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Regional Differences in the Labor Market Impact of Immigration: Evidence from Spain

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I. Introduction

How immigration affects the labor market of the host country is a topic of major concern for many immigrant-receiving nations. Spain is no exception following the rapid increase in immigrant flows experienced over the past decade. In 1991, only 1.2 percent of the Spanish adult population (about 300,000 individuals) was foreign-born. Within a decade, this percentage quadrupled to 4.0 percent (1,370,000 individuals) and, by 2005, it reached 8.0 percent (3,100,000 individuals). Not surprisingly, about 60 percent of Spanish citizens declared immigration as their main social concern, before unemployment, housing and terrorism (CIS, September 2006). Yet, immigration concerns vary by region along with the geographic distribution and impact of immigrants. Indeed, most immigrants are concentrated in a few Spanish regions that absorb about 83.5 percent of the immigrant flow and where immigrants represent up to 17 percent of the adult working population, i.e. Andalucía, Balearic Islands, Canary Islands, Cataluña, Valencia, Madrid and Murcia (see Tables 1 and 2).

How has immigration affected Spanish natives? And, does this impact differ substantially by region? In this paper, we address these two questions with an analysis of the impact of recent immigration flows to the Spanish economy while taking into account regional differences. As in the Hecksher-Olin Model, where trade raises national income if the factor shares in the trading partner differ from those in the home country, immigration raises income inasmuch the skill shares of the inflow of immigrants differ from those of natives. The greater the difference between the skill shares of natives and immigrants, the greater the increase in income will be. This implies that the increase in income depends on the degree of substitutability between natives and immigrants, with an underlying redistribution of income from groups of natives to those of incoming immigrants with similar skills as well as to groups of immigrants and natives with complementary skills. It is this income redistribution that often lies behind anti-immigration sentiments and, more importantly, substantiates the need to gain a better understanding of the consequences that immigrant concentration may have on the well-being of natives at the regional and national levels.

To date, most studies concerning the effects of immigration on natives on account of the differential skill share between immigrant and native groups have focused on the impact of immigration on the national economy (e.g. Altonji and Card 2001; Card 2001; Borjas 1995, 2003; Ottaviano and Peri 2005, 2006). Peri (2006) is an exception with its focus on the effect of immigration on natives' wages in California. The present study follows this literature and computes the net immigration surplus (IS) accruing to the various Spanish regions on account of the uneven distribution of immigrants throughout Spain and the regional variation in skills between immigrants and natives. At the core of these figures lays a crucial policy question regarding the role of immigration in balancing out differences in the supply of specific skills across regions and, in that manner, in reducing regional labor market disequilibria.

The rest of the paper is organized as follows: Section II provides a description of the data we will be using in our analysis and Section III discusses some descriptive evidence on the regional distribution by skill level of the foreign-born relative to natives. Section IV presents the production function we use in our structural approach to estimate the IS in each of the main immigrant-receiving regions as well as at the national level. Results and shortcomings of the analysis are discussed in Sections V and VI, respectively, whereas Section VII concludes the study.

II. Data

In our analysis, we use the 2001 Census data. The Census has the advantage of, in principle, interviewing all immigrants regardless of their legal status. Nonetheless, we are aware that an important fraction of unauthorized immigrants may not fill in the questionnaire and, as such, this group is likely to be under-represented in the Census. The Census gathers information on personal and demographic characteristics (such as age, education or province of residence). This information is used to group individuals into education and experience (proxied using age and educational attainment) cells.

However, the Census is limited with respect to the list of variables for which data are compiled. For instance, it lacks information on where respondents completed their schooling; as such, we are left to assume that, for our group of recent migrants, this is likely to have taken place in their countries of origin.[1] Additionally, the Census does not contain any data on language skills or on the nationality of respondents' parents and grandparents. As such, we define immigrants as individuals reporting a foreign nationality. More important to the study at hand is the lack of information on labor earnings in the Census. To supplement this shortcoming, we rely on wage data from the 1995 and 2002 Earnings Structure Surveys –known by their acronyms of EES-95 and EES-02. These surveys include random samples of establishments in the manufacturing, construction and service industries. Additionally, we make use of the 1995 and 2002 Current Population Surveys, which contain detailed information on employment and immigration for those two years –data we rely upon to compute employment and wages for natives and immigrants in various skill groups later on.

III. Some Descriptive Evidence

A) Differences in the Regional Distribution of Immigrants and Natives

The figures in Table 1 and Table 2 provide testimony of the fast growing presence of immigrants in the various Spanish regions. Specifically, the first three columns of Table 1 display the increasing fraction of the overall adult population –

[1] The Census question regarding the educational attainment of individuals 10 years of age and older is phrased as follows: "What is the highest grade you have completed?"

defined as individuals 16 years of age and older– with a foreign nationality. In certain immigrant-receiving regions, such as Cataluña or Madrid, the percentage of immigrants has grown from 2 percent to around 12 percent in approximately 14 years. As a fraction of the adult working population, the increase is even more pronounced, moving from 2 percent to as much as 17 percent in Madrid or 19 percent in Balearic Islands.

Furthermore, as noted in the Introduction, immigrants are unevenly distributed throughout Spain. The figures in Table 2 show that a few regions, such as Andalucía, Balearic Islands, Canary Islands, Cataluña, Valencia, Madrid and Murcia, concentrate most immigrants. In 1991, these Spanish regions accounted for 78 percent of all immigrants –a percentage that grew to 83 percent by 2001. In contrast, only 65 percent of natives lived in those regions during that period of time.

B) Differences in the Educational and Age Distribution of Immigrants and Natives

The growingly uneven regional distribution of immigrants is, nonetheless, accompanied by small differences in the skill shares of immigrants and natives, both at the national and regional levels. Figures 1 through 12 display the percentage of foreign-born and native workers with a particular educational attainment and in a specific age group –both variables to be used in constructing education and experience groups.

Perhaps the most surprising finding from Figures 1 through 6 is the astonishing similarity education-wise of employed immigrants and natives in Spain. Immigrants seem to have a slight greater presence relative to natives among workers with less than a primary education at the national level (Figure 1) and at the regional level (Figures 2 through 6). Additionally, there are some differences in the relative incidence of immigrants among groups of workers with a secondary or university education in some of the regions being examined but nevertheless, differences are small. For instance, the fraction of immigrants with a secondary education is practically 10 percentage points lower than the corresponding share of natives in Cataluña and Murcia. Likewise, the share of working immigrants with a university degree is about 10 percentage points lower than the corresponding share of working natives in Madrid and Murcia.

How distinct are the age distributions of working immigrants and natives? Figures 7 through 12 address this question. Not surprisingly, immigrants are, overall, younger than natives and, as such, the fraction of working immigrants of a younger age is higher than the corresponding fraction of working natives nationwide (Figure 7). Differences in the age distribution of both groups are particularly acute in Cataluña, Madrid, Murcia, and Valencia (see Figures 9 through 12). For instance, the fraction of working immigrants 25 to 34 years of age is about 10 percentage points higher than the corresponding fraction of natives in all those regions. In contrast, the fraction of employed immigrants 45 years of age and older in those four regions is anywhere between 13 and 20 percentage points lower than the corresponding fraction of natives.

In sum, working immigrants and natives appear to have similar educational attainment, even if they differ with respect to age. This apparent similarity in the distribution of immigrants and natives education-wise can play an important role in shaping the IS, which is proportional to the difference in skill shares between immigrants and natives.

IV. Theoretical Framework

Our main objective is to learn about the gains to native Spaniards from increasing immigrant flows during the past decades. Do natives benefit from immigration? How large are those benefits? And, do these gains from immigration fluctuate by region as a by-product of varying production complementarities between immigrants and natives in each of those regions?

A) Computing the Immigration Surplus

In order to address the aforementioned questions, we make use of simple framework proposed by Borjas (1995, p.21) to estimate the immigration surplus (IS) that accrues to natives. We adapt Borjas' (1995) calculation of the immigrant surplus under the assumption of homogeneous labor to a case of heterogeneous labor where workers can present up to *n* different skills. We assume a production technology that can be described by the following concave and linear homogeneous production function:

$$Q = f\left(K, L_1, \ldots, L_n\right) \qquad (1)$$

where b_i and β_i denote the shares of natives and immigrants, respectively, with a particular skill level *i*, with $i = 1 \ldots n$. Each skill level *i* is defined in terms of educational attainment (k) and experience (j). Educational attainment is measured in eight categories: less than primary, primary, secondary, first level of vocational training, second level of vocational training, high-school, first level of a university education and second level of a university education. Experience, on the other hand, is proxied with age. We distinguish seven age categories: less than 30, 30-34, 35-39, 40-44, 45-49, 50-54 and 55-65.

We make several assumptions about the production function. First, we assume that all capital is owned by natives. Immigrants do not contribute any capital. If they did, the IS accruing to natives would only be smaller as we shall discuss later on. Second, the supply of labor is perfectly inelastic. As noted by Borjas (1995), this assumption only makes the calculation of the IS simpler. Third, we assume that native and immigrant workers within a particular skill *i* are perfect substitutes –an assumption we will double check later. Fourth, we assume that capital is infinitely elastically supplied at a constant rate *r*. This assumption is more realistic than assuming a fixedcapital stock and it implies that all output will be distributed to workers as *r*. Capital owners do not obtain any gain as there is no change in the interest rate, *r*. Finally, we assume that the production function exhibits constant returns to scale. Therefore, the entire output is distributed among workers as *r* is constant. At equilibrium, the price of each of the factors of production has to equal its corresponding value of marginal product and the increase in income accruing to natives following the entry of *M* immigrants (i.e. the increase in national income per unit of output accruing to natives) is given by:

$$IS = \frac{\Delta Q_N}{Q} = (K\frac{\partial r}{\partial M} + b_1 N\frac{\partial w_1}{\partial M} + b_2 N\frac{\partial w_2}{\partial M} + ... + b_n N\frac{\partial w_n}{\partial M})\frac{M}{Q} \qquad (2)$$

Under the assumption that capital is infinitely elastically supplied at a constant rate *r*, we can rewrite equation (2) as:

$$IS = \frac{\Delta Q_N}{Q} = \frac{1}{2}\left[b_1 N\left(\beta_1 - b_1\right)M\frac{\partial w_1}{\partial M} + b_2 N\left(\beta_2 - b_2\right)M\frac{\partial w_2}{\partial M} + ... + b_n N\left(\beta_N - b_N\right)M\frac{\partial w_n}{\partial M}\right] \qquad (3)$$

As in free trade, immigrants create a surplus as long as their skills differ from those of natives, i.e. the IS is positive only when $\left(b_i - \beta_i\right) \neq 0$. Otherwise, owing to the CES assumption, the prices of the various factors of production would remain unchanged (as their relative supplies would remain unaltered) and natives would not gain anything from immigration.

Given that: $\frac{\partial w_i}{\partial M} = \frac{\partial w_i}{\partial L_i}\frac{\partial L_i}{\partial M} = (\beta_i - b_i)\frac{\partial w_i}{\partial L_i}$, we can convert equation (3) into percentage terms and measure the surplus at the average value of M, which yields the following expression for the IS at the national level:

$$IS = \frac{\Delta Q_N}{Q} = -\frac{1}{2}(1-m)m\sum_{i=1}^{n}\frac{(\beta_i - b_i)^2 s_i}{p_i}\sum_{j=1}^{n} e_{ij}$$

(4)

where $m = \frac{M}{L}, s_i = \frac{w_i L_i}{Q}, p_i = \frac{L_i}{L}$, and e_{ij} stands for the (absolute value of the) inverse of factor price elasticity within and across skills. According to equation (4), the IS increases with: (i) the difference in the skill composition of the native and immigrant workforce, (ii) the shares of national income accruing to each skill level, and (iii) the total factor price elasticity (in absolute value), which will be larger when the labor demand is inelastic.

What would be the IS accruing to natives in a particular region *c*? In order to answer this question with a similar formula to the one in equation (4), we make some assumptions. First, we assume that the production function is the same across regions, i.e. e_{ij} is the same across regions. Second, we assume that natives do not move across regions in response to immigrant inflows. This assumption is crucial as, if incorrect, it can lead us to overestimate the labour supply shock caused by the incoming flow of immigrants. Peri (2006) looks at whether this assumption holds in California and does not find evidence of much native mobility. Likewise, we have found no empirical evidence on the inter-regional mobility of natives in Spain. In fact, the inter-regional mobility of Spanish natives has been found to be negligible, with most native mobility taking place within regions (Bentolila 2001). Under these assumptions, the IS for region *c* could be written as:

$$IS(c) = -\frac{1}{2}\left[1 - m(c)\right] m(c) \sum_{i=1}^{n} \frac{(\beta_i(c) - b_i(c))^2 s_i(c)}{p_i(c)} \sum_{j=1}^{n} e_{ij} \qquad (5)$$

B) The Production Function

In order to compute the IS accruing to the main immigrant-receiving regions as well as to the nation as a whole, we need information on $b_i, \beta_i, m, p_i, s_i$ and e_{ij}. The first four parameters can be easily computed using information from the 2001 Census data. However, in order to compute the factor price elasticities $\left(e_{ij}\right)$, we need to make some specific assumptions regarding the technology at hand. Following Borjas (2003), we assume a three-level CES technology. This type of production function imposes certain simplifications. Specifically, we assume that natives and immigrants within the same education-age group are perfect substitutes, with the elasticity of substitution between workers with the same education (or with the same experience) being the same across adjacent educational (or experience) categories. Therefore, under the three-level CES production function, we assume that workers with similar educational attainment are aggregated to form the labor supply of a particular education group. Workers of different educational levels but with the same work experience, as captured by age, are, in turn, aggregated to form the national labor supply. As such, the aggregate production function for the whole economy at time *t* is given by:

$$Q_t = \left[\lambda_{K_t} K_t^{v} + \lambda_{L_t} L_t^{v}\right]^{\frac{1}{v}} \tag{6}$$

where $v = 1 - 1/\sigma_{KL}$, with σ_{KL} being the elasticity of substitution between capital and labor. As suggested by Hamermesh (1993, p.92) and assumed in Borjas (2003), we allow for σ_{KL} to take the value of 1. The lambdas represent time-variant technology shifters, which satisfy that: $\left(\lambda_{K_t} + \lambda_{L\,t}\right) = 1$. The labor aggregate L_t includes workers that differ in their educational attainment and experience and is defined as:

$$L_t = \left[\sum_{k=1}^{4} \theta_{kt} L_{kt}^{\rho}\right]^{\frac{1}{\rho}} \tag{7}$$

where *k* stands each of the educational categories. The parameter ρ is given by: $\rho = 1 - 1/\sigma_E$, where σ_E is the elasticity of substitution across education groups. Within each educational group *k*, we allow for workers with different experience levels to be imperfect substitutes. As such, the labor supply of workers within a particular educational group at a point in time is given by:

$$L_{kt} = \left[\sum_{j=1}^{4} \alpha_{kj} L_{kjt}^{\eta} \right]^{\frac{1}{\eta}} \tag{8}$$

where j are age intervals. The parameter η is given by: $\eta = 1 - 1/\sigma_j$, where σ_j measures the elasticity of substitution between workers with different experience levels but within the same educational group.

One advantage of the three-level CES production function is that the technology can be summarized in terms of three elasticities of substitution: $\sigma_{KL}, \sigma_E, \sigma_j$. As noted by Card and Lemieux (2001), the marginal productivity condition describing the wage for workers in skill group (k, j, t) for this type of production function allows us to get an estimate of σ_j as follows:

$$\log(w_{kjt}) = \delta_t + \delta_{kt} + \delta_{kj} - \left(1/\sigma_j \right) \log L_{kjt} \tag{9}$$

whereas the marginal condition determining the wage of workers in a particular educational group *k* allows us to derive an estimate of σ_E from:

$$\log(w_{kt}) = \delta_t + \delta_{kt} - \left(1/\sigma_E \right) \log L_{kt} \tag{10}$$

In order to estimate equations (9) and (10), we need aggregate data on wages and total employment for each skill category in the various time periods. As noted in the Data section, one important drawback of the Spanish Data is that neither the Census nor the Current Population Survey report wages. All the wage information comes from the Spanish Earnings Structure Surveys in 1995 and 2002. Employment data (as well as data on the number of immigrants, which is used to instrument for employment) for each skill cell is derived from the 1995 and 2002 Spanish Current Population Surveys.

Overall, we have 56 skill cells resulting from 8 educational categories and 7 age groups detailed earlier in the paper. Because we have data for two time periods, i.e. 1995 and 2002, we have a total of 112 observations for the estimation of equation (9) and 16 observations, i.e. 8 educational categories and 2 time periods, for the estimation of equation (10). Because of the limited number of observations available, we do not include interaction terms between education and experience (which imply an additional 56 dummies) in the estimation of equation (9). Instead, and in addition to the time fixed-effects and the interaction terms between time and education in equation (9), we include sets of education, experience, and time interacted with experience dummies (which amount to a total of 22 dummies instead). Equation (10) is estimated as is, that is, with 1 time fixed-effect and 7 interaction terms between time and the educational categories (i.e. a total of 8 dummies) using the 16 observations we have at hand.

We initially estimate equations (9) and (10) using OLS.[2] Subsequently, we account for the endogeneity of the workforce size to wages in a particular cell using the number of immigrants in that cell at the national level as an instrument for the cell's workforce size.[3] Table 3 displays the results from the estimation of equations (9) and (10) at the national and regional levels using OLS and IV techniques. The implied elasticity of substitution across experience (age) groups is approximately 5.3 —a figure not far off from the Card-Lemieux (2001) estimates ranging between 3.8 to 4.9 using U.S. data. However, our point estimate of the elasticity of substitution across education groups is significantly larger in number (about 12.5) than the one found by Borjas (2003) and Katz-Murphy (1992) for the U.S. (between 1.1 and 3.1). Because equation

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[2] We use the logarithm of gross annual earnings as the dependent variable and weight the regressions by the size of each cell. Standard-errors are corrected for clustering at the cell level.

[3] This IV is valid insofar the number of immigrants in a particular cell is independent of the relative wages for the various cell categories. Even if this unlikely, cells with higher relative wages should have a larger number of workers in them and, therefore, we would still have underestimates of the negative impact of a labor supply increase on the average cell wage.

(10) is estimated using only 16 observations, our estimate of the elasticity of substitution among workers with different levels of education is highly imprecise. Indeed, it is not statistically different from zero. Therefore, in the estimation of the IS, we use a value of 1.5 for the elasticity of substitution among workers of different educational attainment.[4]

With estimates for the three elasticities summarizing our production function, we can proceed to compute the factor price elasticities describing the wage impacts of immigration on natives in the same education-experience group, as well as in other education and experience categories. Following Hamermesh (1993), the factor price elasticity is given by:

$$e_{kj,kj} = -\frac{1}{\sigma_j} + \left(\frac{1}{\sigma_j} - \frac{1}{\sigma_E}\right)\frac{s_{kj}}{s_k} + \left(\frac{1}{\sigma_E} - \frac{1}{\sigma_{KL}}\right)\frac{s_{kj}}{s_L} + \frac{1}{\sigma_{KL}} s_{kj} \qquad (11)$$

where $e_{kj,kj}$ are the own factor price elasticities, and s stands for the share of income accruing to each input. Likewise, the cross-factor price elasticities are given by:

$$e_{kj,kj'} = \left(\frac{1}{\sigma_j} - \frac{1}{\sigma_E}\right)\frac{s_{kj'}}{s_k} + \left(\frac{1}{\sigma_E} - \frac{1}{\sigma_{KL}}\right)\frac{s_{kj'}}{s_L} + \frac{1}{\sigma_{KL}} s_{kj'} \qquad (12)$$

and:

$$e_{kj,k'j'} = \left(\frac{1}{\sigma_E} - \frac{1}{\sigma_{KL}}\right)\frac{s_{k'j'}}{s_L} + \frac{1}{\sigma_{KL}} s_{k'j'} \qquad (13)$$

To compute the factor price elasticities summarized in equations (11) through (13), we use a value of 0.7 for the labor's share of income,[5] along with data from the EES-02 to compute income shares for each education-experience group (see Table A in the appendix). Table B in the appendix displays the estimated elasticities. The own elasticities range between -0.1 and -0.3, cross elasticities within an education branch

[4] This value is somewhere in between the mid range of what has been found for the U.S.
[5] See Conesa (2004) for the calibration of the labor share of income in Spain.

fluctuate between -0.01 and -0.1, and cross elasticities between workers with different educational attainments are very close to zero, with an average of 0.001. These elasticities are, overall, smaller than the ones reported by Borjas (2003) for the U.S.

V. Results

To finally estimate the IS at the national and regional levels, we combine the estimated factor price elasticities and labor income shares with information on the parameters $b, \beta, p,$ and m using equations (4) and (5).[6] Table 4 shows the estimated IS at the national and regional levels. In general, the IS remains of a very small magnitude relative to previous estimates found for the U.S. (about 0.1 percent of GDP, see Borjas (1995)). This is true at the national as well as at the regional level.

What may explain the low IS? One of the reasons may be the small differences in the skill distribution between working immigrants and natives. As noted earlier in the paper, immigrants create a surplus as long as their skills differ from those of natives. As shown by Figures 1 through 12 and the figures in the last columns of Table C in the appendix, the skill distribution of immigrants and Spanish natives is not that different, possibly contributing to the small IS. To partially gauge the role played by differences in the skill contribution of immigrants with respect to natives, Table 4 includes the estimates of the IS under two different assumptions regarding the skill distribution of incoming migrants. As can be seen from column (2) in Table 4, the largest increase in the IS occurs when we alter the skill composition of the immigrant flow to a more highly educated immigrant flow. In that event, the IS at the national level rises to about 0.0001 percent of GDP –a magnitude that is doubled in Andalucía (0.0002 percent of GDP), more than tripled in Cataluña and Madrid (0.0003 to 0.00035 percent of GDP, respectively) and sextupled in Murcia (0.0006 percent of GDP). This is not surprising

[6] Table C in the appendix displays the values for the aforementioned parameters at the national level. Values for each of the regions are available from the authors upon request.

given the greater share of income that accrues to more skilled workers and, in any event, suggests that a potential explanation for the small size of the Spanish IS may lay on the skill similarity between immigrants and natives.

Another reason for the low IS may reside in the lower factor price elasticities for Spain relative to the U.S. (see Borjas (2003) for U.S. figures). We thus experiment with imposing a much larger value for the factor price elasticity, i.e. -1. Indeed, we find that the IS more than triples, rising from $2x10^{-6}$ percent of GDP in column (1) to $7x10^{-6}$ percent of GDP in column (4), Table 4. The numbers are, nevertheless, very small. What may, nonetheless, explain the lower factor price elasticity in the Spanish case? Is this a reasonable finding? We believe it is given the higher wage rigidity in Europe and, in particular, Spain, relative to the U.S. The higher wage rigidity in Spain is a by-product of a more regulated wage-setting that occurs through collective bargaining agreements often negotiated at the sector and even national level.

In addition to the two aforementioned reasons, there are a number of assumptions made in the model that could also play a role in the low IS. One example is the assumption that β_i is exogenous. However, the parameter β_i is unlikely to be exogenous as immigrants may locate themselves in regions where their skills are most valued. Therefore, in column (5) of Table 4, we instrument this parameter with the share of immigrants in a particular education-experience category at a national level. The IS figures, however, become slightly smaller and, as such, do not suggest that the endogeneity of β_i is causing an underestimate of the IS.

A third potential explanation for a small IS could be the size of the immigrant shock, i.e. m. The figures in columns (1) through (5) use the 2001 immigrant share in the Spanish workforce. Because much of the increase in immigration has occurred in recent years, we re-compute the IS using the 2006 figures. The figures in column (6) indicate that the IS doubles from 2x10^{-6} percent of GDP in column (1) to 4x10^{-6} percent of GDP in column (6). This is still a small figure. However, it is important to keep in mind that, while immigrants account for up to 40 percent of the workforce in some U.S. regions, in Spain this figure does not exceed 15 percent. A small immigrant shock may not require a significant adjustment in factor prices, i.e. native wages, and, consequently, may yield a low IS.

VI. Limitations of the Computed Immigration Surplus

At this juncture in the paper, it is worth discussing a couple of limitations in the computation of the IS. A first limitation comes from the assumption of identical factor price elasticities across the various Spanish regions. As noted by Ciccone and Peri (2006), immigration may create positive externalities affecting the local wage structure. In that event, we may underestimate factor price elasticities in those regions where the externalities are larger. However, the assumption of factor price equalization across regions in a smaller economy, like Spain, where wages are often negotiated at the sector or national level in collective bargaining agreements is not far fetched. Furthermore, while the computed IS under the assumption of a much larger factor price elasticity of -1 (see column (4) in Table 4) increases in size, it does not remotely bring the IS estimates close to the figures found for the U.S.

Yet, the most pressing limitation is the perfect substitutability between immigrants and natives within a skill cell assumed by the three-level CES production function. The latter suggests that immigrants and natives compete against each other within each skill cell. A first way to assess whether this is the case is to compute the index proposed by Altonji and Card (1991). As noted in Card (2001), the index for any given occupation q would be given by: $I_{I,N} = \sum_q f_q^N f_q^I / f_q$, where f_q^N and f_q^I are the fractions of natives and immigrants of a particular skill group employed in occupation q, with f_q reflecting the overall fraction of the workforce in that particular cell employed in that occupation. If both immigrants and natives have similar occupation distributions, the index should take value of 1, whereas immigrants and natives with very distinct occupation distributions would result in an index close to zero. Table 5 shows the index of competition for immigrants and natives computed using occupations held by workers grouped at the one-digit ISCO-88 level so as to avoid some empty occupation categories at the cell level. For all education-experience groups, we find indexes with values near one; thus suggesting that immigrants and natives within a skill group are likely to serve as fairly good substitutes.

However, the above index groups immigrants and natives at one-digit ISCO-88 occupational level categories, possibly not capturing any ongoing segregation within skill level. Therefore, we use instead two-digit ISCO-88 occupational level categories and plot the occupational distributions of immigrants and natives within a particular skill level –defined by their educational attainment and age. If immigrants and natives within skill groups are perfect substitutes, their occupational distributions within skill levels should be very similar. For the sake of brevity, we display the plots of the occupational distribution of immigrants and natives in the skill level where immigrant density is at its highest, i.e. the skill level defined by having secondary level studies and being younger than 30 years of age. Approximately 13.2 percent of immigrants in the Spanish territory belong to this skill level, as well as 11.3 percent of immigrants in Andalucía, 10.3 percent of immigrants in Cataluña, 15 percent of immigrants in Valencia, 14.4 percent of immigrants in Madrid and 17.1 percent of immigrants in Murcia. One of the facts revealed by Figures 13 through 18 is the unequal occupational distribution of immigrants and natives within the skill level under consideration. Immigrants younger than 30 years of age with secondary studies are more frequently working in jobs for non-qualified workers in the 91 through 99 occupational coding range relative to similarly skilled natives. This finding is suggestive of their imperfect substitutability within a skill cell. Therefore, the assumption of perfect substitutability between immigrants and natives within a skill cell may not be a reasonable one once we consider a fine occupational disaggregated level.

VII. Summary and Conclusions

Spain has experienced growing immigration inflows during the past decade. As such, it is only logical to question how these new immigrants have affected Spanish natives. Additionally, given the uneven distribution of immigrants throughout the Spanish territory and the important labor market disequilibria found across Spanish regions, it is also important to understand how the recent immigrant inflows' impact may have differed across Spanish regions. In this paper, we address these questions using data from the 2001 Census, along with aggregate time series data from the 1995 and 2002 Current Population Surveys and Earnings Structure Surveys. With the aforementioned data, and assuming a three-level CES production function along with minimal interregional labor mobility or shifts in the production of goods that intensively employ migrants (Lewis 2003), we compute the immigration surplus (IS) accruing to Spanish natives at the national and regional levels via changes in relative factor prices. We find a small IS of approximately $2x10^{-6}$ percent of GDP, which increases to 0.0001 percent of GDP depending on the assumptions made in the calculation. The IS accruing to the regions receiving most immigrants is up to six times larger, i.e. Murcia. Yet, these figures still remain well below previous estimates for the U.S. (about 0.1 percent of GDP, see Borjas (1995)).

After reviewing the various model assumptions possibly driving our results, we conclude that there are two potential reasons for the small value of the IS in Spain:

(1) the small differences in the skill distribution of immigrants and Spanish natives, and (2) the relatively low factor price elasticity characteristic of countries with greater wage rigidities, such as Spain. High wage rigidity is often due to the broad collective bargaining agreements typically used as the principal wage-setting mechanism.

Additionally, we note that the computed IS assumes perfect substitutability within cells between immigrants and natives. Yet, the two-digit level occupational distribution of natives and immigrants within the skill group with the largest concentration of immigrants (i.e. the skill group corresponding to a secondary education and 30 years of age or younger) is far from similar. Instead, immigrants seem to be more concentrated in non-qualified occupations in the 91 through 99 coding range than their similarly skilled native counterparts, challenging the validity of the assumption of perfect substitutability of immigrants and natives within a skill level and, as such, the IS being computed.

Finally, it is worth noting that the computed IS does not take into account the fact that immigrants create consumption externalities. Specifically, increase the demand for various goods and services. The growing demand shifts the labor demand curve to the right, creates employment, and raises the IS beyond the figure computed herein. Likewise, the IS does not include other costs and benefits from immigration. As such, a low IS does not imply that immigrants do not significantly impact the Spanish economy. We know they do in a variety of facets. For instance, immigrants alter the demand for social and educational services, typically financed through income taxes. Similarly, the IS ignores the contribution of immigrants to the population pyramid –a contribution that may be crucial in financing the retirement of a progressively older population owing to declining fertility rates and increasing longevity.

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Table 1: Percentage of Immigrants in Population and Employment (1991-2005)

Regions	Percent of Immigrants in the Adult Population			Percent of Immigrants in the Adult Employed Population		
	1991 Census	2001 Census	2005 Padrón	1991 Census	2001 Census	2005 Padrón
Average	1.2	4.0	8.5	1.1	4.6	10.9
Andalucía	1.0	2.5	5.6	0.8	2.9	7.2
Aragón	0.5	3.0	7.2	0.5	4.1	10.0
Asturias	0.8	1.3	2.7	0.7	1.6	3.1
Balearic Islands	2.9	8.4	16.3	2.3	8.4	18.9
Canary I.	2.6	6.1	11.5	0.3	6.2	14.0
Cantabria	0.7	1.3	3.8	0.4	1.5	4.9
C. León	0.5	1.5	3.5	0.5	1.9	5.0
C. La Mancha	0.2	2.9	6.1	0.2	3.4	8.6
Cataluña	1.6	4.6	11.3	1.4	5.2	12.9
C. Valenciana	1.6	5.6	12.6	0.8	5.3	15.4
Extremadura	0.3	1.2	1.9	0.3	1.5	2.4
Galicia	1.1	1.2	2.6	0.9	1.3	2.9
Madrid	1.9	6.6	13.2	1.7	8.4	17.0
Murcia	0.4	5.9	12.5	0.4	8.8	16.3
Navarra	0.6	4.1	7.8	0.6	5.1	10.0
P.Vasco	0.6	1.5	3.5	0.5	1.6	4.5
Rioja	0.6	4.5	10.4	0.7	5.5	13.1
C. y Melilla	0.3	7.8	-	2.7	5.4	-

Note: The adult population is defined as individuals 16 years of age and older. Adult Population (1991 Census): 30,665,000. Adult Population (2001 Census): 34,223,000. Adult Population (2005 Padrón): 36,415,975.

Table 2: Distribution of Immigrants and Natives across Regions (Adult Population)

Regions	Immigrants	Natives	Immigrants	Natives	Immigrants
	1991 Census		2001 Census		2005 Padrón
Andalucía	14.1	17.5	11.4	17.6	11.3
Aragón	1.2	3.0	2.4	3.0	2.6
Asturias	1.8	2.9	0.9	2.8	0.7
Balearic Islands	1.2	1.7	4.5	1.9	4.2
Canary Islands	8.3	3.9	6.4	3.9	6.0
Cantabria	0.7	1.4	0.5	1.4	0.6
C. León	2.8	6.5	2.4	6.3	2.4
C. La Mancha	0.9	4.1	2.6	4.3	3.1
Cataluña	21.1	16.0	19.0	15.6	21.4
C. Valenciana	12.4	9.7	14.6	10.0	15.6
Extremadura	0.7	2.6	0.8	2.6	0.7
Galicia	6.3	6.9	2.2	7.0	1.9
Madrid	19.7	12.9	23.1	12.9	20.9
Murcia	0.9	2.7	4.4	2.8	4.4
Navarra	0.7	1.4	1.5	1.3	1.3
P.Vasco	2.9	5.9	2.0	5.4	2.0
Rioja	0.4	0.7	0.8	0.7	0.8
C. y Melilla	0.9	0.3	0.6	0.3	-

Table 3: Elasticities of Substitution at the National Level
(Dependent Variable: Log Gross Annual Earnings)

Elasticity of Substitution across Experience Groups ($1/\sigma_j$)		Elasticity of Substitution across Educational Groups ($1/\sigma_E$)	
OLS	**IV**	**OLS**	**IV**
-0.057	-0.19	-0.139	-0.08
(0.014)	(0.07)	(0.08)	(0.08)

Note: The regressions estimating ($1/\sigma_j$) include 7 education fixed-effects, 6 fixed-age effects, 1 year effect, interactions between year and education effects and interactions between year and age effects. We do not include interaction terms between education and experience (age) groups because the total number of observations in those regressions is only 112. We instrument the log of the number employed in each cell with the number of working immigrants in that cell at the national level. The regressions estimating ($1/\sigma_E$) include 1 year effect and interactions between education and year effects. The number of observations in those regressions is only 16 and the same instruments used in the estimation of ($1/\sigma_j$) is used.

Table 4: Estimates of the 2001 Immigration Surpluses at the National and Regional Levels

National and Regional Level	IS (1)	IS (2)	IS (3)	IS (4)	IS (5)	IS (6)
National	1.7E-06	1.07E-04	1.7E-05	6.7E-06	--	3.76E-06
Andalucía	5.8E-06	2.1E-04	3.6E-05	2.12E-05	2.36E-06	7.58E-06
Cataluña	4.5E-06	3.31E-04	2.6E-05	1.72E-05	2.31E-06	7.3E-06
Valencia	6.4E-07	1.25E-04	1.05E-05	2.84E-06	1.21E-06	9.6E-07
Madrid	1.2E-06	3.5E-04	9.92E-06	4.5E-06	1.78E-06	1.5E-06
Murcia	4.5E-06	6.4E-04	1.1E-05	4.5E-06	1.16E-06	5.9E-06

Column 1: Presents the value of the IS at the national and regional levels that comes out from computing equation (3) for the national level and (4) for the regional levels.

Column 2: Presents the value of the IS if all immigrants coming into Spain have tertiary education, and the distribution across ages is uniform.

Column 3: Presents the value of the IS if all immigrants coming to Spain have less than primary education and the distribution across ages is uniform.

Column 4: Presents the value of the IS when the Factor Price Elasticity equals -1 (much bigger than the estimated values).

Column 5: Presents the value of the IS when the share of immigrants in each region is instrumented with the share of immigrants at the national level.

Column 6: Presents the same value of the Surplus but assuming the percentage of immigration not at the 2001 level, but at the 2006 level.

Table 5: Occupational Distribution of Natives and Immigrants, by Skill Group

Education	Age	Index of Competition
Less than Primary	<30	0.952
Less than Primary	30-34	0.957
Less than Primary	35-39	0.967
Less than Primary	40-44	0.970
Less than Primary	45-49	0.986
Less than Primary	50-54	0.995
Less than Primary	>54	0.996
Primary	<30	0.984
Primary	30-34	0.973
Primary	35-39	0.979
Primary	40-44	0.984
Primary	45-49	0.988
Primary	50-54	0.995
Primary	>54	0.997
Secondary	<30	0.986
Secondary	30-34	0.980
Secondary	35-39	0.982
Secondary	40-44	0.984
Secondary	45-49	0.988
Secondary	50-54	0.993
Secondary	>54	0.995
Vocational Training (1st cycle)	<30	0.992
Vocational Training (1st cycle)	30-34	0.989
Vocational Training (1st cycle)	35-39	0.993
Vocational Training (1st cycle)	40-44	0.978
Vocational Training (1st cycle)	45-49	0.992
Vocational Training (1st cycle)	50-54	0.997
Vocational Training(1st cycle)	>54	0.995
Vocational Training (2nd cycle)	<30	0.993
Vocational Training (2nd cycle)	30-34	0.983
Vocational Training (2nd cycle)	35-39	0.984
Vocational Training (2nd cycle)	40-44	0.970
Vocational Training (2nd cycle)	45-49	0.976
Vocational Training (2nd cycle)	50-54	0.989
Vocational Training (2nd cycle)	>54	0.994
High School	<30	0.943
High School	30-34	0.912
High School	35-39	0.938
High School	40-44	0.949
High School	45-49	0.947
High School	50-54	0.972
High School	>54	0.992
University (1st cycle)	<30	0.975
University (1st cycle)	30-34	0.949
University (1st cycle)	35-39	0.943
University (1st cycle)	40-44	0.957
University (1st cycle)	45-49	0.965
University (1st cycle)	50-54	0.986
University (1st cycle)	>54	0.994
University (2nd cycle)	<30	0.976
University (2nd cycle)	30-34	0.963
University (2nd cycle)	35-39	0.942
University (2nd cycle)	40-44	0.960
University (2nd cycle)	45-49	0.966
University (2nd cycle)	50-54	0.993
University (2nd cycle)	>54	0.993

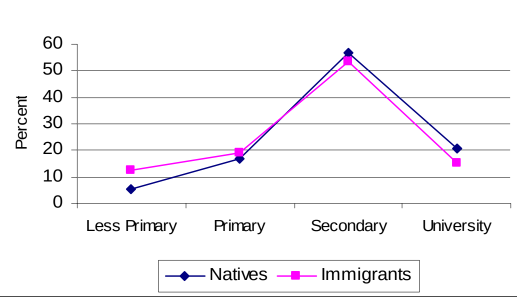


Figure 1: Distribution of Natives and Immigrants by Education - National Average (2001)

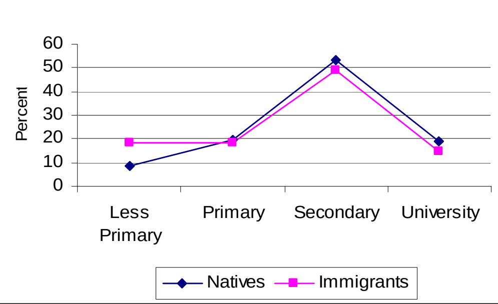


Figure 2: Distribution of Natives and Immigrants by Education - Andalucía (2001)

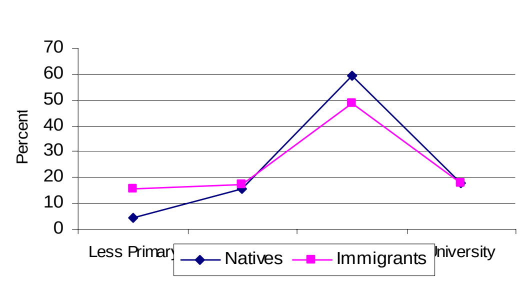


Figure 3: Distribution of Natives and Immigrants by Education - Cataluña (2001)

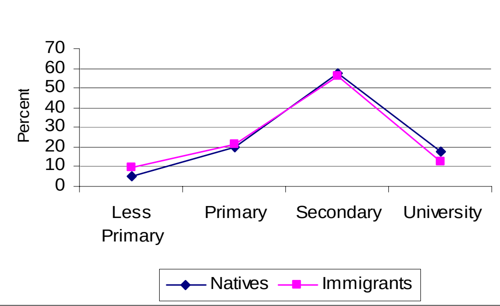


Figure 4: Distribution of Natives and Immigrants by Education - Valencia (2001)

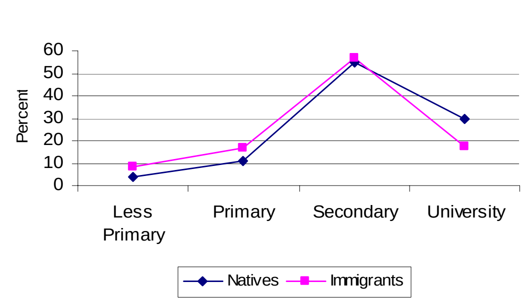


Figure 5: Distribution of Natives and Immigrants by Education - Madrid (2001)

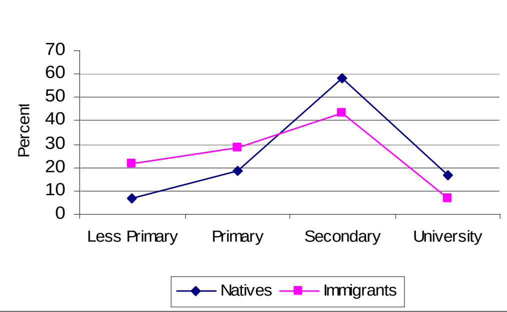


Figure 6: Distribution of Natives and Immigrants by Education - Murcia (2001)

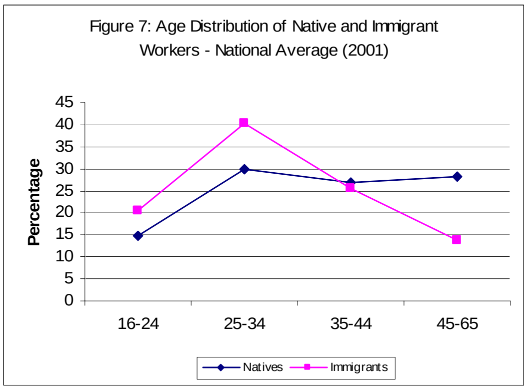


Figure 7: Age Distribution of Native and Immigrant Workers - National Average (2001)

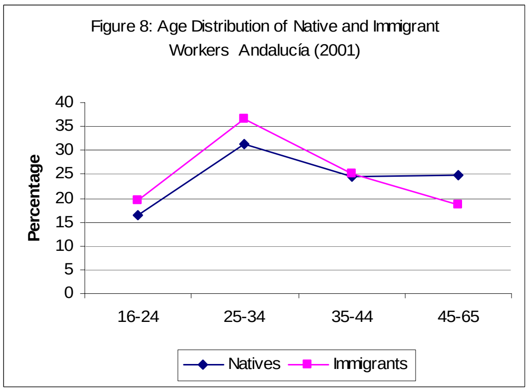


Figure 8: Age Distribution of Native and Immigrant Workers Andalucía (2001)

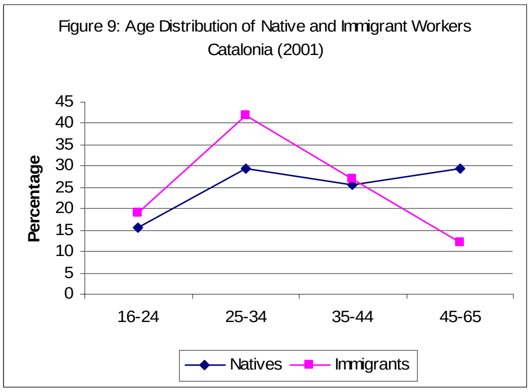


Figure 9: Age Distribution of Native and Immigrant Workers Catalonia (2001)

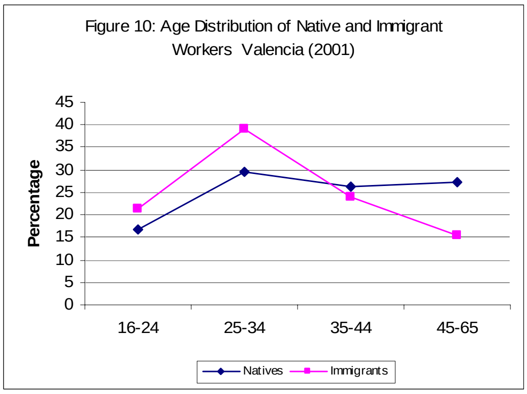


Figure 10: Age Distribution of Native and Immigrant Workers Valencia (2001)

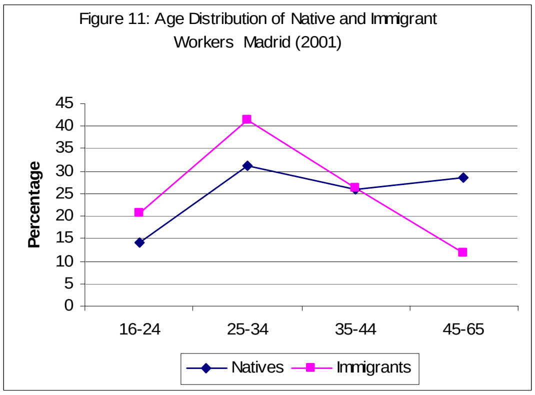


Figure 11: Age Distribution of Native and Immigrant Workers Madrid (2001)

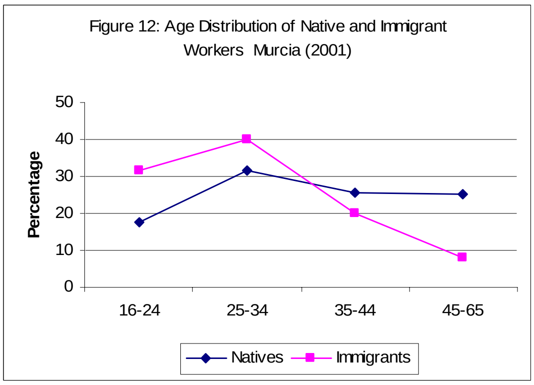


Figure 12: Age Distribution of Native and Immigrant Workers Murcia (2001)

Figure 13
Occupational Distribution of up to 30 Yrs. Old Workers with Secondary Schooling in Spain

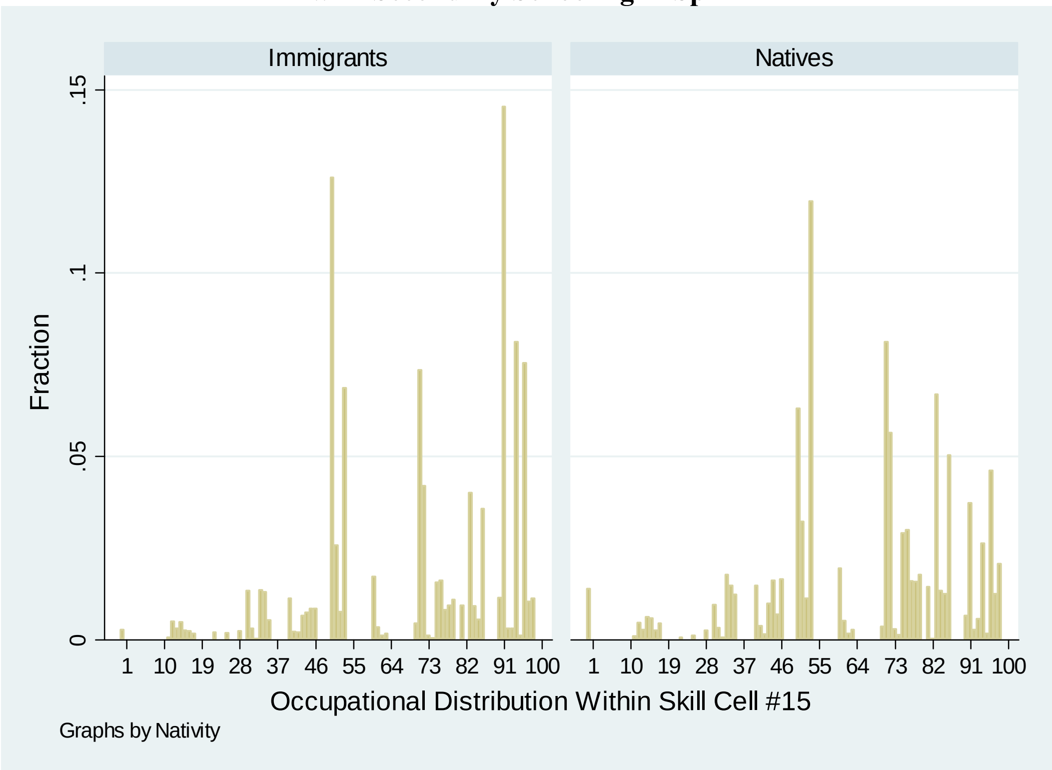


Figure 14
Occupational Distribution of up to 30 Yrs. Old Workers with Secondary Schooling in Andalucía

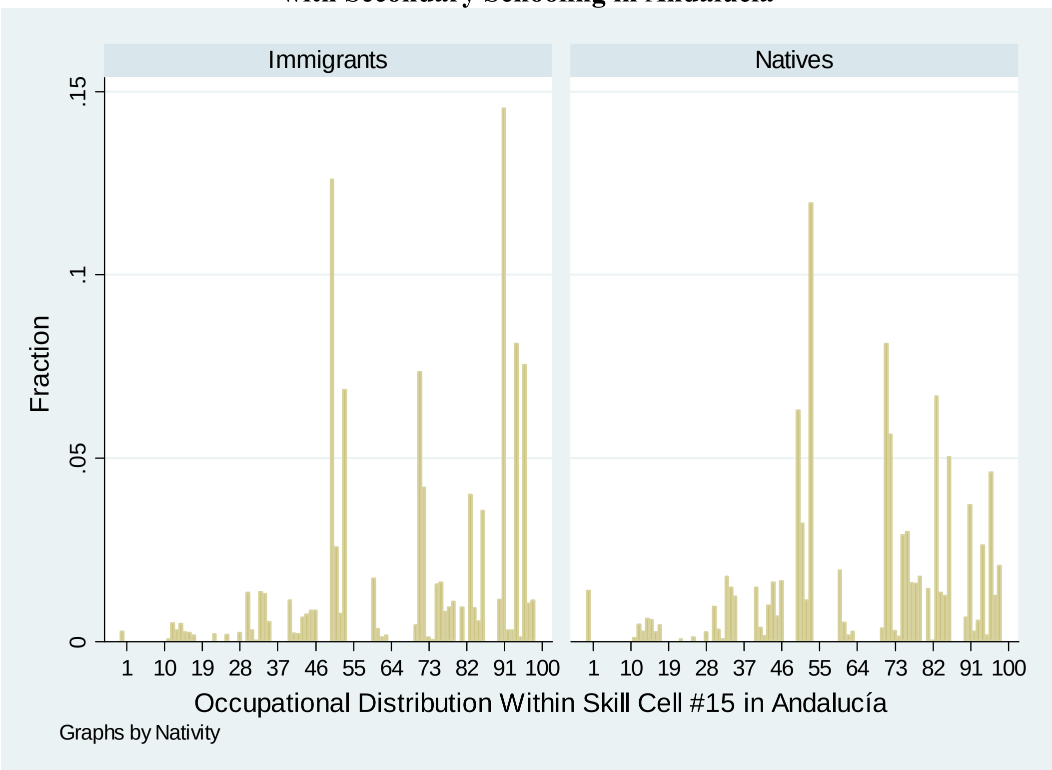


Figure 15
Occupational Distribution of up to 30 Yrs. Old Workers with Secondary Schooling in Cataluña

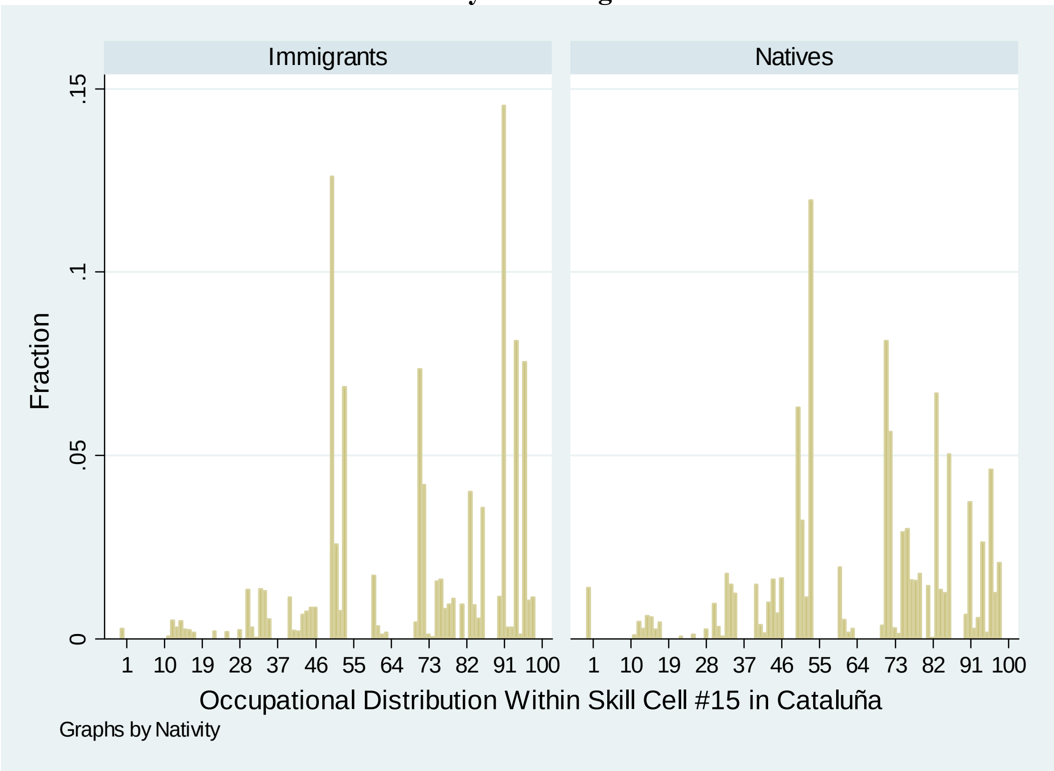


Figure 16
Occupational Distribution of up to 30 Yrs. Old Workers with Secondary Schooling in Valencia

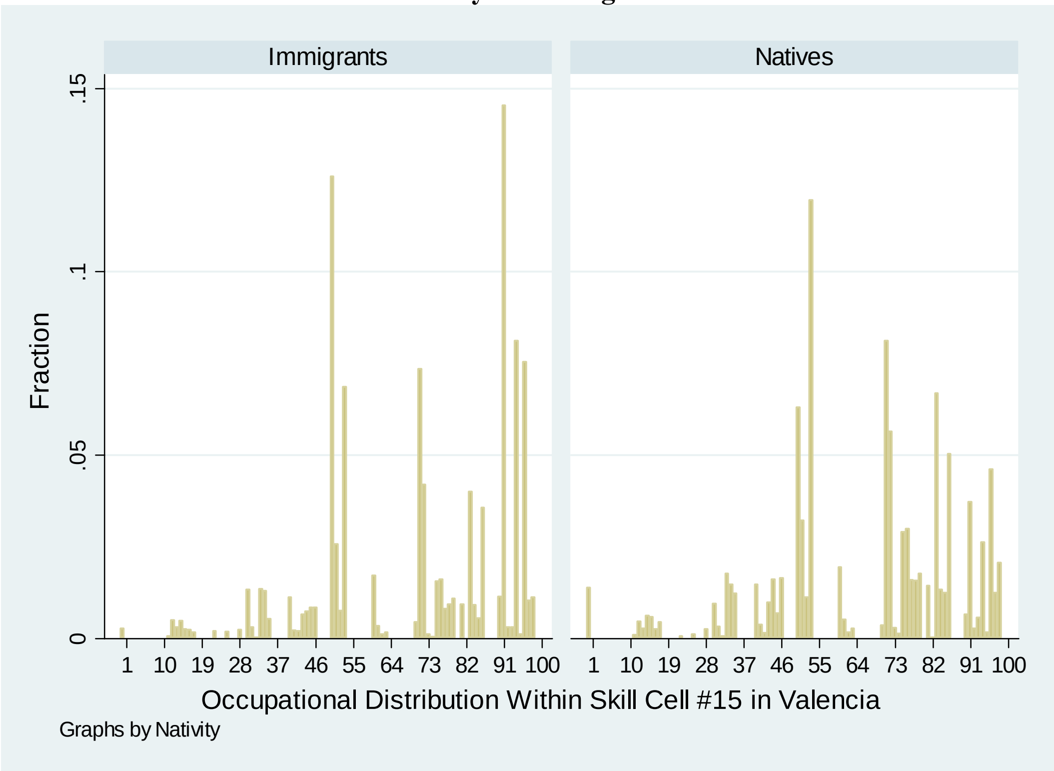


Figure 17
Occupational Distribution of up to 30 Yrs. Old Workers with Secondary Schooling in Madrid

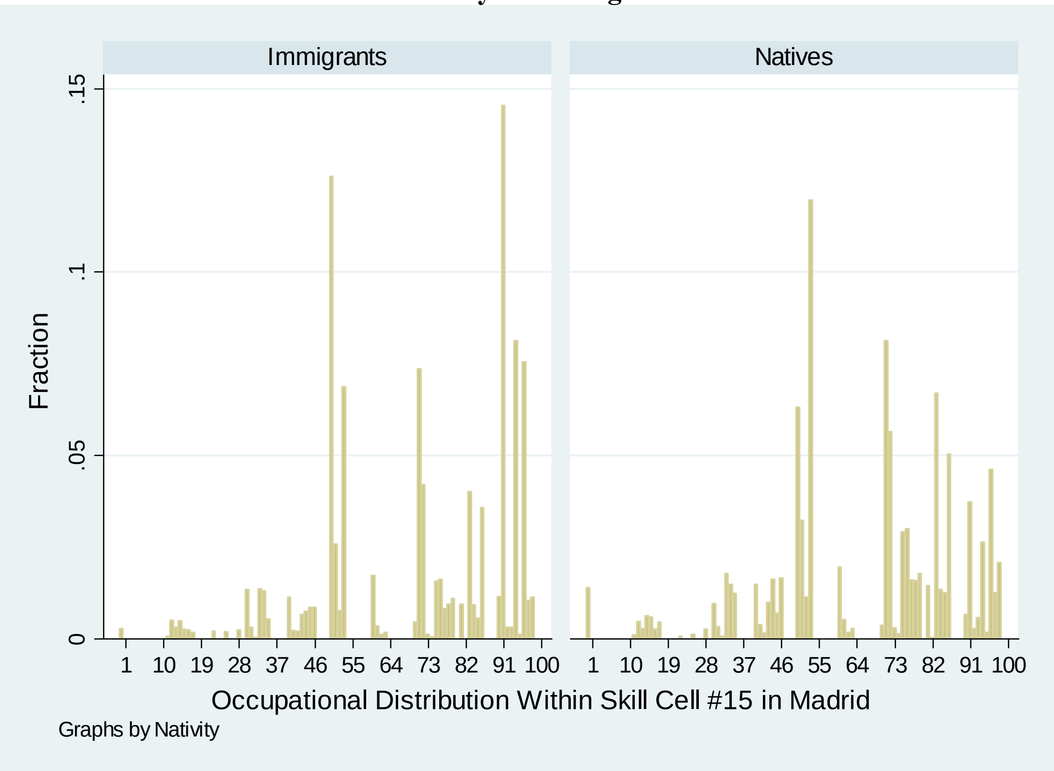
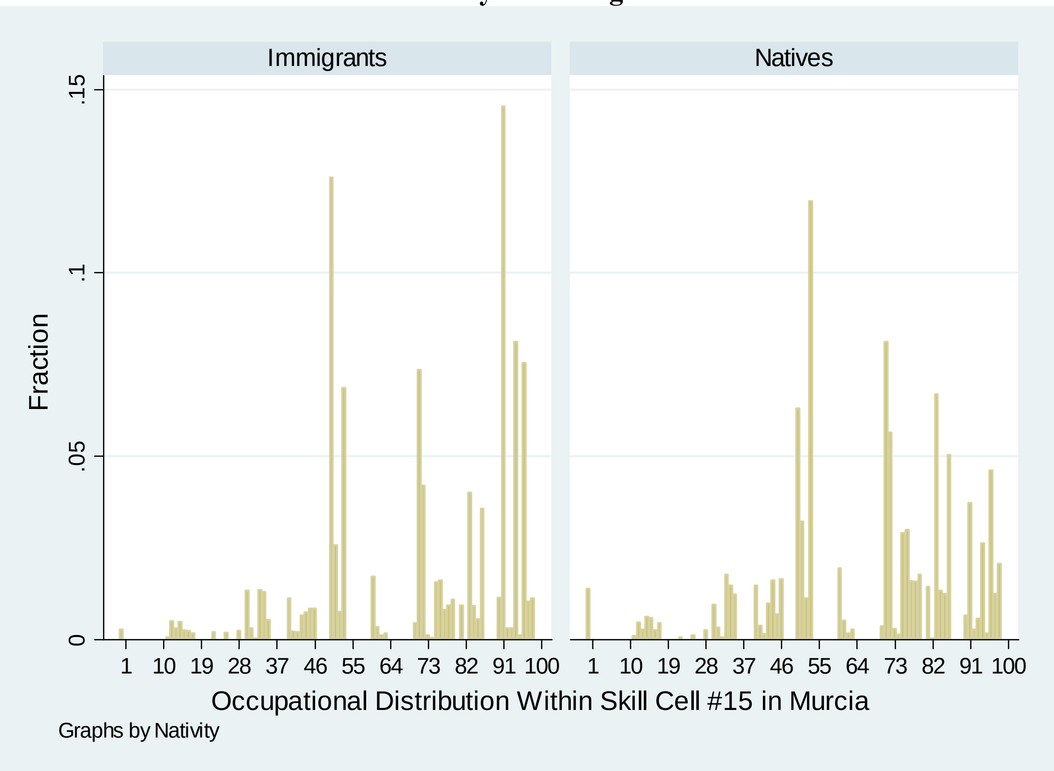


Figure 18
Occupational Distribution of up to 30 Yrs. Old Workers with Secondary Schooling in Murcia



APPENDIX TABLES
Table A: Income Shares, by Skill Group

Education	Age	Cell Income Shares	Income Shares (within education branch)
Less than Primary	<30	0.001	0.018
Less than Primary	30-34	0.001	0.018
Less than Primary	35-39	0.001	0.018
Less than Primary	40-44	0.002	0.018
Less than Primary	45-49	0.003	0.018
Less than Primary	50-54	0.005	0.018
Less than Primary	>54	0.007	0.018
Primary	<30	0.012	0.132
Primary	30-34	0.007	0.132
Primary	35-39	0.010	0.132
Primary	40-44	0.021	0.132
Primary	45-49	0.029	0.132
Primary	50-54	0.031	0.132
Primary	>54	0.036	0.132
Secondary	<30	0.063	0.132
Secondary	30-34	0.029	0.205
Secondary	35-39	0.033	0.205
Secondary	40-44	0.028	0.205
Secondary	45-49	0.020	0.205
Secondary	50-54	0.016	0.205
Secondary	>54	0.012	0.205
Vocational Training (1st cycle)	<30	0.016	0.052
Vocational Training (1st cycle)	30-34	0.008	0.052
Vocational Training (1st cycle)	35-39	0.010	0.052
Vocational Training (1st cycle)	40-44	0.006	0.052
Vocational Training (1st cycle)	45-49	0.005	0.052
Vocational Training (1st cycle)	50-54	0.003	0.052
Vocational Training(1st cycle)	>54	0.002	0.052
Vocational Training (2nd cycle)	<30	0.025	0.074
Vocational Training (2nd cycle)	30-34	0.012	0.106
Vocational Training (2nd cycle)	35-39	0.010	0.106
Vocational Training (2nd cycle)	40-44	0.008	0.106
Vocational Training (2nd cycle)	45-49	0.007	0.106
Vocational Training (2nd cycle)	50-54	0.005	0.106
Vocational Training (2nd cycle)	>54	0.004	0.106
High School	<30	0.026	0.100
High School	30-34	0.012	0.100
High School	35-39	0.014	0.100
High School	40-44	0.015	0.100
High School	45-49	0.014	0.100
High School	50-54	0.008	0.100
High School	>54	0.006	0.100
University (1st cycle)	<30	0.014	0.056
University (1st cycle)	30-34	0.008	0.080
University (1st cycle)	35-39	0.008	0.080
University (1st cycle)	40-44	0.007	0.080
University (1st cycle)	45-49	0.007	0.080
University (1st cycle)	50-54	0.006	0.080
University (1st cycle)	>54	0.006	0.080
University (2nd cycle)	<30	0.013	0.063
University (2nd cycle)	30-34	0.010	0.063
University (2nd cycle)	35-39	0.011	0.063
University (2nd cycle)	40-44	0.008	0.063
University (2nd cycle)	45-49	0.008	0.063
University (2nd cycle)	50-54	0.005	0.063
University (2nd cycle)	>54	0.006	0.063

Table B: Estimated Factor Price Elasticities, by Skill Group

Education	Age	Own Elasticity	Cross Elasticity (within education branch)	Cross Elasticity (across education branches)
Less than Primary	<30	-0.114	-0.014	0.00005
Less than Primary	30-34	-0.113	-0.013	0.00005
Less than Primary	35-39	-0.115	-0.015	0.00006
Less than Primary	40-44	-0.126	-0.026	0.00010
Less than Primary	45-49	-0.135	-0.035	0.00013
Less than Primary	50-54	-0.160	-0.060	0.00022
Less than Primary	>54	-0.193	-0.093	0.00035
Primary	<30	-0.120	-0.020	0.00056
Primary	30-34	-0.112	-0.012	0.00032
Primary	35-39	-0.118	-0.018	0.00049
Primary	40-44	-0.136	-0.036	0.00100
Primary	45-49	-0.150	-0.050	0.00138
Primary	50-54	-0.154	-0.054	0.00149
Primary	>54	-0.161	-0.061	0.00170
Secondary	<30	-0.209	-0.109	0.00301
Secondary	30-34	-0.132	-0.032	0.00140
Secondary	35-39	-0.136	-0.036	0.00156
Secondary	40-44	-0.130	-0.030	0.00132
Secondary	45-49	-0.122	-0.022	0.00095
Secondary	50-54	-0.117	-0.017	0.00074
Secondary	>54	-0.114	-0.014	0.00059
Vocational Training (1st cycle)	<30	-0.173	-0.073	0.00078
Vocational Training (1st cycle)	30-34	-0.137	-0.037	0.00039
Vocational Training (1st cycle)	35-39	-0.144	-0.044	0.00047
Vocational Training (1st cycle)	40-44	-0.129	-0.029	0.00031
Vocational Training (1st cycle)	45-49	-0.121	-0.021	0.00022
Vocational Training (1st cycle)	50-54	-0.114	-0.014	0.00015
Vocational Training(1st cycle)	>54	-0.110	-0.010	0.00011
Vocational Training (2nd cycle)	<30	-0.179	-0.079	0.00121
Vocational Training (2nd cycle)	30-34	-0.125	-0.025	0.00056
Vocational Training (2nd cycle)	35-39	-0.121	-0.021	0.00047
Vocational Training (2nd cycle)	40-44	-0.117	-0.017	0.00038
Vocational Training (2nd cycle)	45-49	-0.115	-0.015	0.00034
Vocational Training (2nd cycle)	50-54	-0.112	-0.012	0.00026
Vocational Training (2nd cycle)	>54	-0.108	-0.008	0.00018
High School	<30	-0.159	-0.059	0.00122
High School	30-34	-0.127	-0.027	0.00055
High School	35-39	-0.131	-0.031	0.00065
High School	40-44	-0.135	-0.035	0.00072
High School	45-49	-0.131	-0.031	0.00065
High School	50-54	-0.117	-0.017	0.00036
High School	>54	-0.115	-0.015	0.00031
University (1st cycle)	<30	-0.157	-0.057	0.00066
University (1st cycle)	30-34	-0.124	-0.024	0.00040
University (1st cycle)	35-39	-0.123	-0.023	0.00038
University (1st cycle)	40-44	-0.121	-0.021	0.00035
University (1st cycle)	45-49	-0.119	-0.019	0.00032
University (1st cycle)	50-54	-0.117	-0.017	0.00028
University (1st cycle)	>54	-0.117	-0.017	0.00029
University (2nd cycle)	<30	-0.149	-0.049	0.00064
University (2nd cycle)	30-34	-0.136	-0.036	0.00046
University (2nd cycle)	35-39	-0.142	-0.042	0.00055
University (2nd cycle)	40-44	-0.131	-0.031	0.00040
University (2nd cycle)	45-49	-0.128	-0.028	0.00036
University (2nd cycle)	50-54	-0.118	-0.018	0.00024
University (2nd cycle)	>54	-0.121	-0.021	0.00028

Table C: Parameter Estimates, by Skill Group

Education	Age	p	m	β	b
Less than Primary	<30	0.007	0.047	0.048	0.005
Less than Primary	30-34	0.004	0.047	0.023	0.003
Less than Primary	35-39	0.004	0.047	0.019	0.004
Less than Primary	40-44	0.006	0.047	0.016	0.006
Less than Primary	45-49	0.007	0.047	0.009	0.007
Less than Primary	50-54	0.009	0.047	0.004	0.010
Less than Primary	>54	0.015	0.047	0.003	0.015
Primary	<30	0.036	0.047	0.081	0.034
Primary	30-34	0.018	0.047	0.035	0.017
Primary	35-39	0.021	0.047	0.028	0.020
Primary	40-44	0.023	0.047	0.020	0.023
Primary	45-49	0.024	0.047	0.013	0.024
Primary	50-54	0.023	0.047	0.007	0.024
Primary	>54	0.026	0.047	0.005	0.027
Secondary	<30	0.105	0.047	0.132	0.104
Secondary	30-34	0.044	0.047	0.049	0.044
Secondary	35-39	0.043	0.047	0.037	0.044
Secondary	40-44	0.039	0.047	0.025	0.040
Secondary	45-49	0.032	0.047	0.017	0.033
Secondary	50-54	0.025	0.047	0.009	0.025
Secondary	>54	0.019	0.047	0.007	0.020
Vocational Training (1st cycle)	<30	0.026	0.047	0.019	0.026
Vocational Training (1st cycle)	30-34	0.011	0.047	0.008	0.012
Vocational Training (1st cycle)	35-39	0.010	0.047	0.005	0.010
Vocational Training (1st cycle)	40-44	0.006	0.047	0.004	0.006
Vocational Training (1st cycle)	45-49	0.004	0.047	0.002	0.004
Vocational Training (1st cycle)	50-54	0.003	0.047	0.002	0.003
Vocational Training(1st cycle)	>54	0.002	0.047	0.001	0.002
Vocational Training (2nd cycle)	<30	0.033	0.047	0.017	0.034
Vocational Training (2nd cycle)	30-34	0.015	0.047	0.009	0.015
Vocational Training (2nd cycle)	35-39	0.011	0.047	0.007	0.011
Vocational Training (2nd cycle)	40-44	0.006	0.047	0.004	0.006
Vocational Training (2nd cycle)	45-49	0.004	0.047	0.003	0.004
Vocational Training (2nd cycle)	50-54	0.003	0.047	0.002	0.003
Vocational Training (2nd cycle)	>54	0.002	0.047	0.001	0.002
High School	<30	0.042	0.047	0.075	0.040
High School	30-34	0.021	0.047	0.037	0.020
High School	35-39	0.021	0.047	0.028	0.020
High School	40-44	0.018	0.047	0.018	0.019
High School	45-49	0.012	0.047	0.011	0.013
High School	50-54	0.007	0.047	0.006	0.007
High School	>54	0.005	0.047	0.005	0.005
University (1st cycle)	<30	0.031	0.047	0.020	0.031
University (1st cycle)	30-34	0.016	0.047	0.014	0.016
University (1st cycle)	35-39	0.014	0.047	0.011	0.014
University (1st cycle)	40-44	0.013	0.047	0.007	0.013
University (1st cycle)	45-49	0.009	0.047	0.004	0.009
University (1st cycle)	50-54	0.007	0.047	0.003	0.007
University (1st cycle)	>54	0.006	0.047	0.002	0.006
University (2nd cycle)	<30	0.030	0.047	0.024	0.031
University (2nd cycle)	30-34	0.022	0.047	0.021	0.022
University (2nd cycle)	35-39	0.019	0.047	0.017	0.019
University (2nd cycle)	40-44	0.016	0.047	0.012	0.016
University (2nd cycle)	45-49	0.011	0.047	0.007	0.011
University (2nd cycle)	50-54	0.007	0.047	0.005	0.007
University (2nd cycle)	>54	0.006	0.047	0.004	0.006