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The impact of education and host language skills on the labor market outcomes of immigrants in Spain

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This article uses micro-data from the Spanish National Immigrant Survey (Encuesta Nacional de Inmigrantes-ENI in Spanish) carried out in 2007 among immigrants in Spain. In recent years, Spain has received unprecedented immigration flows. The economic assimilation of immigrants is crucial for keeping a cohesive and stable society, especially under the particular circumstances of Spain. As a consequence, immigrants need to invest in human capital since it plays a crucial role in determining their economic status. Educational attainment and destination language ability are two essential components of human capital of migrants. As a result, the nature of the immigrants' labor market participation and their earnings are closely mediated by their host language proficiency and level of schooling. I carry out an analysis of the impact of Spanish language ability on the likelihood of full-time employment and earnings among immigrants in Spain. The results indicate that educational attainment and belonging to a higher Spanish speaking proficiency category both lead to an increase in the probability of holding a full-time job. In contrast, there is no significant impact of schooling and host language ability on earnings.

1   Introduction

This paper analyzes the links between language proficiency --and education in general-- on the labor market outcomes of immigrants in Spain. Due to the massive migration flows, the number of foreign workers present in Spain's Labor force increased by 2,259,330 people in the period between 2001 and 2008. This rise corresponds to 53% of the increase in the labor force for that period in Spain. As a result, immigrants now constitute a significant segment of the country's labor force. It is important to document their labor market outcomes and to examine the determinants of such outcomes. How language skills affect an individual's performance in the labor market has also implications about the income and poverty levels of immigrant families, and ultimately about the social and cultural integration of those families to the host country society. Analyzing the impact of destination language proficiency on labor market outcomes is thus important for understanding the immigrant's overall socioeconomic well-being.

There exists now a significant literature examining how language affects earnings and employment. Studies by Carliner (1981), Grenier (1987), Rivera-Batiz (1990, 1992), Chiswick (1991, 1998), Chiswick and Miller (2001, 2005), Dustmann & Soest (2001), Dustmann & Fabbri (2003), Tainer (1988), and McManus et al. (1983) analyze the impact of host language proficiency on labor market outcomes. Most of these studies conclude that language proficiency is positively associated with earnings and employment.

This paper studies the impact of Spanish language ability on earnings and employment among immigrants in Spain. I use micro-data from the Spanish National Immigrant Survey (NIS in English or Encuesta Nacional de Inmigrantes-ENI in Spanish) carried out among immigrants in Spain between November 2006 and February 2007. The survey was published by the National Statistics Institute in 2008. It is the first large-scale immigration survey carried out in Spain. It examines 15,465 respondents and their families, defined as individuals born abroad, irrespective of their nationality. The INS comprises a single cross-section, which presently does not allow for a longitudinal analysis.

The NIS collects a wide range of statistical data about immigrants, including multiple questions on their socio-economic status, their mother language, as well as their Spanish and regional language speaking ability. In particular, the survey includes questions on Spanish language proficiency that will be used as one of the explanatory variables in the model that explores the impact of Spanish language proficiency on earnings and employment. The relevant survey questions are stated as follows:

- *Besides your mother language, what other languages do you know?*

For the respondents that list Spanish as one of their spoken foreign languages, an additional question is posed:

- *Thinking of what you need for communicating at work, at the bank, with the public authorities/administration. How well do you speak Spanish?*
  1. Very Well   2. Well   3. Sufficient   4. Need to improve

The dependent variable that I use in the *employment determination model* is full-employment status. In particular, the survey questions are stated as follows:

- *In which of the following situations did you find yourself last week*
  a) Working b) Looking for a job c) Retired d) Studying e) Housework f) Disabled
- *How many weekly hours do you work at your job?*

The dependent variable that I use in the *earnings determination model* is the monthly wage. In particular, the survey question is stated as follows:

- *How much money do you get paid for your work monthly?*

Firstly, the impact of schooling and language proficiency on employment is estimated with a model that regresses full-time job status on a set of explanatory variables. Secondly, for the impact of language acquisition on earnings the equations are estimated using the human capital earnings function, a standard technique that regresses the natural logarithm of hourly earnings on a set of explanatory variables including educational attainment, labor market experience, Spanish language proficiency and other variables related to the immigrants contact with the host country. The analysis is carried out separately for men and for women to avoid problems derived from modeling labor supply for women. The earnings estimations are carried out using an OLS estimator. Moreover, the impact of host language proficiency on employment is estimated using a probit technique.

The main results that emerge from this study are as follows. Educational attainment and Spanish language proficiency have positive effects on full-time employment. Immigrants with a higher level of schooling and better language ability are more likely to obtain a full-time job. Moreover, educational attainment leads to higher earning among immigrants. However, destination language proficiency does not have a positive impact on immigrant wages for men or women. It seems that language ability is important for obtaining a full-time job, but does not have an effect on the level of earnings. The impact of language proficiency is positive only for men working in managerial positions.

The remainder of the paper is organized as follows. Section 2 briefly presents and explains the data. Section 3 introduces some relevant variables and the methodology, section 4 shows some descriptive statistics and discusses the results. Finally, Section 5 summarizes and provides the conclusions and policy recommendations.

2 The data: The National Immigrant Survey

The final results from the National Immigrant Survey (NIS in English or Encuesta Nacional de Inmigrantes-ENI in Spanish) were published by the National Statistics Institute of Spain (www.ine.es) in July 2008. It is the first large-scale immigration survey carried out in Spain. It examines 15,465 respondents and their families, defined as individuals born abroad, irrespective of their nationality. It does not include those foreign nationals that were born in Spain but does include foreign-born individuals holding a Spanish citizenship. The participants are 16 years or older that either have been living in Spain for more than one year or have the intention to do so. The survey was implemented between November 2006 and February 2007 and covers the entire Spanish territory.

The survey shows that the majority of the immigrants arrived in Spain in the last 10 years from a relatively limited number of countries, compared to other EU immigrant recipient countries, the US or Canada. Latin-America, Morocco, Romania and Western Europe are the most important

immigrant origin countries and world regions. Western European immigrants are older, show a higher level of educational attainment and work in more qualified jobs or are already retired. Latin-American, African and Eastern European immigrants arrived more recently and hold less qualified positions in the labor market. We are mainly interested in their level of educational attainment, their Spanish proficiency level, earnings and employment status.

3   Methodology

3.1   *The impact of language proficiency and educational attainment on employment*

In order to determine the impact of Spanish speaking proficiency and educational attainment on employment, I use a probit model for the probability of being employed full-time*. Categories other than fully employed include part-time employment, unemployment and out of the labor force. The employment function for immigrants, where *W* is the full-employment status can be written separately for men and for women as:

$$W_{i=}b_o + b_1 E_i + b_2 A_i + b_3 CH_i + b_4 LS_i + b_5 SL_i + b_6 R_{i+} b_7 RB_{i+}$$
$$b_8 MS_{+} e_i$$

There are a number of explanatory variables used in my analysis: *E* is the education level, *A* is age, *CH* children, *LS* Legal Status, *SL* Spanish language proficiency, *R* is region of residence in Spain, *RB* region of birth, *MS* is marital status, and *e* is a stochastic term that captures the effect of unobserved or unmeasured variables.

Gender is known to affect the process of labor market participation. As a consequence, the analysis will be carried out separately for males and females. Marital status and having children are two variables that may have differential effects on men and women. The direction of the partial effects is hypothesized as follows:

EMPLOYMENT = f (Educational attainment (+), Spanish-language proficiency (+), Age (+) Legal Status (+), Marital Status (?), Children (?), Region of birth, Region of Residence)

3.2   *The impact of language proficiency and educational attainment on earnings*

I. Ordinary Least Squares

In order to determine the impact of Spanish speaking proficiency on earnings, I use the typical *human capital earnings* function (Chiswick 1978) that regresses the natural logarithm of earnings on a set of explanatory variables that include Spanish-language proficiency and the level of schooling. The earnings function for immigrants can be written as:

$$Ln\ Y_{i=}b_o + b_1 E_i + b_2 TS_i + b_3 TH_i + b_4 P_i + b_5 SL_i + b_6 ES_i + b_7 R_{i+} b_8 RB_{i+} b_9 O_{i+} e_i$$
*Full-time: at least 30 weekly hours

Where *Y* are the hourly earnings, *E* is the education level, *TS* is the potential length of time spent in the labor market in Spain, *TH* is potential work experience at home, *P* permanent contract,

SL Spanish language proficiency, *ES* schooling in Spain, *R* is region of residence in Spain, *RB* region of birth, *O* is the occupation sector and e is a stochastic term that captures the effect of unobserved or unmeasured variables.

The relationship between earnings and potential work experience in Spain is intended to capture some additional factors besides the work experience itself. These factors include learning about the Spanish labor market institutions, cultural adjustment factors and the development of social networks. The acquisition of destination language skills can be viewed as an investment in human capital and is expected to have a positive impact on earnings. Moreover, educational attainment is expected to have a positive impact on earnings and Spanish schooling is intended to capture the advantage of local education over foreign degrees. These are all standard assumptions in the immigration adjustment literature.

The potential length of time spent in the labor market is constructed using the algorithm developed by Mincer (1974), whereby labor market experience is approximated by the difference between age and the school finishing age. Variables for region of birth are also included in the earnings equation to capture any unmeasured average productivity differences across immigrant groups. This may also reflect international transferability of skills or differences in the selectivity of immigrants. A region of residence dummy variable is added to take regional wage differentials due to labor market disequilibria into account. Finally, dummy variables for occupational categories are added to account for the impact of different types of jobs on salaries. As a consequence, the direction of the partial effects is hypothesized as follows:

EARN = f (Educational attainment (+), Potential labor market experience in Spain (+), Potential work experience at home (+), Spanish-language proficiency(+), Permanent Contract (+), Education in Spain(+), Region of birth, Region of Residence, Occupation)

The analysis is carried out separately for men and for women to avoid problems derived from modeling labor supply for women. The estimations are carried out using OLS. I present a baseline specification based on the conceptual equation presented earlier leaving out the Spanish language proficiency explanatory variable. I then add the language variable to the specification. The purpose is to analyze the additional impact of language proficiency on earnings and to see how the coefficients for the other explanatory variables change when we add the language variable into the equation. The statistical analysis includes males and females aged 16-65. Only respondents that work and earn a monthly income that is between 200-9000 € will be included in the regression analysis. I will note the cases in which the direction or intensity of the estimated coefficients varies significantly between men and women.

4 Statistical analysis of the determinants of employment and earnings

4.1 Descriptive statistics

Table 1 presents some descriptive statistics for the explanatory variables:

Table 1: Variable summary statistics

Variable	Mean	Std. Dev.
Age	37.663	10.735
Educational attainment	10.352	4.1805
Spanish level (1-4)	3.495	0.8896
Education in Spain	.21636	0.4117
Legal resident	0.645	0.4782
Work experience at home	10.4281	0.0108
Work experience Spain	10.877	9.9017
Married	0.529	0.4991
Children	0.662	0.4728
Employed	0.590	0.4980

The data shows that the mean age for the individuals in our employment sample is 37.6 years. Average educational attainment was 10.35 years and 21.6% of the respondents have acquired part of their education in Spain. Their mean potential work experience at home is 10.4 years and their potential work experience in Spain 10.8 years. As mentioned earlier, the potential length of time spent in the labor market is constructed using the algorithm developed by Mincer (1974), whereby labor market experience is approximated by the difference between age and the school finishing age. I then use age at arrival to split total work experience between work experience at home and work in the destination country. Finally 59% of the immigrants are working, 52.9% of the immigrants were married at the time of the interview and 66.2% had children.

4.2 Employment Regression Analysis

I run separate regressions for men and for women in order to compare the strength of the impact of the explanatory variables on employment status between genders. I apply a probit technique and run regressions for immigrants 16-65 years old. Table 2 presents the probit regression results for men.

Table 2 shows the outcome for the analysis of the determinants of full-time employment among immigrant men in Spain. The employment status is regressed on socio-demographical, geographical and human capital variables. The first specification does not contain an explanatory variable for Spanish language proficiency, which is added in the second specification. The results show that age has a positive impact on full-time employment, but at a decreasing rate. Older immigrants are more likely to have a full-time job, but the positive impact diminishes as age increases. More importantly, the level of educational attainment is positively associated with full-

time employment. In contrast, having children does not have an impact on men's occupational situation as expected. Surprisingly, the immigrant's legal situation does not have a statistically significant impact on his employment status. This may reflect a high percentage of undocumented workers in Spain.

Table 2: Employment probit regressions for men

	(i)		(ii)	
Variable	Coeff	t-stat	Coeff	t-stat
Age	.0409***	11.38	.0406***	11.31
Age square	-.0005***	-12.97	-.0005***	-12.92
Spanish skill|			.0493***	6.20
Education	.0271***	3.49	.0187*	2.37
Children	.0087	0.56	.0089	0.57
Married	.0280	1.87	.0298*	1.99
Legal status	.0129	0.88	.0161	1.10
Andalusia	-.0842**	-2.77	-.0706*	-2.32
Aragon	-.0250	-0.66	-.0156	-0.41
Asturias	-.0401	-0.86	-.0350	-0.75
Baleares Isl.	-.0637*	-2.06	-.0639*	-2.06
Canary Isl.	.0578	1.67	.0622	1.80
Cantabria	.0626	1.64	.0606	1.58
Castile Leon	.0249	0.69	.0218	0.60
Castile LaMa	.0179	0.53	.0192	0.57
Catalonia	-.0039	-0.16	-.0004	-0.02
Valencia	-.0888**	-3.12	-.0867**	-3.05
Extremadura	-.0004	-0.01	.0160	0.41
Galicia	.0080	0.20	.0150	0.38
Murcia	.0441	1.50	.0499	1.70
Navarra	-.0619*	-2.06	-.0667*	-2.21
Basque Count.	-.1311**	-3.36	-.1238**	-3.18
La Rioja	.0461	1.16	.0518	1.32
Maghreb	-.0467*	-2.08	-.0160	-0.70
Subsa.Africa	-.0438	-1.29	-.0014	-0.04
Eastern Eur.	-.0160	-0.70	.0227	0.97
America	-.0127	-0.68	-.0302	-1.58
Asia	-.0250	-0.65	.0140	0.37
Oceania	.0050	0.03	.0044	0.03
LogLikelihood	-3732.87		-3713.6165	
Observations	6171		6171	

* p<.05**p<.01***p<.001

I add the regional variables to adjust for differences in employment between Autonomous Communities due to low labor mobility and rigidities in the labor market in Spain. A dummy variable is included for each region and Madrid is set as the benchmark region. The results show that Andalusia, the Balearic Islands, the Valencian Community, Navarre and the Basque Country are negatively associated with full-time employment status. This may reflect a combination of

higher regional unemployment levels (Andalusia, Valencia and Balearic Islands-INE, 2009) and bilingual regions (Valencia, Balearic Islands, Navarre, and the Basque Country). The need for bilingual proficiency and a higher average unemployment rate are likely to have a negative impact on the level of full-time employment among immigrants living in these regions.

I finally add dummy variables for birthplace, with Western European immigrants as the benchmark. Maghrebians are the only ethnic group that shows a negative correlation with occupational status. However, when the language proficiency variable is added, the negative impact for Maghrebians disappears. The immigrants' origin does not seem to play an important role in the determination of his employment status.

The second specification includes a variable for Spanish speaking proficiency. Adding the Spanish language variable affects the level of significance and the strength of some of the other explanatory variables. More importantly, belonging to a higher Spanish speaking proficiency category leads to an increase in the probability of holding a full-time job, ceteris paribus.

Moreover, the impact of educational attainment on employment since it was partly reflecting the immigrant's language proficiency category. The positive impact of being married on employment becomes statistically significant at a 95% level of confidence. Married immigrant men are more likely to hold a full-time employment status. Adding the language variable does not lead to substantial changes for the regional dummies. The statistical significance on the negative coefficient for Maghrebian immigrants disappears, since it was most likely reflecting the lack of language proficiency among North-African immigrants.

The next step is to run the regression analysis for women. As mentioned earlier, the analysis is carried out separately to avoid problems derived from modeling labor supply for women. The following table presents the probit regression results for the two specifications. The second specification includes the language variable. Table 3 shows the result for the determinants of full-time employment for women.

Table 3 shows the results for immigrant women in Spain. The results in column *i* correspond to a standard specification for the employment regression that does not contain the explanatory variable for Spanish speaking ability. I also include dummy variables for Spanish regions to adjust for differences in salaries across regions and geographical dummies for country of origin.

The results show that age has a positive impact on full-time employment, but at a decreasing rate. Surprisingly, having children does not have a statistically significant impact on women's occupational status. Moreover, being married is associated with a lower degree of full-time employment since men are most likely providing the necessary income in the household. Interestingly, the immigrant's legal status does have a statistically significant positive impact on women's employment. The impact was non-significant for immigrant men. This may reflect a lower level of undocumented workers among immigrant women in Spain. The informal sector may

be more prevalent in industries with a larger fraction of men among their workers. More importantly, schooling has a statistically significant positive impact on full-time employment.

Table 3: Employment probit regressions for women

	(i)		(ii)	
Variable	Coeff	t-stat	Coeff	t-stat
Age	.0277***	7.72	.0276***	7.68
Age square	-.0003**	-8.23	-.0003***	-8.20
Spanish skill			.0496***	5.93
Education	.0515***	6.25	.0451***	5.42
Children	.0189	1.33	.0175	1.22
Married	.0820***	-6.29	-.0807***	-6.18
Legal status	.1180***	8.56	.1203***	8.72
Andalusia	-.1839***	-6.76	-.1757***	-6.43
Aragon	-.1900***	-5.71	-.1838***	-5.51
Asturias	-.1729***	-5.12	-.1706***	-5.06
Baleares Isl.	-.1495***	-5.40	-.1430**	-5.15
Canary Isl.	-.1060**	-3.17	-.0956*	-2.84
Cantabria	-.1493***	-3.90	-.1510***	-3.94
Castile Leon	-.1452***	-4.61	-.1401***	-4.43
Castile Lam	-.0298	-0.86	-.0280	-0.81
Catalonia	-.0887***	-3.61	-.0878***	-3.57
Valencia	-.1799***	-7.10	-.1757***	-6.92
Extremadura	-.2199***	-5.28	-.2041***	-4.86
Galicia	-.1887***	-5.12	-.1812***	-4.90
Murcia	-.1206***	-4.00	-.1124***	-3.72
Navarra	-.1309***	-4.93	-.1292***	-4.86
Basque Count.	-.2686***	-8.29	-.2646***	-8.14
La Rioja	-.0595	-1.59	-.0565	-1.51
Maghreb	.1743***	6.99	.1962***	7.81
Subsa.Africa	.1931***	4.56	.2065***	4.88
Eastern Eur	.1675***	8.07	.2005***	9.37
America	.1728***	9.77	.1587***	8.87
Asia	.2136***	4.42	.2441***	5.12
Oceania	.4546***	9.44	.4529***	9.28
LogLikelihood	-4781.35		-4763.6364	
Observations	7,390		7,390	

* p<.05**p<.01***p<.001

Differences in the level of employment between Madrid and the rest of the Autonomous Communities are considerably stronger among women. The majority of the sixteen regions show a negative correlation with woman's full-time employment status. I add the dummies for country or region of origin establishing Western Europe as the benchmark territory. The results show that immigrants from the other world regions are more likely to have full-time employment. This may reflect lower salaries for non-Western European immigrant men, requiring women to work full-time.

The second specification includes a variable for Spanish speaking proficiency. Adding the Spanish language proficiency variable does not lead to substantial changes in the rest of the explanatory variables. More importantly, belonging to a higher Spanish speaking proficiency category leads to an increase in the probability of holding a full-time job. The only substantial change occurs for the effect of educational attainment. The impact falls since it was partly reflecting the positive effect of the immigrant's language proficiency. Note that the impact of schooling on employment status is significantly higher for women. This may reflect a stronger impact of academic credentials in sectors with a larger fraction of women workers. I find the same pattern for the impact of educational attainment on earnings.

Being married is positively associated to employment for men but negatively associated for women, most likely reflecting the man's role as the main income provider in the household. Other gender differences arise from the region of residence and geographical origin. Immigrant women from regions outside Western Europe are more likely to hold full-time employment. This may reflect their greater need to work due to lower salaries among non-western European immigrant households. Finally, immigrant women living in Spanish regions outside Madrid are less likely to hold a full-time position. For men this occurs just for bilingual Autonomous Communities and regions with a high average level of unemployment.

4.3 Earnings Regression Analysis

I run an Ordinary Least Squares (OLS) regression for the following age range: 16-65 years. Table 4 presents the regression results for men.

Table 4 presents the OLS results for the determinants of monthly earnings among immigrant men in Spain. Following standard practice, the natural logarithm of hourly wages is regressed on demographical, geographical and human capital variables. It is hypothesized that earnings increase with the level of educational attainment, work experience and having a permanent contract. Following the literature, it is also hypothesized that earnings are greater for those immigrants who are more fluent in spoken Castilian Spanish.

The outcome on column *i* corresponds to a standard specification for the immigrant earnings equation that does not include Spanish speaking proficiency as one of the explanatory variables. The language proficiency variable is added in further specifications and dummies for occupations are added on column *iii*. The results show that additional levels of schooling are strongly associated with higher earnings. Moreover, an additional year of potential labor market experience in the immigrant's home country is also associated higher earnings. Work experience in Spain has an even stronger positive impact on earnings. As expected, the impact of destination country labor market experience is greater. A permanent contract is also linked to higher wages. However, acquiring some schooling in Spain does not have a statistically significant impact on earnings.

Table 4: Earnings regressions for men

	(i)		(ii)		(iii)	
VARIABLE	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat
Constant	5.121	14.86	5.0398	11.67	5.4550	13.38
Spanish skill			.0261	0.31	−.0425	−0.54
Education	.1985***	12.66	.1977***	12.48	.0851***	5.25
Work Ex.home	.0150*	1.98	.0152*	2.00	.0053	0.75
Work Ex.Spain	.0596***	6.72	.0591***	6.55	.0413***	4.85
Educat. Spain	−.0846	−0.47	−.0861	−0.48	.0158	0.09
Permanent Emp	.3184**	2.67	.3156*	2.64	.2650*	2.33
Andalusia	.0221	0.08	.0254	0.09	.0260	0.10
Aragon	−.3517	−1.02	−.3470	−1.01	−.2448	−0.76
Asturias	−.8078	−1.44	−.7996	−1.42	−1.2083*	−2.29
Baleares Isl.	.6420*	2.32	.6397*	2.31	.7314**	2.81
Canary Isl.	.4379	1.28	.4399	1.29	.3713	1.16
Cantabria	−.7370*	−1.97	−.7351*	−1.96	−.3244	−0.92
Castile Leon	−.8884**	−2.88	−.8876**	−2.88	−.7623**	−2.62
Castile Lam.	−.8766**	−2.87	−.8763**	−2.87	−.6363*	−2.21
Catalonia	.6534***	3.01	.6523**	3.01	.4557*	2.24
Valencia	−.4711	−1.90	−.4692	−1.89	−.4140	−1.78
Extremadura	−1.2255***	−3.71	−1.2156***	−3.66	−.8283**	−2.63
Galicia	−1.2222***	−3.52	−1.2199***	−3.51	−2.199***	−6.67
Murcia	−.0508	−0.21	−.0488	−0.20	−.1459	−0.63
Navarra	.2797	1.07	.2774	1.06	.4565	1.86
Basque Coun.	.3095	0.73	.3126	0.73	.0785	0.20
La Rioja	−.5335	−1.48	−.5339	−1.48	−.3309	−0.98
Maghreb	−2.0897***	−10.02	−2.077***	−9.78	−1.3472***	−6.65
Subsa.Africa	−2.2579***	−7.17	−2.237***	−6.96	−1.3815***	−4.54
Eastern Eur.	−2.1432***	−10.36	−2.128***	−10.01	−1.0604***	−5.14
America	−1.8153***	−10.56	−1.8273***	−10.37	−.9672***	−5.69
Asia	−1.2338***	−3.23	−1.2134**	−3.13	−.4654	−1.27
Oceania	1.9029	0.82	1.8958	0.82	1.9349	0.89
Director					3.1785***	10.22
Technician					3.9316***	18.98
Service/Clerk					−.1284	−0.70
Administrativ					.4559	1.43
Agric/Fishing					.4266	1.04
Mach/Manu/Con					.8721***	6.22
Adjusted R²	0.1679		0.1677		0.2703	
Observations	3398		3398		3398	

*p<.05 **p<.01 ***p<.001

   I add the regional dummies to adjust for geographical differences in salaries due to low labor mobility and other rigidities in the Spanish labor market. The Spanish labor market legislation is quite rigid and most experts recommend more flexibility. I include sixteen dummy variables, one for each Autonomous Community and Madrid acts as the benchmark region. The results show that Catalonia and the Balearic Islands are associated with higher earnings compared to Madrid. On the other hand, working in Extremadura, Galicia, Cantabria, Castile-Leon and Castile-La Mancha is

linked to lower average earnings for immigrant men. These findings match the data for average salaries in Spain published by the INE.

I finally add dummy variables for the immigrants' birthplace. Eastern Europe, Maghreb, Sub-Saharan Africa, Asia, America (including North, Central and South) and Oceania are the broad selected categories for the world regions. Western European immigrants act as the benchmark category. We observe a strong wage penalty for Eastern European, Asian, African and Latin-American immigrants. This may reflect unmeasured average productivity differences across immigrant groups, heterogeneous international transferability of skills including education and work experience, differences in the selectivity of immigrants or a certain degree of discrimination in the labor market in Spain. Interestingly, Asian immigrants suffer the weakest wage penalty, most likely due to their higher proportion of self-employment (25% for Asians, as opposed to 5-8% for the other immigrant groups).

The second specification introduces the language proficiency variable in the model. Surprisingly, Spanish speaking proficiency does not have a statistically significant positive impact on earnings. In other words, belonging to a higher language proficiency category does not lead to greater earnings. Furthermore, adding the language variable does not change the level of significance or the strength of the coefficients for the other explanatory variables.

Finally, column iii expands the earnings equation by adding dummy variables for occupations. Non-qualified work is used as a benchmark. The other occupational categories include directors and managers, scientific and technical personnel, administrative workers, services and clerks, agriculture and fishing, and construction and industry workers. Adding the occupational variables captures part of the positive impact of educational attainment, work experience and other explanatory variables on wages. In fact work experience in the home country becomes non-significant and the impact of schooling and work experience in Spain diminishes considerably. That is, educational attainment and labor market experience lead to a superior occupational category which in turn provides immigrants with a higher salary.

Adding the occupational dummies allows for a better evaluation of possible discrimination in the labor market. We observe a substantial reduction in the magnitude of the negative coefficients for Maghreb, America, Sub-Saharan Africa and Eastern Europe. Interestingly, for Asia the coefficient becomes non-significant. However, once the occupational dummies have been added the negative coefficients still remain statistically significant and strong for Eastern Europe, Africa (including Maghreb) and North/South-America. This may reflect wage discrimination, unmeasured average productivity differences across immigrant groups, or lack of international transferability of skills. For the occupational categories, managerial jobs and scientific/technician personnel fall into the highest salary categories, enjoying a substantial wage premium compared to non-qualified workers. Working in the construction and manufacturing sector is also associated with higher

wages for immigrant men. The rest of the occupational categories do not enjoy a statistically significant wage premium compared to non-qualified workers. Table 5 presents the earnings regression OLS results for immigrant women.

Table 5: Earnings regressions for women

VARIABLE	(i) Coeff.	(i) t-stat	(ii) Coeff.	(ii) t-stat	(iii) Coeff.	(iii) t-stat
Constant	4.6405	17.64	4.7024	12.98	4.8012	14.03
Spanish skill			-.0540	-0.25	-.1009	-0.50
Education	.1610***	11.78	.1605***	11.65	.0687***	5.01
Work Ex.home	.0099	1.74	.0100	1.75	.0022	0.42
Work Ex.Spain	.0551***	8.30	.0550***	8.27	.0265***	4.16
Educat. Spain	-.0149	-0.11	-.0160	-0.11	-.1935	-1.47
Permanent Emp	.2431*	2.52	.2427*	2.52	.1765*	1.96
Andalusia	.0058	0.03	.0075	0.04	.1151	0.58
Aragon	-.0311	-0.12	-.0320	-0.12	.0593	0.58
Asturias	-1.5223***	-6.00	-1.5203***	-5.99	-.8948***	-3.76
Baleares Isl.	.2893	1.31	.2915	1.32	.4084*	1.99
Canary Isl.	.4943*	2.08	.5048*	2.09	.7529**	3.30
Cantabria	-.3833	-1.23	-.3842	-1.23	-.4121	-1.42
Castile Leon	-.6457*	-2.29	-.6436*	-2.28	-.5671*	-2.16
Castile Lam.	.4153	1.73	.4163	1.74	.2355	1.05
Catalonia	.6180***	3.65	.6184***	3.65	.4911**	3.11
Valencia	.5601**	3.13	.5631**	3.14	.7863***	4.69
Extremadura	-.4662	-1.35	-.4625	-1.33	-.2487	-0.77
Galicia	-.4603	-1.34	-.4576	-1.33	-.4634	-1.45
Murcia	-.0594	-0.28	-.0583	-0.28	.0683	0.35
Navarra	.4718*	2.35	.4724*	2.35	.5865**	3.12
Basque Coun.	.3357	1.16	.3360	1.16	.9359**	3.45
La Rioja	-.3681	-1.27	-.3698	-1.27	.0505	0.19
Maghreb	-2.0956***	-10.09	-2.0918***	-10.04	-1.9011***	-9.73
Subsa.Africa	-2.4585***	-6.90	-2.4562***	-6.89	-1.2800***	-3.80
Eastern Eur.	-1.7448***	-10.01	-1.7419***	-9.97	-1.0341***	-6.07
America	-1.7147***	-12.08	-1.7182***	-12.04	-1.0515***	-7.60
Asia	-1.5280***	-3.91	-1.5237***	-3.89	-.9212*	-2.51
Oceania	-.3879	-0.82	-.3885	-1.01	-1.3159***	-3.61
Director					3.2360***	10.03
Technician					3.0343***	18.61
Service/Clerk					-.17720	-1.42
Administr.					.0101	0.06
Agric/Fishing					.3873	0.80
Mach/Manu/Con					1.2635***	9.77
Adjusted R²	0.1696		0.1694		0.2847	
Observations	3787		3787		3787	

* p<.05 **p<.01 ***p<.001

Table 5 presents the OLS results for immigrant women in Spain. The outcome on column *i* does not include the explanatory variable for Spanish speaking proficiency. The results for the first specification show that educational attainment and potential work experience in Spain are strongly associated with higher earnings. A permanent contract is also linked to higher wages. On the

contrary, home country work experience and schooling in Spain do not lead to increased earnings for immigrant women.

The regional dummies reveal that working in Catalonia, Valencia, Navarre, and the Canary Islands is associated with higher earnings compared to Madrid. Conversely, working in Asturias and Castile-Leon is linked to lower average wages for immigrant women. Finally, the birthplace dummies reveal a strong wage penalty for Eastern European, Asian, African and Latin-American immigrants as in the case of immigrant men. The strength of the wage penalty for the different immigrant groups is very similar between men and women.

The second specification captures the impact of the introduction of the language proficiency variable in the model. As in my previous analysis for immigrant men, Spanish speaking proficiency does not have a statistically significant impact on women's earnings. Moreover, adding the language variable does not change the impact on wages for the rest of the explanatory variables.

Column *iii* expands the earnings equation by adding dummy variables for occupations. Adding the occupational variables captures part of the positive impact of educational attainment, work experience and other variables on earnings. In fact, the positive impact of schooling and work experience in Spain diminishes substantially since educational attainment and labor market experience lead to a superior job category which in turn provides immigrants with a higher salary.

We also observe a substantial reduction in the strength of the coefficients for the geographical dummies for immigrant women from the Latin-America, Sub-Saharan Africa, Asia and Eastern Europe. Interestingly, the dummy variable for Maghreb remains very high and hardly changes. The outcome shows that there is a substantial wage penalty for non-Western European immigrant women, particularly in the case of Maghrebians. This may reflect some sort of wage discrimination, unmeasured average productivity differences across immigrant groups, or lack of international transferability of skills. Finally, the occupational dummies reveal that managerial jobs and scientific/technician personnel fall into the categories that enjoy the highest salaries. The wage premium is substantial. Working in the manufacturing sector is also associated with higher wages for immigrant women. The rest of the occupational categories do not enjoy or suffer a statistically significant wage premium or penalty.

4.4 Self-selection, endogenous choice and measurement error

There are several methodological issues that we need to address regarding the use of OLS. On the one hand, the estimated coefficients for the language proficiency variable may be biased due to endogeneity. This may lead to an upward bias as a consequence of the positive correlation between unobserved heterogeneity in earnings and language proficiency. This problem may be corrected using an instrumental variable, but it is important to find adequate instruments.

Furthermore, the coefficient for language ability may also be biased as a result of measurement error. Measurement error in the self-reported language variable is expected to lead to a substantial downward bias in the estimated coefficients. This occurs when respondents have the tendency to over- or under-report consistently in surveys. It is difficult to correct for misclassification using cross-sectional data, as in the present case. There is a need for longitudinal immigration data that is currently not available for this survey in Spain.

We may also encounter selectivity bias, a problem that arises from non-random attrition. This inconvenience can be corrected for following a two-stage sample selection bias procedure postulated by Heckman in 1979. This method allows us to measure the extent to which attrition is non-random by comparing the means of the explanatory variables for individuals who do and do not have a full-time job.

Selectivity Correction

The results obtained using OLS should represent the average impact of Spanish language ability and education on earnings. However, the group of immigrants that are employed may not be randomly selected. The bias that results from using non-randomly selected samples to estimate behavioral relationships can be corrected. To correct for self-selection, Rivera-Batiz (1990, 1992) and Chiswick and Miller (1995, 2002) suggest using a selectivity correction procedure postulated by Heckman in 1979. To implement this technique a two-stage procedure is used. The first stage is used to estimate the structure of the self-selection process, obtaining the expected value of the error. In the second stage, we rerun the original regression with the estimated expected error, called *Mills ratio*, as an additional explanatory variable. This technique is known as the Heckman selectivity correction model.

The key issue is labor market participation. The separation of the data by participation in the labor force may not be random. If that is case, using non-random samples would result in biased and inconsistent estimates. If the selectivity-correction variable (λ_i) is statistically significant, this will indicate that the samples separated on the basis of participation in the labor market are not random. This would show that there is a positive selection into each group. I run the regressions and Table A1 (Appendix) shows the selectivity correction results for immigrant men.

The results show that lambda is not statistically significant. This indicates that the samples separated on the basis of participation in the labor market for immigrant men are fairly random. In other words, the selectivity correction technique does not show positive selection into each group. This is a common result in the immigration literature since immigrant men are more likely to experience financial constraints that limit their capacity to choose whether to enter the labor market. Immigrants face liquidity restrictions, forcing them to accept any type of work. The results also show a downward bias in the coefficients for work experience at home and having a permanent contract.

Table A2 (Appendix) shows the selectivity correction results for immigrant women. The results show that lambda is positive (as opposed to the case for men), but not statistically significant. This indicates that the samples separated on the basis of participation in the labor market for immigrant women are fairly random as well. In other words, we don't find positive selection into each group (employed, non-employed). This result for women is not commonly observed in the literature. It is likely that immigrant women in Spain are facing financial constraints that limit their capacity to choose whether to work full-time due to the low average salaries in the Spanish labor market. The low average salaries paid in the Spanish labor market put a significant downward pressure on the immigrants' purchasing power and this leads to a higher level of employment among immigrant women in Spain. This seems to be a family income effect rather than a price effect. The latter would lower female labor supply due to lower opportunity costs.

Adding the selectivity correction term also leads to changes in the regional dummy variables. In particular the statistically significant positive effect of working in Catalonia, Valencia, Navarre and the Canary Islands disappears. Moreover, working in Galicia and Extremadura are now associated with lower average earnings for women. The regional wage penalty is now more similar for men and women. There is also a reduction in the wage penalty for African, Eastern European, Asian and Latin-American immigrant women and in the coefficient for work experience in Spain.

5   Conclusions and discussion

This paper analyzes the determinants of full-time employment and earnings for male and female immigrants in Spain following standard practices in the labor economics literature. The main patterns found for Spain are similar to those obtained in previous analyses for major immigrant recipient countries (Germany, U.S., Canada, Australia and Israel). However, the lack of a positive impact of language speaking ability on earnings is an exception. My research is one of the few analysis carried out among immigrants in a non-English speaking country. Moreover, the recent and intense nature of immigration in Spain makes it a unique context for analysis. Most of the immigrants in Spain arrived in the last decade, which makes it a more homogenous group and reduces the problems that arise from cohort effects. The present research is limited to individuals aged 16-65 years. Both male and female immigrants are considered separately.

My examination uses a survey-based measure of Spanish speaking ability to evaluate the impact of language proficiency and educational attainment on the level of employment and earnings. In the initial part of the article, full-time employment status is regressed on socio-demographical, geographical and human capital variables. I run a probit regression and the results for immigrant men show that educational attainment and belonging to a higher Spanish speaking

proficiency category both lead to an increase in the probability of holding a full-time job. Being married also leads to an increase in the chances of having a full-time job.

In contrast, being married is associated with a lower level of full-time employment for immigrant women since men are most likely providing the necessary income in the household. Interestingly, the immigrant's legal status has a statistically significant positive impact on women's employment status but not for men. Differences in the level of employment between Madrid and the other sixteen Autonomous Communities are larger among women. Immigrant women living in other regions present a lower level of full-time employment. This may reflect a low degree of labor mobility among women. Finally Maghrebian, Eastern European, Asian, Sub-Saharan African and Latin-American immigrant women are more likely to be working full-time. This may reflect lower salaries among immigrant men migrating from these world regions. As a consequence, women are required to work full-time. Note that the impact of schooling on employment status is stronger for men. Interestingly, the impact of Spanish language proficiency on employment is very similar for men and women.

The second part of the article examines the determinants of monthly earnings. The results for the determinants of earnings show that additional years of schooling and labor market experience in Spain lead to higher earnings for immigrant men and women. A permanent contract is also associated with higher monthly earnings. However, labor market experience in their home country does not have a statistically significant effect on women's wages. More importantly, Spanish speaking proficiency is not associated with higher salaries for immigrant men and women, after adjusting for other human capital variables, country of origin and Spanish region of residence. I suspect that part of the explanation for the non-statistically significant impact of Spanish language proficiency on immigrants' earnings is the inclusion of immigrants that speak Spanish as their mother language. I run the regressions excluding Latin-American immigrants and find that there is a statistically significant positive of speaking language proficiency for immigrant men. However, the results show that the effect is non-significant for women.

There are also differences in earnings between immigrants from different geographical origins. These results may reflect unmeasured average productivity differences across immigrant groups, heterogeneous international transferability of skills or some type of discrimination in the labor market.

Finally, the immigrants participating in the labor market may not be randomly selected. Using non-randomly selected samples to estimate behavioral relationships may result in biased estimates. To correct for self-selection, I use a selectivity correction procedure postulated by Heckman (1979). The results show that lambda is not statistically significant. In other words, selection into the labor market seems fairly random for immigrants in Spain.

Economic assimilation in the host country is crucial for keeping a cohesive and stable society, especially under the particular circumstances that occurred in Spain. The increase in immigration has occurred very rapidly and there is an urgent need for mutual adaptation to the new social and cultural reality. Employment and earnings seem two accessible and measurable variables for the evaluation of economic assimilation. This article analyzes the determinants of employment and earnings for immigrants in Spain. I'm particularly interested in the impact of Spanish language proficiency, work experience and educational attainment. Economic assimilation through employment and higher earnings in the labor market is an important benefit derived from language acquisition and investment in human capital in the host country.

The results are important to enable policy makers to devise strategies and immigration policies that promote and guarantee economic and social stability. The analysis shows that immigrants with higher educational attainment and more work experience in the Spanish labor market are more likely to hold a full-time employment and earn higher earnings. Moreover, a higher level of Spanish speaking proficiency is associated with greater chances of becoming employed. However, better speaking proficiency leads to greater chances of being employed but not to higher monthly earnings. This is partly explained by the inclusion of Latin-American immigrants in the sample. Potential work experience in Spain is highly correlated with the length of the immigrants' stay. Immigrants who live in Spain for a longer period of time increase their Spanish speaking ability, as well as their knowledge and professional networks in the Spanish labor market. Finally, temporary migration reduces the incentive to invest in human capital in the destination country.

From a policy perspective, it would be advisable to provide affordable education, training programs and language courses for immigrants. An introduction program could partly consist of Spanish language instruction, combined with knowledge about the Spanish labor market, in order to ensure familiarity with work-related terms and usages. This may be combined with vocational training and/or internships that provide immigrants with real work experience in Spain. What employers seem to value and reward is work experience in the Spanish labor market. Successful integration is associated with early contact with the host labor market. Real work experience provides immigrants with an opportunity to learn Spanish work practices, to demonstrate their skills and socialize with native workers. Temporary jobs may lead to more permanent employment.

Moreover, policies that favor permanent migration over temporary migration would also allow for a better social and economic integration. It would provide immigrants with more time to acquire the necessary education, work experience and language skills to achieve full integration in the society. Finally, the evidence points to a certain degree of discrimination in the Spanish labor market. Wider and more rapid recognition of foreign educational degrees and work qualifications would certainly contribute to a reduction in the wage gap between Western European immigrants

and the rest. Moreover, cultural diversity programmes are also necessary to encourage a better representation of immigrants in the work place and in society.

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7   Appendix

Table A1: Selectivity Correction Results MEN

VARIABLES	Coefficient	z
Constant	4.6033***	9.95
Education	.1984***	14.00
SpanishProf.	.0900	1.08
Homeworkexp	.0278***	3.81
Hostworkexp	.0607***	6.86
Educ.Spain	.0815	0.51
Permanent	.3834***	3.64
Andalusia	-.2376	-0.90
Aragon	-.4460	-1.46
Asturias	-.5183	-1.03
BalearicIs.	.4195	1.70
CanaryIs.	.3227	1.06
Cantabria	-.7844*	-2.39
Castile-Leon	-.9703***	-3.59
Castile-Manch	-.8592**	-3.19
Catalonia	.5484**	2.87
Valencia	-.4360	-1.95
Extremadura	-1.4091***	-4.77
Galicia	-1.2217***	-4.05
Murcia	-.0675	-0.31
Navarre	.2398	1.03
BasqueCount.	.4808	1.17
LaRioja	-.4153	-1.28
Maghreb	-1.8857***	-10.20
Subsah-Africa	-2.0312***	-7.31
EasternEur.	-2.0123***	-10.68
America	-1.9424***	-12.36
Asia	-1.0809**	-3.18
Oceania	1.8518	0.95
Lambda	-.1274	-0.32
Observations	5208	

* $p<.05$**$p<.01$***$p<.001$

Table A2: Selectivity Correction Results WOMEN

VARIABLES	Coefficient	z
Constant	4.6244***	8.37
Education	.1684***	11.43
SpanishProf.	-.1356	-1.75
Homeworkexp	.0032	0.55
Hostworkexp	.0272***	3.57
Educat.Spain	.2023	1.53
Permanent	.2340*	2.39
Andalusia	-.0951	-0.39
Aragon	-.3821	-1.31
Asturias	-1.5328***	-4.66
BalearicIs.	.2009	0.82
CanaryIs.	.1920	0.73
Cantabria	-.4808	-1.51
Castile-Leon	-.8415**	-2.60
Castile-Manch	.4549	1.91
Catalonia	.3267	1.80
Valencia	-.0351	-0.16
Extremadura	-.8276*	-2.19
Galicia	-1.0697**	-2.67
Murcia	-.1626	-0.75
Navarre	.3591	1.62
BasqueCoun.	-.2998	-0.83
LaRioja	-.1271	-0.42
Maghreb	-1.7868***	-7.55
Subs.-Africa	-1.8377***	-4.67
EasternEur.	-1.5820***	-7.33
America	-1.2703***	-7.14
Asia	-1.2703**	-3.06
Oceania	.4856	0.85
Lambda	.4837	1.29
Observations	6590	

* p<.05**p<.01***p<.001