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Canadian Labour Economics Forum

WORKING PAPER SERIES

Descriptive labor market outcomes of immigrant women across Europe

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Winter 2020, WP #18

Descriptive labour market outcomes of immigrant women across Europe

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Abstract. We consider the job progression of immigrant women in five European countries: France, Italy, Spain, Sweden and the UK. We complement data from the European Labour Force Survey (2005-2015), with information about the skills contained in the jobs held by women, using data from the O*Net. In particular, we focus on analytical and strength skills in immigrant´s jobs and compare them to those required by jobs held by similar native women. Even though immigrants experience upon arrival a gap in participation relative to the native born, they gradually increase participation during the first ten years spent in the country (approximately, 1% per year in Spain, Italy and the UK, and 2% and 4 % per year in France and Sweden respectively). Our results reveal significant differences across countries of origin as well as differences within countries over the period of analysis. Recent immigrant women show relatively large gaps in the analytical skill content of the jobs they held relative to native-born women across our host countries. Further, with the exception of immigrants to Spain, they also work jobs with higher requirements of strength than their native-born counterparts do. Although educated immigrants show a different pattern in most countries (included Spain). We find differences within countries over the period of analysis that may be consistent with the variation of incentives to move depending on the business cycle at arrival - particularly given the meager opportunities in many destination countries during aftermath of the recent great recession.

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1. Introduction

Understanding the role of immigrant women in the labour force remains a challenging issue. Traditional models viewed immigrant women as secondary workers, and considered that they enter the labour market only as a response to family income shocks, and may likely exit it when they are not needed to ensure the subsistence of their families or when their spouses have settled in the destination labor market. Specifically for immigrant women, this means that they will show higher than usual levels of employment upon arrival, mostly in unskilled jobs, and subsequently reduce participation over time as partners settle in the labour market (Long (1980, Baker and Benjamin 1997). This view, however, does not seem to describe recent patterns of work for immigrant women in the US and Canada, Blau et al. (2003), Blau and Khan 2013), Adsera and Ferrer (2016). These papers report patterns of labour supply for immigrant women that seem to respond to their own opportunities in the labor market, in the same ways as natives do, rather than conditional on the needs of their partners. Results in this more recent work show that immigrant women increase (rather than decrease) participation in the labour market and experience wage improvements with time spent in the country, as well as some job status progression, as measured by the skills required by jobs they work in.

In this paper, we aim to look into patterns of immigrant female participation across Europe. We focus on women because the labour market choices of men and women are quite different and require separate analysis. [1] There is a large literature analyzing the double penalty of women immigrant in different countries. Instead, we prefer to abstract from institutional settings affecting women labour choices in general, to focus on factors affecting women immigrants, relative to the native born women, which we view as a different issue. Further, our study that analyzes changes in skills contained in the jobs performed by immigrant women is complementary of previous work that focusses on either participation or earnings. The type of employment women immigrants do has been underexplored in the literature with some notable exceptions (Adsera and Chiswick, 2007) and some works that are generally restricted to a single country.[2]

We use data from the European Labour Force Survey 2005-2015 for five European countries with significant immigrant population: Spain, Italy, France, the U.K. and Sweden. These countries differ not only in the timing of immigration arrival and the origin of immigrants, but also in economic conditions during the time of study as well as institutional settings of labour markets and immigrant policy.

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[1] See for instance Worswick (1993), for a study of the double penalty of immigrant women in Canada, and Antecol (2000), for the case of the US.

[2] Amuedo Dorantes and de la Rica (2007) and Fernandez-Macias et al. (2014) analyze the case of Spain; Adsera and Ferrer (2016) look into women immigrants to Canada.

We use the standard human capital theory applied to immigration to interpret our results. This theory predicts that immigrants experience depreciation in human capital that is specific to their country of origin and commonly related to language fluency, knowledge of institutions and established networks. Part of the economic assimilation process consists in acquiring these forms of specific human capital in the country of destination. An important characteristic of the immigrant population regards the time of arrival. The immigration literature typically documents lower labour market outcomes for movers than for equivalent native born upon arrival and a process of "catching-up" during the first ten to fifteen years after migration, although whether complete parity is ever achieved is a matter of much controversy. It is worth noticing that the empirical investigation into this prediction has uncovered a more complex process of "catching-up". (See Chiswick (1986); Borjas (1995) and Duleep and Regets (1997) for the US; Bevelander and Nielsen (2001) for Sweden; Clark and Lindley (2005) for the UK; Aydemir and Skuterud (2005) for Canada).

Immigration flows are generally linked to economic conditions with increases in GDP per capita being considered pull factors in major gravity migration models and economic recessions a deterrent for new entrants (Grogger and Hanson 2011). The economic performance of the five economies included in our empirical analysis fluctuated during our sample period. Initially, Europe was going through a strong economic bonanza and in some of these countries, such as Spain and to some extent Italy, this was associated with a booming construction sector that attracted both skilled and unskilled labor. The severe crisis of 2008 affected all European markets to a different degree. GDP fell uniformly during the first phase of the crisis, and GDP was around 5-6 percentage points lower at the end of 2009 than it had been in the first quarter of 2008. However, the crisis was much more profound in Italy and Spain with cumulative GDP losses of up to 10 percentage points by the end of 2013 in both economies.[3] At the end of our sample period, GDP was still below pre-crisis levels in these two countries. The crisis greatly shaped immigration inflows and outflows to these two countries as it concentrated on sectors with high levels of immigrant employment (construction, tourism and related trades). The sectoral distribution of immigrants in the other three countries was more balanced.

While previous papers interested in the evolution of jobs immigrant women hold in the labor market focus on mobility across occupational sectors (see for ex, Martinez-Macias et al. (2014) and Amuedo-Dorantes and De La Rica (2007) for Spain), we choose to focus into skill requirements because we believe they better capture job progression. Since workers could use a similar set of skills in completely different occupations, moving across occupations does not necessarily imply an improvement in the labour

[3] http://ec.europa.eu/eurostat/statistics-explained/index.php/National_accounts_and_GDP

market situation of women. Conversely using a different set of skills or a greater amount of a given set of skills in a new job would indeed indicate the degree of advancement in the labor market. In addition, our research offers a broader scope in the topic than previous literature given our period of analysis – which includes the economic crisis of the late 2000s- and the inclusion of a set of major European recipient countries with diverse sectoral structures.

We present the data and method employed in section 2 and discuss the main findings in section 3. The paper closes with some general conclusions.

2. Data and Methodology

We use yearly data from the European Union Labour Force Survey (EU LFS), conducted in the 28 Member States of the European Union (plus Iceland, Norway and Switzerland). The EU LFS is a large household sample survey providing quarterly results on labour participation of people aged 15 and over as well as on persons outside the labour force. The Labour Force Surveys are conducted by the national statistical institutes across Europe and are centrally processed by Eurostat to make available harmonised data at European level.

2.1 Sample and basic descriptives

Our sample collects cross sectional information from 2005 to 2015 on women aged 20 to 59 living in five European countries that have a significant fraction of immigrants: Spain, Italy, France, Sweden and the U.K. Our choice of age attempts to reduce confounding issues due to either school attendance or retirement choices. In figure 1 we show the increase over time in the fraction of immigrant population in these countries in our weighted sample. Immigration in Italy, the U.K. and Sweden has grown at a similar pace over the period of interest, with substantial increases in the stock of immigrants – approximately 7 percentage points between 2005 and 2015. Spain experienced a similar increase – of about 5 percentage points – between 2005 and 2011, but the immigrant share declined afterwards, whereas France maintained a constant stock of immigrants, between 12% and 14% of the population over the period of analysis.

[Figure 1 here]

Figure 1 is based on the stock of immigrants in each country. To learn about flows we arrange immigrants by period of arrival. The EU LFS only discloses information about year of arrival for the first ten years in the country, and collapses "older" immigrants into a category "more than ten years since arrival". As a result, we then focus on the initial years immigrants spend in the host country, which in any case are the more interesting for our analysis as these are the years where theory predicts a faster rate of assimilation into the labour market. To assess the progression of immigrants in the host country using repeated cross sectional data the literature uses two variables combined - *arrival cohort,* and *years since*

migration - to disentangle the effects of heterogenous arrival groups from those of economic assimilation that happen over time in the destination (Borjas, 1985). We consider three arrival cohorts by grouping arrival years in four years cells of adequate size for econometric analysis: those arriving between 2004-2007, between 2008-2011 and between 2012-2015. In addition to these, we consider immigrants arriving before 2004 as a separate category and include in our models a trend accounting for *years since migration* for the first ten years in destination. We document the distribution of immigrants in our sample by cohort of arrival in Table 1 separately for each country. Italy, Spain and Sweden show similar distributions with 22% to 25 % of immigrants arriving over the last ten years. In Italy and Spain most of these recent immigrants arrived during the mid 2000s, but the flow was reduced almost completely over the last 3 years of the sample, reflecting the depth of the economic crisis affecting these countries. Our U.K. sample includes over 30% of recent immigrants (arriving after 2004), whereas in France only 13% arrived after 2004. In the pooled sample, recent immigrants to the U.K. and Sweden arrived mostly between 2004 and 2011, but there was still some small amount of immigration over the last three years. Table 2 shows the distribution of immigrants in each country by area of origin at the beginning and at the end of the sample to illustrate changes in immigrant composition over the period of study. Not surprisingly, former colonies of Spain, France and the UK influence migration flows to these countries. Spain's main source of immigration is South America, whereas migrants arriving from outside the EU15 to France are predominantly from Africa, and to the UK from Africa and Asia. Finally, border countries with the EU and those with special treatment constitute a substantial portion of immigrants to Italy and Sweden.

[Table 1 and Table 2 here]

2.2 Skill Requirements

We complement demographic and labour market information from the EU-LFS with information about the skill content of the jobs individuals hold. The nature of the work performed in a particular job is a dimension along which the labour force outcomes of immigrant and native-born workers are likely to differ. Considering broad measures of occupational status – such as blue/white collar or managerial/non-managerial jobs – to analyze these differences may miss a substantial part of the heterogeneity within them, but including too finely itemized occupations in the econometric specification is impractical. Autor et al (2003) pioneer the use of the detailed information contained in occupation databases, such as the Dictionary of Occupational Titles (DOT) or the Occupational Information Network (O*NET), to derive a small set of fundamental skill requirements for each job. These measures have the advantage of being limited in range, but to account for variation across very detailed occupational classifications (Autor, 2013). We follow this strategy and construct indexes for the physical strength and analytical content of the jobs individuals hold to perform our analysis on the occupational assimilation of immigrant women. Specifically, we construct, based on the O*Net information, a low-dimensional vector of skill

requirements at the detailed 3-digit occupational category using Principal Component Analysis (PCA). The vector includes two indexes for cognitive skills (social and analytical) and one index for manual skills (physical strength). [4] This classification focuses on a general notion of manual and non-manual skills that we feel is more relevant for immigrant women. It differs from that employed by those who study the routine/non-routine nature of the jobs (Autor et al. 2003) to understand the effect of skill-biased technological change on wage inequality.

We link these indexes to each individual's employment record through 3-digit occupational codes available in the EU_LFS. [5] The index assumes that occupations have similar content requirements across the five countries, which we believe it is quite likely given levels of development and close economic ties between the countries. Note that the indexes measure skills from the demand side of the market, i.e. the skills involved in performing each job, not the actual skills of the worker. The indexes are normalized using the distribution of workers in each country, hence they are easily interpretable: a positive value for the analytical index indicates that a job demands more analytical skills than the job held by the average worker. Further, one unit of the skill score (with mean zero) is equivalent to one standard deviation in the skill distribution of the population.[6]

[Table 3 here]

Table 3 shows the mean and standard deviation (SD) of analytical and physical strength skills for immigrant and native-born women in different countries. While native women consistently employ less physical strength than the average worker in all countries of the sample, immigrant women use more than the average worker except in the UK. In general, immigrant women use less analytical skills and more strength in their jobs than native women. The largest differences are observed in Spain and Italy where immigrants use almost 1 SD less analytical skills and between 0.6 and 0.8 SD more strength skills than the native-born women do. These differences are reduced by half in France and are the lowest in the UK. Figure 2(a) and 2(b) show the full distribution of analytical and physical strength skills respectively.[7]

[FIGURE 2 here]

It is worth noting that these differences in terms of the aggregated skills required by the jobs of immigrants and the native born across the five countries in our sample are likely related to the economic

[4] For the sake of space, we do not report here the analysis of social skills since these results are very similar qualitatively to those of analytical skills. These estimates are available upon request.

[5] We used the crosswalk and codes prepared by the Institute for Structural Research *(www.ibs.org.pl/resources).*

[6] The principal component analysis calculates factor loadings so that they maximize the variation of the data explained by index.

[7] The graphs for social skills are similar to those of analytical skills and are available upon request.

structure of those countries. Table 4 shows the distribution of female workers by aggregated industry and immigrant status. On average women are more likely to work in the retail and hospitality and the service than in the rest of the sectors (from 79% to 89% of native born women, and 84% to 89% of immigrant women). The distribution of workers between the retail-hospitality industry and other services is similar across countries, except in Spain where the retail-hospitality industry is substantially larger than in other countries, particularly among immigrants (in Spain, 30% of immigrant women work in this industry, versus 14% to 20% in the other countries in the sample). Sweden and France are the two countries where the distribution of workers across industries is the most similar between immigrant and native-born women. In Italy and Spain, more immigrant women work in services than manufacturing, relative to the native born, whereas in the UK a slighter higher fraction of immigrant work in manufacturing, relative to the native-born. Further, besides the employment compositions just described, immigrants and native born perform different jobs within industries, according to the average level of skills their jobs require (see Table 5).

[Table 4 and 5 here]

A final point of interest concerns the human capital that immigrants bring to the host country. Despite obstacles regarding credential recognition or discrimination, the higher the amount of pre-existing level of human capital of immigrants, the easier it should be for them to acquire local human capital in the country of destination and integrate in the labour force of the host country. Table 6 shows the distribution of education of immigrants and native born. The EU LFS considers three levels of education (low secondary, upper secondary and tertiary education). The fraction of low educated immigrants in Spain is similar to that of natives, but the largest fraction of immigrants are middle educated, and less immigrants have tertiary education– relative to the native born. Immigrants to Italy have very similar levels of education than the native born, whereas immigrants to the UK are better educated than natives. In contrast, immigrants to France and Sweden have relatively lower levels of education. In particular, there is a large fraction of immigrants to these two countries in the lowest education category - 44% in France (versus 23% native born) and 29% in Sweden (versus 12% native born).

[Table 6 here]

2.3. Empirical Specification

Our basic specification mimics a common Mincer equation that measures either factors influencing the likelihood of labour force participation or the level of skills used in jobs held by workers.[8] The main

[8] Unfortunately, the EU LFS does not include good earnings measures, but rather income deciles, and does not allow a more complete picture of labor market performance.

variables of interest in the model are those related to immigrant characteristics. In particular, we are interested in assessing the labour market performance progression of immigrant women over the first ten years in the country.

$$Skill_i = X_i\beta_1 + \beta_2 \sum_j C_j + \beta_3 \sum_{y=1}^{10} Ysm_y + \beta_4 \sum_j F_i + \epsilon_i \qquad (1)$$

The dependent variable ($skill_i$) is a measure of the skill index, analytical, social or physical strength, associated to the job of individual i (alternatively, whether the woman works or not). The vector X_i contains standard individual demographic characteristics such as marital status, age and education, as well as indicators for area of origin of immigrants. We measure the influence of timing of arrival on the level of job skills with indicators for arrival cohorts, C_j, j =*2004-07, 2008-11, 2012-15,* and a trend for the first ten years since migration (Ysm_y, *y=0,1,.. 10*), where the 0 corresponds to the native born. We also include a separate indicator for immigrants arriving more than ten years and for those arriving before 2004. Area of origin indicators net out additional immigrant heterogeneity that relates to the cultural background, including the quality of the home country institutions, such as the availability and quality of education. These will play an important role on economic assimilation, as the closer the country of origin is in terms of economic development, institutions and culture to the host country, the lower the expected depreciation of immigrant's human capital upon arrival. We classify immigrants as coming from (1) other countries within the European Union as of January 2004 (EU15); (2) a country that became a Union member between May 2004 and July 2013 (EU28); (3) a non-member European countries (Other Europe); (4) North Africa and Middle East; (4) Other Africa; (5) Asia; (6) South and Central America or (7) North America and the Pacific.[9] In some models we include a vector of controls, F_i, related to the nature of the job and the firm in which the individual works, such as firm size, tenure, part time, industry, and whether the worker was overqualified for the job.[10]

3. Results

3.1. Labour Force Participation

[9] EU28 includes 10 countries joining between May 2004 and December 2006 (Cyprus , Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta , Poland , Slovakia and Slovenia) two countries joining between January 2007 and June 2013 (Bulgaria and Romania); and one country joining after July 2013 (Croatia). It is worth noting that these countries typically enjoyed preferential trade agreements and mobility of factors prior to becoming members. Other European countries no-in the Union are Iceland, Liechtenstein, Norway, Switzerland, Montenegro, The former Yugoslav Republic of Macedonia, Albania, Serbia, and Turkey

[10] We construct the overqualification indicator following Arranz, et al. (2017), by assigning educational levels to occupational groups at two digits level of the National Classification of Occupations. If the individual's educational attainment is higher than that required by the occupation, then we consider that there is over-qualification (or sub-employment)

We start by looking at factors correlated with female participation in the labour market across Europe using a version of equation (1) where the dependent variable is an indicator of labour force participation, and the vector *F* is omitted. The destination countries in our sample vary by many institutional factors that result in different levels of female participation in the labour force. For instance, female labour force participation in Italy is relatively low among natives (60%) relative to the other countries in the sample that show native participation rates between 72% (in Spain) and 87% (in Sweden).[11] To distinguish these from factors related to the cultural background of immigrants that may also influence participation of immigrant we include controls for area of origin. Hence, our estimates of participation by arrival cohort and years since migration relative to the native born hold constant the host country institutions and the cultural background of immigrants, and cannot be compared across regressions. These results are shown in Table 7.

[Table 7 here]

The basic demographic factors considered in the model have the expected signs. Relative to the youngest women, participation increases during prime age (25 to 44) and declines thereafter. Education significantly boosts participation in all countries. Single and married women participate less than widowed/separated women (the omitted category) do, although these differences are more noticeable in Spain and Italy, and almost insignificant in the UK. Finally, women with young children are less likely to participate - particularly in France and in the UK.[12]

Our interest lies in studying the differences in participation between similar native-born and immigrant women. In accordance with the human capital theory outlined above, immigrants experience upon arrival a gap in participation relative to the native born. This is likely due in part to human capital depreciation, lack of credentials and networks. Not surprisingly, this gap is moderate for the cohorts arriving between 2004 and 2007, a time of economic prosperity and wider for those arriving between 2008 and 2015, a time of economic turmoil in Europe. Further, the coefficient of years since migration is positive, indicating that the first ten years spent in the country gradually increase participation (approximately, 1% per year in Spain, Italy and the UK, and 2% and 4 % per year in France and Sweden respectively). The speed at which the gaps close is somewhat larger in the countries where migrant's participation is the lowest at arrival. This fact may be related to differences between France and Sweden (with gaps between 25-35% relative to natives at arrival) versus Spain and Italy in terms of the mechanisms of entry into the labour market, which are more informal in the latter group of countries.

[11] See Table 6.

[12] We classify marital status as married (or in a legal partnership), single-never married, and widowed/separated. "Married/legal partnership" is defined according to the local laws that define cohabitation in the country. Individuals in a first partnership that is not officially registered will appear as "Single"

Further, in the case of Sweden it could derive from the relative large share of refugees among the earlier arrival cohorts and the potential delay of entry in the labor market of those migrants as opposed to traditional economic migrants. It is worth noting that substantial participation gaps exist for the older cohorts (arriving before 2004) and that after the first ten years since migration, participation does not continue to increase (except in France), at least for cohorts arriving before 2004.[13]

Note that there exist considerable heterogeneity in terms of the participation by country of origin. Immigrants participate to a higher degree in Spain and Italy than the native born do, except for those from North Africa and the Middle East. However, this is not the case in France and Sweden where immigrant women participate substantially less than the native born. In the UK, immigrants from the extended EU, South and Central America and North America and the Pacific participate equally or more than the native born.

3.2 Skill progression of recent immigrants.

Next, table 8 presents results for the relationship between skills used in jobs and time spent in the country by immigrants of different arrival cohorts. For each country, we show two specifications of equation (1) one including only demographic controls (labeled (I)) and a second one, labeled (II), that includes demand side controls (F). Whereas many of these variables are arguably endogenous, we believe it is interesting to address how considering them affects the estimates for skill progression of immigrants.

[Table 8]

In terms of strength skills, the average position of immigrant women at the time of arrival, relative to native-born women, varies by country of destination as displayed in Panel A. Immigrant women to Spain show a substantial initial negative gap in strength skills, between 0.1 and 0.3 standard deviations less strength, relative to native-born women, whereas immigrants to Italy show small positive gaps, mostly no significant, for cohorts arriving after 2004. Immigrants to France show positive gaps, meaning that these immigrants work, on average, at jobs requiring more strength skills than the average native born does. However, the positive gaps become not significant once we control for demand side factors. This indicates that selection into different types of jobs is probably at the root of this gap. The same is true in the case of the UK, where the significant positive differences in strength skills vanish when we include controls for types of jobs, tenure, over-qualification, etc... In Sweden, there are no significant differences between the two groups.

[13] Of course, our indicator of more than 10 years since migration does not isolate cohort effects from assimilation for "older" immigrants

Further, the coefficient of the trend variable for the *first ten years since migration* is positive in all specifications though not significant in Sweden or in the UK (where it is essentially zero). The estimates indicate that, since it departs from a negative position, the gap shrinks in the case of Spain during those first ten years close to 2% annually, but it increases further for immigrants in the rest of the destination countries that already depart from similar or higher levels of strength than natives at arrival. For instance, an immigrant arriving in 2004 to Spain, would initially work in a job requiring 0.1 SD less strength skills than the average native born, but will on average work a job with similar level of skills after 7 years in Spain (-0.115 +0.018*7 = 0.01). An immigrant arriving the same year in Italy would initially work a job with the same skills as the average native born but will work, after 7 years, a job requiring 0.2 standard deviations more strength than the average native born. France shows a smaller rate of change in skills, still significant at 0.015 per year, in this case to further increase the gap. Sweden and the UK do not show significant rates of change in the strength skills during the first ten years. The interpretation of these differences needs to be cautious. Over the last years, as noted, European countries underwent major economic recession with growing unemployment, particularly in Southern countries. Thus, whether the closing of the gap in terms of strength requirements between natives and immigrants in Spain is the result of true progress or rather of changing composition of employment opportunities and rising unemployment in strength-intensive sectors is a matter that deserves further analysis.

Panel B in table 8 reports similar results for analytical skills. Results regarding initial gaps are common to all immigrants and indicate substantial gaps in analytical skills required by the jobs immigrants held, relative to the native born. In Spain and Italy, somewhat surprisingly, it is possible to appreciate a change in the average level of analytical skills in jobs performed by immigrants for the last cohort. The gap substantially declines to the point of being no longer statistically significant. Another distinctive feature of immigration to Spain and Italy is the apparent progression of immigrants during the initial years in these countries. To continue with the above example, an immigrant arriving in Spain in 2004 initially works in jobs requiring 0.4 SD less analytical skills than those required in jobs held by the average native-born women; after ten years in Spain the difference between the jobs of the two groups is only 0.08 SD (-0.395+0.032*10 =-0.075). Similarly, a 2004 immigrant to Italy will reduce the initial gap in analytical skills by 2/3 after ten years in Italy (from -0.31 SD to -0.1 SD). The same is true for France and Sweden, although the rates of progression in analytical skill content are somewhat slower, and the initial gaps larger, in these countries. Finally, in the UK there does not seem to be a significant change in analytical skills with time spent in the country. The results for social skills are similar qualitatively to analytical skills and we do not report them here for the sake of space, but they are available upon request.

These OLS estimates are likely biased, because women that work are typically a selected sample of all women. We use a Heckman regression model on a version of equation (1) that does not include the

marital status or presence of children indicator and use these variables instead as a source of variation to determine employment. Our selection equation includes also age indicators, cohort of arrival, country of origin and education. To the extent that marital status and the presence of young children determine employment, the resulting estimates are free of selection bias and can be interpreted as those resulting from observing a random female worker. Table 9 shows our Heckman estimates of the progression of analytical and strength skills with time spent in the country by immigrants of different arrival cohorts. The first column for each country shows the main equation estimates and the second column, labelled employment, shows the coefficients for the selection equation. The coefficient of lambda summarizes the selection process; a significant lambda suggests that the sample is indeed biased.

[Table 9 here]

Regarding analytical skills, selection is present in Spain, Italy and France. The Heckman estimates of skills at entry indicate a larger gap than the OLS estimates did, suggesting that women with higher potential to work in high analytical skill jobs are also more likely to be in the labour force. In the case of strength skills, selection appears to exist in all countries. The Heckman coefficients for strength skills are indeed larger, particularly for Spain, which now change sign and become positive for the most recent cohorts. According to these, a random female would hold, upon entry in Spain, a job that requires more strength skills than the average native-born worker. Results for other countries are closer to the original results in table 8. We take these results to suggest that in general, immigrant women initially in the labour force take jobs that are "better" in terms of requiring more analytical and less strength skills than the average immigrant women would be able to hold. This seems to be particularly true in Mediterranean countries, notably in Spain.

3.2. The role of education

A final point of interest concerns the possibility that progression in job skills is linked to immigrant's human capital and that immigrants with high levels of education/experience have better outcomes relative to similar natives than those without them. This is a straight forward implication of the human capital model, under the assumption that the stock of human capital facilitates further human capital acquisitions and it has inspired the immigration policy of several major host immigrant countries, such as Canada and Australia (Ferrer et al. 2014; Clark et al. 2017). More recently, the UK has also implemented a program along these lines and recent changes in the H1 visa program in the US are based on similar considerations. Despite the general high level of educational attainment among cohorts arriving during the 1990s and 2000s, immigrants to Canada have not reached the expected level of labour market success. A series of papers investigates the possible causes behind this puzzling result and point to the lack of credential recognition, language barriers, and economic conditions at the time of entry as possible mechanisms

among others (See for instance, Duleep and Regets (1999); Hou and Picot (2009), Ferrer and Riddell (2008), Green and Worswick (2012). Adsera and Ferrer (2016 AND WP) focus specifically on the progression Canadian immigrants make in terms of job status using also a measure of job-skill content. Their paper finds that, while no advancement is apparent for the population of immigrants on average, educated immigrants make more rapid progression than their less-educated peers towards jobs similar to those held by similarly-educated native born.

We repeat the same exercise shown in table 8 but using a subsample of high-educated immigrants (those with upper secondary and tertiary education) to see if there is a change in the average skill gap at arrival or in the skill progression of immigrants. We use the version from column (I), table 8 that does not include the demand side controls and present results in Table 10. We do this to avoid to the extent possible the inclusion of too many endogenous variables, although results using that alternative specification are not different qualitatively from the ones presented here.

The first point to note is that our right hand side variables explain much less of the variation in skills for the subsample of high-educated workers than in the sample of all women. In fact, the amount of variation explained in France, Sweden and the UK is minimal, well below 10%, in contrast with estimates for the whole population, which explain between 10% and 60% of the variation in skills. This is particularly true in the case of the models estimating progression in strength, which becomes insignificant in these three countries. In the case of Spain and Italy, we observe substantially lower initial gaps but similar rates of progression as those observed for the general immigrant population (except for analytical in Italy). For instance, in Spain, our proverbial immigrant arriving in 2004 would have worked initially in a job requiring analytical skills 0.37 SD below the average native born, but would, after ten years, work in a job only requiring 0.11SD less analytical skills. A notable fact is that immigrants arriving in Spain after 2008 work in jobs that have (statistically speaking) the same analytical job requirements than those of the native born and the same is true in the case of Italy. Changes in employment opportunities in Southern countries, particularly hit by the construction bust, may have affected the selection of new migrants in the aftermath of the crises and may explain this finding. Note however, that Italian immigrants seem to make no progression in terms of analytical skills.

France and Sweden show little progression in analytical skills, but also smaller and non-significant gaps at arrival, particularly for recent cohorts. The UK shows some significant small gaps for recent cohorts, but a strong progression during the first ten years in analytical skills. This is in contrast with the progression made by older cohorts after more than ten years. These results suggest that high-educated immigrants make significant progress in terms of analytical skills during the first ten years in the country in the case of Spain and the UK. Further, this is also the case for immigrants arriving before 2004 to

Southern Europe if we consider the large and significant coefficient for the indicator of *progression made after more than ten years in the country* (0.20SD in Spain and 0.31SD in Italy).

A somewhat puzzling piece that deserves further investigation is the strong rate of progression in strength skills observed for immigrants to Italy or Spain during the first ten years in the country. This could either reflect true advancement of women in the labor force as they regularize their situation (remember this is more prevalent in Southern Europe and then elsewhere) or be potentially related to the destruction of high-strength skill jobs during the period of the crises that pushed these women either to unemployment, selective return migration or shift to other occupations.

4. Conclusion

We consider the job progression of immigrant women as measured by their labor force participation over time and quality of their jobs in five European countries: France, Italy, Spain, Sweden and the UK. We use data from the repeated cross-sectional European Labour Force Survey (2005-2015) that contains information on the year of arrival, origin and sector of employment.

We combine this data with information about the skills demanded in the jobs held by women, using data from the O*Net, at the 3-digit sector level. In particular, we focus on analytical and strength skills in immigrant´s jobs (as well as social skills, available upon request) and compare them to those required by jobs held by similar native women. Even though immigrants experience upon arrival a gap in participation relative to the native born, they gradually increase participation during the first ten years spent in the country (approximately, 1% per year in Spain, Italy and the UK, and 2% and 4 % per year in France and Sweden respectively). This is consistent with recent research that has shown strong labor market attachment of immigrant women of most recent arrival cohorts in many developed countries. Recent immigrant women show relatively large gaps in the analytical skill content of the jobs they held relative to native-born women across our host countries. In Spain and France, and to a lesser extent in Italy and Sweden, these women also show significant job progression with time in the country. Further, with the exception of immigrants to Spain, they also work, in general, jobs with higher requirements of strength than their native-born counterparts do. We also find differences within countries over the period of analysis that may be consistent with the variation of incentives to move depending on the business cycle at arrival - particularly given the meager opportunities in many destination countries during aftermath of the recent great recession. For instance, after the 2008 crisis, the analytical skill gap closed in Spain, Italy and France, while it increased in Sweden and the UK, countries that were not similarly hit by the crisis. In addition, results for a subsample of educated immigrant women reveal much smaller gaps that are often not statistically significant.

Therefore, our results reveal significant differences across countries of origin, likely related to both differences in labor force participation at origin as well as pathways of arrival (irregular, economic, family reunification or refugee, among others). We believe this deserves particular attention in a future analysis and with a richer dataset.

References

* Adserà, A. and B. Chiswick (2007) “Are There Gender Differences in Immigrant Labor Market Outcomes across European Countries?”, *Journal of Population Economics*, 20 (3), 495–526, 2007

*Adserà and Ferrer, (2016) “Occupational Skills and Labour Market Progression of Married Immigrant Women in Canada”, *Labour Economics* Vol 39, p. 88-98, April.

* Amuedo-Dorantes, C., De La Rica, S., 2007. Labour market assimilation of recent immigrants in Spain. Br. J. Ind. Relat. 45 (2), 257–284

* Antecol, Heather (2000), “An Examination of Cross-Country Differences in the Gender Gap in Labor Force Participation Rates”, Labour Economics 7, pp. 409-426. A

*Arranz, J. M.; García-Serrano, C. and Hernanz, V. (2017), “Employment quality: Are there differences by types of contract?”, Social Indicators Research, 1-28.

* Autor, D., Frank Levy and Richard J. Murnane, (2003). "The Skill Content of Recent Technological Change: An Empirical Exploration," The Quarterly Journal of Economics, Oxford University Press, vol. 118(4), pages 1279-1333.

* Autor, David H., (2013). "The "task approach" to labor markets : an overview," Journal for Labour Market Research, Institut für Arbeitsmarkt- und Berufsforschung (IAB), Nürnberg [Institute for Employment Research, Nuremberg, Germany], vol. 46(3), pages 185-199

*Aydemir, A. and Skuterud, M. (2005) “Explaining the Deteriorating Entry Earnings of Canadian Immigrant Cohorts: 1966-2000”, *Canadian Journal of Economics*, Vol. 38(2), pp. 641-72.

* Baker, Michael, and Dwayne Benjamin (1997) "The Role of the Family in Immigrants' Labor-Market Activity: An Evaluation of Alternative Explanations." *The American Economic Review* 87(4): 705-27.

* Beach, C. and C. Worswick (1993), "Is There a Double-Negative Effect on the Earnings of Immigrant Women?," *Canadian Public Policy*, vol. 19(1), pages 36-53.

* Bevelander, P. and Nielsen, H. S. (2001). “Declining employment success of immigrant males in Sweden: Observed or unobserved characteristics?”’ *Journal of Population Economics*, 14 (3): 455–72.

*Borjas, G., 1985. Assimilation, changes in cohort quality, and the earnings of immigrants. J. Labour Econ. 3 (4), 463–489

* —— (1995). ‘Assimilation and changes in cohort quality revisited: what happened to immigrant earnings in the 1980s?’ *Journal of Labor Economics*, 13, pp. 201–45.

* Blau, F. & L. M. Kahn (2007) “Changes in the Labor Supply Behavior of Married Women: 1980-2000” *Journal of Labor Economics*, vol. 25(3), pp. 393-438

* Blau, F.D., Kahn, L.M., Papps, K.L., 2011. Gender, source country characteristics and labor market assimilation among immigrants: 1980–2000. Rev. Econ. Stat. 93 (1), 43–58

* Clark, K. and Lindley, J. (2005). 'Immigrant Labour Market Assimilation and Arrival Effects: Evidence from the Labour Force Survey'. Sheffield Economic Research Paper Series, No. 2005004, University of Sheffield.

* Chiswick, B. (1986) "Ìs the New Immigration Less Skilled Than the Old?" *Journal of Labor Economics*, 4(2):168-192

* Duleep, H. and M. Regets (1997) "The Decline in Immigrant Entry Earnings: Less Transferable Skills or Lower Ability?" *The Quarterly Review of Economics and Finance*, Vol. 37, special issue, pp. 189-208.

_____. (1999). "Immigrants and Human-Capital Investment." *The American Economic Review*,
* Vol. 89, No.2, Papers and Proceedings, pp. 186-191.

* Ferrer, A.M., and C. Riddell (2008), "Education, credentials and immigrant earnings", *Canadian Journal of Economics*, vol. 4(1), pp. 186-216

* Ferrer, A., G. Picott and C. Riddell (2014), "Canada's Immigration Policy: Recent changes and developments" *International Migration Review*, vol. 48(3), pp.846-867

* Green, D. and C.Worswick (2012) "Immigrant earnings profiles in the presence of human capital investment: measuring cohort and macro effects," Labour Economics, 19(2) April: 241-259.

* Grogger, J. and Hanson, G.H. (2011). "Income maximization and the selection and sorting of international migrants", Journal of Development Economics, vol. 95 (1), pp. 42-57.

* Hou, Feng & Picot, Garnett. (2009). The Effect of Immigrant Selection and the IT Bust on the Entry Earnings of Immigrants. UBC Department of Economics, CLSRN Working Papers.

* Long, James, E. "The Effect of Americanization on Earnings: Some Evidence for Women*." Journal of Political Economy*, June 1990, 88(3), pp. 620-29.

Table 1. Distribution of female immigrants by arrival cohort in the pooled sample

	SPAIN	ITALY	FRANCE	SWEDEN	UK
Arrival Cohort					
Before 2004	75.15	77.63	86.49	78.03	68.51
2004-07	18.45	14.28	6.8	10.27	16.29
2008-11	5.73	7.27	5.12	9.58	11.56
2012-15	0.67	0.83	1.59	2.11	3.64

Source: Authors's tabulations

Table 2. Distribution of female immigrants by area of origin and year

	SPAIN		ITALY		FRANCE		SWEDEN		UK	
	2005	2015	2005	2015	2005	2015	2005	2015	2005	2015
EU15	14.83	12.64	16.85	8.24	25.31	17.6	25.53	14.07	19.76	2.85
New EU members	13.70	16.36	15.33	26.75	3.03	4.15	10.63	10.34	7.57	4.16
Outside EU	4.41	5.86	25.53	26.54	6.57	9.72	20.26	20.16	3.21	0.73
N. Africa	10.95	15.03	10.77	9.22	39.64	37.39	17.66	23.58	3.42	0.82
Other Africa	2.77	2.69	5.69	4.17	13.30	16.52	4.31	8.86	19.97	3.13
Asia	2.37	5.67	9.21	11.37	7.82	8.33	13.45	16.37	30.69	5.53
South America	50.28	40.91	14.23	12.37	2.60	5.54	6.72	5.24	7.08	0.9
North Am./Pacific	0.70	0.84	2.37	1.35	1.71	0.75	1.44	1.39	8.30	1.06
Total	100.00	100	100.00	100	100.00	100	100.00	100	100.00	100

Source: Authors's tabulations

Table 3. Women's jobs mean (Standard deviation) of Analytical and Strength skills

	SPAIN		FRANCE		ITALY		SWEDEN		UK	
	Analytical	Strength	Analytical	Strength	Analytical	Strength	Analytical	Strength	Analytical	Strength
Native Born	-0.005	-0.298	-0.092	-0.192	-0.049	-0.290	0.058	-0.165	-0.016	-0.189
	(1.084)	(0.923)	(1.032)	(0.952)	(0.964)	(0.924)	(0.981)	(0.918)	(0.964)	(0.890)
Immigrant	-0.920	0.282	-0.545	0.068	-1.045	0.490	-0.261	0.088	-0.073	-0.014
	(1.115)	(0.770)	(1.198)	(0.944)	(1.117)	(0.711)	(1.158)	(0.909)	(1.120)	(0.954)

Table 4. Distribution of female immigrant and native-born workers by industry

	SPAIN		FRANCE		ITALY		SWEDEN		UK	
	NB	Immigrant	NB	Immigrant	NB	Immigrant	NB	Immigrant	NB	Immigrant
Primary	1.21	2.89	0.73	0.74	1.68	2.20	0.45	0.40	0.33	0.53
Manufacturing-Utilities	9.59	5.56	9.62	7.39	15.59	11.81	7.04	7.74	6.42	8.49
Construction	1.50	0.66	1.41	1.20	1.20	0.39	1.11	0.70	1.85	1.19
Transportation-communication	2.99	1.92	2.84	2.69	2.75	0.90	3.12	2.18	2.73	3.50
Retail Trade-Hospitality	23.11	30.11	15.71	16.67	18.70	16.93	13.75	13.52	18.44	20.09
Service	61.60	58.86	69.70	71.30	60.07	67.77	74.53	75.46	70.23	66.21
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 5. Women's jobs mean (Standard deviation) Analytical and Strength skill by industry

		SPAIN		FRANCE		ITALY		SWEDEN		UK	
		NB	Immigrant	NB	Immigrant	NB	Immigrant	NB	Immigrant	NB	Immigrant
Primary	A	-0.559	-0.789	-0.222	-0.343	-0.755	-0.851	-0.093	-0.661	-0.315	-0.535
		(0.688)	0.323	0.645	0.645	0.569	0.434	0.827	0.836	0.849	0.885
	S	0.797	1.163	0.483	0.667	1.003	1.195	0.445	0.850	0.241	0.805
		(0.891)	0.377	0.932	0.840	0.825	0.448	0.905	0.657	1.055	0.942
Manufacturing	A	-0.112	-0.483	-0.029	-0.149	-0.252	-0.603	-0.045	-0.392	-0.017	-0.370
Utilities		(0.987)	1.009	0.895	0.961	0.931	0.836	1.025	1.065	0.984	1.130
	S	-0.236	0.123	-0.139	0.026	-0.141	0.402	-0.184	0.289	-0.408	0.214
		(1.061)	0.990	1.083	1.074	1.038	0.883	1.074	1.024	0.998	1.114
Construction	A	0.345	0.004	0.057	-0.155	0.241	-0.137	0.209	-0.238	0.180	0.224
		(0.866)	1.034	0.747	0.887	0.694	0.846	0.961	1.311	0.851	0.953
	S	-1.208	-0.792	-1.067	-0.652	-1.165	-0.594	-0.637	-0.353	-0.852	-0.812
		(0.720)	1.085	0.850	1.095	0.639	1.169	1.009	1.177	0.693	0.755
Retail trade	A	-0.269	-0.726	-0.150	-0.446	-0.255	-0.805	-0.294	-0.655	-0.386	-0.591
Hospitality		(0.779)	0.797	0.792	0.933	0.797	0.818	0.907	1.114	0.895	1.002
	S	-0.019	0.345	-0.150	0.057	-0.066	0.411	-0.075	0.142	0.098	0.269
		(0.751)	0.645	0.845	0.846	0.786	0.660	0.809	0.832	0.762	0.808
Transportation-	A	0.387	0.264	0.164	0.350	0.205	0.121	0.279	0.363	0.120	0.204
Communication		(0.787)	0.751	0.841	0.879	0.727	0.845	0.846	0.978	0.863	0.975
	S	-1.071	-0.958	-0.669	-0.885	-0.881	-0.748	-0.914	-0.948	-0.701	-0.660
		(0.742)	0.826	0.877	0.880	0.744	0.914	0.777	0.827	0.841	0.926
Services-	A	0.097	-1.114	-0.099	-0.652	0.071	-1.209	0.124	-0.190	0.073	0.105
Professional		(1.192)	1.235	1.112	1.270	1.013	1.197	0.980	1.160	0.962	1.106
	S	-0.377	0.271	-0.179	0.116	-0.392	0.525	-0.146	0.087	-0.209	-0.086
		(0.913)	0.745	0.944	0.926	0.886	0.654	0.908	0.889	0.889	0.938

Table 6. Female's education and employment status by immigrant status and country

	SPAIN		ITALY		FRANCE		SWEDEN		UK	
	NB	Imm.	NB	Imm.	NB	Imm.	NB	Imm.	NB	Imm.
Education										
low	40.94	38.96	38.19	41.01	22.91	43.5	11.64	29.08	26.31	21.84
medium	22.68	35.27	44.98	44.39	43.61	29.76	49.73	34.73	39.2	37.13
high	36.38	25.77	16.83	14.6	33.47	26.74	38.63	36.19	34.49	41.04
Labour force Status										
Employed	59.63	57.78	53.97	52.87	72.6	54.54	82.98	62.34	74.56	61.85
Unemployed	12.69	19.16	5.86	9	6.44	9.76	4.31	10.67	3.85	5.53
Inactive	27.67	23.06	40.16	38.13	20.96	35.7	12.71	26.99	21.59	32.62

Table 7 Female Labour force participation relative to similar native born (p-val in brackets)

	Spain	Italy	France	Sweden	UK
Arrival cohort					
Before 2004	-0.088***	-0.105***	-0.269***	-0.363***	-0.095***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
2004-07	-0.079***	-0.124***	-0.260***	-0.335***	-0.091***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
2008-11	-0.115***	-0.139***	-0.271***	-0.310***	-0.142***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
2012-15	-0.203***	-0.221***	-0.292***	-0.298***	-0.192***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Years since migration [1 to 10]	0.011***	0.008***	0.024***	0.036***	0.008***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
More than 10 years since migration	-0.037***	-0.033***	0.012**	-0.050***	-0.018**
	[0.000]	[0.000]	[0.013]	[0.000]	[0.012]
Area of origin (Europe 15 omitted)					
Additional EU members	0.137***	0.132***	-0.042***	-0.002	0.082***
	[0.000]	[0.000]	[0.000]	[0.489]	[0.000]
Other Europe	0.037***	0.075***	-0.211***	-0.058***	-0.173***
	[0.003]	[0.000]	[0.000]	[0.000]	[0.000]
North Africa – Middle East	-0.085***	-0.060***	-0.150***	-0.151***	-0.304***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Other Africa	0.105***	0.152***	-0.010***	-0.047***	-0.037***
	[0.000]	[0.000]	[0.004]	[0.000]	[0.000]
Asia	0.050***	0.066***	-0.115***	-0.035***	-0.184***
	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
South/Central America	0.161***	0.119***	-0.099***	-0.009**	-0.013
	[0.000]	[0.000]	[0.000]	[0.029]	[0.162]
North America-Australia	-0.011	-0.023***	-0.059***	-0.020**	-0.013
	[0.725]	[0.003]	[0.000]	[0.014]	[0.137]
Age (20 to 29 omitted)					
30-49	0.112***	0.239***	0.164***	0.118***	0.034***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
50-59	-0.046***	0.117***	0.056***	0.092***	-0.037***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Education (Lower Secondary omitted)					
Upper Secondary	0.097***	0.222***	0.121***	0.126***	0.174***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Tertiary	0.250***	0.356***	0.205***	0.184***	0.265***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Marital status (other omitted)					
Single	-0.056***	-0.071***	-0.029***	0.025***	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.674]
Married/Legal Partnership	-0.142***	-0.159***	-0.044***	0.050***	0.014***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Children under 3	-0.047***	-0.056***	-0.146***	(1)	-0.183***
	[0.000]	[0.000]	[0.000]		[0.000]

Constant	0.634***	0.398***	0.617***	0.631***	0.628***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	471,878	1,846,409	1,257,784	900,236	306,983
R-squared	0.106	0.118	0.095	0.085	0.104

(1) This information is not available for Sweden

*** p<0.01, ** p<0.05, * p<0.1

qq

Table 8. Skill gaps at arrival and skill required in jobs held (relative to the native born. OLS estimates**)**

	SPAIN		ITALY		FRANCE		SWEDEN		UK	
Panel A. Dependent variable: Strength skills										
Arrival cohort										
Before 2004	-0.239***	-0.331***	-0.092*	-0.347***	-0.018	-0.082	-0.041	-0.147	0.025	0.041
	[0.000]	[0.000]	[0.081]	[0.000]	[0.807]	[0.180]	[0.740]	[0.173]	[0.477]	[0.153]
2004-07	-0.115***	-0.177***	0.004	-0.121***	0.111*	-0.006	0.064	-0.064	0.059*	-0.016
	[0.001]	[0.000]	[0.929]	[0.006]	[0.081]	[0.915]	[0.570]	[0.512]	[0.058]	[0.535]
2008-11	-0.099**	-0.065*	0.057	0.041	0.244***	0.078	0.008	-0.108	0.073**	-0.027
	[0.023]	[0.083]	[0.267]	[0.367]	[0.000]	[0.117]	[0.936]	[0.186]	[0.015]	[0.273]
2012-15	-0.299***	-0.265***	0.034	0.062	0.285***	0.135	0.025	-0.107	0.166***	0.015
	[0.007]	[0.005]	[0.813]	[0.622]	[0.002]	[0.106]	[0.863]	[0.388]	[0.000]	[0.669]
Ysm [1 to 10]	0.018***	0.025***	0.029***	0.043***	0.015*	0.013*	0.017	0.023*	0.000	0.002
	[0.000]	[0.000]	[0.000]	[0.000]	[0.092]	[0.075]	[0.273]	[0.088]	[0.994]	[0.536]
+10 ysm	-0.079***	-0.027	-0.155***	-0.082***	-0.051	0.034	-0.176**	-0.115*	-0.119***	-0.129***
	[0.001]	[0.172]	[0.000]	[0.001]	[0.222]	[0.337]	[0.019]	[0.081]	[0.000]	[0.000]
Demographic [1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demand side controls [2]		Yes		Yes		Yes		Yes		Yes
Observations	72,327	72,313	78,478	78,478	110,533	109,678	19,371	19,034	120,147	119,417
R-squared	0.288	0.482	0.272	0.442	0.149	0.401	0.107	0.348	0.054	0.369
Panel B. Dependent variable: Analytical skills										
Arrival cohort	(I)	(II)	(I)	(II)	(I)	(II)	(I)	(II)	(I)	(II)
Before 2004	-0.387***	-0.265***	-0.476***	-0.216***	-0.549***	-0.405***	-0.404***	-0.235**	0.120***	0.089***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.019]	[0.000]	[0.001]
2004-07	-0.395***	-0.270***	-0.314***	-0.184***	-0.527***	-0.329***	-0.560***	-0.368***	-0.132***	-0.049**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.033]
2008-11	-0.216***	-0.192***	-0.135***	-0.107**	-0.513***	-0.251***	-0.380***	-0.214***	-0.188***	-0.080***
	[0.000]	[0.000]	[0.009]	[0.014]	[0.000]	[0.000]	[0.000]	[0.005]	[0.000]	[0.000]
2012-15	-0.100	-0.075	-0.060	-0.053	-0.385***	-0.183**	-0.417***	-0.218*	-0.322***	-0.161***
	[0.406]	[0.473]	[0.682]	[0.664]	[0.000]	[0.018]	[0.002]	[0.057]	[0.000]	[0.000]
Ysm [1 to 10]	0.032***	0.025***	0.020***	0.008	0.019**	0.019***	0.026*	0.016	-0.000	-0.004
	[0.000]	[0.000]	[0.001]	[0.115]	[0.027]	[0.007]	[0.066]	[0.192]	[0.931]	[0.207]
+10 ysm	0.086***	0.034	0.215***	0.108***	0.126***	-0.006	0.167**	0.095	-0.057**	-0.029

	[0.001]	[0.132]	[0.000]	[0.000]	[0.002]	[0.850]	[0.018]	[0.118]	[0.023]	[0.130]
Demographic [1]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Demand side controls [2]		Yes		Yes		Yes		Yes		Yes
Observations	72,327	72,313	78,478	78,478	110,533	109,678	19,371	19,034	120,147	119,417
R-squared	0.446	0.583	0.388	0.572	0.334	0.587	0.353	0.534	0.256	0.578

(1) Demographic characteristics include indicators for age, country of origin, education, marital status and presence of children under 3, as in table 5
(2) Demand side controls include term contract indicator, part time indicator, tenure, industry and an indicator for the worker being under or adequately qualified, years of tenure and sector of activity (omitted category are primary sector or manufacturing workers

Table 9. Skill gaps at arrival and skill progression of immigrants (Heckman estimates**)**

	SPAIN		ITALY		FRANCE		SWEDEN		UK	
	Analytical	employed	Analytical	employed	Analytical	employed	Analytical	employed	Analytical	employed
Arrival cohort										
Before 2004	-0.479***	-0.110***	-0.584***	-0.196***	-0.500***	0.018	-0.392***	-0.167***	0.105***	-0.107***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.361]	[0.000]	[0.001]	[0.002]	[0.000]
2004-07	-0.480***	-0.222***	-0.427***	-0.308***	-0.496***	-0.398***	-0.567***	-0.645***	-0.114***	-0.183***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
2008-11	-0.343***	-0.575***	-0.264***	-0.471***	-0.502***	-0.567***	-0.373***	-0.752***	-0.182***	-0.435***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
2012-15	-0.246**	-0.704***	-0.187	-0.934***	-0.405***	-0.774***	-0.385***	-0.849***	-0.303***	-0.565***
	[0.027]	[0.000]	[0.180]	[0.000]	[0.000]	[0.000]	[0.004]	[0.000]	[0.000]	[0.000]
Ysm [1 to 10]	0.038***		0.026***		0.014*		0.027**		-0.002	
	[0.000]		[0.000]		[0.084]		[0.049]		[0.680]	
+10 ysm	0.117***		0.240***		0.139***		0.144**		-0.029	
	[0.000]		[0.000]		[0.000]		[0.036]		[0.237]	
Lambda	0.183***		0.188***		0.058***		-0.027		-0.020	
(Standard error)	(0.025)		(0.019)		(0.015)		(0.058)		(0.019)	
	Strength	employed	Strength	employed	Strength	employed	Strength	employed	Strength	employed
Arrival cohort										
Before 2004	-0.157***	-0.056**	0.001	-0.196***	-0.036	0.015	-0.071	-0.167***	0.012	-0.108***
	[0.000]	[0.014]	[0.979]	[0.000]	[0.599]	[0.448]	[0.541]	[0.001]	[0.726]	[0.000]
2004-07	0.036	-0.192***	0.097**	-0.308***	0.062	-0.401***	0.007	-0.645***	0.035	-0.184***
	[0.325]	[0.000]	[0.040]	[0.000]	[0.313]	[0.000]	[0.946]	[0.000]	[0.245]	[0.000]
2008-11	0.337***	-0.470***	0.170***	-0.469***	0.198***	-0.572***	-0.067	-0.752***	0.055*	-0.436***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.464]	[0.000]	[0.055]	[0.000]
2012-15	0.312***	-0.526***	0.123	-0.931***	0.155*	-0.776***	-0.059	-0.850***	0.133***	-0.565***
	[0.006]	[0.000]	[0.352]	[0.000]	[0.085]	[0.000]	[0.678]	[0.000]	[0.001]	[0.000]
Ysm [1 to 10]	0.018***		0.024***		0.016*		0.017		0.002	
	[0.000]		[0.000]		[0.063]		[0.225]		[0.705]	
+10 ysm	-0.062***		-0.170***		-0.055		-0.168**		-0.119***	
	[0.000]		[0.000]		[0.168]		[0.020]		[0.000]	
Lambda	-1.116***		-0.206***		0.101***		0.174***		0.089***	

(Standard error)	(0.004)	(0.031)	(0.034)	(0.051)	(0.022)
Observations	450,176	1,839,487	394,956	895,265	280,524

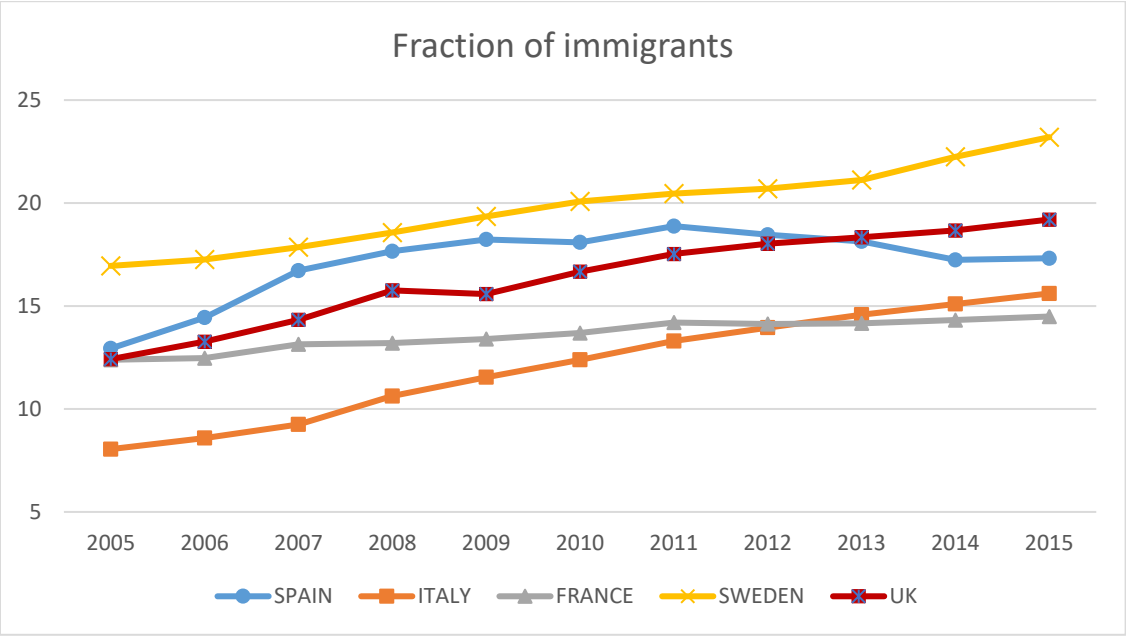
Table 10. Skills gaps at arrival and skill progression for educated workers (OLS estimates**)**

	SPAIN		ITALY		FRANCE		SWEDEN		UK	
	Analytical	Strength	Analytical	Strength	Analytical	Strength	Analytical	Strength	Analytical	Strength
Arrival cohort										
Before 2004	-0.413***	-0.296***	-0.332***	-0.046	-0.274***	-0.107	-0.108	-0.078	0.072*	0.013
	[0.000]	[0.000]	[0.000]	[0.487]	[0.004]	[0.247]	[0.451]	[0.566]	[0.065]	[0.723]
2004-07	-0.373***	-0.164***	-0.251***	0.076	-0.289***	0.015	-0.261**	-0.014	-0.128***	0.021
	[0.000]	[0.000]	[0.000]	[0.229]	[0.000]	[0.849]	[0.047]	[0.912]	[0.000]	[0.531]
2008-11	-0.075	-0.211***	-0.081	0.098	-0.226***	0.111	-0.076	-0.100	-0.115***	0.022
	[0.233]	[0.000]	[0.222]	[0.130]	[0.002]	[0.125]	[0.488]	[0.341]	[0.001]	[0.481]
2012-15	0.185	-0.510***	-0.057	0.064	-0.096	0.134	-0.104	-0.102	-0.171***	0.109**
	[0.216]	[0.000]	[0.765]	[0.730]	[0.409]	[0.238]	[0.541]	[0.530]	[0.000]	[0.012]
Ysm [1 to 10]	0.024***	0.028***	0.004	0.029***	0.018	0.006	0.013	0.014	0.024***	-0.006
	[0.000]	[0.000]	[0.618]	[0.000]	[0.130]	[0.627]	[0.474]	[0.421]	[0.000]	[0.147]
+10 ysm	0.199***	-0.156***	0.312***	-0.211***	0.057	0.011	0.079	-0.140	-0.143***	-0.099***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.304]	[0.839]	[0.380]	[0.102]	[0.000]	[0.000]
Observations	50,200	50,200	57,381	57,381	87,093	87,093	17,255	17,255	98,121	98,121
R-squared	0.201	0.112	0.212	0.133	0.019	0.014	0.081	0.041	0.051	0.024
Demographic (1)	Yes									
Demand side (2)	No									

(1) Demographic characteristics include indicators for age, country of origin, education, marital status and presence of children under 3, as in table 5

(2) Demand side controls include term contract indicator, part time indicator, tenure, industry and an indicator for the worker being under or adequately qualified, years of tenure and sector of activity (omitted category are primary sector or manufacturing workers)

Figure 1. Fraction of immigrants by country and sample year



Source: Authors' tabulation

Figure 2a. Distribution of Analytical skills by country

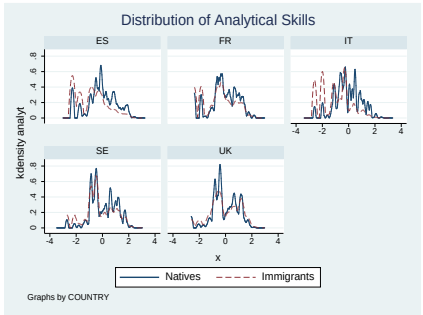

Distribution of Analytical Skills
ES
FR
IT
SE
UK
kdensity analyt
0
.2
.4
.6
.8
-4
-2
0
2
4
x
Natives
Immigrants
Graphs by COUNTRY

Figure 2b. Distribution of Physical Strength skills by country