 (0.673)	-	-	-	0.94 (0.613)
<b>Number of Employment:</b>					
(Base Group: Job 1)					
Job 2	-	1.04 (0.672)	-	1.17 (0.077)	1.05 (0.615)
Job 3	-	0.96 (0.780)	-	1.11 (0.447)	0.98 (0.876)
Job 4	-	0.90 (0.625)	-	1.03 (0.892)	0.92 (0.670)
Job 5 / 6 / 7 / 8	-	0.86 (0.570)	-	1.14 (0.624)	0.89 (0.672)
Job 4 / 5 / 6 / 7 / 8	-	-	0.88 (0.456)	-	-
<b>Type of Contract:</b>					
(Base Group: Temp. Contract)					
Permanent Contract	-	0.32 (0.000)	0.32 (0.000)	-	0.38 (0.000)
Without Contract	-	0.68 (0.000)	0.68 (0.000)	-	0.67 (0.000)
<b>Duration Dependence</b>					
Paramter $\alpha$	0.91	0.97	0.97	0.89	0.97
(Confidence Interval)	[0,88 – 0,95]	[0,93 – 1,01]	[0,93 – 1,01]	[0,85-0,93]	[0,93 – 1,02]

P-Values in Brackets.

Source: Spanish SWT Observatory

<sup>19</sup> We follow the ideas in Kaplan (2012).

**Table 13: Cox Proportional Hazard Estimation Results - OBJECTIVE OVERQUALIFICATION**

	(1) Personal Characteristics	(2) Employment Specific Characteristics 1	(3) Employment Specific Characteristics 2	(4) Employment Specific Characteristics 3	(5) Personal + Employment Specific
<b>Gender:</b>					
Female	1.04 (0.610)	-	-	-	0.99 (0.880)
<b>Age:</b>					
(Base Group: <20)					
20 to 24	0.89 (0.145)	-	-	-	0.92 (0.316)
> 24	0.66 (0.001)	-	-	-	0.74 (0.020)
<b>Education:</b>					
(Base Group: Compulsory Educ)					
Non-Compulsory					
Secondary Education	1.71 (0.000)	-	-	-	1.65 (0.000)
Tertiary Education	2.04 (0.000)	-	-	-	1.86 (0.000)
<b>Number of Employment:</b>					
(Base Group: Job 1)					
Job 2	-	1.12 (0.205)	-	1.28 (0.008)	1.12 (0.216)
Job 3	-	0.95 (0.705)	-	1.12 (0.397)	0.96 (0.779)
Job 4	-	1.19 (0.312)	-	1.52 (0.013)	1.23 (0.225)
Job 5 / 6 / 7 / 8	-	1.10 (0.702)	-	1.53 (0.090)	1.10 (0.693)
Job 4 / 5 / 6 / 7 / 8	-	-	1.13 (0.417)	-	-
<b>Type of Contract:</b>					
(Base Group: Temp. Contract)					
Permanent Contract	-	0.26 (0.000)	0.25 (0.000)	-	0.26 (0.000)
Without Contract	-	0.67 (0.000)	0.67 (0.000)	-	0.79 (0.026)
<b>Duration Dependence</b>					
Parameter $\alpha$	0.88	0.94	0.95	0.83	0.96
(Confidence Interval)	[0.84 – 0.92]	[0.90 – 1.00]	[0.91 – 0.99]	[0.79-0.88]	[0.91 – 1.01]

P-Values in Brackets.

Source: Spanish SWT Observatory

### 4.3. Predicting individual overqualification

The Weibull model can also be used to obtain predictions of individual durations of subjective and objective overqualification. In contrast to the duration analysis above, spells of unemployment between jobs are explicitly taken into account for the purpose of obtaining predictions. We want to predict the time it takes young entrants into the Spanish labor market to find a job which is adequate for their qualifications. Consider two individuals entering the labor market at the same time and both finding an adequate job after two years. While individual A is overqualified in the same job over the whole two years, individual B quits the first job in overqualification after one year, stays unemployment for half a year and then finds another job for which she is overqualified



for half a year. To ignore individual B's period of unemployment and to count only the duration of jobs in overqualification would be misleading. Rather than predicting the duration of jobs in overqualification, it is more interesting to predict the time it takes young entrants to the labor market to find an adequate job (including periods of unemployment).

Table 14 summarizes predictions of subjective and objective overqualification as predicted by our main specification and by a restricted model excluding explanatory variables. If we use our main specification for predictions, we face the problem that our employment-specific explanatory variables are not defined for periods of unemployment. In order to still be able to estimate the model, we simply assume that the explanatory variables take the value of the job following the period of unemployment. The restricted model without explanatory variables is used as a robustness-check for the predictions of the main specification. Our main duration model predicts that the mean duration of objective overqualification is approximately 9.5 years while the median duration is 5 years. For subjective overqualification, predicted durations are shorter. The predicted median duration is 3.5 years, and mean duration is 3.5 years. These shorter durations are in line with the higher probability of transition out of overqualification for the subjective indicator as described in section 3<sup>20</sup>.

Table 14: Predictions of Duration of Overqualification

	<b>Subjective Overqualification</b>	<b>Objective Overqualification</b>
<b>Excluding explanatory variables:</b>		
Median Duration Time	1476 days (~ 4 years)	2218 days (~6 years)
Mean Duration Time	2564 days (~7 years)	3803 days (~10.5 years)
<b>Main Specification:</b>		
Median Duration Time	1246 days (~ 3.5 years)	1809 days (~5 years)
Mean Duration Time	2315 days (~6.5 years)	3480 days (~9.5 years)
Median Duration at Mean of Explanatory Variables	1313 days (~ 3.5 years)	1940 days (~5.5 years)

Source: Spanish SWT Observatory

<sup>20</sup> Montalvo and Peiro (2009) argue that young workers who are overqualified during a long period of time, tend to adjust their expectations downwards and claim in their self-assessment that a new job is adequate for their level of education even if it is not (with argument like "my skills have been depreciated since I finished college", "the job is not that bad compared with others that are around", etc.). This could be a mechanism to reduce cognitive dissonance.

## 5. CONCLUSIONS

The Spanish labor market is known to display very high levels of unemployment, in general, and record levels of youth unemployment, in particular. In both indicators (general and youth unemployment) the level is around twice the OECD average. Spanish workers have also the highest levels of overqualification among OECD countries. The level of overqualification of Spanish workers is also double the average of the OECD. This paper analyzes the determinants of youth overqualification with special emphasis on its duration. We use the Spanish School to Work Transition database to study these questions. This database is particularly well-suited to analyze the duration of overqualification among young workers since it covers the whole employment history of individuals since the initial transition from the school to the labor market. In particular, there is a long list of the characteristics of each job, including a self assessment of the quality of the match between education and required skills, and a detailed definition of each occupation. The sample covers a long time period (1996-2011) with surveys taking place every three years, which adds up to six waves of data collection. The average proportion of objective overqualification among young workers is 40.7%. Some economic models lead to the conclusion that overqualification is only due to a temporary disequilibrium between supply and demand or the results of low-level entrance jobs. They assume that over time the quality of the match improves. If this is the case we should see this improvement happening more often among young workers in the years after their initial transition to the labor market. However, in our data overqualification is a very absorbing state since transition matrices show that the probability to continue overqualified after moving to a new job is 76.3%. We find that the number of past jobs is not statistically significant in the explanation of the current situation with respect to the education-job match. These results are robust to alternative definitions of overqualification and statistical models of duration. We also find that the probability of getting an adequate job is, in fact, slightly decreasing on the number of employment. The median duration of overqualification ranges between 3.5 and 5 years with mean duration ranging from 6.5 to 9.5 years. Therefore, overqualification among Spanish young workers seems to be a very persistent situation.

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