Native-immigrant wage differentials in Greece: discrimination and assimilation

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Abstract: This paper applies the Blinder-Oaxaca methodology in order to decompose the average earnings differentials between Greek workers and different groups of immigrants. We use information about 8,429 individuals of which 1,185 are immigrants. The data are drawn from the Greek Labor Force Survey (2009). The main objective is to explore how much of the differential is explained by differences in observed characteristics. We also investigate the effect that assimilation has on the immigrants' earnings. Our results provide empirical evidence that the part of the wage gap due to differences in the coefficients is largest for immigrants originating from non-EU countries and negative for those immigrants who terminated education in Greece.

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1. Introduction

The collapse of the USSR, the consequent collapse of all the communist countries and the Yugoslav wars in the 1990's caused a massive influx of immigrants from these countries towards Southern Europe and in Greece in particular. In addition, the gap in wages and living conditions between the South and the North Europe has been gradually narrowing over the last three decades, making the South European countries a desirable destination for immigration. Today, Greece is the main route of illegal immigrants[1] from Middle East, Africa and southern Asia who seek entry into Western Europe.

According to the 2001 Census of Population, foreign population is estimated at 797,000[2] or about 7% of total population. Today, the immigrants' share is estimated at about 10%. Immigrants from Albania (57.5%), Bulgaria (4.6%), Georgia (3.0%), Romania (2.6%) and Russia (2.3%) are the majority among the immigrant population (Cholezas and Tsakloglou, 2006). Moreover, about 80 percent of immigrants are unskilled and medium skilled workers.

These masses of unskilled immigrants give rise to issues such as their economic integration and equal treatment in the Greek labor market. The economic performance of foreign workers is of fundamental importance for the well being of immigrants themselves and the cohesion of the host society. The principle of equality in payment irrespective of racial or ethnic origin has been implemented by the Racial Equality Directive (2000/43/EU) which came into place in 2000. This Directive complements the anti-discrimination law on gender discrimination, which was introduced by the adoption of the Amsterdam Treaty (1999). Nevertheless, it is widely believed that immigrants are employed for wages that are significant lower than the wages of Greek workers (see e.g. Lianos et al., 1996; Fakiolas, 1999).

[1] According to the Hellenic Migration Policy Institute (IMEPO) the number of illegal migrants is estimated at about 400,000.

[2] Attiki[2] (53.6%) and Central Macedonia (13.6%) appear to be the regions where the concentration of immigrants is the highest.

Consequently, the main objective of this paper is to examine the factors that explain the wage gap between immigrants and natives. Moreover, we are also interested in the assimilation of immigrants and the influence it has on the earnings differential. To the best of our knowledge, no other study has been carried out on the assimilation of immigrants on the Greek labor market[3]. To this end, we proceed by applying the Oaxaca (1973) and Blinder (1973) decomposition technique by employing data from the Greek Labor Force Survey (2009).

The only study that employs the Blinder and Oaxaca methodology for Greece is that of Demoussis et al. (2010). Our paper differs form the study of Demoussis et al. in several important ways. Firstly, in our analysis we follow closely de Coulon's (2001) alternate decomposition methodology. This framework allows us to analyze the ethnical gap in payment into a part attributed to observed characteristics, a part due to difference in coefficients and examine how education and experience before and after immigration affect the results and therefore to highlight the immigrants' assimilation process in the Greek labor market. On the contrary, the analysis of Demoussis et al. is based on the assumption that the quality of human capital of immigrants is identical to that of natives. Secondly, we distinguish immigrants into three groups: (i) immigrants originating from EU countries, (ii) immigrants originating from non-EU countries and (iii) immigrants that terminated education in Greece. The rationale behind this strategy is that there exist significant differences in the levels and the quality of human capital between immigrants coming from EU and non-EU countries. Moreover, we consider immigrants that have completed formal education in Greece as the most assimilated group of immigrants and we expect that they are the group exposed to lower levels of discrimination in terms of wages. Thirdly, Demoussis et al. employ data from the Greek Household Budget (2004-2005), while our examination employs data from the Labor Force Survey.

Our main results are as follows. When we consider the group of non-EU immigrants we find that 39 percent of the mean wage gap is due to differences in the observed characteristics.

[3] However, as far as native-immigrant wage differentials are concerned, see Lianos et al, 1996; Demoussis et al, 2010; Drydakis and Vlasssis, 2010.

Moreover, we provide empirical evidence that the returns to schooling and experience in Greece are higher than those in the countries of origin. On the other hand, the explained part is around 67 percent for the immigrants originating from EU countries. In addition, we find that the differences in education and experience do have an impact on the reported results. More precisely, the explained part due to education (experience) is higher (lower) for the group of immigrants originating from non-EU countries than it is for the EU immigrants. These results highlight the fact that EU immigrants have on average 1.5 more years of foreign schooling and 2.1 less years of labor market experience in Greece than non-EU immigrants. Finally, as far as immigrants terminated education in Greece are concerned, we find that the part due to differences in coefficients is negative, that is, they experience positive discrimination.

The remainder of this paper is organized as follows: In the next Section we present the theoretical considerations and a review of the empirical literature. Section 3 describes the data. In Section 4 we discuss the methodology followed in order to decompose the average earnings differentials between natives and immigrants. Moreover, we proceed by explaining the strategy followed in order to address the sample selection bias. In Section 5, we report the results from the regressions of the earnings equations. In section 6 we report the results from the decomposition analysis. Finally, section 7 concludes the paper.

2. Literature Review

There are two classes of economic models that have been developed to explain the sources of race differences in labor market outcomes – discrimination models in which discriminatory treatment of minority groups leads to lower wages and reduced employment opportunities and assimilation models in which immigrants upon arrival face inferior labor market prospects relative to natives due to limited transferability of human capital across countries. Section 2.1

presents a brief review of theoretical and empirical studies on the issue of discrimination. In Section 2.2, we proceed by making a review of the literature on assimilation.

2.1 Discrimination

According to Alonji and Blank (1999) economic models of discrimination may be divided into two broad categories: one of competitive models in which an agent acts individually (taste-based and statistical discrimination) and one of collective models in which one group acts collectively against another.

The seminal model of Becker (1971) on taste-based discrimination formalizes the idea that some employers are prejudiced against at least some members of a minority group. Discriminating employers consider the cost to be both the wage and the disutility from hiring a member of the minority group and employ minority workers only if they accept lower wage for identical productivity. Hence, this model generates a wage gap between native and immigrant groups, while at the same time discriminating employers earn lower profits than non-discriminators. Nevertheless, Becker points out that if there is free entry and constant returns to scale, then in the long-run unprejudiced employers will increase to the point that it is no longer necessary for minority workers to work for prejudiced employers (Alonji and Blank 1999).

On the other hand, the statistical discrimination literature is based on the idea of imperfect knowledge about the qualifications and the productivity of an agent (Phelps, 1972; Arrow, 1973). The hiring and pay decisions are influenced by prior beliefs about the productivity of group members. Hence, a member of a group that is considered as more productive tends to be paid more than a member of a group that is considered as less productive. However, Aigner and Cain (1977) argue that such mistaken behavior is not compatible with the profit maximizing behavior of firms.

Finally, a strand of the literature is concerned with the fact that some groups of workers may be crowded into lowering paying occupations, i.e. occupational segregation (Alonji and Blank,

1999). One possibility is more severe employer discrimination in one occupation than in another. A second possibility, relative to collective action, is that some groups have limited access towards sectors characterized by high wages, either because social norms or because institutional regulations. Hence, occupational segregation may then generate wage differentials between native and immigrant workers.

The most prominent approach to identify discrimination between natives and immigrants is the decomposition methodology suggested by Blinder (1973) and Oaxaca (1973). The approach is based on the estimation of two separate earnings equations for each group, which are then used in the estimation of the wage gap due to differences in observed characteristics (explained part) and due to differences in coefficients which is referred as discrimination (see e.g. Kidd, 1993; Golder, 2000; Nielsen, 2000; Nielsen et al, 2004; Lang, 2000; Aldashev et al, 2008)

2.2 Assimilation

Economic assimilation is defined as the catching up process of immigrants with natives in terms of earnings with additional time of residence. The rationale behind assimilation is that immigrants often lack country-specific human capital which leads to an initial wage gap between natives and immigrants. However, as years since migration elapse, immigrants acquire skills relevant to the labor market in the host country that gradually increase the immigrants' wages at a rate higher than that of natives.

One of the first empirical studies examining the impact of assimilation on the earnings of immigrants is the pioneering study of Chiswick (1978). Chiswick (1978) sets as dependent variable the natural logarithm of hourly wage and investigates the impact of years since migration. This study provides empirical evidence that the earnings of immigrants catch up to those of natives within 15 years. Borjas (1985) challenged this finding by pooling the 1970 and 1980 census data and examining the earnings growth of different cohorts of immigrants. The empirical findings provide evidence that recent cohorts experience lower earnings growth than

natives and earlier cohorts of immigrants. Friedberg (2000) argues that education and labor market acquired abroad are valued significantly less than human capital obtained domestically. Using the Israeli Censuses of Population (1972 and 1983) she concludes that investing in human capital after immigration raises significantly the earnings of immigrants. Finally, Sanroma et al, 2009 provide empirical evidence that the returns to human capital obtained in Spain are significantly higher than the returns to human capital acquired in the countries of origin.

Kee (1995) combined the Blinder-Oaxaca decomposition with the assimilation approach a la Chiswick (1978) –by controlling for differences in education and experience acquired before and after immigration- in order to analyze the native immigrant earnings gap in the Netherlands. The empirical results provide evidence that discrimination is present against Antilleans and Turks while the part of the wage gap due to differences in observed characteristics is dominated by the effect of the relatively low number of school years acquired in the Netherlands. Finally, de Coulon (2001) using a similar strategy analyzes the average wage differentials between immigrants and the Swiss workers. This study provides strong evidence that education is the major determinant of the difference in the observed characteristics

3. Data and Descriptive Statistics

For the purpose of our analysis we make use of the information provided by the Greek Labor Force Survey (2009)[4]. Since we are interested in earning differentials, the sample is restricted to individuals working in the wage and salary sector, whose age lies between 18 and 65. The lower age limit is chosen because 18 is the legal minimum working age. The upper age limit is chosen because 65 is the average retirement age in Greece. We keep in our sample only males because it is difficult to isolate the effect of gender discrimination on ethnic discrimination. We also exclude self-employed workers since their earnings include returns to capital and they usually do not

[4] The sample contains 74,293 individuals of which 4,855 (6.5%) are immigrants.

report or underreport their earnings. Furthermore, we exclude unemployed, retirees and individuals out of workforce. After excluding also the cases where there are missing observations, we end up with a sample of 8,429 individuals of which 1,185 are immigrants. Finally, we chose to distinguish immigrants into two broad categories – those originating from EU and those originating from non-EU countries- because there are substantial differences between them with respect to the levels of education, experience and years since migration (see Table 2 below). We also expect that formal education and training obtained in EU countries is of higher quality than the human capital acquired in non-EU countries.

Since the LFS questionnaire provides information on monthly earnings, in order to construct a measure of hourly earnings we divided monthly earnings by 4.4[5] multiplied with the number of hours worked. The LFS also provides information on the level of education completed and the year when education was terminated. Utilizing this information, we assigned the total number of school years between the range of 0 and 20[6]. Furthermore, a measure of potential labor market experience is computed from age 18 onwards equal as age minus 6 minus years of schooling[7]. Finally, when we consider immigrants' human capital, we distinguished between education and experience acquired before and after immigration based on the question about years since immigration.

The other control variables are the standard dummy variables used in the empirical literature of the wage determination process (see e.g. Kee, 1995; de Coulon, 2001). Specifically, we employ dummies indicating: (i) the marital status (denoted as married), (ii) sex (male), (iii) whether an individual is considered as the head of a household (household head), (iv) whether an individual has managerial duties, (v) whether an individual is employed in firms which employ between 10 and 50 employees (medium firm) and (vi) whether an individual is employed in firms

[5] 4.4 indicates the number of weeks in a month.
[6] The lower limit indicates workers without formal education and the upper limit indicates Ph.D graduates.
[7] We subtract 6 because primary education begins at the age of 6 years.

which employ more than 50 workers (large firm), Finally, we also employ eight occupational dummies.

Table 1. Variables definition

Variable	Description
Schooling	total years of education completed
Experience	years of work experience
(Exp^2)	years of work experience squared
Manager (0,1)	Dummy=1 if an individual is in charge of a certain group of tasks and has a staff of people who report to him
Head of Household (HH)	Dummy=1 if an individual is the principal income earner of the household
Male (0,1)	Dummy=1 if gender = male
Married (0,1)	Dummy=1 if married
Medium (0,1)	if the individual is working at a firm that employs between 10 and 50 employees
Large (0,1)	if the individual is working at a firm that employs more than 50 employees
Residual income	the difference between the family income (the income of all members of household) and the income of the person who answer the questionnaire
Children (0,1)	Dummy=1 if the individual has at least one child

Table 2 presents sample statistics for the variables used in the analysis. The average native hourly wage is 25.3 percentage points higher than the non-EU immigrants' wage, and 23.9 percentage points higher than the EU immigrants' wage. Natives have on average 3.2 years more schooling than non-EU immigrants and 1.6 years more schooling than EU immigrants. Most school years obtained by immigrants are years acquired in their home country. The average total labor market experience for natives (22.6) is higher than total experience for non-EU and EU immigrants. The proportion of natives reported themselves as the head of a household and as married is lower than the proportion of immigrants. On the other hand, the proportion of natives reported themselves as managers, employed in medium and large firms is higher than the proportion of immigrants. Moreover, non-EU immigrants have on average 2 more years since migration than EU immigrants. Finally, the mean age of non-EU immigrants (EU immigrants) is 5 (4.6) years lower than the mean age of natives.

Table 2. Means of variables: Male wage earners

	Natives	Non-EU immigrants	EU Immigrants
hourly wage (Euro)	7.1	5.3	5.4
Total years of schooling	12.3	9.1	10.7
	(3.7)	(3.1)	(3.3)
- in the home country		8.8	10.3
		(3.1)	(3.3)
- in Greece		0.3	0.4
		(1.5)	(1.5)
Terminated education in Greece (%)		12.1	22.1
Total years of experience	22.6	20.7	19.2
	(11.9)	(9.5)	(10.3)
- in the home country		10.7	11.4
		(8.4)	(9.2)
- in Greece		9.9	7.8
		(4.7)	(5.1)
married (%)	61.7	66.2	66.1
	(48.6)	(47.3)	(47.5)
head of household (%)	72.1	77.8	83.1
	(44.9)	(41.6)	(37.7)
manager (%)	14.2	2.1	3.7
	(34.9)	(14.6)	(18.9)
Large firm (%)	18.5	3.2	4.4
	(38.8)	(17.7)	(20.1)
Medium firm (%)	14.3	4.1	5.9
	(35.0)	(19.9)	(23.6)
Age at migration		25.5	27.9
		(8.6)	(9.3)
Years since migration		10.3	8.3
		(4.8)	(5.5)
Age	40.7	35.7	36.1
	(10.8)	(9.4)	(10.3)
Wage earners/total sample	7244/ 15626	1049/1320	136/186

Standard deviations are shown in parentheses below the means.

4. Empirical methodology

4.1 Decomposition analysis

We proceed our analysis by applying the Blinder (1973) and Oaxaca (1973) decomposition methodology (hereafter denoted as BO). The standard BO methodology for linear models decomposes the overall pay gap between two groups into a component explained by observable differences in human capital characteristics, and a component due to differences in coefficients,

which is usually referred as discrimination. The first step of the BO methodology, involves estimating a Mincer-type earnings funtion:

$$\ln W_i = \beta_i X_i + v_i, \; i=N,M \tag{1}$$

where *lnW* denotes the natural logarithm of hourly wages, *X* is a matrix of the individual characteristics, and subscript *i* indicates the ethnic group (natives and immigrants, respectively). The mean wage difference can then be expressed as the difference in the linear prediction at the group-specific means of the regressors:

$$\ln \bar{W}_N - \ln \bar{W}_I = \hat{\beta}_N (\bar{X}_N - \bar{X}_I) + \bar{X}_I (\hat{\beta}_N - \hat{\beta}_I) \tag{2}$$

where the first term on the right hand side of equation (2) represents the explained component, attributed to individual characteristics and the second term the unexplained component, attributed to potential discrimination. Decomposition (2) is expressed from the viewpoint of group N, that is, the differences in average characteristics are weighted by the coefficients of natives and the differences in coefficients are weighted by immigrants' average characteristics. Alternatively, the differential can be expressed from the viewpoint of group I[8].

Decomposition (2) imposes the restriction that the native and immigrant model should be identically specified. However, immigrants have accumulated a part of their human capital in the country of origin. On the other hand, it is assumed that natives have acquired all of their skills in the home country. Hence, there are no native coefficients for schooling and experience in the immigrants' country of origin. In order to tackle the problem of unequal number of coefficients we follow de Coulon's (2001) alternative decomposition which resemble the original decomposition of Oaxaca (1973) and Blinder (1973):

$$\begin{aligned}\Delta = &\underbrace{(\overline{X}^C{}_N - \overline{X}^C{}_M \beta^C{}_N)}_{E1} + \underbrace{\overline{X}^C{}_M (\beta^C{}_N - \beta^C{}_M)}_{D1} + \underbrace{(\overline{X}_N - \overline{X}^{pre}{}_M)\beta_N}_{E2} \\ &+ \underbrace{\overline{X}^{pre}{}_M (\beta_N - \beta^{pre}{}_M)}_{D2} - \underbrace{\overline{X}^{post}{}_M \beta_N}_{E3} + \underbrace{\overline{X}^{post}{}_M (\beta_N - \beta^{post}{}_M)}_{D3}\end{aligned} \tag{3}$$

[8] See e.g. Cotton, 1988; Oaxaca and Ransom, 1994; Jann, 2008 for detailed reviews of different types of decomposition methodologies.

and,

$$\Delta = \underbrace{(\overline{X}^{C}{}_{N} - \overline{X}^{C}{}_{M}\beta^{C}{}_{N})}_{E1} + \underbrace{\overline{X}^{C}{}_{M}(\beta^{C}{}_{N} - \beta^{C}{}_{M})}_{D1} + \underbrace{(\overline{X}_{N} - \overline{X}^{post}{}_{M})\beta_{N}}_{E2}$$
$$+ \underbrace{\overline{X}^{post}{}_{M}(\beta_{N} - \beta^{post}{}_{M})}_{D2} - \underbrace{\overline{X}^{pre}{}_{M}\beta_{N}}_{E3} + \underbrace{\overline{X}^{pre}{}_{M}(\beta_{N} - \beta^{pre}{}_{M})}_{D3} \quad (4)$$

where E_i and D_i represent respectively the contribution of the observed characteristics and of the discrimination. The superscript *c* denotes the common characteristics of natives and immigrants, while the last four terms refer to education and experience.

In (3), the term (*E2*) on the right-hand side measures the part of the gap due to differences in human capital characteristics. Specifically, it reflects the difference between natives' human capital and immigrants' human capital acquired abroad. The term (*E3*) represents the return to education and experience acquired in Greece if immigrants faced the non discriminatory wage structure. On the other hand, decomposition (4) attributes the explained gap to differences in human capital after immigration (*E2*), and the term (*E3*) which is considered as the return to human capital acquired abroad if immigrants were treated in a similar way as the natives.

4.2 Sample selection bias correction

The "true" wage differential between natives and immigrants can sometimes be different from the observed differential if the wage and salary earners are self-selected from a larger population. The omission of this selectivity bias leads to an underestimation or an overestimation of the discrimination (Reimers, 1983; Kee, 1995; de Coulon, 2001).

To correct for sample selection bias, we adopt the Heckman's (1979) two step method. The wage sample selection equation is added to the model in order to estimate potential sample selection bias:

$$E_i^* = \gamma Z_i + u_i \quad (5)$$

where E_{ij}^* is the selection variable which is not observed whereas its sign is. Therefore, the selection mechanism becomes:

$$E_i = \begin{cases} 1 & if \quad E_i^* > 0 \\ 0 & if \quad E_i^* < 0 \end{cases} \tag{6}$$

and the regression model:

$$\ln w_i = \begin{cases} \beta X_i + e_i & if \quad E_i = 1 \\ 0 & if \quad E_i = 0 \end{cases} \tag{7}$$

with $u_i, e_i \; N[0,0,1,\sigma^2_\varepsilon,\rho]$ and Z is a matrix of observable variables that includes at least one variable that is orthogonal to the wage determination process. In order to address the selection process in the wage and salary sector we follow the relevant literature (see e.g. Kee, 1995; de Coulon, 2001) and employ the following variables: (i) residual household income, (ii) years of schooling, (iii) years of labor market experience (and its square) and (iv) a dummy variable denoting the presence of children. Consequently, the empirical specification is augmented by the Heckman correction term:

$$\ln w_i = \beta X_i + \beta_\lambda \lambda_i + v_i \tag{8}$$

where λ_i is the Heckman correction term[9] (or the inverse of Mill's ratio). The sign of the Heckman's correction term determines whether the observed wage is above or below the offered wage that would prevail if those unemployed, out of work force or self-employed, were wage and salary earners. Thus, a negative λ_i implies that the offered wage exceeds the observed wage and vice versa.

5. Regression Results

The empirical results from the regression of the earnings equation are presented in Table 3. The R-square ranges from 0.13 to 0.37 implying a relatively high explanatory power for the earnings equations. Coefficients of the inverse Mill's ratio are negative for the three groups and

[9] The inverse of Mill's ratio is given by: $\lambda_i = \phi(\beta X_i) / \Phi(\beta X_i)$, *where Φ(.)* is the standard normal cumulative distribution function and *φ(.)* is the standard normal density function.

significant for natives. Hence, the offered native wages would have been higher if the excluded workers would be included in the wage and salary sector. The estimated coefficients of the human capital variables (schooling, experience and experience squared) for the group of natives are significant and have the expected sign. One more year of schooling increases the native wage by 0.022 log points. Experience has an inverted U-shaped effect on the wage. Moreover, natives employed as managers earn more than those workers without any responsibility. Married and those who are head of households are also rewarded more than the respective omitted categories. Employees in large and medium firms are better paid than those employed in small firms.

Table 3. Estimated log wage equation, corrected for sample selection bias

	Natives	**Non-EU immigrants**	**EU Immigrants**
Schooling (home)		0.005	-0.000
		(0.004)	(0.013)
Schooling (Greece)	0.022***	0.017*	-0.026
	(0.001)	(0.008)	(0.025)
Experience (home)		-0.000	-0.015
		(0.004)	(0.011)
Experience (Greece)	0.018***	0.020*	0.012
	(0.001)	(0.009)	(0.014)
Experience (home) squared		0.003	0.060
		(0.014)	(0.032)
Experience (Greece) squared	-0.018***	-0.042	-0.025
	(0.003)	(0.042)	(0.058)
Married	0.032***	0.000	-0.032
	(0.011)	(0.028)	(0.060)
Medium firm	0.076***	-0.086	-0.039
	(0.010)	(0.052)	(0.125)
Large firm	0.082***	0.055	-0.162
	(0.010)	(0.057)	(0.126)
Manager	0.041***	0.103	0.257
	(0.011)	(0.070)	(0.192)
Head of household	0.057***	0.136***	0.096
	(0.012)	(0.031)	(0.083)
Constant	1.328***	1.277***	1.663***
	(0.034)	(0.064)	(0.163)
lambda	-0.045*	-0.132	-0.387
	(0.024)	(0.126)	(0.409)
Occupation dummies	*Yes*	*Yes*	*Yes*
R-squared	0.370	0.130	0.212

Robust standard errors are shown in parentheses below the estimated coefficients. ***, **,* indicate significant at 1%,5%,10% significant levels

As far as the group of non-EU immigrants is concerned, column 2 shows that education and working experience obtained in Greece are significant determinants of the immigrant wage. On the other hand, years of schooling and years of potential experience acquired in the home countries are not statistically different from zero. When the group of EU immigrants is considered, column 3 shows that neither education nor experience has significant effects on the earnings. As can be seen, human capital turns out insignificant either obtained abroad or in Greece. Hence, considering the effect of human capital on immigrant earnings we could argue that it is not identical across countries. Finally, as it is evident in columns 2 and 3 the other explaining variables are not statistically different from zero but the variable head of household for the group of EU immigrants.

6. Decomposition results

The results of the decomposition using formula (3) are reported in table 4. To establish that the results are robust to sample selection bias we follow Heckman's (1979) two step correction. Hence, the observed differences in mean wages differ from the offered differentials. When we consider the wage differential between natives and non-EU immigrants, the offered differential (0.28) is slightly lower than the observed differential (0.29). On the other hand, the adjusted differential (0.12) between natives and EU immigrants is 0.15 log points higher than the raw differential (0.27).

For immigrants originating from non-EU countries the part due to differences in coefficients is about 61 percent. On the other hand, around 33 percent of the mean wage gap between natives and EU immigrants is attributed to discrimination.

Our second task is to perform a detailed decomposition of the part attributed to differences in characteristics. For the group of non-EU immigrants, around 7 percent of the gap due to differences on characteristics or 25 percent of the total differential is explained by the difference

in education. For the group of EU immigrants the difference of education accounts for 50 percent of the explained gap or 33 percent of the total wage gap. When the total effects of education are further decomposed into a pre and post immigration part, we estimate that the difference of education accounts for 0.08 log points of the wage differential for non-EU immigrants and 0.05 for EU immigrants. This result highlights the fact that the average school years of immigrants followed in the countries of origin are lower than the average years of schooling of the natives.

Table 4. Detailed decomposition (3) of the native-immigrants wage gap

	Non-EU immigrants	**EU Immigrants**
Mean wage gap	0.28	0.12
Due to differences in coefficients	0.17	0.04
Due to differences in characteristics	0.11	0.08
- years of schooling in the home country	0.08	0.05
- years of schooling in Greece	-0.01	-0.01
total schooling	0.07	0.04
- years of experience in the home country	0.21	0.20
- years of experience in Greece	-0.17	-0.14
- years of experience squared (home)	-0.08	-0.08
- years of experience squared (Greece)	0.02	0.02
total experience	-0.03	0.00
- married	0.00	0.00
- manager	0.00	0.00
- household head	0.00	-0.01
- size of firm	0.02	0.02
- occupation dummies	0.05	0.04

Moreover, in Table 4, we observe the effect of total experience and its decomposition into a pre and post immigration parts. As it is evident, experience decreases the wage differential by 0.03 log points for the group non-EU immigrants. On the other hand, the differential for the group EU immigrants remains intact by the differences on labor market experience. Moreover, the effect of experience in the countries of origin is very similar across the ethnic groups. This result highlights the fact that both foreign groups have around the same average years of experience in the countries of origin. Nevertheless, non-EU immigrants have on average two more years of experience in the Greek labor market than EU immigrants. This fact is reflected on

the effect of years of experience in Greece. As can be seen, the differential for the non-EU immigrants is reduced by experience acquired in Greece by 0.03 log points more than it is reduced for EU immigrans.

Table 5. Detailed decomposition (4) of the native-immigrants wage gap

	Non-EU immigrants	**EU Immigrants**
Mean wage gap	0.28	0.12
Due to differences in coefficients	0.17	0.04
Due to differences in characteristics	0.11	0.08
- years of schooling in the home country	-0.19	-0.22
- years of schooling in Greece	0.26	0.26
total schooling	0.07	0.04
- years of experience in the home country	-0.19	-0.20
- years of experience in Greece	0.22	0.26
- years of experience squared (home)	0.03	0.04
- years of experience squared (Greece)	-0.10	-0.10
total experience	-0.03	0.00
- married	0.00	0.00
- manager	0.00	0.00
- household head	0.00	0.00
- size of firm	0.02	0.02
- occupation dummies	0.05	0.04

In Table 5 we proceed by applying the formula (4). As it is evident, the difference of education accounts for a large part of the wage differential. This result highlights the small average school years that immigrants followed in Greece. On the other hand, it is interesting to note that for non-EU immigrants education acquired in the countries of origin compensate 0.19 log points of the differential. For EU immigrants education in the home countries compensates 0.22 log points. As far as the impact of experience on the wage gap is concerned, the results again highlight the fact that EU immigrants have on average less years of labor market experience in Greece from a different point of view.

Table 6. Immigrants terminated education in Greece

	Means	Estimated coefficients	Decomposition of the wage gap
Mean wage gap			0.20
Due to differences in coefficients			-0.02
Due to differences in characteristics			0.22
hourly wage (Euro)	5.4		
Years of schooling	10.9	0.027*	0.03
		(0.01)	
Years of experience	11.9	0.023	0.19
		(0.01)	
Experience squared		-0.027	-0.08
		(0.03)	
Married	40.3	0.027	0.01
		(0.07)	
Large firm	2.3	0.237	0.01
		(0.16)	
Medium firm	7.8	0.085	0.01
		(0.11)	
Manager	2.3	-0.092	0.01
		(0.18)	
Head of household	42.6	0.061	0.02
		(0.08)	
Occupation dummies		*Yes*	0.04
lambda		-0.152	
		(0.23)	
Age at migration	12.3		
Years since migration	14.2		
Age	29.1		
R-squared		0.433	
Wage earners/total sample	129/190		

In Table 6 we employ formula (2) in order to decompose the average wage differentials between natives and immigrants who terminated their formal education in Greece. Column (1) shows the sample statistics. As can be seen, natives have on average 1.4 more school years and 10.7 more years of experience than immigrants. On the other hand, the average native is 11.6 years older than the average immigrant. In column (2) the log of hourly wage is regressed on a set of variables outlined in section 4. As it is evident, education is more valued for this particular group of immigrants than it is for natives. As far as the rest of the explanatory variables are concerned, we observe that none of them is statistically different from zero. Column (3) reports

the results of the decomposition. As can be seen, the negative sign of the part due to differences in coefficients indicate that the pay gap would have been higher if immigrants were treated in a similar way as the natives, i.e. that immigrants have an earnings advantage over natives. Moreover, the difference in education accounts for a small part of the explained differential (13.6 percent). Finally, differences on total years of labor market experience appear to explain a substantial part (50 percent) of the gap due to characteristics. This latter result, most probably is explained by the fact that immigrants are on average younger than natives.

7. Conclusion

The main objective of the present paper was to examine the determinants of the average wage differentials between natives and immigrants on the Greek labor market. Our dataset consists of cross-sectional data from the Greek Labor Force Survey (2009). Our analysis provides empirical evidence that the part of wage gap due to differences in coefficients is higher for the group of non-EU immigrants than it is for immigrants originating from EU countries. More precisely, differences in coefficients account for 61 percent of the total wage gap for the former and only 33 percent for the latter. Moreover, we provide empirical evidence that the part due to differences in coefficients is negative (that is, positive discrimination) for immigrants who terminated education in Greece.

As far as the effect of human capital is concerned, we find that the impact of human capital acquired abroad is insignificant either for EU or for non-EU immigrants. This result indicates the limited transferability of skills to the Greek labor market. On the contrary, the impact of education and experience acquired in Greece is found to be a significant determinant of the non-EU immigrants' wages, although the average school and experience years in Greece are very low (as in de Coulon, 2001). Differences on average years of schooling appear to explain a large part

of the average wage gap. On the other hand, our analysis provides evidence that experience do not exert a systematic impact on the average wage gap.

When the analysis is carried out for the most assimilated group of immigrants, those who terminated formal education in Greece, we find that differences in labor market experience account for the largest part of the explained (and total) differential. On the other hand, the part due to differences in coefficients is negative, indicating that this particular group of immigrants has an earnings advantage compared to natives.

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