

# A “glass-ceiling” effect for immigrants in the Italian labour market?

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## **Abstract**

This paper investigates earnings differentials between immigrants and natives. We focus on returns and on the (imperfect) international transferability of human capital. Data are drawn from the 2009 Italian Labour Force Survey. We show that returns to human capital are considerably lower for immigrants as compared to natives and that there is no return to pre-immigration work experience, suggesting imperfect transferability of human capital. We also show that the returns to immigrants’ human capital are mainly driven by intra-occupational earnings mobility. We detect a “glass-ceiling” effect for immigrants workers, who appear to face a large penalty in accessing high paying occupations.

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## 1. Introduction

In recent years Italy experienced a marked increase in immigration. The population share of migrants rose very rapidly, from 1.1 percent (738,000) in 1995 to 7 percent (4,235,059) in 2010. EU enlargement, since 2007, further contributed to increase migration flows from eastern European countries. Migrants are generally younger and more active in the labour market, hence when computed on the labour force their share is close to 9 percent (in 2010). This significant and rapid growth of immigrants constitutes a substantial (supply) shock which is expected to affect both employment and earnings differentials of immigrants relative to natives. This paper investigates the effects of immigration on wage determination for migrants and natives.

Empirical research has shown, for different countries, that returns to human capital are generally lower for immigrants as compared to native born (Chiswick, 1978; Dustmann, 1993; Baker and Benjamin, 1994; Shields and Wheatly Price, 1998; Friedberg, 2000; Chiswick and Miller, 2008). This is often explained with reference to the low portability of immigrants' human capital (i.e. pre-immigration education and work experience). Due to the poor quality of data with information on migrants, in Italy we lack sound empirical evidence - based on nationally representative data - on immigrants' earnings differentials.<sup>1</sup> Previous studies, which investigated the migrants pay gap in Italy, mainly used administrative archives or survey limited to specific regions. Accetturo and Infante (2010) analyse earning differentials in a large Italian region (Lombardy) and find that returns to education for immigrants are, on average, much lower as compared to natives (0.7 to 0.9 percent *versus* 4.7 to 6.1 percent). They also show that immigrants' returns to education, when compared to natives, remain low even over time, which they interpret as lack of assimilation. Venturini and Villosio (2008) use administrative data drawn from the social security archives (INPS) to investigate the labour market assimilation of foreign workers in Italy. Their analysis focusses on earnings and employment status of male workers, but due to the limited information available on individuals' characteristics (i.e. educational attainment is missing), the study is unable to provide any evidence on returns to human capital. They find no differences in earnings between immigrants and natives at the beginning of the working life, but earnings profiles diverge over time with work experience pointing to a lack of assimilation which is persistent.

This paper brings new evidence to the existing literature on earnings differentials and returns to human capital for immigrants and native Italians, using the 2009 Italian Labour Force Survey (LFS). The 2009 wave of LFS is, indeed, the first large nationally representative data for Italy with

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<sup>1</sup> A number of studies have investigated the displacement effect of immigration on native workers' employment and wages for Italy. For example, Gavosto, Venturini and Villosio (1999) find no evidence of immigration on natives earnings and mixed results for (un)employment.

information on both earnings and foreign status.<sup>2</sup> The analysis is particularly interesting for Italy, where the share of highly educated migrants is one of the lowest among OECD countries: in 2007 migrants with tertiary attainment were just 12.2 percent (a lower value is found only for Austria, 11.3 percent, and Poland, 11.9 percent). This sharply contrasts with the migration pattern of countries such as Ireland or Canada, where the same share is around 40 percent.<sup>3</sup>

We distinguish between the effect of human capital acquired domestically and abroad on earnings, and investigate the patterns of immigrants' skill transferability. We allow for differences in the returns to human capital (both education and work experience) between immigrants and natives, and for differences in returns to home and destination country's work experience (Friedberg, 2000).<sup>4</sup> In line with previous findings, we show that returns to immigrants' education are lower as compared to that of natives. We also find that pre-immigration work experience grants no returns in the Italian labour market and that years of post-migration labour market experience are rewarded at a considerably lower rate for immigrants when compared to natives.

In the second part of the paper, we explore models of occupational attainment among immigrants and the native born. In particular, we analyse the role of human capital in governing the allocation of immigrants, as compared to native workers, in the occupational hierarchy (Chiswick and Miller, 2007). Our findings suggest that wage progression for immigrants occurs mainly within, rather than between, occupations. In other words, contrary to what is observed for natives, immigrants' human capital does not seem to contribute get access to high-paying occupations. This contrasts with the empirical evidence provided by Chiswick and Miller (2007) for the US, where they show that education is the key factor, for immigrants, determining access to high-paying occupations as compared to natives. The latter may show the existence of occupational segregation in the Italian labour market, which we interpret as a "glass-ceiling" effect for immigrant workers located in the upper part of the wage distribution, who face a larger penalty in accessing high paying occupations. The rest of the paper is organised as follows. The next section describes the data used and presents some descriptive evidence. Section 3 presents different specifications for wage equations and compares returns to human capital of immigrants and natives. In section 4, we estimate both inter-occupational and intra-occupational wage differentials, as well as their patterns over the earnings

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<sup>2</sup> Note that most studies which focus on the effects of immigration on earnings are usually forced to use large cross-sectional data (Census, Labour Force Surveys) to guarantee representativeness of the immigrant population (see for example, Chiswick and Miller, 2007 and Friedberg, 2000).

<sup>3</sup> Moreover, OECD's evaluations suggest that Italy is the country with the lowest tendency to attract more highly educated immigrants on average, given its country of origin mix (OECD, 2008).

<sup>4</sup> Friedberg (2000) showed that the returns to schooling obtained in the country (i.e. Israel) for immigrants was lower as compared to natives (8 and 10 percent respectively), and that for immigrants the returns to schooling acquired abroad was even lower (7 percent).

distribution using quantile regressions. Section 5 presents some sensitivity checks, while section 6 concludes.

## 2. Data and descriptive statistics

We use data drawn from the 2009 wave of the Italian Labour Force Survey (LFS), a nationally representative dataset with information on workers' earnings as well as a foreign identifier (i.e. individuals with non-Italian citizenship).<sup>5</sup> The LFS only covers foreigners registered at municipal registry offices; hence the study does not consider illegal immigration. We restrict our sample to migrants from Eastern Europe, Asia, Centre and South America and Africa, while we exclude foreigners from EU15, North America, Oceania and Japan.<sup>6</sup> We also focus the analysis on males only, since female migration patterns are quite different from that of males -- both in terms of purposes (i.e. family reunions) and with respect to the specific labour market segment where it is concentrated (mainly households' service sector). Our final sample contains 94,269 individuals, with 7,252 (7.69 percent) immigrants and 87,017 (92.31 percent) Italian citizens. Our variable of interest, as recorded in the LFS, is net monthly earnings (which excludes occasional elements of pay such as annual productivity bonuses, allowances, pay for non customary overtime, etc.).

Table 1 shows some basic characteristics of the sample separately for immigrants and natives. Average monthly earnings are much lower for immigrants (-20 percent) as compared to Italians, while working hours are higher for latter group. Immigrants are younger (5 years), have resided in Italy on average for 10 years and their work experience, while being on average lower, is equally split between Italy and their country of origin.<sup>7</sup> Moreover, immigrants tend to be less educated (approximately 1.5 years)<sup>8</sup> and more frequently hired on "non-standard" contracts (15 *versus* 10 percent). Finally, immigrants are mainly located in Northern regions, as compared to Italians (68 *versus* 48 percent), while they are under-represented in the South (11 *versus* 36 percent).

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<sup>5</sup> In order to improve the quality of data on foreigners, the LFS employs a number of *ad hoc* strategies to collect data on the immigrant population. For example, interviews in households with a foreigner head are made using the Capi technique (Computer assisted personal interviewing) instead of the Cati technique (Computer assisted telephoning interviewing). Moreover, since 2004 further constraints referring to foreigners separately by gender and citizenship have been introduced into the procedure of computing individual weights.

<sup>6</sup> Immigration from these countries is very limited in Italy (it represents just 3 percent of the whole sample of migrants) and, most importantly, it is very different in terms of education and skills from immigration from the rest of the world.

<sup>7</sup> Note that the small difference between years since migration and experience in destination country (less than 3 months) is due to a small number of foreigners who have acquired part of their education in Italy.

<sup>8</sup> The LFS provides information on schooling levels (i.e. highest educational level achieved), which was converted in years of education with reference to the Italian educational system. Obviously this conversion may suffer from potential measurement errors.

**Table 1. Descriptive statistics**

	Natives		Immigrants	
	<i>Mean</i>	<i>Std. Dev.</i>	<i>Mean</i>	<i>Std. Dev.</i>
Net monthly wage	1372.50	563.79	1097.71	343.74
Weekly working time	39.13	6.92	40.19	6.93
Age	41.85	10.94	36.99	9.32
Education (years)	10.94	3.46	9.36	3.95
Work experience (natives)	24.91	11.75	-	-
Pre-immigration work experience	-	-	11.80	8.73
Post-immigration work experience	-	-	9.82	5.60
Years since migration	-	-	10.05	5.61
Full time	0.96	0.20	0.94	0.24
Married	0.61	0.49	0.59	0.49
Permanent worker	0.89	0.31	0.85	0.36
Nr obs	87017		7252	

Table 2 reports average earnings across quartiles of the distribution separately by education and work experience for natives and immigrants – i.e. for the latter both pre-immigration and post-immigration measures are reported. Earnings levels are positively associated to both education and work experience, for both natives and immigrants, but the relationship is stronger for natives: comparing the first quartile with the fourth quartile, average education is 3 years higher for natives, and only 1.1 years higher for immigrants. The same holds for overall work experience: from the first to the fourth quartile, average work experience ranges from 21 to over 27 years for Italians, and 21 to 23 years for immigrants.<sup>9</sup> At a descriptive level, the evidence presented shows that earnings levels are higher and exhibit a steeper progression along the distribution for Italians as compared with immigrants.

**Table 2. Distribution of human capital by wage quartiles**

	Natives			Immigrants				
	<i>Education</i>	<i>Work experience</i>	<i>Monthly net wage</i>	<i>Education</i>	<i>Work experience</i>	<i>Pre-immigration work experience</i>	<i>Post-immigration work experience</i>	<i>Monthly net wage</i>
Wage quartile								
1	9.87	21.23	830.73	8.75	20.76	12.09	8.66	712.87
2	10.06	25.06	1175.75	9.26	21.07	11.8	9.29	1033.72
3	10.92	26.06	1403.22	9.67	21.89	11.64	10.22	1189.18
4	12.92	27.3	2082.1	9.84	23	11.65	11.36	1496.51

### 3. Earnings equations and the immigrants' wage differential

We first specify a standard human capital earnings equation, which represents our baseline model.

The estimated equation is:

<sup>9</sup> Interestingly, experience in home country for immigrants is smaller at higher wage levels; while experience in the domestic country is greater at higher wage levels, although the observed increase is lower as compared to Italians.

$$\ln(w_i) = \alpha + \beta_0 WT_i + \beta_1 M + \beta_2 ED_i + \beta_3 EXP_i + \beta_4 YSM_i + \beta_4 X_i + \varepsilon_i \quad (1)$$

where  $\ln(w_i)$  is the log of net monthly earnings,  $WT$  is weekly hours worked,  $M$  is a dummy variable for immigrant status,  $ED$  is education in years,  $EXP$  is potential work experience<sup>10</sup>,  $YSM$  is the number of years since arrival in Italy, while  $X$  is a vector of personal and job characteristics (marital status, full-time, permanent job). Obviously  $YSM$  is equal to zero for natives.

This specification imposes equal returns to schooling and experience for both immigrants and Italians, and it restricts the returns to pre- and post-immigration work experience, for immigrants, to be the same.<sup>11</sup> The coefficient on the immigrant dummy  $M$  virtually measures the (expected) earnings gap between immigrants and natives upon arrival, while the coefficient on  $YSM$  quantifies the yearly returns to migration.

All restrictions implicit in model (1) are relaxed in model (2), where a more flexible specification allows for differences in the returns to human capital between immigrants and natives, and for differences in the returns to home and destination country's work experience<sup>12</sup>. Hence, the unrestricted version of our earnings equation is,

$$\ln(w_i) = \alpha + \delta_0 WT_i + \delta_1 M + \delta_2 ED_i + \delta_3 (ED_i * M) + \delta_4 EXP_i^H + \delta_5 EXP_i^D + \delta_6 (EXP_i^D * M) + \delta_7 X_i + \mu_i \quad (2)$$

where we interact education with the immigrant dummy ( $ED_i * M$ ), and we split immigrants work experience between the part acquired in their home country ( $EXP_i^H$ ) ( $H$ =home) and the part acquired in the destination country ( $EXP_i^D * M$ ) ( $D$ =Destination).<sup>13</sup> For immigrants, the overall returns to education are given by  $\delta_2 + \delta_3$ , while the returns to post-immigration work experience are  $\delta_5 + \delta_6$ . Discrimination, occupational segregation or imperfect transferability of human capital, in the Italian labour market, will show-up as a negative sign on the coefficients of the interaction terms  $\delta_3$  and  $\delta_6$  - respectively for schooling and experience -, which represents the earnings penalty that immigrants face with respect to native workers.

Table 3 presents estimates of both model (1), first two columns, and model (2), columns 3 to 5. For each model we fit different specifications: a baseline specification, without additional controls, and an augmented specification with industry, firm size and occupational dummies added. Estimates of model (1), where returns to education and experience are restricted to be the same between

<sup>10</sup> Potential labour market experience is measured as age minus education minus six years.

<sup>11</sup> All specifications include regional fixed effects.

<sup>12</sup> We do not split immigrants' education between the parts acquired in home and in destination country because in our sample only less than 3 percent attended some year of schooling in Italy.

<sup>13</sup> Pre-immigration work experience is equal to age at immigration minus education, minus six years.

immigrants and natives (columns 1 and 2), show a 10 percent earnings penalty for immigrants upon arrival (7.7 percent when controlling for industry and firm size). Interestingly, the *YSM* coefficient is negative and statistically significant in the first column, suggesting that immigrants' relative earnings decrease by 0.2 percent per year, after migration. However, when controlling for industry and firm size the coefficient is no longer statistically significant. A direct comparison of estimated coefficients suggests that the earnings penalty following migration is at least partly due to immigrants' concentration in small firms or low-wage industries.<sup>14</sup>

**Table 3. Baseline earnings equations**

VARIABLES	(1)	(2)	(3)	(4)	(5)
Immigrant	-0.1039*** (0.008)	-0.0772*** (0.007)	0.4222*** (0.016)	0.3428*** (0.016)	0.1754*** (0.016)
Education	0.0453*** (0.000)	0.0360*** (0.000)	0.0493*** (0.000)	0.0402*** (0.000)	0.0215*** (0.000)
Education x immigrant	-	-	-0.0414*** (0.001)	-0.0336*** (0.001)	-0.0165*** (0.001)
Work experience (all)	0.0077*** (0.000)	0.0064*** (0.000)	-	-	-
Work experience (natives)	-	-	0.0082*** (0.000)	0.0069*** (0.000)	0.0054*** (0.000)
Pre-immigration work experience (immigrant)	-	-	-0.0005 (0.000)	0.0001 (0.000)	0.0005 (0.000)
Post-immigration work experience (immigrant)	-0.0019*** (0.001)	-0.0009 (0.001)	-0.0048*** (0.001)	-0.0032*** (0.001)	-0.0017*** (0.001)
Constant	5.4179*** (0.013)	5.4541*** (0.015)	5.3605*** (0.013)	5.3995*** (0.015)	6.2503*** (0.024)
Observations	93,982	93,982	93,982	93,982	93,982
R-squared	0.407	0.445	0.417	0.451	0.502
Personal and job characteristics	YES	YES	YES	YES	YES
Regional fixed-effects	YES	YES	YES	YES	YES
Industry fixed-effects and firm size	NO	YES	NO	YES	YES
Occupations	NO	NO	NO	NO	YES

Robust standard errors in parentheses. Control for working time is included in all specifications.

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

Estimated returns to education and work experience are, respectively, 4.5 and 0.77 percent (column 1) and 3.6 and 0.64 percent (column 2) when additional controls are included. The baseline specification, however, is easily rejected by the data. When we fit the unrestricted specification, as in model (2), the estimated returns to education are, respectively, 4.9 and 4 percent for natives and

<sup>14</sup> Particular care should be taken in interpreting this result given the potential selection induced by return migration, which we do not address in the paper.

0.79 and 0.66 percent for immigrants (see columns 3 and 4).<sup>15</sup> The inclusion of occupational dummies (column 5) further reduces the returns to education for both natives and immigrants. We will further delve into this issue in the following section.

The returns to work experience also show some interesting results. First, pre-immigration work experience is not valued at all in the Italian labour market. Second, there is a penalty for immigrants (as shown by the negative and statistically significant coefficient of the interaction term,  $\delta_6$  in equation 2) on the returns to work experience. Hence, overall we find that returns to human capital (both education and work experience) are considerably lower for immigrants in the destination country, as compared to natives.

As a final point, it is interesting to notice that the earnings gap between natives and immigrants upon arrival is mainly explained by the lower returns to immigrants' human capital: the gap is close to zero (other things being equal) when both natives and immigrants have (roughly) ten years of schooling and becomes negative at higher levels of schooling, while work experience matters less.<sup>16</sup>

#### **4. Earnings and occupational attainment**

Part of the progression of earnings associated with additional years of schooling and with additional years of experience occurs through access to high-paying occupations. The remaining part of the payoff to education and experience is associated with higher earnings within occupations. By comparing patterns of occupational attainment for both immigrants and natives, we find that both inter-occupational and intra-occupational earnings progression are likely to be influenced, in the case of immigrants, by the penalty associated to the imperfect transferability of human capital. (Chiswick and Miller, 2007). In other words, with respect to the estimates reported in section 3 above, here we ask how and in what proportions the overall earnings gains associated with years of education and experience are split between “intra” and “inter” occupational earnings progression, both for immigrants and natives. We also investigate whether there is any earnings penalty for immigrants associated to the imperfect transferability of skills. The relevance of these features in wage determination is empirically evaluated by augmenting our specification of the earnings equations, separately for immigrants and natives, with a wide array of occupational dummies.<sup>17</sup> Then comparing estimates of earnings equations with and without controls for occupations – that is,

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<sup>15</sup> Note that, in this case, the returns to education for immigrants is the algebraic sum of the returns to schooling for natives and the wage penalty for immigrant's schooling ( $\delta_2 + \delta_3$ ).

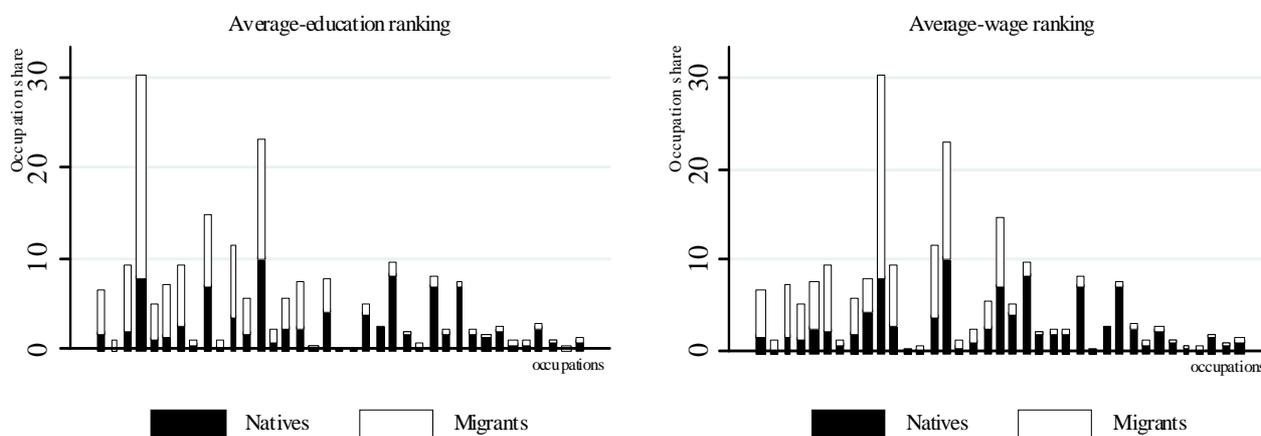
<sup>16</sup> The high positive immigrants' earnings gap estimated upon arrival, as in columns (3) and (4) in Table 3, can be explained by the fact that there are very few individuals in the sample with less than 10 years of schooling.

<sup>17</sup> As discussed in Chiswick and Miller (2007), occupational fixed effects are generally not included in the earnings equation because they can be considered either as grouped variant of the dependent variable or an alternative measure of labour market outcome. Their inclusion, however, can shed light on the indirect channels through which earnings gains are achieved, that is through occupational attainment. More educated and more experienced workers have in general access to occupations that are ranked higher-up in the occupational ladder and pay higher wages.

with and without occupational fixed effects – allows us to assess the returns to human capital that exclude the effects of the inter-occupational wage progression. The conditional returns to human capital can then be interpreted as the component of the payoff due to intra-occupational earnings progression. It is worth notice that, since the distribution of immigrants and natives across occupations is unlikely to be random (as shown in the following Figure 1), we do not interpret the structure of inter-occupational earnings differentials and focus mainly on the effect of human capital variables (i.e. schooling and work experience) on earnings.

Figure 1 describes the actual distribution of immigrants and natives across occupations, using the 2 digit ISCO classification which consists of 37 occupational groups. In panel (a) occupational groups are ranked (from low to high) using the average level of education, while in panel (b) the within-occupation average wage is used instead. The (unconditional) distribution of immigrants across occupations shows that they are more likely to be employed in low-skilled and low-paid jobs, which may partly reflect differences in accumulated human capital and partly unobserved factors such as imperfect transferability or discrimination. In the latter case, even when immigrants have comparable levels of education and work experience to those of native workers, they may be paid less due to their concentration in low-ranked occupations.<sup>18</sup>

**Figure 1: Distribution by occupations – Natives and Migrants**



In Table 4, we report the estimates of earnings equations, this time separately for natives and immigrants, obtained replicating the same specifications shown in Table 3, but conditioning on a set of occupational dummies. We find that the returns to schooling for native Italians, when occupational fixed effects are included, decrease from 4 percent (column 1) to 2.1 percent (column 2), close to a 50 percent reduction (column 3). In a similar way, but much smaller in magnitude,

<sup>18</sup> As previously noted, this evidence contrasts with that reported by Chiswick e Miller in their study on U.S using census data (Chiswick and Miller, 2007).

returns to schooling for immigrants decrease when we condition on occupational dummies: the coefficient on schooling decreases from 0.8 percent (column 4) to 0.64 percent (column 5), corresponding to a 20 percent reduction (column 6). This means that while for Italians almost half of the overall education payoff is associated to having access to high-paying occupations, for immigrants only 20 percent of the (already quite modest) returns to education originate from access to high-paying occupations. For both groups, the remaining part of the returns to education is related to higher wages obtained within occupations.

**Table 4. Earnings and occupational attainment**

VARIABLES	Natives			Immigrants		
	(1)	(2)	(3)	(4)	(5)	(6)
	Standard model	Model with 37 occupation dummies	% change from standard model	Standard model	Model with 37 occupation dummies	% change from standard model
Education	0.0399*** (0.000)	0.0213*** (0.000)	-0.47***	0.0080*** (0.001)	0.0064*** (0.001)	-0.20***
Work experience	0.0068*** (0.000)	0.0053*** (0.000)	-0.22***	-	-	-
Pre-immigration work experience	-	-	-	0.0014*** (0.000)	0.0016*** (0.000)	+0.14**
Post-immigration work experience	-	-	-	0.0054*** (0.001)	0.0052*** (0.001)	-0.04
Observations	86,800	86,800		7,233	7,233	
R-squared	0.447	0.500		0.381	0.403	
Personal and job characteristics	YES	YES		YES	YES	
Regional fixed-effects	YES	YES		YES	YES	
Industry fixed-effects and firm size	YES	YES		YES	YES	
Occupations	NO	YES		NO	YES	

Robust standard errors in parentheses. Control for working time is included in all specifications.

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

The returns to work experience, calculated before and after controlling for inter-occupational pay differentials, also prove very informative. The payoff to work experience for Italians show a modest decline from 0.7 percent (column 1) to 0.53 percent (column 2), equivalent to a 22 percent reduction (column 3), thus suggesting that only a minor part of the earnings progression is achieved *via* access to high-paying occupations. For immigrants, we find that post-migration work experience is hardly affected when occupation dummies are included (the coefficient drops by just 4 percent and the change is not statistically significant), while the payoff to pre-immigration work experience (i.e. accumulated in the home country) slightly increases with respect to the unconditional model –

i.e. a 14 percent change (see column 3).<sup>19</sup> This positive effect suggests that while experience accumulated in the destination country seems to add almost nothing to the (inter-occupation) wage progression of immigrant workers, more years of pre-immigration experience (conditional on years since migration) appear to influence immigrants' over-representation into low-paying occupations. This result is in line with earlier findings in the literature and can be explained with reference to both the imperfect transferability of skills across countries, as well as considering that immigrants' skills become more country-specific with longer work experience in the origin (see Chiswick, 1978; and Chiswick and Miller, 2007). Moreover pre-immigration work experience is strictly related to age-at-immigration, and immigrant outcomes in the host country labour market appear to decline with increasing age-at-immigration (Goldman et al., 2011). Our results confirm that the overall returns to immigrants' human capital are generally very low. Moreover the modest increase in earnings associated with improvement in education and experience occurs mainly through intra-occupational progression rather than through access to high-paying occupations.

#### *4.1 Quantile regression analysis*

In order to explore better the patterns of earnings differentials for immigrant and native workers along the entire wage distribution, in this section we replicate the analysis of the returns to human capital using quantile regressions (Buchinsky, 1998). In particular, we focus attention on the penalty immigrant workers face, as compared to natives, in the returns to educational achievements at different deciles of the distribution.<sup>20</sup> The results are summarized in Figure 2, where we plot, at each decile, the coefficient estimates (and their confidence intervals) of the schooling variable interacted with the immigrant dummy, first excluding (panel a) then including occupational dummies (panel b)<sup>21</sup>. The mean penalty estimated with OLS, as in columns 3 and 5 of Table 3, is also reported for comparison purposes.

Results show that, when occupational controls are excluded, the estimated penalty for immigrants increases along the earnings distribution: from -3.2 percent at lower deciles to -5 percent at the top of the distribution (OLS is -4.1 percent). This result is consistent with previous findings suggesting that for natives the payoff to education increases along the deciles of the earnings distribution, while for immigrants the payoffs are far less pronounced (Chiswick, Le and Miller, 2006). When

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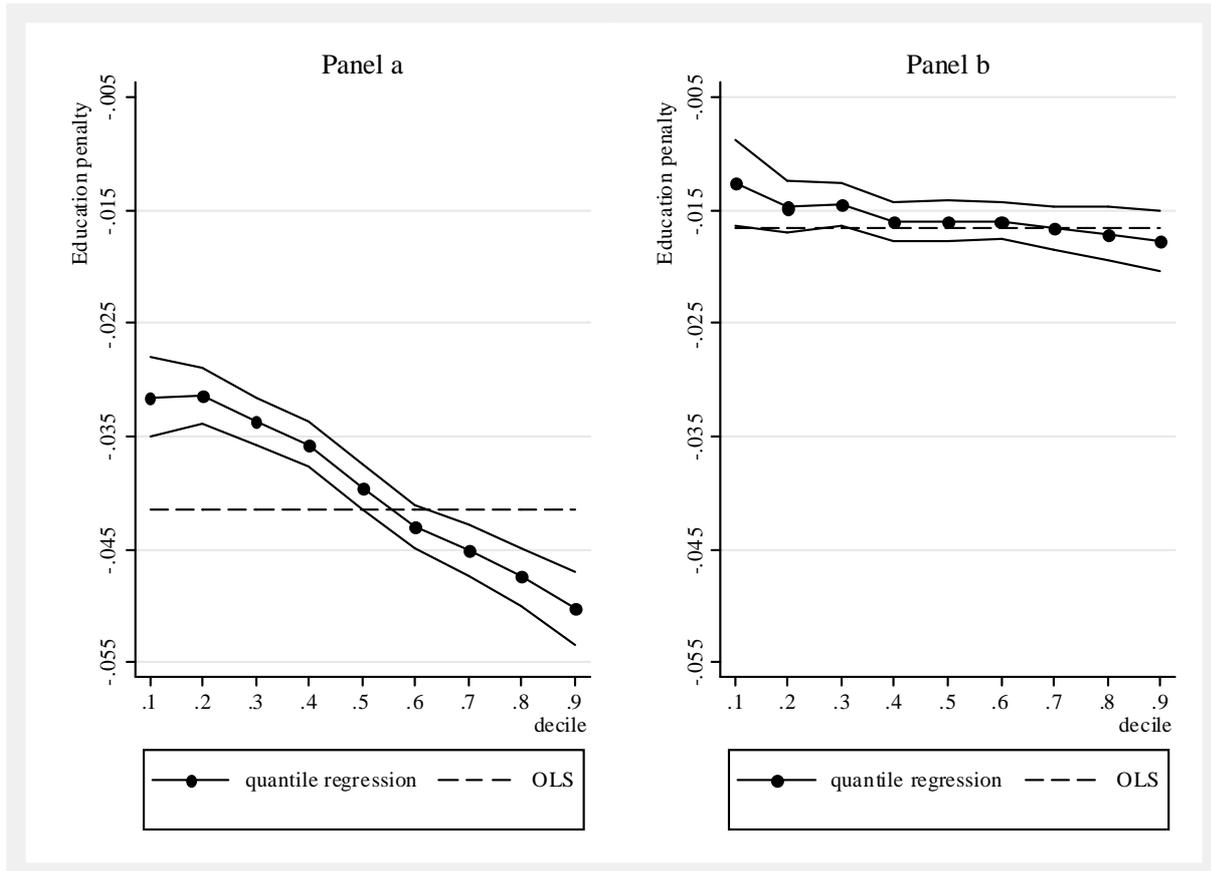
<sup>19</sup> Notice that while estimating equation (2) on the full sample the return on pre-immigration work experience did not reveal statistically significant, when estimates are performed separately on natives' and migrants' samples we find that the coefficient, albeit very small, is positive and significant.

<sup>20</sup> In practice, we re-estimated model (2), with and without occupational controls (i.e. as in Table 3 columns 4 and 5), and reported in Figure 2 the coefficient estimates of the schooling interaction term. We do not perform the same exercise for work experience because the difference between coefficients in column 4 and 5 of Table 4 is not statistically significant.

<sup>21</sup> The full set of estimates, as well as the graph for the intermediate specification as in column 4 of Table 3, are not reported here for lack of space but they are available upon request with the authors.

occupational fixed effects are added, both the value and the gradient along the deciles of the distribution decreases (OLS is -1.6 percent), and we cannot reject the null that the estimated penalty for immigrants is constant for the most part of the earnings distribution (i.e. the estimated penalty is statistically different from OLS only at the first and third decile).

**Figure 2: Education penalty for immigrants**



With reference to the findings reported in the previous sections (see Tables 3 and 4), this evidence also suggests that differences between natives and immigrants over the earnings distribution are mainly driven by the larger penalty that immigrants workers, located in the upper part of the distribution, face in accessing high paying occupations. There is no equivalent gradient in the penalty for within occupation returns to education. Overall, results point to a sort of “glass-ceiling” effects for immigrants which we interpret as determined partly by the imperfect transferability of educational achievements and partly to the existence of discrimination and occupational segregation.<sup>22</sup>

<sup>22</sup> Note that this can also be consistent with the hypothesis that immigrants at the bottom of the distribution are more favourably selected on the basis of unobserved characteristics as compared to immigrants located at the top, hence the smaller gap could also be attributed in part to higher ability and motivation of immigrants with respect to natives at lower deciles (see Chiswick, 1978)

## 5. Robustness check

In this section we investigate heterogeneity across different groups of the immigrant population, and check the robustness of our results against a number of alternative specifications of the models. We first extend the analysis to assess whether the estimated effects are different according to the ethnic group. Considering our sample of male employees, amongst the ethnic groups resident in Italy Rumanians (19.3 percent), Albanians (16.2 percent) and Moroccans (11.9 percent) are the most represented, followed by migrants from former Yugoslavia (Macedonia, Kosovo, Serbia, Bosnia-Erzegovina and Croazia, 8 percent), India (5,8 percent), Philippines (3.2 percent) and Tunisia (3,1 percent). We re-estimate the human capital penalty for immigrants, specifying a dummy for each immigrants' groups. More specifically, we defined the following immigrant groupings: Eastern Europe, Africa, Asia (excluding Japan) and Latin-America. Results are reported in Table 5. With respect to returns to education the highest penalty is found for Asian migrants and the lowest for Latin-Americans. This finding may indicate, as shown in the literature, that language skills play an important part in the returns to human capital: Spanish-speaking migrants from Central and South America will probably find easier to learn Italian - given the greater lexical proximity between the Spanish and the Italian languages – as compared to Asian.

**Table 5. Estimates by ethnic group<sup>a</sup>**

Area of origin	Wage penalty		Return on pre-immigration work experience
	Education	Post-migration work experience	
Eastern Europe	-0.0419*** (0.001)	-0.0015 (0.001)	Ref
Africa	-0.0413*** (0.002)	-0.0045*** (0.001)	0.0002 (0.001)
Asia	-0.0454*** (0.002)	-0.0065*** (0.002)	-0.0012 (0.001)
Latin America	-0.0377*** (0.004)	-0.0047 (0.003)	-0.0004 (0.002)

Robust standard errors in parentheses.

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

a: specification as in columns 3 of Table 3

Estimates of the education penalty, however, show rather large effects also for some immigrant groups from Eastern Europe and some Balkan countries, including Rumanians and Albanians, whose proficiency in Italian is traditionally considered rather good<sup>23</sup>. Experience in home country is

<sup>23</sup> The neo-latin Rumanian language is quite similar to Italian language and Italian TV channels are usually broadcasted on the Albanian television. We replicated estimates splitting European migrants between those coming from Albany

not valued for any migrant group while an interesting result emerges when considering work experience in Italy: we find no penalty for immigrants from Europe and Latin-America, while for Asians and Africans work experience in the destination country is less valued as compared to native workers.

We also analysed whether results differ when considering immigrants' age at migration (young *versus* adult at migration). Age at immigration might matter for labour market outcomes for different reasons. For example, younger immigrants are more likely to have obtained some schooling in the host country, that typically yields a higher return than schooling in the source country<sup>24</sup>. Alternatively, older immigrants may face greater difficulty than younger immigrants with acculturation and adjustment to the linguistic and cultural challenges associated with living in a new country (Schaafsma and Sweetman, 2001). To test for differences between young and adult immigrants, we specified two dummies for age at immigration below and above 20. The interaction terms show that the immigrants' penalty in the return to education is lower for younger immigrants – i.e. arrived in Italy before their 20 (and with more than 10 years of schooling) while for older immigrants – i.e. arrived after their 20 - returns are lower.<sup>25</sup> Finally, we find that for younger immigrants, return to post-migration work experience is not statistically different from that of native workers, while for older immigrants a longer experience in the country of origin is associated to lower wages in Italy.

**Table 6. Estimates by age at immigration<sup>a</sup>**

Age at immigration	Wage penalty		Return on pre-immigration work experience
	Education	Post-migration work experience	
Less or equal to 20	-0.0386*** (0.003)	-0.0017 (0.001)	Ref
More than 20	-0.0424*** (0.001)	-0.0058*** (0.001)	-0.0011** (0.001)

Robust standard errors in parentheses.

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

a: specification as in columns 3 of Table 3

and Rumania and those coming from other European countries but we found no statistically significant differences in the penalties between the two groups.

<sup>24</sup> In our sample, this effect is likely to be very small as most immigrants completed their education in their country of origin.

<sup>25</sup> Simon et al. (2011) analyse the determinants of occupational mobility of immigrants between their origin countries and Spain. In line with our results, they find that the downgrading with respect to occupational status in origin is significantly higher for older-at-immigration immigrants.

Additional robustness check were performed. In order to assess the contribution of inter-occupational wage progression (differentials) we re-estimated our model defining monthly earnings as the mean earnings level in each occupational group<sup>26</sup>. The results reported in Table 7 show that the payoffs to years of education and work experience are consistent with those reported earlier in Table 4, that is the part of the returns to education and of post-migration work experience that comes *via* access to high-paying occupations is much higher for native workers as compared to migrants, while the contribution of work experience in the home country to occupational earnings progression is still negative (Chiswick and Miller, 2009).

**Table 7. Occupational attainment**

VARIABLES	(1) Natives	(2) Immigrants
Education	0.0303*** (0.000)	0.0031*** (0.000)
Work experience (natives)	0.0026*** (0.000)	-
Pre-immigration work experience (immigrant)	-	-0.0003** (0.000)
Post-immigration work experience (immigrant)	-	0.0004** (0.000)
Constant	6.4308*** (0.007)	6.7952*** (0.018)
Observations	86,800	7,182
R-squared	0.485	0.501
Personal and job characteristics	YES	YES
Regional fixed-effects	YES	YES
Industry fixed-effects and firm size	YES	YES

Robust standard errors in parentheses. Control for working time is included.

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

As a final check, our model was re-estimated enforcing a common support, in personal and job characteristics, between immigrants and natives.<sup>27</sup> While this is not commonly done in migration studies, there is evidence that immigrants often have quite different characteristics, as compared to natives, which could bias results. Imposing a common support leads to a reduction of 5,436 observations in our sample, while results are largely unchanged (see Table 8). We just observe a negligible reduction in the penalties of immigrants for both education and work experience.

<sup>26</sup> In particular, we use the geometric mean of earnings in the occupation (i.e. the mean of log earnings) using 37 occupational groups.

<sup>27</sup> In practice, we estimate a propensity score for immigrant status using all the variables included in our model. We then sorted immigrants and native workers by their propensity score and dropped all workers that fell out of the support.

**Table 8. Baseline earnings equations: enforcing the common support**

VARIABLES <sup>a</sup>	(1)	(2)	(3)
Immigrant	0.3980*** (0.016)	0.3293*** (0.016)	0.1675*** (0.016)
Education	0.0475*** (0.000)	0.0390*** (0.000)	0.0208*** (0.000)
Education x immigrant	-0.0398*** (0.001)	-0.0326*** (0.001)	-0.0159*** (0.001)
Work experience (natives)	0.0078*** (0.000)	0.0068*** (0.000)	0.0053*** (0.000)
Pre-immigration work experience (immigrant)	-0.0006 (0.000)	0.0001 (0.000)	0.0005 (0.000)
Post-immigration work experience (immigrant)	-0.0045*** (0.001)	-0.0031*** (0.001)	-0.0016*** (0.001)
Constant	5.3788*** (0.014)	5.4124*** (0.015)	6.2727*** (0.028)
Observations	88,546	88,546	88,546
R-squared	0.416	0.451	0.500
Personal and job characteristics	YES	YES	YES
Regional fixed-effects	YES	YES	YES
Industry fixed-effects and firm size	NO	YES	YES
Occupations	NO	NO	YES

Robust standard errors in parentheses. Control for working time is included in all specifications.

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

a: specification as in columns 3, 4 and 5 of Table 3

## 6. Concluding remarks

This paper investigated earnings differentials between immigrants and natives in the Italian labour market. We used the 2009 Italian Labour Force Survey, which is the first nationally representative dataset with information on both earnings and foreign status. The analysis focused on the effect of human capital acquired abroad and domestically on earnings, allowing for differences in the returns to both education and work experience between immigrants and natives. In line with previous findings, we show that returns to human capital are considerably lower for immigrants with respect to natives. We find no statistically significant returns to pre-immigration work experience, suggesting the existence imperfect transferability of human capital. We also explored the role of human capital, for immigrants and natives, in explaining inter-occupational and intra-occupational earnings progression (differentials). Our findings suggest that the returns on human capital (main source of wage progression) for immigrants (is) are mainly driven by intra-occupational earnings, progression and that, contrary to what is observed for natives, immigrants' human capital – *ceteris paribus* - does not help to get access to high-paying occupations. This result contrasts with the empirical evidence provided by Chiswick and Miller (2007) for the US where they show that

education is the key factor determining access to high-paying occupations for immigrants as compared to natives. Finally, we estimated quantile regressions to assess the effects of human capital immigrants' penalty along the earnings distribution. We show that immigrants workers located in the upper part of the distribution face a "glass-ceiling" effect through a restricted access to high-paying occupations. Overall our results show that there is little assimilation of immigrants to natives, confirming earlier findings in the literature for other countries. While providing new and important evidence for the economic effects of immigration flows in the Italian labour market, there are some important questions that are left for future research. For example, future studies should try to assess what part of the observed wage penalties for immigrants' workers depend on imperfect transferability of educational attainment and what part is related to the existence of discrimination or occupational segregation in the Italian labour market.

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