

# Temi di Discussione

(Working Papers)

Skills or culture? An analysis of the decision to work by immigrant women in Italy

by Antonio Accetturo and Luigi Infante







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Number 815 - July 2011

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## SKILLS OR CULTURE? AN ANALYSIS OF THE DECISION TO WORK BY IMMIGRANT WOMEN IN ITALY

by Antonio Accetturo\* and Luigi Infante\*

#### Abstract

Activity and employment rates for immigrant women in many industrialized countries display a great variability across national groups. The aim of this paper is to assess whether this well-known fact is due to a voluntary decision (i.e. large reservation wages by the immigrants) or to an involuntary process in that . the labour market evaluation of their skills is low. This is done by estimating the reservation wages for each individual in the dataset. Our results show that low activity and employment rates for certain national groups are not associated with high reservation wages. This implies that low participation should not be interpreted as a voluntary decision.

### JEL Classification: J22, J61, J15.

Keywords: reservation wages, female labour supply, cross-national differences.

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## 1. Introduction<sup>1</sup>

The immigrant labour force makes an essential contribution to the growth and development of most of the industrialized countries. At the beginning of the 2000s, 85 million people residing in the OECD countries had been born abroad, almost three times more than in the 1960s. The share of immigrants in total population is quite high for economically advanced countries and it ranges from 6 per cent in Italy to almost 25 per cent in Canada.

In many European countries, characterized by a rapidly aging population, the economic integration of immigrants is a necessary condition for the achievement of the Lisbon targets of full employment and sustainable growth under the European Employment Strategy. However, although labour market integration for immigrant men is not generally an issue, employment rates for women are often low and characterized by great variability according to country of origin.

There are two possible explanations for this fact. The first is based on "cultural bias". For certain nationalities, gender differences in the division of the family burden may play an important role in the labour supply. In other words, traditions may relegate women to the more traditional roles and tasks of housekeeping and child-raising. The second is a skill mismatch on the labour market. In this case, immigrants are willing to work outside the family but their human capital does not satisfy local employers' requirements.

This issue is particularly important for policy making. Whether the cultural bias explanation is true or not, migration policy should focus on the borders: visas should be issued mainly to the nationalities that are more willing to participate in the labour market. In the case of skill mismatch, the policy options are more complex and may range from selective migration for immigrants whose characteristics are more compatible with the host

<sup>&</sup>lt;sup>1</sup> We wish to thank Prof. G. Blangiardo, ISMU, for kindly providing us with the dataset. We are also indebted to Federico Cingano, Sauro Mocetti, Laura Pagani, Alfonso Rosolia, Alberto Zazzaro, two anonymous referees, the seminar participants at the Bank of Italy, University of Bari, Bocconi University and AIEL (Sassari, 2009) and Jennifer Parkinson for editorial assistance. The views expressed are the authors' own and do not necessarily reflect those of the Bank of Italy. Usual disclaimers apply. E-mail: antonio.accetturo@bancaditalia.it, luigi.infante@bancaditalia.it

country's needs to labour market policies aimed at educating and training workers to help them become more suited to local labour market requirements.

The aim of this paper is to disentangle these two effects by assessing the impact of cultural background on women's decision to participate in the labour market. In particular, we investigate whether the observed high variability in the employment and activity rates across nationalities is attributable to a cultural or a skill effect by estimating individual reservation wages.

We make use of an extremely rich database compiled by the non-governmental organization Iniziative e Studi sulla Multietnicità - ISMU (Initiatives and Studies on Multiethnic Society) from surveys of immigrants from the least developed, emerging and transition countries now resident in the region of Lombardy in the North-West of Italy. The fact that the interviews are collected in the same (relatively small) area of Italy is particularly useful for our analysis. The women surveyed face the same labour market conditions; moreover, given Italy's recent tradition in immigration, they are most likely to preserve their cultural attitudes with respect to labour market participation.

There is a considerable body of international evidence on immigrant female participation. Many studies (Dustmann and Schmidt, 2000; Constant et al., 2006; Bevelander and Groeneveld, 2007; Dustmann and Fabbri, 2005; Adsera and Chiswick, 2007) find that the probability to work for an immigrant woman is significantly lower even after controlling for observable characteristics. This is generally attributed to an unbalanced family burden and a cultural bias. Moreover, as Dustmann and Schmidt (2000) point out, the same motives also prevent women from accumulating human capital. By using the British Time Use Survey, Zaiceva and Zimmermann (2007) obtained a similar result for the UK and showed that non-white females usually spent more time in "traditional" duties such as religious activities and food management than white females.

The poor labour market outcomes by foreign women is usually attributed to culture or religion. For the US, Fernandez and Fogli (2009) find that intergenerational transmission of cultural attitudes helps to explain the low contribution to the labour forces by second generation immigrant women. Vella (1994) obtains a similar result for educational choices.

Heineck (2004) confirms the influence of religion, finding that the frequent attendance of places of worship reduces female participation in the labour market in Germany.

Compared with the previous literature, this paper disentangles the demand (skill) and the supply (cultural) components in the decision to participate in the labour market. We assess whether low participation rates for certain national groups are due to the fact that they attach a high economic value to the time spent at home or because there is a weak demand for their skills. This is done by estimating their reservation wages. Our results show that culture has a low impact on the decision to work by immigrant women in Lombardy. We show that low activity and employment rates for certain national groups (mainly those from North African, the Middle East and central Asian) are involuntary since their estimated reservation wages are no greater than those of nationalities characterized by higher employment levels (for example, Central and Eastern Europeans).<sup>2</sup>

The paper is organized as follows: Section 2 describes the ISMU dataset and shows some of the descriptive statistics; Section 3 explains the most relevant econometric issues; Section 4 presents the results; and Section 5 concludes the paper. Appendix 1 shows how countries of origin are aggregated in homogenous groups while Appendix 2 presents a comparison between our estimated reservation wages and Labour Force Survey (LFS) data.

## 2. Data

Our main data source is a dataset collected by the ISMU in Lombardy (with the financial support of the Lombardy regional government and other private institutions) in the period 2001-2005. Since 2001, the ISMU has conducted a yearly survey of immigrants living in Lombardy. As for migration studies, the dataset has a strong comparative advantage. Its most important characteristic is that it is also able to collect information for undocumented aliens due to its data-collection process based on the method of aggregation centres developed by Blangiardo (1993).

<sup>&</sup>lt;sup>2</sup> The result has an antecedent in Europe in Niesing et al. (1994). By analysing the high unemployment rates of ethnic minorities in the Netherlands, they conclude many national groups suffer from a "discrimination in employment possibilities" due to employer choices.

Survey design – Surveys on aggregation centres are specifically designed to collect information on a representative sample of immigrants that include also irregular migrants. The idea is that even undocumented individuals generally lead a social life by attending, for example, places of religious worship or cultural centres. Blangiardo's method hinges on those centres and is based on a three-stage design. In the first, the ISMU interviewers allocate the total number of questionnaires (roughly 8,000 each year) across the 11 provinces into which Lombardy is partitioned; this is aimed at obtaining significant estimates at provincial level by having roughly the same sample variability within each province. In the second stage, the ISMU selects a number of representative municipalities (slightly less than 350, almost 25 per cent of all the towns in Lombardy) within each province according to the social and economic characteristics of the area. In the third stage, the ISMU interviewers visit all possible aggregation centres for immigrants within each municipality and randomly meet the potential interviewees. The aggregation centres usually fall within 11 categories: help and counselling centres for immigrants, Italian language courses for foreigners, places of worship, healthcare centres, cultural centres, phone/money transfer centres, public offices (police stations, town halls, etc.), ethnic restaurants/bars, ethnic shopping centres, other (train stations, etc.).<sup>3</sup> Within each aggregation centre, the ISMU interviews usually have the support of the leading personalities of the centres (priests, shop owners etc.); this ensures that the interviewers are seen as "trusted" people and not public officials. As for the ability of the survey to truly detect irregular immigrants, the misreporting of legal status seems tiny. In order to provide a comparison between the ISMU estimates and actual data, we compare survey results with the most recent alternative dataset based on applications for regularization under the Bossi-Fini amnesty law of 2002. In that year, 144,369 individuals applied in Lombardy (647,000 in Italy as a whole): this indicates that at least the 31 per cent of the total foreign population in Lombardy was irregular in 2002. ISMU estimates for that year do not appear far off that figure: in the 2002 wave, self-declared illegal aliens represented 27 per cent of the sample.

Dataset description – This study uses five pooled waves from 2001 to 2005. We concentrate on women of working age (i.e. the 15-64 cohorts), which leaves us with roughly

<sup>&</sup>lt;sup>3</sup> See Accetturo and Infante (2010) for a detailed description of the aggregation centres.

12 thousand individuals. The ISMU datasets are quite rich and contain some information on social and economic characteristics. Table 1 presents the summary statistics for the variables used in the empirical analysis. Average schooling is quite high (10.7 years)<sup>4</sup> and comparable with the figures for the Italian population. Almost 60 per cent of the interviewed women is married; they have been residing in Italy for a relatively short period of time (5.7 years). Irregular women make up 11.7 per cent of the total. As for religion, more than two thirds of the dataset is Catholic or Muslim. Other Christians (mainly Greek-Orthodox) are slightly more than one fifth of the sample. Table 1 also provides the distribution of immigrants according to the groups of country of origin (see Appendix 1 for the list of countries belonging to each group). Almost 30 per cent of the immigrant women come from European countries; sizeable groups are also constituted by Central and South Americans and people coming from the Near East and North Africa.

Standard figures on employment status are reported in Table 2,<sup>5</sup> which shows, as is usual in many industrialized countries, that there is considerable heterogeneity in labour market outcomes according to the country of origin. The employment rate averages 60 per cent for the entire sample, while the activity rate is much larger (73.4 per cent). The employment rate of the women coming from the Central and Eastern European Countries (CEEC) and Central and South America is roughly two-thirds higher than that for the Near East and North African countries (NENAC).<sup>6</sup> The figure for the Central Asia group is even smaller. Activity rates display the same great variability across national groups.<sup>7</sup>

<sup>&</sup>lt;sup>4</sup> As usual in this literature, we assigned zero years of schooling when the individual does not have any formal education, 8 years for a compulsory school leaving certificate, 13 years for high school and 17 for at least a university degree.

<sup>&</sup>lt;sup>5</sup> To be clear, we split the the immigrants in three groups as regards employment status. The first comprises the inactive population, i.e. those who stated they were housewives or students. The second group is made up of the self-reported unemployed. The third is composed of all employed persons. The "active" group includes both unemployed and employed individuals.

<sup>&</sup>lt;sup>6</sup> A similar finding is reported by Amuedo and de la Rica (2006) for Spain, according to which African women suffer the lowest occupational attainment, with respect to other immigration groups (in particular if taken into account the years since migration), while Central and South Americans, along with immigrants within EU15, show high level of assimilation.

<sup>&</sup>lt;sup>7</sup> The characteristics of migration in Lombardy are quite similar to those of the rest of the country. According to the Italian LFS (2006-2008 averages), the average schooling level of immigrant women is 10.2 years. The activity rate is slightly lower (65 per cent) probably due to the different definitions of working status between LFS and ISMU. Cross-country differences in the working status for LFS confirm the ISMU data: activity rate for NENAC is 20 percentage points lower than the one of CEEC. The only relevant difference

## **3.** Empirical approach

## 3.1 How do economists obtain reservation wages?

The aim of this paper is to report an econometric estimate of the immigrants' reservation wages. In job search theory, the reservation wage is the lowest offered wage that an unemployed individual looking for work is prepared to accept (see Blundell and MaCurdy, 1999).<sup>8</sup> Although this is a crucial variable in the neoclassical theory of labour supply, there is still an open discussion on the best way to estimate it. Two prevailing methods are usually available in literature.

The first is based upon surveys in which unemployed respondents are directly asked what their reservation wage is.<sup>9</sup> This information is widely used in many studies: see, among others, Addison et al. (2004 and 2010) and, for the Italian case, Sestito and Viviano (2011). The reliability of this information, however, is widely debated. As shown by Burdett and Vishwanath (1988) and Hofler and Murphy (1994), self-reported reservation wages are often biased and they are usually inconsistent with the actual behaviour of a worker. As Addison et al. (2010) point out, this is mainly due to the fact that respondents usually answer by indicating the prevailing wage on the labour market, rather than their true reservation value.

The second method treats reservation wages as unobservables, that must be inferred econometrically by the actual behaviour of a worker. This was pioneered by Heckman (1974) in his contribution on women's shadow prices in the labour market and was subsequently developed in further studies (see, Kiefer and Neuman, 1979; Fishe, 1982; Ferber and Green, 1985; Duncan, 1992; Sharpe and Abdel-Ghany, 1997). The idea is that observed wages for employed individuals are those that succeed in exceeding the individual

between ISMU and LFS is in the country of origin composition: in LFS the share of women coming from CEEC is 54 percent, more than 20 percentage points greater than the ISMU figure.

<sup>&</sup>lt;sup>8</sup> In a static framework, with quasi-convex utility functions, the reservation wage is equal to the marginal rate of substitution between leisure and consumption.

<sup>&</sup>lt;sup>9</sup> For example, the Italian Labour Force Survey asks unemployed workers "What is the lowest net monthly wage you would be willing to accept?".

reservation values. This implies that, by controlling for the selectivity bias, actual market wages contain enough information to infer workers' reservation wages.<sup>10</sup>

In this paper we adopt the second methodology for two main reasons. The first relies upon the above-mentioned reliability problems of self-reported reservation wages – problems that can be greatly aggravated for migrants, whose understanding of the crucial features of the local labour market is more limited. The second relates to whether there is sufficient information in the LFS. In Appendix 2 we provide the results for self-reported reservation wages in the Italian LFS. By concentrating on immigrants living in the North (where Lombardy is located and where most of the immigrants in Italy live), we end up with just under 1,000 individuals, which is one-tenth of our baseline estimates database.

The methodology we use in this paper is based on the Mohanty's (2005) extension of the Heckman model with frictional unemployment and feedbacks between labour demand and supply. As will soon be clearer, from a technical point of view, the only difference between this methodology and Heckman's lies in the first stage, which is bivariate-probit rather than probit estimated. This allows us to take into account a double selectivity bias due to involuntary unemployment or feedback effects between demand and supply.<sup>11</sup>

# *3.2 The estimate of reservation wages: an econometric approach*

A woman *i* decides to participate in the labour market (i.e. to be active) whenever the wage offers she expects to receive are greater than her own reservation wage. In formulas, this implies that she is active whenever  $w_i^o - w_i^r = y_{1i} \ge 0$ , where  $w_i^o$  is the expected wage offer,  $w_i^r$  is her reservation wage and  $y_{1i}$  represents the (normalized) individual preference for labour market participation. Whenever  $y_{1i}$  is greater than zero, individual *i* participates in the labour market, whenever it is negative she prefers to stay at home. It immediately follows that reservation wages can be obtained as  $w_i^r = w_i^o - y_{1i}$  and can be computed by estimating preferences ( $y_{1i}$ ) and wage offers ( $w_i^o$ ).

<sup>&</sup>lt;sup>10</sup> An important advance on this topic is the estimation of structural search models by using the panel structure of many LFSs. As will be clearer later, this method cannot be used in this paper because the ISMU dataset is compiled on the basis of pooled cross-sections.

<sup>&</sup>lt;sup>11</sup> Mohanty (2005), in turn, generalizes the procedure to cases with multiple selection bias following the approach in Meng and Schmidt (1985). Recently Baffoe-Bonnie (2009) uses a similar framework to study wage differentials.

Estimates for  $y_{1i}$  and  $w_i^o$  are obtained in two steps.

In the first step we consider both the participation decision and the hiring process in the labour market. Woman *i* is employed only if she decides to participate in the labour market (Participate<sub>i</sub> =1) and is hired by an employer (Employed<sub>i</sub> = 1). Formally,

$$Participate_{i} = \begin{cases} 1 & \text{if } y_{1i} \ge 0 \\ 0 & \text{if } y_{1i} < 0 \end{cases}$$

and

$$Employed_{i} = \begin{cases} 1 & \text{if } y_{2i} \ge 0\\ 0 & \text{if } y_{2i} < 0 \end{cases}$$

where  $y_{2i}$  represents the (normalized) employers' preferences over individual *i*.

The aim of the first step is to compute the latent variables  $y_1$  and  $y_2$  by estimating the following two equations:

$$y_1 = x_1 b_1 + e_1$$
 (1)

$$y_2 = x_2 b_2 + e_2$$
 (2)

by a bivariate probit with partial observability. The choice of the bivariate probit is particularly useful since it allows us to treat demand and supply components simultaneously. As mentioned above, this allows us to take into account the existence of feedbacks between the decision to participate and the expected labour market outcome. Operationally,  $x_1$ contains a set of variables aimed at capturing the economic and cultural determinants for the labour supply, while  $x_2$  includes all the possible personal characteristics which are likely to influence the employer's willingness to hire an individual.

As for the supply components,  $x_1$  includes schooling, potential experience, religion dummies and their interaction with marital status, number of children below and above 18 years of age and a set of time dummies. The number of under age children may indicate a greater interest for childcare and housekeeping while the number of children over 18 should have a positive effect on the labour supply since offspring could need financial support from the family of origin. Religion dummies indicate a cultural attitude toward labour, especially when a woman is married. As will be clear later, religion dummies play a fundamental role as identification variables in the empirical strategy.

On the demand side,  $x_2$  contains schooling; years since migration; dummies for country of origin; time; and space.<sup>12</sup> Years since migration are expected to enhance the probability for a worker to be employed since during these years the worker is likely to increase his ability to understand the crucial features of the host country's labour market and local language; country dummies capture the workers' heterogeneity in terms of the quality of the institutions in their area of origin (for example, educational system, sectoral specialization) while spatial dummies capture time invariant local characteristics that are likely to influence employment levels.

 $x_1$  and  $x_2$  share the schooling variable and time dummies, since education is likely to have an effect on both the demand and supply components and year dummies take into consideration business cycle fluctuations.

The latent variable of interest  $(\hat{y}_1)$  is calculated by taking the predicted values (linear prediction) of equation (1).

In the second step, we compute expected wage offers. We estimate the following wage equation using a correction for a double selectivity bias (Tunali, 1986):

$$\ln w_i^m = \alpha + b_3 x_3 + c_{13} \lambda_{1i} + c_{23} \lambda_{2i} + D_s + D_t + D_c + u_i$$
(3)

where 
$$u_i = \varepsilon_i - c_{13}\lambda_{1i} - c_{23}\lambda_{2i}$$
,  $\lambda_{1i} = \frac{\phi(x_{1i}b_1)\Phi\left(\frac{x_{2i}b_2 - \rho x_{1i}b_1}{\sqrt{1 - \rho^2}}\right)}{F(x_{1i}b_1, x_{2i}b_2, \rho)}$  and

 $\lambda_{2i} = \frac{\phi(x_{2i}b_2)\Phi\left(\frac{x_{1i}b_1 - \rho x_{2i}b_2}{\sqrt{1 - \rho^2}}\right)}{F(x_{1i}b_1, x_{2i}b_2, \rho)}.$   $\phi$  and  $\Phi$  represent, respectively, the density and the

cumulative function of a standard normal distribution, while  $\rho$  (rho) is the correlation of the

<sup>&</sup>lt;sup>12</sup> Spatial dummies include one dummy for each of local labour markets in the partitions of Lombardy.

error terms in the bivariate probit.  $x_3$  includes standard variables in migration-augmented mincerian equations: schooling, potential experience and years since migration. The regression includes spatial dummies  $(D_s)$  to take into account spatial differences in wage levels; time dummies  $(D_t)$  to control for business cycle effects; and country of origin dummies  $(D_c)$  to control for institutional factors such as sectoral specialization or educational quality.

Expected wage offers are computed as follows:

$$\hat{w}^o = \exp\left(\ln w^m\right)$$

Where  $\ln w^m$  is the predicted value of equation (3).  $\hat{w}^o$  represents the expected market wage conditional on the individual characteristics and controlling for the selectivity bias due to participation and hiring decisions.<sup>13</sup>

Reservation wages can now be calculated as  $\hat{w}^r = \hat{w}^o - \hat{y}_1$  for all the individuals in the sample.

By comparing all the variables in  $x_1$ ,  $x_2$  and  $x_3$ , the crucial role of religion dummies and their interaction with marital status as identification variables is now apparent. The idea is that religion is a private matter that affects the individual working decisions but should not affect the labour market evaluation (wages) and the hiring decision by a non-discriminating employer. In other words, the worker's productivity should be influenced by the country of origin's institutional setting (school quality, sectoral specialization etc.) but not by the migrant's private attitudes toward religion (which does, however, influence her decision to work). This implies that by inserting country dummies in equations (2) and (3) we estimate a supply effect that is within-country and across religions. This can be done only if we have an

<sup>&</sup>lt;sup>13</sup> Expected wages are also computed for unemployed and inactive individuals. Predicted values are computed without the country of origin dummies coefficients. In this way, we net out the effects of wage level differentials on the computed reservation wages. However, results do not change when we insert country of origin dummies in the predicted values calculations.

imperfect overlap between religions and countries of origin, i.e. when there are different religious creeds within a country. In order to have a suitable sample for this identification we exclude all individuals coming from a country where, according to the ISMU dataset, only one creed is professed. The list of a diversification indicator of religions (Herfindhal index: HI<sup>14</sup>) in each country is provided in Appendix 1; the higher HI the less diverse the country; in all the analyses we exclude all countries with a HI equal to one.

## 3.3 Cross-country differences and robustness

After computing the reservation wages, we test whether they systematically differ across groups of nationalities. We calculate the percentage differences between each group and our reference cluster (Central and Eastern European Countries, CEEC). The choice of CEEC as a benchmark<sup>15</sup> relies on the fact that, Central and Eastern European women share similar institutions with the host country. We focus, in particular, on the differences between the CEEC group and two nationalities that display the lowest activity and employment rates: NENAC and Central Asia. If the reservation wages for those groups were higher, the observed low labour market participation would be interpreted as voluntary: the value NENAC and Central Asian women attach to their time spent at home is so high that they are not attracted by the local labour market. Conversely, if their reservation wages were comparable or lower to that of our reference group, their inactive status would be interpreted as involuntary: their reservation values are not particularly high but they remain unemployed because the arrival rate of job offers is quite low.

We further check the robustness of these estimates along four lines.

<sup>14</sup> HI for country c is calculated as follows:  $HI_c = \sum_{r \in R} \left(\frac{P_{rc}}{P_c}\right)^2$  where R is the set of religions,  $P_{rc}$  is the

number of immigrants of religion r coming from country c and  $P_c$  is the number of people coming from country c. When in country c there is only one religion, HI is equal to one.

<sup>&</sup>lt;sup>15</sup> As in most papers, our first choice would have been native women; but since the ISMU dataset only concentrates on immigrants, we chose the CEEC group as the closest to the native one.

The first check is based on Italian migration law according to which it is necessary to have a job in order to obtain a visa. As an exception to this rule, immigrants can enter Italy to join their family and obtain a visa based on family reunification. For those cases, migrants' true shadow values should be revealed since they do not need to work to obtain a residence permit. We check this issue by restricting the analysis to those women who migrated to Italy with a family reunification visa. This information is available for all years except for 2004: migrants entering the country for with a family reunification visa amount to 2,408.

The previous scheme obviously implies that the immigrants have a good knowledge of the Italian migration laws. We can generalize this scheme by focussing on migrants with a blood relative already residing in the country. Again, for those individuals their shadow values could be higher, since they can rely on the family's financial support while looking for work. We check this issue by restricting the analysis to women who entered the country when a next of kin was already residing here. This leaves us with 1,753 individuals.

The third check is based on the analysis of the irregular migrants. Undocumented aliens have very weak bargaining power with respect to their employers as they cannot join a union and must work off the books. This implies that wage offers are usually quite low (see Accetturo and Infante, 2010, on this topic) and, therefore, they may be quite close to the reservation wages. Moreover, illegal aliens' incentives to work are particularly strong since their only chance of being regularized under one of the recurrent amnesties is strictly linked to evidence that they are employed on Italian soil. In other words, they are more likely to accept the jobs they are offered. In the ISMU dataset, irregular women are surveyed each year and they amount to 1,303 individuals.

The fourth check is based on the relationship between religions and countries. As we said before, we already discard all the observations coming from one-religion countries. However, in some countries a religion could prevail but not be the only one (for example, Islam in Arab countries or Roman Catholicism in Central and South America); this implies that from the employer's point of view religions and countries of origin are quite indistinguishable thus invalidating our identification structure. We cope with this problem by restricting our analysis to a group of countries that can be considered truly multi-religious.

This is done by discarding all observations coming from countries whose HI based on religions exceeds 0.75: this leaves us with 8,305 individuals.

# 4. **Results**

### 4.1 Baseline sample

The first part of this section is devoted to the results of the baseline sample. This group is constituted by all the regular women of working age interviewed in the 2001-2005 waves.

Table 3 shows the results of both the bivariate probit estimates (columns [1] and [2]) and the wage equation (column [3]). As expected, schooling positively affects the probability to be active and to be employed in the labour market. Moreover, potential experience increases the probability to supply labour and the years spent in Italy increases the likelihood to be employed. The number of children below (above) 18 years old reasonably raise (decrease) the probability to be active. Estimates also show that the correlation among error terms (rho) is quite high.<sup>16</sup>

In the second step, we estimate a classical wage equation for all working individuals and we take into account the possible selection bias by plugging the computed  $\lambda_1$  and  $\lambda_2$  into the equation. Results are displayed in column [3]. All variables have the expected sign and they are significant. The highly significant coefficients of  $\lambda_1$  and  $\lambda_2$  imply that selection is at work. The use of estimated values of columns [1] and [3] allows us to compute reservation wages.

Before starting with the comparison across national groups it is worth assessing whether estimated reservation wages are consistent with the predictions of the standard theory of labour supply (Table 4). As Blundell and MaCurdy (1999) point out, individuals with a higher inter-temporal elasticity of substitution should have lower reservation wages: this is confirmed in our estimates since younger individuals attach a lower economic value to

<sup>&</sup>lt;sup>16</sup> This is due to the fact that the dependent variables in the biprobit are highly correlated since they only differ in the values they assume for unemployed individuals. This may generate a collinearity problem between  $\lambda_1$  and  $\lambda_2$  in the estimate of the wage equation. A possible way to circumvent this problem is to treat equations (1) and (2) in a sequential way by estimating an Heckprob model. The results, not shown here to save space but available upon request, are in line with those presented in the text.

time spent at home compared with older cohorts. Even education plays an important role in setting the individual's reservation value. Consistently with the standard theory, we find that more educated individuals usually set higher reservation wages. Finally we check whether individuals residing in a city<sup>17</sup> have a lower reservation value because of lower job-search costs thanks to better access to the transportation network. This is confirmed by the bottom panel, in which we show reservation wages for workers in a city by educational group.

We subsequently deal with the core estimates of the paper. In Table 5 we analyse the reservation wages and their differences across national groups. Columns [1] and [2] show the activity and employment rates for the baseline sample (regular aliens),<sup>18</sup> the last column reports the percentage difference of the reservation wage of a national group with respect to the CEEC.

Estimates show that while the share of active and working population is substantially low for the NENAC and Central Asia group, their reservation wages are statistically smaller than those computed for the CEEC group. This suggests that low participation should not be attributed to a cultural attitude that raises the economic value of the time spent at home, but, rather, to a skill mismatch between local labour market requirements and immigrants' abilities.

We further split the computed reservation wages across educational levels and years since migration.

Table 6 shows the differentiated effects across four classes of education: no education, primary, secondary and tertiary schooling. Baseline results are confirmed as reservation wages for NENAC and Central Asian are always statistically lower than the estimate for the CEEC. In columns [1] to [4] of table 7 we report the percentage differences in reservation wages for subgroups belonging to (respectively) the first to the fourth quartile of the distribution of years since migration. Even in this case the results remain undisputed.

<sup>&</sup>lt;sup>17</sup> We define "city" the local labour market of the three most important towns of Lombardy: Milan, Brescia and Bergamo.

<sup>&</sup>lt;sup>18</sup> Reported figures are quite similar to those in Table 2 since the regular aliens constitute almost 90 per cent of the ISMU sample.

## 4.2 Robustness

So far we have obtained the interesting result that the low employment/activity rates registered for certain groups are not associated with higher reservation wages.

In this section we present four robustness checks by restricting the analysis to: (i) a women who benefited from a visa based on family reunification, (ii) immigrants with a blood relative at the time of migration to the host country, (iii) undocumented immigrants, and (iv) immigrants coming from truly multi-religious countries.

Results for the first check are shown in Table 8. Columns [1] and [2] report, respectively, the shares of active and working population among those who entered with a family reunification visa: consistently with the standard theory of labour supply, activity and employment rates are quite small now, thus reflecting their possibility to sustain larger spells of unemployment;<sup>19</sup> however, there are still differences across national groups. In column [3] we report the estimated reservation wage. Baseline results are still confirmed: NENAC and Central Asia are among the lowest participant group in the labour market, while the reservation wage in this subsample is also the lowest for the Central Asian women, and statistically equivalent to the benchmark group for the NENAC women. A very similar picture is depicted in Table 9, which shows the estimates for immigrants with a blood relative already residing in Italy.

Estimates for the irregulars are reported in Table 10. Columns [1] and [2] (activity and employment rates) show that incentives to work are particularly strong for the irregulars. Activity rate averages around 90 per cent, while the employment rate is much lower (64 per cent). Cross-national differences are still in place, especially in the employment rates, although they narrow with respect to the baseline sample. However, our baseline result on reservation wages remains undisputed: the difference in reservation wages is negative and statistically significant for the NENAC group, while negative but not significant for Central Asian migrants.

Finally, Table 11 tackles the issue of the multi-religious countries. As explained above, even in nations with an HI based on religions smaller than one, we can observe the

<sup>&</sup>lt;sup>19</sup> This result is confirmed by Constant and Zimmermann (2005).

prevalence of one religion that can invalidate our identification strategy. To address this concern, we only consider countries with an HI lower than 0.75. Results remain quite similar to the baseline ones, thus confirming the correctness of the identification strategy.

### 5. Concluding remarks

As in many advanced countries, activity and employment rates for immigrant women in Italy display great variability across nationals groups. Some nationalities (NENAC, Central Asia), in particular, are characterized by extremely low participation in the labour market. This fact can be due to either a supply "cultural" or a demand "skill" effect. The aim of this paper is to disentangle these two components by estimating the economic value of the time spent at home (reservation wages).

From a technical point of view, we use religion as an identification variable for the effects of culture on labour supply in multi-religious countries. Our results show that low activity and employment rates for NENAC and Central Asia are not associated with higher reservation wages; this implies that low migrant participation is attributable to a weak demand for their skills rather than to a high value ascribed to time spent at home. This result is quite robust to a number of sample selections and specification tests. In particular, the reservation wage differentials do not change according to the mode of entry into the host country (visa based on family reunification or the presence of blood relatives) or to legal status within the host country.

This result can hardly be overstated and it may have some important policy implications. As low participation is mainly involuntary, policymakers have a set of policies that can be used to raise participation and employment rates. The first option is related to selective migration. As far as the policymakers are concerned, with a quantitative target (e.g. Lisbon criteria), admissions could be aimed at those nationalities whose capabilities to integrate are particularly high. The policy, in this case, could also be designed to require different educational levels for different countries of origin. Alternatively, for the nationalities whose skills are particularly mismatched, the policymaker can think of stricter educational requirements. The second set of options relates to policies for labour market inclusions. The idea is to create a set of training programmes with the aim of helping immigrants to become more suited to local labour market requirements.

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# SUMMARY STATISTICS OF THE MAIN VARIABLES

	No. Obs.	Sample mean	Std. Dev.
School	11,852	10.746	4.541
Potential Experience	11,852	16.764	9.295
Years in Italy	11,989	5.734	4.610
Net monthly wage	9,988	606.874	1214.336
Children below 18yrs	12,015	0.696	0.990
Children above 18yrs	12,015	0.527	1.566
Married	12,015	0.569	0.495
Family network	4,851	0.358	0.479
Family reunification visa	9,914	0.226	0.441
Irregular	12,015	0.117	0.321
	No. Obs.	Percent	tages
Religions:			
Catholic	12,015	38.3	33
Muslim	12,015	30.8	39
Other Christians	12,015	18.4	6
Buddhists	12,015	3.2	1
Hindu	12,015	1.3	5
Other	12,015	2.2	4
No creed	12,015	5.5	2
Groups of countries of origin:			
Central and Eastern European Countries	12,015	28.5	56
Central or Southern America	12,015	19.5	55
Near East and North Africa	12,015	18.2	29
Sub-Saharan Africa	12,015	15.5	59
East Asia	12,015	12.4	4
Central Asia	12,015	5.5	7

	Activity rate	Employment rate
Central and Eastern European Countries	82.0	70.1
Central or Southern America	86.9	73.9
Near East and North Africa	49.7	41.4
Sub-Saharan Africa	78.3	66.0
East Asia	77.1	71.1
Central Asia	38.2	29.8
Total	73.4	62.8

# ACTIVITY AND EMPLOYMENT RATES ACROSS NATIONAL GROUPS

Source: Authors' calculations on ISMU dataset. Activity and employment rates are computed on self-declared working status. Averages weighted according to the sample design.

	[1]	[2]	[3]
	Biprobit estimates		Wage equation
	Dependent variable:	Dependent variable:	Dependent variable:
	Participate	Employed	Net monthly wage
School	0.039***	0.024***	0.007***
	(0.004)	(0.004)	(0.001)
Potential experience	0.043***	-	0.009***
	(0.005)		(0.002)
(Potential experience)2 (x100)	-0.069***	-	-0.021***
	(0.011)		(0.000)
Years in Italy	-	0.101***	0.016***
		(0.009)	(0.005)
(Years in Italy)2(x100)	-	-0.415***	-0.047*
		(0.051)	(0.025)
Children below 18yrs	0.045**	-	-0.058***
	(0.021)		(0.007)
Children above 18yrs	-0.088***	-	-0.022***
	(0.016)		(0.006)
Marital status	-0.554***	-	-0.046**
	(0.066)		(0.014)
Spatial dummies	NO	Local labour system	Local labour system
Year dummies	YES	YES	YES
Religion dummies and their interaction with the marital status	YES	NO	NO
Country of origin dummies	NO	YES	YES
Lambda1	-	_	-0.171**
			(0.068)
Lambda2	-	_	-0.163**
			(0.074)
Intercept	0.231**	-0.492***	7.100***
	(0.103)	(0.119)	(0.089)
Rho		916	-
No. Obs.	10	5,937	

# **BASELINE SAMPLE**

Source: Authors' calculations on ISMU dataset. Robust standard errors in parenthesis. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. All regressions are weighted according to the sample design.

(BASELINE SAMPLE)					
All individuals	780.86				
Age:					
< 25	746.47				
25-29	767.43				
30-34	795.95				
35-39	796.18				
>39	778.07				
Years of schooling:					
< 8	682.24				
8-12	780.25				
13-16	786.96				
≥17	820.88				
Years of schooling in a city:					
< 8	677.69				
8-12	765.09				
13-16	778.79				
≥17	816.54				
Source: Authors' calculations on ISMU dataset					

**ESTIMATED RESERVATION WAGES: STANDARD PROPERTIES** (**BASELINE SAMPLE**)

Source: Authors' calculations on ISMU dataset. Means are weighted according to the sample design. A woman is considered to be living in a city if she resides in one of the towns belonging to the local labour markets of Milan, Brescia and Bergamo.

	[1]	[2]	[3]
· · · · · ·	Activity	Employment	<b>Reservation wages (1)</b>
	rate	rate	
			Percentage difference with respect to the CEEC group:
Central and Eastern European Countries	79.8	69.9	
Central or Southern America	85.3	73.4	0.029*** (0.006)
Near East and North Africa	47.0	40.5	-0.096*** (0.007)
Sub-Saharan Africa	76.4	66.6	-0.003 (0.007)
East Asia	76.9	71.2	0.045*** (0.009)
Central Asia	35.1	27.5	-0.143*** (0.011)
No. Obs.			10,459

#### **RESERVATION WAGE DIFFERENCES ACROSS NATIONALITIES** (**BASELINE SAMPLE**)

Source: Authors' calculations on ISMU dataset. (1) Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

(BASELINE SAMPLE)					
[1]	[2]	[3]	[4]		
No formal	Compulsory	Secondary	Tertiary		
education	school	education	education		
0.054	0.042***	0.022**	-0.002		
(0.038)	(0.014)	(0.009)	(0.015)		
-0.021	-0.026*	-0.082***	-0.074***		
(0.027)	(0.013)	(0.010)	(0.016)		
0.052*	0.071***	0.040***	-0.075***		
(0.029)	(0.014)	(0.011)	(0.020)		
-0.040	-0.001	0.026**	0.011		
(0.042)	(0.014)	(0.012)	(0.015)		
-0.039	-0.102***	-0.116***	-0.137***		
(0.033)	(0.018)	(0.017)	(0.033)		
964	3702	4273	1520		
	[1] No formal education 0.054 (0.038) -0.021 (0.027) 0.052* (0.029) -0.040 (0.042) -0.039 (0.033)	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		

## **RESERVATION WAGE DIFFERENTIALS ACROSS EDUCATIONAL LEVELS** (**BASELINE SAMPLE**)

Source: Authors' calculations on ISMU dataset. Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

	(BASELINE SAMPLE)					
[1]	[2]	[3]	[4]			
Less than 3	3 to 5	5 to 8	More than 8			
years	years	years	years			
0.017	0.008	0.015	0.030**			
(0.017)	(0.013)	(0.013)	(0.015)			
-0.063***	-0.064***	-0.120***	-0.064***			
(0.016)	(0.013)	(0.012)	(0.015)			
0.030	-0.040***	-0.045***	0.061***			
(0.019)	(0.015)	(0.013)	(0.015)			
-0.029	0.010	-0.022	0.008			
(0.021)	(0.016)	(0.015)	(0.015)			
-0.071***	-0.171***	-0.159***	-0.104***			
(0.020)	(0.019)	(0.022)	(0.024)			
1901	2601	2855	3102			
	Less than 3 years           0.017           (0.017)           -0.063***           (0.016)           0.030           (0.019)           -0.029           (0.021)           -0.020)	Less than 3 years         3 to 5 years           0.017         0.008           (0.017)         (0.013)           -0.063***         -0.064***           (0.016)         (0.013)           0.030         -0.040***           (0.019)         (0.015)           -0.029         0.010           (0.021)         (0.016)           -0.071***         -0.171***           (0.020)         (0.019)	$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$			

## **RESERVATION WAGE DIFFERENTIALS ACROSS YEARS SINCE MIGRATION** (BASELINE SAMPLE)

Source: Authors' calculations on ISMU dataset. Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

	[1]	[2]	[3]
	Activity rate	Employment rate	Reservation wages (1)
	Tutt	Tute	Percentage difference with respect to the CEEC group:
Central and Eastern European Countries	54.4	42.8	
Central or Southern America	68.1	55.3	0.067*** (0.023)
Near East and North Africa	27.0	22.6	0.015 (0.016)
Sub-Saharan Africa	52.8	47.5	0.025 (0.020)
East Asia	53.0	50.5	-0.025 (0.021)
Central Asia	28.6	16.5	-0.063*** (0.022)
No. Obs.	-		2,408

#### **ROBUSTNESS CHECK: FAMILY REUNIFICATION VISA**

Source: Authors' calculations on ISMU dataset. (1) Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

	[1]	[2]	[3]
	Activity rate	Employment rate	Reservation wages (1)
			Percentage difference with respect to the CEEC group:
Central and Eastern European Countries	60.8	45.4	
Central or Southern America	72.1	65.7	-0.0126 (0.0128)
Near East and North Africa	24.7	19.9	-0.0234** (0.00986)
Sub-Saharan Africa	51.7	44.3	0.0248** (0.0110)
East Asia	66.6	60.1	0.0108 (0.0133)
Central Asia	24.5	16.0	-0.0438*** (0.0130)
No. Obs.			1,753

**ROBUSTNESS CHECK: FAMILY TIES** 

 No. Obs.
 1,753

 Source: Authors' calculations on ISMU dataset.
 (1) Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \*

 between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

	[1]	[2]	[3]
	Activity	Employment	<b>Reservation wages (1)</b>
	rate	rate	Percentage difference with respect to the CEEC group:
Central and Eastern European Countries	91.6	61.4	0 1
Central or Southern America	94.8	74.6	0.087*** (0.031)
Near East and North Africa	86.9	56.4	-0.251*** (0.045)
Sub-Saharan Africa	92.0	59.6	-0.078** (0.037)
East Asia	85.5	72.6	0.028 (0.052)
Central Asia	88.8	57.7	-0.153 (0.103)
No. Obs.	-		1,303

#### **ROBUSTNESS CHECK: IRREGULAR ALIENS**

Source: Authors' calculations on ISMU dataset. (1) Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

	[1]	[2]	[3]
	Activity	Employment	<b>Reservation wages (1)</b>
	rate	rate	
			Percentage difference with respect to the CEEC group:
Central and Eastern European Countries	79.8	69.9	
Central or Southern America	84.0	71.0	0.0296 (0.0301)
Near East and North Africa	31.0	27.7	-0.482*** (0.0470)
Sub-Saharan Africa	76.6	66.8	0.0893*** (0.0286)
East Asia	76.9	71.2	-0.0319 (0.0303)
Central Asia	35.1	27.5	-0.495*** (0.0401)
No. Obs.		_	8,305

#### **ROBUSTNESS CHECK: MULTIRELIGIOUS COUNTRIES**

Source: Authors' calculations on ISMU dataset. (1) Percentage differences in computed reservation wages. Stars show significance levels, \*\*\* up to 1 per cent, \*\* between 1 per cent and 5 per cent, \* between 5 per cent and 10 per cent. Mean differences are weighted according to the sample design.

#### Appendix 1. National groups and countries of origin

(Herfindhal index of religions in parenthesis)

**Central and Eastern European Countries**: Bulgaria (0.42), Czech Rep. (0.46), Estonia (0.33), Latvia (0.38), Lithuania (0.36), Poland (0.66), Romania (0.43), Slovakia (0.62), Slovenia (0.34), Hungary (0.56), Albania (0.30), Belarus (0.70), Bosnia-Herzegovina (0.34), Croatia (0.33), Serbia-Montenegro (0.34), Macedonia (0.31), Moldova (0.68), Russia (0.46), Turkey (0.68), Ukraine (0.59).

**Central and Southern America**: Argentina (0.54), Bahamas (0.55), Barbados (1), Belize (1), Bolivia (0.88), Brazil (0.67), Chile (1), Colombia (0.77), Costa Rica (0.55), Cuba (0.40), Dominica (0.78), Dominican Rep. (0.72), Ecuador (0.77), El Salvador (0.58), Jamaica (0.37), Guatemala (1), Haiti (1), Honduras (0.72), Mexico (0.94), Nicaragua (1), Panama (0.50), Paraguay (0.83), Peru (0.70), Santa Lucia (1), Trinidad and Tobago (1), Uruguay (0.73), Venezuela (0.58).

**Near East and North Africa**: Algeria (0.92), Egypt (0.72), Libya (0.76), Morocco (0.81), Tunisia (0.98), Saudi Arabia (1), UAE (1), Jordan (0.53), Bahrain (1), Iran (0.76), Iraq (0.50), Kuwait (1), Lebanon (0.61), Palestine (0.34), Syria (0.66), Yemen (0.25).

Sub-Saharan Africa: Angola (0.41), Benin (0.30), Botswana (1), Burkina Faso (0.44), Burundi (0.45), Cameroon (0.46), Capo Verde (0.73), Central African Rep. (1), Chad, Comores, Congo (0.37), Congo (Dem. Rep.) (0.57), Côte d'Ivoire (0.47), Eritrea (0.31), Ethiopia (0.36), Gabon (0.33), Gambia (0.58), Ghana (0.38), Djibouti (1), Guinea (0.51), Guinea Bissau (0.52), Equatorial Guinea (0.26), Kenya (0.26), Lesotho (0.26), Liberia (0.25), Madagascar (0.52), Malawi (1), Mali (0.88), Mauritania (0.32), Mauritius (0.29), Mozambique (0.59), Namibia (1), Niger (0.36), Nigeria (0.38), Rwanda (0.43), Sao Tome e Principe (1), Seychelles (0.28), Senegal (0.60), Sierra Leone (0.44), Somalia (0.43), South Africa (1), Sudan (1), Tanzania (0.55), Togo (0.38), Uganda (0.72), Zambia (0.59), Zimbabwe (0.50).

**East Asia**: Cambodia (0.30), China (0.30), North Korea (0.26), South Korea (0.37), Philippines (0.69), Indonesia (0.27), Laos (0.33), Malaysia (0.62), Myanmar (0.50), Singapore (1), Sri Lanka (0.31), Taiwan (1), Thailand (0.53), Vietnam (1).

**Central Asia**: Afghanistan (0.5), Armenia (1), Azerbaijan (0.55), Bangladesh (0.68), Georgia (1), India (0.25), Kazakhstan (0.36), Kyrgyzstan (1), Nepal (1), Pakistan (0.74), Uzbekistan (0.55).

# Appendix 2. A comparison with the self-reported reservation wages in the Italian Labour Force Survey.

In this Appendix, we compare our estimates for reservation wages on ISMU data with those provided in the Labour Force Survey (LFS). We use on the 2006-08 waves of LFS, as previous ones do not provide information on the citizenship of foreign workers. Moreover, in order to provide a comparable result we concentrate on unemployed females in the 15-64 age bracket residing in the North of the country,<sup>20</sup> where Lombardy is located. We provide here the answer to the question "What is the lowest net monthly wage you would be willing to accept?" Results (Table A1) show that the magnitude for reservation wages is quite similar across national groups. Moreover, cross-national differences in LFS basically mirror those in our estimates.

 $<sup>^{20}</sup>$  The extension to other regions provides very similar results since immigrants in Italy mostly settle in the North.

	[1]	[2]
· · · · ·	LFS	Our estimates
tral and Eastern European Countries	832.93	780.03
Central or Southern America	816.22	797.43
Near East and North Africa	728.55	754.16
Sub-Saharan Africa	731.42	811.01
East Asia	741.45	781.28
Central Asia	788.53	715.12

# COMPARISON BETWEEN LFS AND OUR ESTIMATES

Source: Authors' calculations on LFS and ISMU dataset.

- N. 793 Credit availability and investment in Italy: lessons from the "Great Recession", by Eugenio Gaiotti (February 2011).
- N. 794 Bridging the gap between migrants and the banking system, by Giorgio Albareto and Paolo Emilio Mistrulli (February 2011).
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