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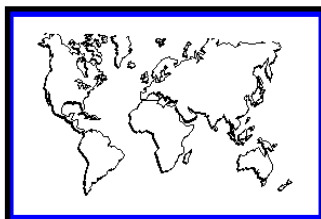
## **Working Papers on International Economics and Finance**

**DEFI 11-02**

**Abril 2011**

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**Carlos Borondo Arribas  
Zenón Jiménez-Ridruejo**



Asociación Española de Economía y Finanzas Internacionales

[www.aeefi.com](http://www.aeefi.com)

ISSN: 1696-6376

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Carlos Borondo Arribas\*

Zenón Jiménez-Ridruejo\*

\* Universidad de Valladolid, Facultad de CC Económicas, Valladolid, Spain.

[borondo@eco.uva.es](mailto:borondo@eco.uva.es)

[zenon@eco.uva.es](mailto:zenon@eco.uva.es)

# Wage Assimilation of Immigrants in Spain

**Keywords:** immigration, wage assimilation, wages, human capital, merging of databases

**JEL codes:** J15, J24, J31, J61

## **Abstract:**

In this study we quantify the effect of the years of residence in Spain on the earnings of immigrants. We take sex, origin, education and age into account. The results are clearly positive, the longer the length of residence the more earnings, confirming the hypothesis of wage assimilation of immigrants as their human capital is adapted to the Spanish labor market. The information used comes from the Social Security's Continuous Sample of Working Lives 2007. Additionally, we merge the earnings data from this source with the National Survey of Immigrants 2007 to obtain additional integration indicators, such as speaking fluently Spanish, validation of studies in Spain, studies finished in Spain. All of them increase the earnings of immigrants. We detail this results by sex and origin (Europe, Latin-America and Rest of the World).

# 1. Introduction

The wage assimilation of immigrants is a topic profusely studied empirically in countries traditionally recipients, like the USA and the United Kingdom, but it is very novel in Spain because immigration has been important only in recent years. Therefore, there are still very few studies about it, and we want to contribute with some new results derived from the Continuous Sample of Working Lives from the Social Security records (MCVL in Spanish) and the National Survey of Immigrants 2007.

We identify the assimilation with the process of wage convergence between immigrants and natives in the framework of the economic life of the host country. With this approach the effects of the labour productivity increase associated both with the technical progress and with the capital accumulation are isolated, but the problem is that citizens with different characteristics are compared. We avoid to this comparison and compute instead the penalty that a new comer to the Spanish labour market suffers, comparing with another immigrant with long years in the market.

In the second section of the paper we briefly review the international literature about wage assimilation and the few studies found on the Spanish case. In the third section, we explain our data and the methodology. Few studies have used the Continuous Sample of Working Lives, and no one has merged this source with the National Survey of Immigrants as we do. In the fourth section, we quantify the assimilation process as the effect that the years of residence in Spain have on the earnings of immigrants, controlling for sex, origin, education and age. The results are clearly positive: the longer the stay in Spain the more earnings, thus confirming the hypothesis of wage assimilation of immigrants with natives in Spain. Moreover, merging the MCVL data with those from the National Survey of Immigrants 2007 we obtain additional integration indicators, such as speaking Spanish, validation of studies in Spain, studies finished in Spain, and so on. All of them increase earnings. In the fifth section the conclusions are gathered.

## 2. Empirical literature on wage assimilation

### 2.1. The Factors of Wage Assimilation

From the empirical point of view, a strong relationship has been proved between the earnings of immigrants and the number of years went by since the moment of their arrival at the host country. This empirical evidence suggests a considerable improvement of education from the moment of immigration due to the process of adaptation along the years. The seminal papers by Chiswick (1978) and Carliner (1980) revealed a strong relationship between the number of years of residence and the real wage, explained by the increase both in education and in the immigrants' motivation. Later interpretations, like the one of Borjas (1985), suggested however a progressive deterioration in the education levels of immigrants. More recently, Friedberg and Hunt (1995) pointed out that changes in the age of arrival (younger immigrants) might be determining lower earnings levels in the population recently emigrated. Since then, an abundant and stimulating literature has been published in recent years on the determining factors in the economic assimilation of immigrant population. In an attempt to limit the scope of this paper we focus on the review of wage assimilation, clearing up aspects as relevant as the assimilation into welfare levels and the influence on host policies, the social and cultural integration and the impact of host networks and family links.

In the recent literature on wage assimilation a first step involves the comparison of two methodologies: longitudinal or cross-section analysis. Lubotsky (2007)<sup>1</sup> uses longitudinal data between 1951 and 1997 on earnings of immigrant workers in the United States. The estimated earnings of immigrants by the longitudinal method are lower than those obtained in cross section studies for the United States since not all the immigrants stay in the country during their working life, which involves a bias in longitudinal data. The estimated growth of earnings of immigrant workers related to those of natives is calculated to be between 10 and 15% throughout the considered period using the longitudinal method, while using the data from the Census it would be about 26% for the same period. If these estimations were true, it seems that the cross section

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<sup>1</sup> A similar analysis can be found in Beenstock et al. (2009).

analysis could be overestimating the effects of the accumulation of human capital obtained between the first and the second generation. It would also involve correcting the assimilation effects estimated in the intergenerational data from the Census. The second problem disclosed using longitudinal data stems from the specification mistakes in comings and goings of immigrants, and their crossed effects in relation to their earnings. Almost a third part of the earnings of immigrant workers in the period 1960-1980 can be attributed to quantification mistakes associated with this phenomenon.

The main line of argument associated with the wage assimilation focuses on the effects of human capital (see Lang 2005; Drinkwater, Eade and Garapich 2006; Toussaint-Comeau 2006; Adsera and Chiswick 2007; Lemaître 2007; Nordin 2007; Akresh 2008). All the authors admit that immigrants have clear difficulties putting their human capital, acquired outside of the destination country, into action in the destination country, the so-called imperfect transferability of the human capital. The evidence available supports that in this context the success in the first job determines in some way later results. Immigrants who experience an initial degradation in the correspondence between their job and their education reduce this difference as time goes by. This is called the U curve of the immigrant employment. The depth of the U depends on the grade of transferability of the capacity, knowledge and education of the immigrants, acquired before the migratory process. The linguistic similarity and the economic proximity reduce the depth of the job degradation. The second factor of the degradation depth depends on the kind of occupation the immigrant had in the country of origin, in addition to the productive specificity of the host country and the demand of credentials. Other determinant factors are non observable qualities of the labour force such as the way of admission, the regular or irregular character of the immigration, the hiring in origin, etc. All of them are linked with the quality of the obtained job and the employment degradation level.

In many of the investigations it is found that the human capital determines the work mobility and is relevant for the integration capacity of the immigrant population. Additionally, work experience constitutes another decisive factor of integration and assimilation. The analysis of the assimilation by origin establishes, nevertheless, the existence of sensible effects according to the sort of the education received and its proximity or not with the education in the host country. On the other hand, the course of time might suppose in some cases a depreciation of the acquired educational

levels, which possibly would have an impact on the evolution of the earnings of the immigrant (Buzdugan and Halli 2009).

The existing relations between earnings assimilation and the years of stay in the destination country have been reviewed in two recent articles<sup>2</sup>. Hammarstedt and Shukur (2007) examine the assimilation behaviour of immigrants in the Swedish labour market from 1990 to 1999 with a regression method using quartiles of pool data. The data reveal a reduced assimilation in earnings of immigrants coming from the North and East of Europe, and a very slow integration capacity. The differences in earnings are only eliminated after 15 or 20 years. The assimilation capacity of immigrants from other areas is even worse, and they are unable to reach the assimilation even after 20 years. The cause of such contrasts can be in the differences of education and training levels, as well as in their proximity to the levels of the native population. The differences are smaller in the case of women, especially for immigrants coming from non European areas. Likewise, the differences observed between immigrants of different cohorts are smaller in the case of European immigration. Additionally, the data show that the differences in earnings and wages have been increasing in the last years, which could be due to the increase of the discrimination and to the observable difficulties in the Swedish economy.

The second paper, Beenstock et al. (2009), defines the immigration assimilation hypothesis (IAH) as the acquisition of human capital by the immigrant with the years of stay in the host country and its effect on the revenue. This effect is positive but decreasing in intensity along the years. The authors use three methodologies: one is based on cross section analysis, another one is linked to the study of immigrant cohorts and the third one is an analysis of panel data. However, they find that different methods of analysis can lead to opposite results. In the case of Israel between 1983 and 1995, for example, the hypothesis with panel data is confirmed, but it is rejected with the other contrasts. The reason of these differences can be that the cross section and the analysis of cohorts are biased towards the surviving immigrants, but we cannot discard an effect of the periods selected on the authentic curve of assimilation. Temporary modifications in the incentives to the

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<sup>2</sup> The first evidences on this relationship are in Jeon and Simmons (1998) and in Barth, Bratsberg and Raaum (2001).

specific education of immigrants (and natives) might distort, in the course of time, the decreasing character of earnings obtained with the years of stay. The increasing presence of recent immigrants might distort the effects derived from the accumulation of human capital and generate increases of revenues lower than those foreseen in the hypothesis compared to the revenues obtained with more years of stay. From this evidence the authors question the reliability of the longitudinal analysis.

Another determinant factor of the wage assimilation underlined by the literature is the geographical origin of the immigrant population<sup>3</sup>. The European evidence suggests that the immigrant population proceeding from the North of Europe has not worsened its earnings in the course of time, but those coming from the South and East of Europe and other origins have seen how their relative earnings fell progressively. An equally differentiated result is appreciated when unemployment rates of the immigrant population are analysed by areas of origin.

In the United States, the results conclude that low education levels and English language capacity are deciding factors of the poverty of Hispanic immigrants and the differences among different groups of origin that characterize them. In the Mexican immigration case, determinant factors of poverty are essentially low educational level of the family head, the number of children, and a relatively low mastery of English. Immigrants from El Salvador and Guatemala present relatively lower levels of poverty than the immigrants from Mexico, in spite of the presence of a certain similarity in social aspects. Immigrants from South America have poverty levels relatively higher than other groups, essentially as a result of the effort in acquisition of human capital before and after of the migratory process. The facility in the mastery of the language and especially the

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<sup>3</sup> As regards this topic, studies which can be quoted are Moore and Amey (2002) for the African population emigrated to the United States; Dustmann and Fabbri (2005) in the case of immigrations in the United Kingdom, and Nekby (2002) and Gustafsson and Zheng (2006) in the case of the Swedish immigration. In addition, Sullivan and Ziegert (2008) evaluate the origin effects in the Hispanic immigration in the United States, and Kahanec and Zaiceva (2009) those effects in the European Union as a whole.



influence of relatives in USA are the main causes of the better situation of immigrants from Puerto Rico.

The literature has revealed the importance of other factors which can be influencing the wage assimilation of the immigrants. The incidence of the ethnic characteristics has been underlined in the study of occupational differences and levels of earnings between non white immigrants and non white natives in the British economy (Elliott and Lindley 2008). Other researchers underline the importance of family ties and mixed marriages for the acquisition of language skills (Meng and Gregory 2005; Meng and Meurs 2009), the processes of nationalization of the immigrant population (Bratsberg, Ragan and Nasir 2002; Fougère and Safi 2008), the settlement in urban areas (Haan 2008) and the link of earnings with the use of computers (Chiswick and Miller 2007).

## **2.2. The analysis of the assimilation in Spain**

Studies on wage assimilation of immigrants in the context of the Spanish labour market are scarce and very recent. They can be divided in three groups: those which carry out an analysis of the wage assimilation, those which study the evolution of the probability of employment with the years of residence and, in the third place, those studies which analyse the wage discrimination.

As regards the analysis of the wage assimilation, Adsera and Chiswick (2007) use data from the European Union Households Data Panel from 1994 to 2000 to compare the revenues of immigrants with those of natives in the countries of the EU15. Their results indicate that for newly arrived people from another country of the EU15 the wage gap is 30% for men and 31% for women, and it rises to 45% and 39% respectively for the born outside of the EU15. In Spain this gap would be 48% and 29% for men and women of the EU15, and 63% and 55% for those from outside. Interestingly, this gap narrows as the immigrants accumulate years of stay in the country, but it takes 18 years in closing completely.

The second study that analyses the wage assimilation is Izquierdo, Lacuesta and Vegas (2009). The longitudinal data of the Continuous Sample of Working Lives of 2005 is used in this case to calculate the evolution of the immigrants' earnings. The authors select for their study men aged 25 to 54 coming from outside of the EU15 and calculate the daily wage. Since there is no previous

data to 1979 they only use data of individuals who began their labour career later. They select individuals from the Social Security's General Regime and define the immigrant status based on nationality, not on origin. They find that the difference with the wages of natives is reduced to half in the first 5-6 years, but it is maintained afterwards. They also observe a higher human capital in recent immigrants and a departure of the most qualified which would distort the results of cross section samples. A small part of the assimilation (11%) can be attributed to a higher geographical mobility of immigrants, which allows them to take advantage of the important labour differences among Spanish provinces. Most of the assimilation is explained by a faster increase of the human capital of immigrants once they are in Spain, relative to the increase of native workers.

Recent studies in other countries confirm three general results: there is more incidence of over-qualification among immigrants than among natives; the wage penalization to the over-qualification is higher for immigrants than for natives and these differences diminish with the length of stay of the immigrant in the destination country. To analyse the Spanish case, Sanromá, Ramos and Simón (2008) start from the imperfect transferability of the human capital of the immigrants, which forces them to accept low qualification jobs, turning them into over-qualified workers. They use data from the Population Census (2001) to determine the human capital of immigrants arrived since 1995 and the Survey of Wage Structure 2002 to estimate wage equations of natives and immigrants. With both results they study the excess of education of immigrants, the so-called *educational mismatch*, estimating logit models of the probability of being unemployed, having excess of education or the appropriate education. They analyse the effect of the years in Spain, controlling for the origin. They confirm the three general results above mentioned in Spain.

With regard to the wage discrimination, Simón, Sanromá and Ramos (2008) study the causes of wage differences between natives and immigrants from developed and developing countries. The most important cause is the segregation of the latter in low quality jobs, which is explained partly by the imperfect transference of its original human capital and partly by discriminatory practices. According to their results, wage differences for equal jobs are not significant. Canal-Domínguez and Rodríguez-Gutiérrez (2008) estimate the wage distribution of natives and immigrants using data from the Survey of Wage Structure 2002. They obtain different results: the differences cannot be explained by variables related to productivity, and this is wage discrimination.

### **3. Data and econometric methodology**

The data used in the econometrical estimations of this study come from two sources: the Social Security's Continuous Sample of Working Lives (MCVL) and the National Survey of Immigrants (ENI) of the National Bureau of Statistics. Both of them are described in the appendix. A significant contribution of our paper is a merge of both data bases carried out in order to trace with more precision the effects of the social integration (with more indicators in the ENI) on the labour income from the MCVL.

In the procedure of merging the ENI and the MCVL five variables have been chosen as common merging variables: origin, age, education, sex and year of arrival (or year of entry in the Social Security system). Both databases had to be homogenized to have the same possible cases for these five variables: origin (Europe, Latin-America, Rest of the World), age (16-24, 25-44, 45-64, 65 and more), education (primary incomplete, primary, secondary, university studies), year of entry (1991-5, 1996-2000, 2001-2, 2003-4, 2005, 2006, 2007). These five variables multiplied by their possible cases give a matrix of 672 cells, which involve as many possible profiles of the studied immigrants.

The following step consists of calculating, from the MCVL, the corresponding average of the variables of interest in each of the 672 cells (or individual profiles). Finally, these averages are imported to the same counterfoil of the ENI. The variable of interest from the MCVL which has been merged into the ENI is the gross earnings obtained from the employers' tax declarations. The result is a new database (ENI+MCVL) which supports the original variables plus this new imported variable. Every individual from the original ENI is assigned the value of the new labour income variable according to his or her sex, age group, area of origin, year of arrival and education, applying to him or her the average value of the labour income for the same profile of immigrant in the MCVL. For example, men from 16 to 24 years, of European origin, with university studies that arrived in Spain in 2005 are applied in the ENI the average labour income calculated in the MCVL for the same profile of identity.

Estimations have the same structure. A set of dummies are included as explanatory variables, showing the fulfilment or not of certain basic characteristics of the individual: age group, sex, origin and education. In every basic category there is a value of reference, specified in the tables, indicating the situation in which all the dummies had zero value. In the case of the age the reference value is 16-24 and the dummies are 25-44 and 45-64. If the dummy 25-44 equals zero we are dealing with the reference population (16-24); but if the dummy equals one, the corresponding estimated coefficient indicates the additional income associated with this category. The reference value for sex is male, for origin is European and for education level is the minimum, the incomplete primary education. In short, the reference profile is a male immigrant male from 16 to 24 years, without Primary Education Certificate and European origin. Any change of this profile is controlled by dummies that quantify the importance of the deviation on earnings.

Additionally, one or more indicators of integration are added to these basic characteristics in every regression. In the case of the MCVL the only integration variable is the seniority in the Social Security system. In case of the merged sample (ENI+MCVL) we have additional integration indicators.

The estimation method has been ordinary least squares. The large number of data has allowed reliable asymptotic contrasts. The existence of heteroscedasticity has been tested with White's asymptotic contrast. In each case the null hypothesis has been rejected (its p-value is always zero) detecting heteroscedasticity. Likewise, the presence of auto-correlation has been also been tested with the asymptotic contrast of Lagrange multipliers (LM), specifying also the value of the statistic and its p-value. In this case the conclusions are not so categorical, detecting autocorrelation in those estimations whose p-value associated with the statistic LM is less than 0.05.

The autocorrelation or heteroscedasticity does not affect the consistency of estimators but it affects the consistency of their variances and the hypothesis tests. In order to settle this problem, in those equations where heteroscedasticity has been detected, White's consistent estimator of the variances and covariances has been used, validating asymptotically the hypothesis tests. In the cases in which heteroscedasticity and autocorrelation were detected, the Newey-West consistent estimator of the variances and covariances has been used, which is not only robust to the autocorrelation, but also to the heteroscedasticity. Thus, the t statistic of the estimations which

contrast the individual significance of every variable, as well as the F statistic which contrasts the joint significance of the corresponding regression, reported in each of the estimations, are both asymptotically valid.

The significance analysis gives very acceptable results in general. All the regressions are significant (the p-value associated with the F statistic is always zero). The analysis of the individual significance is more uneven but, in general terms, in any of the three used surveys (ENI, MCVL, ENI+MCVL), the variables are significant for the whole sample and the signs are the expected. Some exceptions are detected when the analysis is detached by origin and sex that will be discussed later.

## **4. Results**

### **4.1. The Continuous Sample of Working Lives.**

Firstly we focus on the data obtained from the MCVL (described in the appendix) alone. Table 1 gather the results of the estimation for the determinants of earnings. For the whole sample (55,171 immigrants) the wage increases with the age of the immigrant and especially with the secondary and university education (10,334 euros). It diminishes for women (5,264 euros), for Latin-American (instead of European) and to a greater extent from another origin. There are significant differences between groups regarding their earnings, particularly by sex, origin and education level.

On the other hand, the indicator of integration 'years in the Social Security system' is equally relevant for the gross earnings. The penalizations for having less seniority in the country are intense, even of 12,397 euros for the newly arrived workers with regard to immigrants arrived before 1996. This indicator gathers multiple effects, but once the age is included explicitly, the most important reference is the adaptation of the human capital of the immigrant to their Spanish work environment.

The analysis by sex adds interesting information. The age has a positive influence on men's earnings but negative on women's. The kind of occupation and the sector of activity are certainly in the origin of these differences. The earnings differentiation by origin and education is supported

qualitatively for both men and women, but it is quantitatively higher for men (but their reference wage is higher too). For instance, the bonus for university studies is 13,276 euros for men and only 7,153 euros for women.

| <b>Table 1. Determinants of immigrants's labour income in 2007 (euros) - MCVL</b> |          |       |          |       |          |       |               |       |                   |       |          |       |
|---|----------|-------|----------|-------|----------|-------|---------------|-------|-------------------|-------|----------|-------|
|   | Total    |       | Men      |       | Women    |       | Latin-America |       | Rest of the World |       | Europe   |       |
|   | coef     | t     | coef     | t     | coef     | t     | coef          | t     | coef              | t     | coef     | t     |
| Constant  | 20504,0  | 31,6  | 20097,9  | 22,3  | 15735,9  | 23,4  | 17793,7       | 11,6  | 13390,9           | 20,1  | 22016,2  | 21,1  |
| <b>Age group (ref: 16-24)</b>   |          |       |          |       |          |       |               |       |                   |       |          |       |
| 25-44   | 1093,0   | 6,1   | 1607,1   | 6,8   | 437,9    | 1,7   | 1387,2        | 6,1   | 623,7             | 2,7   | 1585,8   | 4,0   |
| 45-64   | 1241,0   | 3,9   | 2299,8   | 5,0   | -453,0   | -1,4  | 974,0         | 3,4   | 571,0             | 1,2   | 2503,5   | 3,5   |
| <b>Women</b>  | -5264,0  | -39,3 |          |       |          |       | -5203,0       | -38,1 | -3851,9           | -17,4 | -7390,1  | -21,4 |
| <b>Origin (ref: Europe)</b>   |          |       |          |       |          |       |               |       |                   |       |          |       |
| Latin America   | -2692,0  | -14,9 | -3474,5  | -11,7 | -1717,0  | -10,6 |               |       |                   |       |          |       |
| Rest of the World   | -4206,0  | -19,0 | -5144,1  | -16,8 | -2033,5  | -8,7  |               |       |                   |       |          |       |
| <b>Education (ref: incomplete primary)</b>  |          |       |          |       |          |       |               |       |                   |       |          |       |
| Primary   | 535,0    | 4,2   | 409,5    | 2,2   | 620,3    | 4,6   | 323,3         | 2,4   | 463,1             | 2,4   | 367,5    | 1,2   |
| Secondary   | 3520,0   | 17,6  | 3928,6   | 12,4  | 2883,4   | 16,5  | 1836,2        | 9,5   | 3571,9            | 5,8   | 4895,0   | 13,2  |
| University  | 10334,0  | 14,0  | 13276,1  | 9,7   | 7153,1   | 16,9  | 5359,4        | 11,7  | 11498,7           | 5,3   | 14184,1  | 9,8   |
| <b>Seniority in Social Security since (ref: before 1996)</b>                      |          |       |          |       |          |       |               |       |                   |       |          |       |
| 2007  | -12397,0 | -19,0 | -12941,8 | -13,9 | -11797,6 | -18,2 | -11686,3      | -7,7  | -8174,0           | -10,8 | -14825,2 | -13,8 |
| 2006  | -7485,0  | -12,2 | -7451,3  | -8,6  | -7697,8  | -11,6 | -6275,3       | -4,1  | -3646,9           | -5,5  | -10457,8 | -10,7 |
| 2005  | -6743,0  | -4,2  | -6401,7  | -7,6  | -7367,6  | -11,5 | -6182,1       | -4,1  | -2524,4           | -4,0  | -9735,9  | -10,2 |
| 2003  | -5238,0  | -8,5  | -5121,7  | -5,9  | -5598,9  | -8,6  | -4142,1       | -2,7  | -1976,0           | -3,0  | -8119,8  | -8,1  |
| 2001  | -4478,0  | -6,9  | -3992,9  | -4,3  | -5388,0  | -8,2  | -4309,9       | -2,9  | -1459,3           | -2,2  | -6226,3  | -5,2  |
| 1996  | -2815,0  | -4,2  | -2146,7  | -2,3  | -4057,5  | -5,8  | -3876,2       | -2,5  | -1185,4           | -1,8  | -2220,4  | -1,8  |
| Observations  | 55171    |       | 34345    |       | 20826    |       | 22040         |       | 14640             |       | 18605    |       |
| F   | 345,0    |       | 171,0    |       | 196,3    |       | 230,9         |       | 74,6              |       | 134,9    |       |
| Prob(F)   | 0,000    |       | 0,000    |       | 0,000    |       | 0,000         |       | 0,000             |       | 0,000    |       |
| White   | 108,1    |       | 95,8     |       | 70,7     |       | 77,9          |       | 81,9              |       | 50,5     |       |
| Prob(White)   | 0,000    |       | 0,000    |       | 0,000    |       | 0,000         |       | 0,000             |       | 0,000    |       |
| LM  | 39,4     |       | 16,7     |       | 8,6      |       | 2,7           |       | 0,8               |       | 9,1      |       |
| Prob(LM)  | 0,000    |       | 0,000    |       | 0,014    |       | 0,261         |       | 0,367             |       | 0,011    |       |

The differences in earnings by seniority in the Social Security system are higher for men (the reduction goes from 12,941 to 2,146 euros depending on the arrival year) than for women (between 11,797 and 4,057 annual euros). It is interesting to notice that even if the reduction is higher for men than for women recently arrived, the process tends to reverse (and the earnings reduction to decrease) with the course of the stay in Spain.

The differences in the gross earnings of immigrants by origin are also worth noting. Taking as a reference the average of the groups, represented by the constant of the regression in the base profile, the average earnings are 22,016 euros for Europeans, 17,793 for the Latin Americans and 13,390 for the rest. The age is not important for the gross earnings of immigrants from the rest of the world, while it is for Latin Americans. In this last group the higher age the less earnings, which probably reflects low qualification jobs. For Europeans the age has the opposite effect: the higher age the more earnings. Being a woman is penalized in any of the origin areas, and curiously the penalization is bigger for Europeans, both in absolute terms and in percentage of the average.

The education has a very intense effect in the whole analysis, but it is more important for Europeans and immigrants from the rest of the world, and relatively smaller for Latin Americans.

The integration, measured by the years in the Social Security system, shows more accused effects on earnings in the European case. The influence is lower for Latin Americans, and even lower for workers from the rest of the world. To verify it, it is only necessary to notice that the income of the new workers, calculated reducing the constant by the penalization for being in the Social Security system only from 2007, provides average earnings of 7,191, 6,108 and 5,216 euros for Europeans, Latin Americans and immigrants from the rest of the world, respectively. On the other hand, the differences are much higher comparing workers between 45 and 64 years in the Social Security system before 1996, with average wages of 24,519, 18,768 and 13,961 euros, respectively.

By contrast, average wages for workers between 25 and 44 years are lower for Europeans and higher for the rest. This could indicate that the differences in education level increase as time goes by, but it might also indicate an increase of the education level in the job or higher promotion levels in the course of time for Europeans.

The breakdown by origin and sex (table not reported for space considerations) incorporates new elements into the analysis. The wage difference between men and women are higher for Latin Americans, with men earning almost double than women. The earnings of the European males are a third higher than those of European women, while there are not significant differences in earnings between men and women from the rest of the world. The effect of the age is not important for women from any area of origin, while it is for men coming from Europe and Latin America, and dubious for immigrants from the rest of the world. The secondary and university education is very

significant for all the combinations of sex and origin. Primary education is only significant for women. The bonus for having university studies is very different by sex and origin, with Europeans showing the biggest relative difference, with university men having a wage bonus more than double than university women. Finally, the integration variable 'years in the Social Security system' shows the expected signs and values, which are similar between men and women of the same origin. Latin-Americans are an exception, with significantly higher earnings for men than for women for any length of stay.

## **4.2. The merged database**

In this subsection we show the results obtained repeating the above regressions using the merged database (MCVL+ENI) explained above in the third section. The advantage is that we can add some qualitative indicators of integration from the ENI and analyse their impact on labour income.

Tables 2 and 3 gather the estimation corresponding to male and women respectively, with the same structure. Column 1 contains the same variables as in table 1 for comparative purposes. Column 2 replaces 'years in the Social Security system' with the ENI variable 'years in Spain'. In column 3 the dummy variable "studies finished in Spain" is added. It turns out to be a significant integration indicator, with positive sign and value of 1,228 euros per year (a 10 % of the wage in the reference case). In column 4 the dummy "studies validated in Spain" is added. It turns out to be also significant, with positive sign and a value of 1,038 euros per year. Finally, we include the dummy variable "speaks Spanish", which is also significant, with positive value of 823 euros per year. In short, the four integration indicators selected from the ENI are significant and with the expected sign. Therefore, it seems reasonable to support that the more integration, the more labor income.

The years in Spain are more valued for men, although only in absolute terms, because if we quantify it in percentage of the reference wage estimated by the constant of regression, the effect is much smaller. The same happens with the others three variables (finished studies in Spain, validated studies in Spain, and speaks Spanish), which are more valued for men than for women, especially the mastery of the language.



| <b>Table 2. Determinants of male immigrants's labour income in 2007 (euros) - MCVL+ENI</b> |            |          |       |         |       |         |       |         |       |         |       |
|--|------------|----------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
|  | 1          |          | 2     |         | 3     |         | 4     |         | 5     |         |       |
|  | <b>MEN</b> | coef.    | t     | coef.   | t     | coef.   | t     | coef.   | t     | coef.   | t     |
| Constant   |            | 20658,7  | 51,9  | 12705,8 | 34,5  | 12843,8 | 24,7  | 12810,1 | 24,6  | 10359,0 | 23,0  |
| <b>Age group (ref: 16-24)</b>  |            |          |       |         |       |         |       |         |       |         |       |
| 25-44  |            | 3937,9   | 14,2  | 5668,1  | 19,8  | 5433,6  | 17,6  | 5478,9  | 17,7  | 5682,8  | 15,1  |
| 45-64  |            | 4864,8   | 13,1  | 6625,7  | 17,2  | 6705,4  | 15,2  | 6738,6  | 15,3  | 9387,0  | 16,8  |
| <b>Origin (ref: Europe)</b>  |            |          |       |         |       |         |       |         |       |         |       |
| Latin America  |            | -7011,6  | -32,7 | -7242,1 | -32,3 | -7570,5 | -33,1 | -7596,3 | -33,3 | -6365,4 | -9,8  |
| Rest of the World  |            | -8886,2  | -43,2 | -8292,3 | -39,0 | -8609,4 | -37,3 | -8603,4 | -37,3 | -7197,1 | -30,1 |
| <b>Education (ref: incomplete primary)</b>   |            |          |       |         |       |         |       |         |       |         |       |
| Primary  |            | 246,0    | 0,9   | 109,4   | 0,4   | 72,3    | 0,2   | 53,6    | 0,1   | 439,8   | 1,5   |
| Secondary  |            | 5504,9   | 20,7  | 5522,7  | 20,5  | 5440,4  | 12,9  | 5388,7  | 12,7  | 5854,3  | 23,8  |
| University   |            | 17107,3  | 41,0  | 17299,0 | 40,4  | 17118,6 | 31,5  | 16972,0 | 30,8  | 20318,6 | 35,1  |
| <b>Seniority in Social Security since (ref: before 1996)</b>                               |            |          |       |         |       |         |       |         |       |         |       |
| 2007   |            | -15968,9 | -5,8  |         |       |         |       |         |       |         |       |
| 2006   |            | -11081,3 | -31,8 |         |       |         |       |         |       |         |       |
| 2005   |            | -10256,8 | -32,0 |         |       |         |       |         |       |         |       |
| 2003   |            | -7571,5  | -30,8 |         |       |         |       |         |       |         |       |
| 2001   |            | -5864,1  | -18,1 |         |       |         |       |         |       |         |       |
| 1996   |            | -3141,8  | -13,4 |         |       |         |       |         |       |         |       |
| Years in Spain   |            |          |       | 168,0   | 19,6  | 172,3   | 14,8  | 172,3   | 14,8  | 197,8   | 12,7  |
| Studies finished in Spain  |            |          |       |         |       | 1064,5  | 3,5   | 1182,3  | 3,9   |         |       |
| Studies validated in Spain   |            |          |       |         |       |         |       | 1082,1  | 2,1   | 494,1   | 0,6   |
| Speaks Spanish   |            |          |       |         |       |         |       |         |       | 318,2   | 1,1   |
| Observations   |            | 6597,0   |       | 6597,0  |       | 6051,0  |       | 6051,0  |       | 3246,0  |       |
| F  |            | 900,0    |       | 1132,9  |       | 927,0   |       | 835,9   |       | 597,9   |       |
| Prob(F)  |            | 0,000    |       | 0,000   |       | 0,000   |       | 0,000   |       | 0,000   |       |
| White  |            | 581,0    |       | 693,1   |       | 746,6   |       | 745,1   |       | 482,9   |       |
| Prob(White)  |            | 0,000    |       | 0,000   |       | 0,000   |       | 0,000   |       | 0,000   |       |
| LM   |            | 1,900    |       | 4,100   |       | 6,000   |       | 6,100   |       | 4,400   |       |
| Prob(LM)   |            | 0,382    |       | 0,130   |       | 0,049   |       | 0,048   |       | 0,109   |       |

In general terms, from the analysis of the results by sex we deduce the following regularities. Women lose relative revenue compared to men as the length of stay increases. Also compared to men, Latin American and women from the rest of the world experience a more intense penalization than Europeans. As regards to educational levels, the estimation allows to confirm that women get more economic advantages from primary education, while men make the most of the university education. Finally, men's earnings grow more than women's as the length of stay in Spain increases.

**Table 3. Determinants of female immigrants's labour income in 2007 (euros) - MCVL+ENI**

| WOMEN  | 1       |       | 2       |       | 3       |       | 4       |       | 5       |       |
|--|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
|  | coef.   | t     | coef.   | t     | coef.   | t     | coef.   | t     | coef.   | t     |
| Constant   | 11411,5 | 51,0  | 5410,4  | 25,4  | 5859,9  | 19,4  | 5831,7  | 19,3  | 2988,8  | 10,5  |
| <b>Age group (ref: 16-24)</b>                                |         |       |         |       |         |       |         |       |         |       |
| 25-44  | 3126,0  | 14,8  | 4067,4  | 19,7  | 3859,9  | 16,5  | 3892,5  | 16,5  | 5329,2  | 22,2  |
| 45-64  | 1601,1  | 6,9   | 2700,6  | 11,3  | 2383,5  | 8,3   | 2428,9  | 8,4   | 4726,9  | 15,1  |
| <b>Origin (ref: Europe)</b>                                  |         |       |         |       |         |       |         |       |         |       |
| Latin America  | -4288,6 | -49,4 | -4527,0 | -46,9 | -4550,9 | -45,8 | -4575,5 | -46,0 | -4058,5 | -15,4 |
| Rest of the World  | -1565,6 | -6,6  | -1519,1 | -6,2  | -1341,4 | -4,8  | -1339,7 | -4,8  | -1547,9 | -6,2  |
| <b>Education (ref: incomplete primary)</b>                   |         |       |         |       |         |       |         |       |         |       |
| Primary  | 2221,5  | 14,4  | 2312,9  | 14,4  | 1664,6  | 6,4   | 1665,4  | 6,4   | 2039,3  | 9,4   |
| Secondary  | 5674,3  | 33,5  | 5917,3  | 33,3  | 5277,7  | 19,5  | 5243,4  | 19,4  | 6001,4  | 27,0  |
| University   | 10246,2 | 45,6  | 10505,0 | 43,9  | 9837,6  | 31,2  | 9744,3  | 30,7  | 10940,6 | 32,0  |
| <b>Seniority in Social Security since (ref: before 1996)</b> |         |       |         |       |         |       |         |       |         |       |
| 2007   | -6567,0 | -1,8  |         |       |         |       |         |       |         |       |
| 2006   | -6615,5 | -35,8 |         |       |         |       |         |       |         |       |
| 2005   | -7086,3 | -38,0 |         |       |         |       |         |       |         |       |
| 2003   | -4681,4 | -34,2 |         |       |         |       |         |       |         |       |
| 2001   | -4611,9 | -31,1 |         |       |         |       |         |       |         |       |
| 1996   | -4129,3 | -32,5 |         |       |         |       |         |       |         |       |
| Years in Spain   |         |       | 132,6   | 22,5  | 147,4   | 17,1  | 145,6   | 16,8  | 145,3   | 14,7  |
| Studies finished in Spain                                    |         |       |         |       | 1039,5  | 5,4   | 1139,7  | 5,8   |         |       |
| Studies validated in Spain                                   |         |       |         |       |         |       | 793,9   | 3,5   | 875,1   | 2,3   |
| Speaks Spanish   |         |       |         |       |         |       |         |       | 1361,6  | 8,0   |
| Observations   | 7907,0  |       | 7907,0  |       | 7202,0  |       | 7202,0  |       | 3424,0  |       |
| F  | 893,2   |       | 1158,9  |       | 923,3   |       | 833,9   |       | 503,6   |       |
| Prob(F)  | 0,000   |       | 0,000   |       | 0,000   |       | 0,000   |       | 0,000   |       |
| White  | 201,1   |       | 208,4   |       | 211,5   |       | 209,5   |       | 843,7   |       |
| Prob(White)  | 0,000   |       | 0,000   |       | 0,000   |       | 0,000   |       | 0,000   |       |
| LM   | 0,400   |       | 0,250   |       | 0,570   |       | 0,630   |       | 0,680   |       |
| Prob(LM)   | 0,817   |       | 0,616   |       | 0,751   |       | 0,729   |       | 0,710   |       |

Finally, additional results for the three areas of origin are discussed<sup>4</sup>. In the cases of Europe and Latin America all the integration variables are significant and with the expected sign, except the primary education of Latin Americans, which not only changes sign but also significance. Finishing

<sup>4</sup> Tables are available upon request.

studies in Spain and mastering the Spanish language are not relevant for the immigrants from the rest of the world.

In a general perspective, the base profile of immigrant (population without studies and between 16 and 24 years) receives similar earnings if he/she comes from Europe or the rest of the world (about 10 thousand Euros). Labor income is slightly higher if the immigrants come from Latin America. The increase of the annual gross earnings with the length of stay is very high for Europeans and lower for the other origins. In any case, the premium per year of stay grows for the Europeans and immigrants from the rest of the world, but decreases for Latin Americans.

As regards earnings by sex, women always get less labor income than men, with a smaller difference for immigrants coming from the rest of the world than in the European and Latin-American cases. Finally, as it is appreciated in all the sources and estimations, Europeans make significantly better use of qualification levels (although they cannot always make them effective in the labor market). It is interesting to notice the absence of effects of primary qualification on earnings levels for Latin-Americans. This could be explained by the concentration of this population in sectors such as house building, intensive in the employment of immigrants and where the competition among the population without primary studies coming from the rest of the world is very strong.

## **5. Conclusions**

With the MCVL it is possible to measure the influence of age, sex, area of origin, educational level and years in the Social Security system on earnings (and of course on other variables like unemployment situations and the number of temporary contracts, which are not addressed in this study). With regard to earnings, for the whole sample (55,171 immigrants) the wage increases with the age of the immigrant, diminishes for women (in 5,264 euros per year), diminishes if the immigrant is Latin-American instead of European, and even more if the immigrant is from another origin, and increases significantly with the secondary and university education (10,334 euros in this latter case). The first conclusion is that many findings of the literature are confirmed econometrically.

The indicator of integration 'years in the Social Security system' is relevant for the gross earnings: the penalizations for having less seniority in the country are intense, even 12,397 euros per year for the newly arrived compared to the immigrants arrived before 1996. This indicator gathers multiple effects, but once we include explicitly the age, the most important effect is the adaptation of the immigrant's human capital to the Spanish labour environment. The reported regressions add details by area of origin and sex.

Since in the MCVL the only variable that measures the integration is the number of years in the Social Security system, we have chosen to merge the labour income data from the MCVL into the ENI, to apply the wider array of integration indicators of the latter survey. The indicator 'years in the Social Security system' is replaced with 'years in Spain', being also significant. The variable 'studies finished in Spain' is added, serving as an additional integration indicator which turns out to be significant, with positive sign and value of 1,228 euros per year (a 10% of the wage in the reference case). 'Validation of studies in Spain' turns out to be also a significant indicator, with positive sign and a value of 1,038 euros per year. Finally, the variable 'speaks Spanish' is added, which is also significant, with positive value of 823 euros per year. In short, the four selected indicators of integration from the ENI are significant and with the expected sign, therefore it seems reasonable to support that the more integration the more labor income.

## **Appendix**

### **The National Survey of Immigrants 2007**

The survey, carried out between November 2006 and February 2007, focus on persons born abroad and aged 16 years or more having residence in Spain for at least one year (or, even if they had not spent a year in Spain, they did have the intention of residing in the country for at least one year). The universe of the survey was calculated by the INE in 4,526,522 individuals. There were 15,465 polled people, each one with a factor of elevation from 8.13 to 2,504.178. In every dwelling some basic data about all the residents are gathered and then only one of them is selected to carry out the complete questionnaire. Every record has 2,973 characters and 1,526 fields. From all these

fields the most notable ones to pursue the target of this investigation have been selected, and they are: sex, origin, age, year of entry in Spain, education, monthly income, mother tongue, Spanish fluency, studies finished in Spain, studies validated in Spain, nationality.

## **The Continuous Sample of Working Lives**

We have worked with the Social Security's Continuous Sample of Working Lives or MCVL (Muestra Continua de Vidas Laborales) for 2007, in its extended version with data from labour income tax deductions. The sample consists of 1,200,998 individuals, 4% of all the records in the Social Security system. The 9,06 % of the sample (108,923 people) are not of Spanish nationality.

From the file of personal data we have extracted the variables: year of birth, sex, nationality, year of death, country of birth and education level. The latter two variables are obtained by the Social Security crossing their data with the Census database, but they are not available for approximately 20% of the cases.

We have worked exclusively with workers of foreign nationality who work for an employer, selecting from the affiliation file the variables: group of contribution to Social Security system, kind of employment contract, situation (unemployed / permanent contract / temporary contract / others), date of signed up, date of signed off, and number of worked days. In this file every contract generates a record, so that every worker can have several of them. The result is a file with 785,632 records for the 105,711 different identities of foreign nationality. The first operation carried out was to reduce all the records of the same individual to just one which summarises his/her experience in the labour market. To that end we defined the new variables: first signed up date in the Social Security system, last signed off date, total days in the Social Security system, average number of days per record, number of unemployment records, average number of days in unemployment situation, number of records with permanent employment contracts, average duration of permanent employment contracts, number of records with temporary employment contracts, average duration of the temporary employment contracts. Eliminating those who have their last signed off date before 2007 and therefore they are not in the labour market, we have 104,710 records (or identities).

Next, we have crossed these identities with the tax deductions file to obtain the gross wage of 2007, previously adding all the fiscal information of an individual, which can be fragmented because of different contracts in the same year. We have found out that there is only fiscal information for 76,088 identities (72.3% of the 104,788 previously chosen). Most of these absences can be household aids, who have no tax deduction in their wage. Finally, as the education level is only available to approximately 80% of the individuals, and the age is also missed in a few cases, the combined data (earnings, education and age) is available for 55,171 identities, which is the number of observations in the regressions carried out with the MCVL.

## **Acknowledgement**

We thank the Social Security and the FIPROS (Fondo para la investigación en protección social) of Spain for the financial support to this project.

## **References**

Adsera A, Chiswick B (2007) Are there gender and country differences in immigrant market outcomes across European destination? *Journal of Population Economics* 20 (3), pp 495-526.

Akresh, I.R. (2008) "Occupational Trajectories of Legal US Immigrants: Downgrading and Recovery", *Population and Development Review*, 34(3), 435-456.

Barth, E.; B. Bratsberg; O. Raaum (2001) "Identifying earnings assimilation of immigrants under changing macroeconomic conditions. The Norwegian experience", wp.

Beenstock, M.; B.R. Chiswick and A. Paltiel (2009) "Testing the immigrant assimilation hypothesis with longitudinal data", *Review of Economic Household*.

Borjas, G. (1985) "Assimilation, changes in cohort quality, and the earnings of immigrants", *Journal of Labor Economics* 3, 463-489.

Bratsberg, B.; J.F. Ragan and Z.M. Nasir (2002) "The effect of naturalization on wage growth: A panel study of young male immigrants", *Journal of Labor Economics* 20(3), 568-597.

Buzdugan, R. and S. Halli (2009) "Labor Market Experiences of Canadian Immigrants with Focus on Foreign Education and Experience", *International Migration Review* 43(2), 366-386.

Canal-Domínguez, J.F. and C. Rodríguez-Gutiérrez (2008) "Analysis of wage differences between native and immigrant workers in Spain", *Spanish Economic Review* 10, 109-134.

Carliner, G. (1980) "Wages, earnings and hours of first, second and third generation American males", *Economic Inquiry* 18, 87-102.

Chiswick, B.R. (1978) "The effect of Americanization on the earnings of foreign-born men", *Journal of Political Economy* 86(5), 897-922.

Chiswick, B.R. and P.W. Miller (2007) "Computer usage, destination language proficiency and the earnings of natives and immigrants", *Rev Econ Household* 5, 129-157.

Drinkwater, S.; J. Eade and M. Garapich (2006) "Poles Apart? EU Enlargement and the Labour Market Outcomes of Immigrants in the UK", IZA DP 2410.

Dustmann, C. and F. Fabbri (2005) "Immigrants in the British Labour Market", *Fiscal Studies* 26(4), 423-470.

Elliott, R. and J. Lindley (2008) "Immigrant wage differentials, ethnicity and occupational segregation", *Journal of the Royal Statistical Society* 171(3), 645-671.

Fougere, D. and M. Safi (2008) "Naturalization and employment of immigrants in France (1968-1999)", CEPR DP 7092.

Friedberg, R.M. and J. Hunt (1995) "The Impact of Immigrants on Host Country Wages, Employment and Growth", *Journal of Economic Perspectives* 9(2), 23-44.

Gustafsson, B. and J. Zheng (2006) "Earnings of Immigrants in Sweden, 1978 to 1999", *International Migration* 44(2), 79-116.

Hammarstedt, M. and G. Shukur (2007) "Immigrants' Relative Earnings in Sweden – A Quantile Regression Approach", *International Journal of Migration* 28(6), 456-473.

Haan, M. (2008) "The Place of Place: Location and Immigrant Economic Well-being in Canada", *Popul Res Policy Rev* 27, 751-771.

Izquierdo, M.; A. Lacuesta and R. Vegas (2009) "Assimilation of immigrants in Spain: A longitudinal analysis", Banco de España, DT 0904.

Jeon, B.P. and W.O. Simmons (1998) "Reward for being an immigrant: Earnings gap between immigrant and native-born West Indians", *AEJ* 26(3), 309-316.

Kahanec, M. and A. Zaiceva (2009) "Labor market outcomes of immigrants and non-citizens in the EU. An East-West comparison", *International Journal of Manpower* 30(1/2), 97-115.

Lang, G. (2005) "The difference between wages and wage potentials: Earnings disadvantages of immigrants in Germany", *Journal of Economic Inequality* 3, 21-42.

Lemaitre, G. (2007) "The integration of immigrants into the labour market: the case of Sweden", OECD social, employment and migration wp 2007/3.

Lubotsky, D. (2007) "Chutes or Ladders? A Longitudinal Analysis of Immigrant Earnings", *Journal of Political Economy* 115(5), 820-867.

Meng, X. and R.G. Gregory (2005) "Intermarriage and the Economic Assimilation of Immigrants", *Journal of Labor Economics* 23(1), 135-175.

Meng, X. and D. Meurs (2009) "Intermarriage, language, and economic assimilation process. A case study of France", *International Journal of Manpower* 30(1/2), 127-144.

Moore, A.R. and F.K. Amey (2002) "Earnings Differentials Among Male African Immigrants in the United States", *Equal Opportunities International* 21(8), 30-50.

Nekby, Lena (2002) "Employment convergence of immigrants and natives in Sweden", Stockholm University, wp.

Nordin, M. (2007) "Immigrants' return to schooling in Sweden", Institute for Labour Market Policy Evaluation, WP 12.



Sanromá, E.; R. Ramos and H. Simón (2008) "The Portability of Human Capital and Immigrant Assimilation: Evidence for Spain", IZA Discussion Paper 3649.

Simón, H.; E. Sanromá and R. Ramos (2008) "Labour segregation and immigrant and native-born wage distributions in Spain: An analysis using matched employer-employee data", Spanish Economic Review 10(2), pp 135-168.

Sullivan, D.H. and A.L. Ziegert (2008) "Hispanic Immigrant Poverty: Does Ethnic Origin Matter?", Popul Res Policy Rev 27, 667-687.

Toussaint-Comeau, M. (2006) "The occupational Assimilation of Hispanic Immigrants in the US: Evidence from Panel Data", International Migration Review 40(3), 508-536.