

In-work Poverty among Immigrants in the EU¹

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Manuscript received: 19 October 2015.

Modified manuscript received: 3 December 2015.

Acceptance of manuscript for publication: 14 December 2015.

Abstract: A considerable share of the population is poor in the European Union (EU), among which many are poor despite working. Immigrants are overrepresented among the working poor. Working immigrants dispose lower equivalent household income on average and face higher risks of falling into poverty than working natives, according to a cross-sectional regression analysis on a sample of 22 EU member states in 2011 (based on EU-SILC 2012). The differential between the two groups shrinks considerably, though does not disappear, when controlling for micro level factors (socio-demographic characteristics such as attained education level, occupation, household size) of the level of household income and the risk of in-work poverty. The income gap underlines the need for better social inclusion of immigrants.

Keywords: income poverty, in-work poverty, immigrant, European Union

Introduction

Employment is essential for integrating immigrants into European societies, although work may not be sufficient in itself to ensure the social inclusion of the foreign born. In this paper I describe whether working immigrants tend to have lower household incomes than working natives, and, correspondingly, whether they have a higher chance of being working poor, even when the observable compositional differences between the two groups are controlled for.

Immigrants are increasingly present in the labor market, having accounted for 70% of the growth in the workforce in Europe over the last decade (OECD 2014a). A considerable share of the population of the EU (approximately 10%) are estimated to be foreign born (Eurostat 2015a). It follows that the integration and social inclusion of immigrants is an increasingly challenging and laborious process. This statement rings particularly true when one bears in mind the recent and intense discourse about immigration. Evidence-based analysis that yields a more comprehensible view of the situation of immigrants is thus of significant importance to policy making. I

¹ An earlier version of this paper was submitted in the form of a thesis for a Master of Arts in Economic Policy in Global Markets at Central European University. I would like to express my gratitude to my supervisor Professor Lajos Bokros for his kind support. I would like to also thank TÁRKI for access to the related database, and to István György Tóth and Márton Medgyesi for comments.

contribute to the discourse by focusing on the case of working immigrants who are participating in the local labor market. Paying special attention to immigrants is key, as this group is overrepresented among the working poor in Europe.

I analyze the working population using a sample of 22 member states of the EU, based on the EU-SILC (European Union Statistics on Income and Living Conditions) for year 2012 (referring to income year 2011) in order to generate a snapshot of the poverty of the stock of immigrants at that point in time. I undertake cross-sectional linear regression analysis, for which the dependent variable is equivalent disposable household income, and the main independent variable of interest is 'foreign born' status. I then estimate in-work poverty using a linear probability model in order to identify whether immigrants are more likely to be working poor than their native counterparts. I control for the micro-level explanatory factors that affect household income and in-work poverty to account for the observable heterogeneity among immigrants and natives. Compositional differences between the two groups are responsible for the bulk of the income differential, although a considerable part of the difference remains unexplained. Many of the sources of unobserved heterogeneity, such as the difference in the motivation of immigrants on the labor market and in the host country in general, cannot be disregarded. Similarly, I cannot rule out the possibility that immigrants encounter different and often discriminatory treatment from the native born. However, some of the potential reasons for the (explained and unexplained) income differential may be addressed using integration policies.

The vulnerable group of immigrants

The foreign-born population numbered 50.8 million in the EU-27² as of 1 January 2013, accounting for approximately 10% of the population. From this number, 33.5 million were born outside of the EU-27, while 17.3 million were born in an EU-27 member state different to their country of residence (Eurostat 2015a). The largest number of immigrants live in Germany, the United Kingdom, Italy, France and Spain; the number is highest relative to the native population in Luxemburg (44%) and also is also high (above 10%) in Cyprus, Latvia, Estonia, Ireland, Austria, Belgium and Spain. In Western Europe the proportion of foreign born almost doubled from less than 8% of the population in 1996 to almost 14% in 2010 (Eurostat 2015a; D'Amuri – Peri 2011). Accordingly, strengthening the social inclusion of immigrants is of growing importance if social cohesion is to be maintained in European countries.

Research that has focused on the circumstances of immigrants in the recipient country found that immigrants are more likely to be at risk of poverty. A person is at risk of poverty if he or she lives in a household with a disposable income that is

2 EU27 stands for the 27 member states of the European Union; all the current member states, except for Croatia.

below 60% of the median equivalent income of the population in the country.³ One out of ten people at risk of poverty in the EU are foreign born (Lelkes et al. 2010).

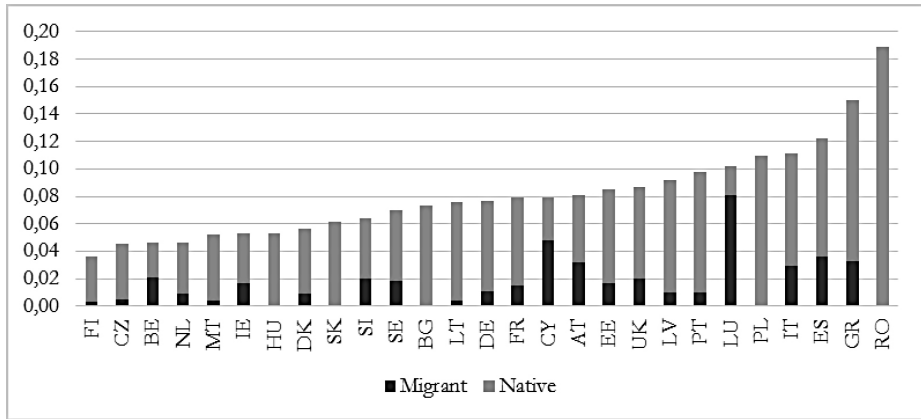
Employment status is strongly associated with risk of poverty in the case of the native born, and even more so in the case of immigrants. Work is 'proportionally' more important for immigrants as it represents a method of integrating into a society when established networks of relatives and friends in the recipient country may be lacking. The risk of falling under the poverty line for the working-age population is highest (47.5%) among immigrants born outside the EU who live in a household with low work intensity (0-0.49); locals with similarly low work intensity face only a 38% probability of entering a situation of poverty (Lelkes et al. 2012). Some of the underlying reasons for the native-immigrant labor market gaps include the shorter time spent in the host country, less social capital and lower returns on human capital (Guzi et al. 2015) of immigrants. It follows that the earnings and social bonds that are created through being employed extensively decrease the vulnerability of the foreign born (Bevelander – Groeneveld 2007). The relationship between employment and poverty indicates that work may be a route through which immigrants can escape poverty.

However, having earnings from employment may not preclude an individual falling into a state of poverty; this phenomenon is referred to as in-work poverty. A person is defined as being 'in-work poor' if he or she has worked for a substantial part of a reference year (i.e. has been an employee or self-employed, either in full or part-time work for at least 7 months in the calendar year of the survey) and is still at risk of poverty. Approximately 9% of the working age population were working poor in the EU in 2012 (Eurostat 2015b).

The phenomenon of working poverty is regarded as an attribute of post-industrial societies that have experienced skill-biased technological changes (Goldin – Katz 2007; Acemoglu – Autor 2012), which have shifted demand toward more skilled labor, resulting in greater wage inequality. In fact, demand is on the rise not only for the highest-skilled occupations (managers and other professionals), but also for the lowest-skilled occupations in the service sector, while mid-level employment opportunities (in terms of skills and occupation distribution, including manufacturing and routine office jobs) is declining due to routinization and automation (Autor et al. 2003). Accordingly, the OECD database shows that wage dispersion increasingly favors those toward the top end (OECD 2008, 2011). The processes of job polarization (Goos et al. 2011) and labor market segmentation (Frazer et al. 2011) have taken root in Europe, although they vary in intensity across countries.

3 Poverty in this paper refers to the 'at risk of poverty' indicator, unless a different meaning is indicated. The aim of the country-specific relative income poverty lines and targets are to ensure the right of residents to fully participate in their respective societies. For a review of the merits and drawbacks of the 'at risk of poverty' indicator, see Atkinson et al. 2002, Decancq et al. 2013.

Figure 1. In-work poverty rate in the countries of the EU27 (% of working population aged 18-64).

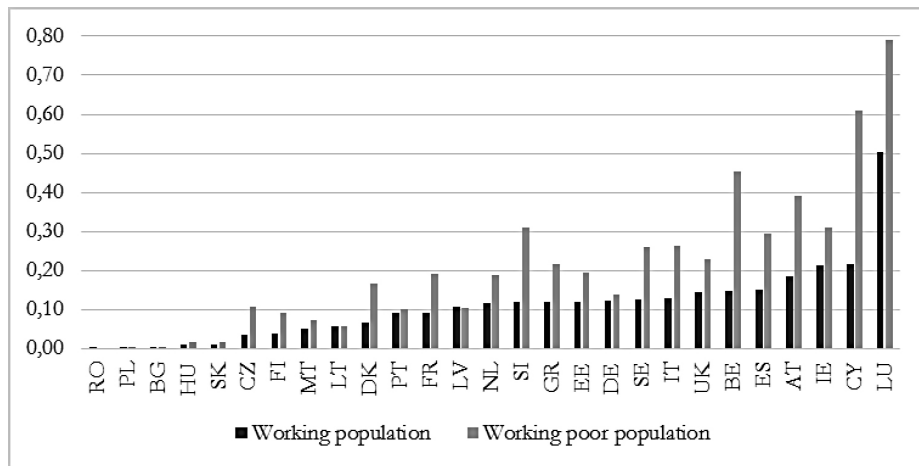


Source: author's own calculation based on EU-SILC 2012. No data was available for Romania about the status of immigrants among the working poor.⁴

A snapshot of in-work poverty rates in the EU in 2012 shows that there is variability across countries in terms of the share of the working population affected by poverty, ranging from less than 5% to almost 20% (see Figure 1). There is also significant variance across countries in terms of the share of immigrants among the working poor (see Figures 1 and 2). Immigrant status is defined in the paper as being foreign born, following Lelkes et al. (2010). Luxembourg stands out with approximately 80% immigrants among the working poor. The proportion of immigrants is also high in southern Mediterranean countries (Cyprus, Spain, Italy, and Greece) and in Belgium and Austria. Comparison of the proportion of migrants among the population of working and the working poor indicates that they are overrepresented among the working poor population in most countries (Figure 2). The difference between the shares of immigrants in the two subpopulations is striking in Belgium, Slovenia, Cyprus and Denmark.

4 Country codes for Figure 1. and 2. are the following: BE – Belgium, BG – Bulgaria, CZ – Czech Republic, DK – Denmark, DE – Germany, EE – Estonia, IE – Ireland, EL – Greece, ES – Spain, FR – France, IT – Italy, CY – Cyprus, LV – Latvia, LT – Lithuania, LU – Luxembourg, HU – Hungary, MT – Malta, NL – Netherlands, AT – Austria, PL – Poland, PT – Portugal, RO – Romania, SI – Slovenia, SK – Slovakia, FI – Finland, SE – Sweden, UK – United Kingdom.

Figure 2. Proportion of immigrants among the working and the working poor population (aged 18-64 years) in the EU, by country (2012).



Source: Author's construction derived from data from EU-SILC 2012.

It is uncertain if immigrants are proportionally more significantly affected because of compositional differences between the groups of natives and immigrants, such as age, educational and household structure, etc., or if some variance between the two populations is not explainable using observable variables that are known to generally influence working poverty.

Research question

The idea of work as a path to welfare leads to the main research questions: do immigrants have the same/a similar chance as natives to escape poverty through work? Do working immigrants in the EU earn less than the 60% of the country's median disposable household income, and thus face higher risks of falling into working poverty than working natives? If so, does this hold true even when both micro-level factors (compositional differences between the two groups, such as different levels of education, occupations, household sizes and differences between the countries, etc.) and macro-level explanatory variables (differences in labor market institutions and welfare regimes) of in-work poverty are controlled for?

I focus on immigrants who have already partly integrated into society via work, and compare working immigrants and working natives in terms of their poverty outcomes. The reader should bear in mind that the research the paper is based on was more of an exploratory study than an attempt to identify causalities. Evidence of an income gap between working immigrants and natives would suggest that activation policies should be complemented by further measures designed to facilitate the integration of

migrants. Any differences that remain between the two groups after compositional differences are accounted for will indicate that alleviating the poverty of immigrants will require policy tools that are specifically tailored to meeting their needs.

Data and methods

The main source of data is EU-SILC 2012 for income year 2011. I analyze the working population (18-64 year-olds) in 22 countries of the EU⁵ based on EU-SILC 2012. The sample consists of household heads, as their socio-economic status is a good predictor of the poverty risk of their households⁶.

The dependent variable is a measure of household income relative to the median income of the country, indicating the household's place in society in terms of disposable income. In the OLS (Ordinary Least Squares) regressions the dependent variable is defined as the equivalent disposable household income of the household head expressed as a percentage of the median equivalent disposable household income of the country of residence. In the linear probability models the outcome variable is in-work poverty (defined as having an equivalent disposable household income that is less than 60% of the national median income, despite being in work, as defined previously).

The main independent variable of interest, immigrant status, is defined as being foreign born, following Lelkes et al. (2010).⁷ Accordingly, second generations of foreign born persons are not regarded as immigrants according to this country-of-birth-based definition. It follows that natives are those persons who were born to mothers that were at the time residing in the country in question. Some of the limitations of this definition of 'immigrant' are that it provides no information about the extent of assimilation or integration (note that some of the foreign born may already have gained citizenship in the country of residence). Nor does it indicate ethnicity; migrants are simply categorized as having being born in the EU, or outside it. Furthermore, illegal and temporary migrants are inevitably underrepresented in the survey.

First, I estimate the income gap between working immigrants and natives using OLS, as specified in the following way:

$$Y_i = c + \alpha_1 IMM_i + \beta_1 DEM_i + \beta_2 EMP_i + \beta_3 HHD_i + \beta_4 MAC_i + \mu_1 CNTR + \epsilon_i \quad (1)$$

5 The sample size is limited as some of the countries in the east of Europe - such as Bulgaria, Hungary, Poland, Romania and Slovakia - had very few immigrants, according to the available data.

6 The household head is taken to be the oldest man of working age (18-64), or the oldest woman of working age if there is no man of working age in the household, following the definition provided by Lelkes et al. (2012). Middle-aged men are overrepresented among household heads, so I mostly compare the poverty risk of households with an immigrant head to the poverty risk of households with a native head, where both heads are likely to be middle-aged men.

7 EU-SILC provides information about citizenship as well; however, this is an unreliable indicator of immigrant status for cross-country analysis purposes as the rules and regulations concerning the acquisition of citizenship vary between countries.

The unit of analysis is the working household head denoted by 'i'. Again, 'Y' is the equivalent disposable household income of the household head expressed as a percentage of the median equivalent disposable household income of the country of residence. 'IMM' is a dummy variable set to unity if the individual is foreign born. I also estimate the model employing a distinction between immigrants either born in or outside the EU, assuming that they may have systematically different in-work poverty outcomes.

'DEM' stands for the vector of the demographic characteristics of the individual (age, gender, marital status and highest educational attainment). 'EMP' is a vector of the labor market circumstances of the individual (occupation, working time, type of employment, type of contract). 'HHD' represents the characteristics of the household (number of full and part-time employees, number of dependent members). These control variables are included as the sociodemographic profile of the working poor; potentially vulnerable groups include young persons (i.e. those with less work experience) (Peña-Casas – Latta 2004), single parents (particularly single mothers), the poorly educated (which strongly influences returns to labor) (Newman – Chen 2008), part-time and temporary workers (Lohmann 2009; Marx – Nolan 2012; Spannagel 2013), and individuals who live in large households. (See the definitions and operationalization of the micro-level explanatory variables of in-work poverty in *Table 1 in the Appendix.*) The models estimate cluster-robust standard errors that are robust to arbitrary heteroskedasticity, while also allowing for arbitrary correlation between observation errors from the same country (Cameron – Miller 2013). 'CNTR' represents country-fixed effects to account for the heterogeneity of the EU member states that may affect in-work poverty.

'MAC' stands for the country-level control variables which describe the labor market institutions of the country, the characteristics of the welfare regime and general macroeconomic status. Variables include the coordination of wage setting, as this is an indicator of bargaining coverage which influences working poverty (Lohmann 2009). The share of poorly educated people (generally with associated lower returns to labor) in the country is also a significant explanatory variable in cross-country working poverty variability (Spannagel 2013). Welfare regimes may counteract earnings inequality on the labor market through processes of redistribution. Welfare system factors that may explain variance in in-work poverty include variations in unemployment benefits and the size and targeting of family and child benefits (Lohmann 2009). Public expenditure on child care and pre-school also matter as they increase female participation in the labor market, and dual earner households are at lower risk of being poor (Spannagel 2013). (The macro-level variables are summarized in *Table 2 in the Appendix.*)

The analysis proceeds with the use of linear probability models to investigate whether immigrants are more likely to be working poor than natives. The dependent variable of in-work poverty is binary (taking a value of 0 if a working individual is

above the poverty line, and 1 if below). Apart from the different dependent variables, the model specifications are similar to those employed in the OLS regressions.

Results and discussion

Before presenting the results of the regression, the raw socio-demographic profiles of working immigrants and natives in the 22 member states of the EU are summarized in *Table 1*. The average age of working immigrant household heads is slightly lower than their native counterparts, and there are somewhat more dependent and fewer full-time employed household members among the immigrant group. Part-time jobs, and especially temporary job contracts, are more widespread among the foreign born. The distribution of level of education of the two groups is similar, although the share of both high educational attainment and lower educational attainment is slightly higher for immigrants. Occupational distribution differs more significantly: a much greater share of immigrants have elementary occupations, especially the foreign born who have come from outside the EU.

Table 1. Socio-demographic profile of immigrants and natives.

| Variable | Natives | | Immigrants | | From EU | | From outside EU | |
|-------------------------------------|---------|-----------|------------|-----------|---------|-----------|-----------------|-----------|
| | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| High level education | 0.37 | 0.48 | 0.40 | 0.49 | 0.42 | 0.49 | 0.39 | 0.49 |
| Mid-level education | 0.43 | 0.49 | 0.37 | 0.48 | 0.33 | 0.47 | 0.39 | 0.49 |
| Low level education | 0.20 | 0.40 | 0.23 | 0.42 | 0.24 | 0.43 | 0.22 | 0.42 |
| Professional | 0.27 | 0.44 | 0.23 | 0.42 | 0.28 | 0.45 | 0.20 | 0.40 |
| Technician | 0.16 | 0.37 | 0.11 | 0.32 | 0.13 | 0.34 | 0.10 | 0.30 |
| Support/service | 0.50 | 0.50 | 0.51 | 0.50 | 0.50 | 0.50 | 0.52 | 0.50 |
| Elementary | 0.06 | 0.24 | 0.14 | 0.35 | 0.10 | 0.30 | 0.17 | 0.38 |
| Age (mean) | 45.48 | 10.81 | 43.97 | 10.42 | 42.87 | 10.32 | 44.68 | 10.43 |
| Female | 0.16 | 0.36 | 0.18 | 0.39 | 0.16 | 0.37 | 0.20 | 0.40 |
| Marital | 0.41 | 0.49 | 0.37 | 0.48 | 0.40 | 0.49 | 0.35 | 0.48 |
| Dependent members (number) | 1.00 | 1.05 | 1.10 | 1.12 | 1.00 | 1.06 | 1.16 | 1.16 |
| Full time employed members (number) | 1.32 | 0.74 | 1.24 | 0.73 | 1.27 | 0.71 | 1.22 | 0.75 |
| Part time job | 0.08 | 0.28 | 0.11 | 0.31 | 0.09 | 0.29 | 0.11 | 0.32 |
| Self-employed | 0.18 | 0.38 | 0.12 | 0.33 | 0.12 | 0.33 | 0.12 | 0.32 |
| Temporary contract | 0.08 | 0.27 | 0.15 | 0.35 | 0.11 | 0.32 | 0.17 | 0.38 |

The mean indicates the share of individuals in the sample of natives and immigrants (from inside and outside the EU) who fall into the specific category (e.g. of having higher/lower educational attainment).

OLS estimations

The findings of the OLS regression show that the expected disposable household income of an immigrant, expressed as a percentage of the median disposable household income in the country, is 18 percentage point lower than that of a native when only country-fixed effects are included (see model M1.0). The difference decreases gradually when observable, individual-level factors are controlled for (M1.1-3.). The baseline model (M1.3) indicates that if micro-level characteristics are controlled for, the average gap between immigrant and native household income (as a % of the median) drops to 10 percentage point (see *Table 2*).

Table 2. *Regression results of Model (1).*

| Household income (% of median) | M1.0 | M1.1 | M1.2 | M1.3 |
|--------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Immigrant | -0.176*** (0.0410) | -0.156*** (0.0240) | -0.110*** (0.0221) | -0.104*** (0.0219) |
| Mid-level education | | -0.355*** (0.0188) | -0.156*** (0.0115) | -0.157*** (0.0115) |
| Low level education | | -0.527*** (0.0306) | -0.277*** (0.0217) | -0.276*** (0.0214) |
| Technician | | | -0.237*** (0.0218) | -0.238*** (0.0217) |
| Support/service | | | -0.427*** (0.0301) | -0.427*** (0.0301) |
| Elementary | | | -0.491*** (0.0291) | -0.489*** (0.0294) |
| Demographic controls | | Yes | Yes | Yes |
| Labor market circumstances | | | | Yes |
| Country-fixed effects | Yes | Yes | Yes | Yes |
| Constant | 1.243*** (0.00643) | -0.107 (0.0925) | 0.330*** (0.0808) | 0.342*** (0.0798) |
| Observations | 65,603 | 65,603 | 65,603 | 65,603 |
| R-squared | 0.030 | 0.271 | 0.302 | 0.303 |

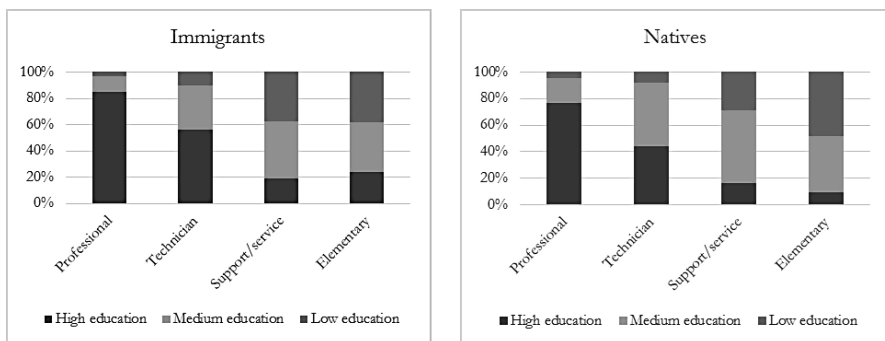
Cluster-robust standard errors in parentheses. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference category for the Education dummies is highly educated. The reference category for the Occupation dummies is professional occupation.

Education and occupation are strongly correlated to household income, as theory predicts. A household head with an elementary education will on average dispose of 28 p.p. (percentage point) less income than a peer with tertiary education,

everything else being kept constant. Similarly, elementary-level workers earn 49 p.p. less on average than professionals when other variables are unaltered (M1.3). Interestingly, the difference in average household income only slightly narrows when education level is controlled for ($a_1 = -0.16$ in M1.1). However, when occupation is accounted for, the gap between the household income of immigrants and natives decreases considerably ($a_1 = -0.11$ in M1.2). This indicates that immigrants may end up in lower-skilled occupations, not being able to fully make use of or benefit from their educations.

Summary statistics also indicate that a more severe education-occupation mismatch exists among immigrants.⁸ More than 20% of the foreign born who have elementary-level occupations have a tertiary degree, compared to less than 10% of natives (see *Figure 3* and *Table 1*).⁹ One potentially significant reason for this mismatch is that the skills acquired in the country of origin are not transferable to the host country's labor market (Kogan 2011).

Figure 3. Education vs. occupation of immigrants and natives (share, %).



Note: the sample consists of the working population from the age of 18-64 in 22 member states of the EU. Source: author's construction derived from data from EU-SILC 2012.

The same set of regressions applied to the two groups of immigrants (those born inside and those outside the EU) show that the income gap is sizeable when compositional differences between the two groups are not controlled for (see *Table 3*). The foreign born from outside the EU fare worse; they have on average 19 p.p. lower household income on average than natives, while the gap is only 15 p.p. between immigrants born in the EU and natives. However, this income gap between the immigrants disappears when all the micro-level control variables are included, which suggests

⁸ In almost every case immigrants are more likely to be overqualified, not only at the aggregate, EU level but at the country level as well, especially in Greece, Spain and Italy (OECD 2014b: 60).

⁹ A significant educational mismatch among high-skilled immigrants was also found for the US labor market (Chiswick and Miller 2009).

that the compositional differences between the immigrants born inside and outside the EU are not substantial.

Table 3. Regression results of Model (1): immigrants born inside and outside the EU.

| Household income (% of median) | M1.0 | M1.1 | M1.2 | M1.3 |
|--------------------------------|-----------|-----------|-----------|-----------|
| Immigrant_eu | -0.147*** | -0.141*** | -0.109*** | -0.107*** |
| | (0.0416) | (0.0311) | (0.0287) | (0.0283) |
| Immigrant_o | -0.194*** | -0.165*** | -0.110*** | -0.103*** |
| | (0.0476) | (0.0274) | (0.0246) | (0.0242) |
| Demographic controls | | Yes | Yes | Yes |
| Occupational controls | | | Yes | Yes |
| Labor market circumstances | | | | Yes |
| Country-fixed effects | Yes | Yes | Yes | Yes |
| Constant | 1.242*** | -0.107 | 0.330*** | 0.343*** |
| | (0.00635) | (0.0925) | (0.0811) | (0.0800) |
| Observations | 65,603 | 65,603 | 65,603 | 65,603 |
| R-squared | 0.030 | 0.271 | 0.302 | 0.303 |

Cluster-robust standard errors in parentheses. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference category for the Immigrant dummies is Native.

Several robustness checks of the baseline model (M1.3) were made to see how consistent the estimated coefficient of immigrant status is. I also included the macro-level variables to control for observed country characteristics that may explain the heterogeneity in disposable household income (see Table 4). As the country-fixed effects already account for most of the macro sources of variance in income dispersion, the overall picture does not change significantly. The regressions are supplemented with model M1.4, a hierarchical linear model, to account for the nested nature of the dataset (given that household heads are nested in countries). Intra-class correlation is significant; the estimation indicates that 0.2% of the variation in household income is due to differences across countries, if all else is kept equal. The close-to-zero intra-class correlation indicates that individual (micro)-level differences better explain income variability.

Table 4. Regression results of Model (1), micro and macro-level control variables included.

| Household income (% of median) | M1.0 | M1.1 | M1.2 | M1.3 | M1.4 |
|-------------------------------------|-----------|-----------|-----------|-----------|-----------|
| Immigrant | -0.154*** | -0.112*** | | | -0.111*** |
| | (0.0434) | (0.0265) | | | (0.0107) |
| Immigrant_eu | | | -0.127** | -0.102** | |
| | | | (0.0441) | (0.0357) | |
| Immigrant_o | | | -0.169*** | -0.118*** | |
| | | | (0.0516) | (0.0290) | |
| Micro-level controls | | Yes | | Yes | Yes |
| Labor market institutions variables | Yes | Yes | Yes | Yes | Yes |
| Welfare regime variables | Yes | Yes | Yes | Yes | Yes |
| Economic control variables | Yes | Yes | Yes | Yes | Yes |
| Country-fixed effects | Yes | Yes | Yes | Yes | |
| Constant | 4.238*** | 2.571*** | 4.222*** | 2.565*** | 2.024*** |
| | (0.0713) | (0.0959) | (0.0692) | (0.101) | (0.361) |
| Observations | 50,672 | 50,672 | 50,672 | 50,672 | 50,672 |
| R-squared | 0.024 | 0.289 | 0.024 | 0.289 | |
| Sigma_u | | | | | 0.0364*** |
| Sigma_e | | | | | 0.745*** |
| Rho | | | | | 0.002*** |

Cluster-robust standard errors in parentheses. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference category for the Immigrant dummies is Native. M1.4: Likelihood-ratio test of $\sigma_u = 0$: $\chi^2(1) = 63.20$ Prob $> \chi^2 = 0.000$.

I also re-estimated the model on several subsamples (see Table 3 in Appendix). Estimations on the sample of the EU15 countries remained largely unchanged. The difference between the baseline results and those for the subsample that includes Germany, Spain, Italy, United Kingdom and France, where the largest number of immigrants reside, are not substantial either. On the other hand, in the Mediterranean countries where in-work poverty is high (Greece, Spain, Italy and Portugal), the income gap between immigrants and natives is higher. Another interesting finding is that in these Mediterranean countries the estimated coefficients for immigrants from inside the EU and outside the EU do not converge strongly, although the estimated coefficient for being a working immigrant born outside the EU is not significant. All in all, the coefficient of the immigrant dummy is stable. These re-estimations prove that household income and being an immigrant to the EU are significantly correlated in a negative direction.

Linear probability model

The results of the linear probability models suggest that an immigrant has a 10 p.p. higher probability on average of being working poor compared to a native if only country-fixed effects are incorporated (see *Table 5*). The difference between the two groups decreases gradually when individual and country-level observable control variables are included. The risk of falling into in-work poverty is predicted to be 7 p.p. higher for those who are foreign born, keeping all else constant (M2.3). The difference is thus considerable. On average, a working household head with only an elementary degree compared to a working household head who has been through tertiary education faces a similarly higher risk (6 p.p.) of entering a state of working poverty as an immigrant faces (7 p.p. higher risk on average) compared to a native, all else being equal (M2.3). To account for the nested structure of the data and some of the shortcomings of the linear probability model, I also estimated a multilevel logit model with the same variables as for model M2.3 (see *Table 4 in Appendix*). The intra-class correlation suggests that 3% of the variability in the propensity to become in-work poor can be attributed to cross-country differences.

Table 5. *Regression results of Model (2).*

| Working poverty | M2.0 | M2.1 | M2.2 | M2.3 |
|----------------------------|------------------------|------------------------|------------------------|------------------------|
| Immigrant | 0.0976*** (0.0182) | 0.0895*** (0.0146) | 0.0777*** (0.0129) | 0.0712*** (0.0116) |
| Mid-level education | | 0.0396*** (0.00525) | 0.0151*** (0.00309) | 0.0153*** (0.00290) |
| Low-level education | | 0.0998*** (0.0104) | 0.0599*** (0.00726) | 0.0579*** (0.00670) |
| Technician | | | 0.00130 (0.00227) | 0.00224 (0.00239) |
| Support/service | | | 0.0432*** (0.00488) | 0.0408*** (0.00460) |
| Elementary | | | 0.117*** (0.0148) | 0.105*** (0.0131) |
| Demographic controls | | Yes | Yes | Yes |
| Labor market circumstances | | | | Yes |
| Country-fixed effects | Yes | Yes | Yes | Yes |
| Constant | 0.0239*** (0.00285) | 0.232*** (0.0227) | 0.178*** (0.0190) | 0.152*** (0.0162) |
| Observations | 65,603 | 65,603 | 65,603 | 65,603 |
| R-squared | 0.024 | 0.085 | 0.098 | 0.112 |

Cluster-robust standard errors in parentheses. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference category for the Education dummies is high-level education. The reference category for the Occupation dummies is professional occupation.

On average, immigrants born in the EU have a 7 p.p., and immigrants born outside the EU a 12 p.p. higher probability, compared to natives, of being poor, in spite of being in work (see *Table 5*). The difference between the two categories of immigrants is rather stable due to the inclusion of micro-level control variables, in contrast to the results of the OLS regressions. This may indicate that immigrants born outside the EU tend to have incomes at the lower end of the household income distribution compared to their counterparts that were born in the EU.

Table 6. Regression results of Model (2): immigrants born inside and outside the EU.

| Working poverty | M2.0 | M2.1 | M2.2 | M2.3 |
|----------------------------|-----------|-----------|-----------|-----------|
| Immigrant_b_eu | 0.0668*** | 0.0657*** | 0.0586*** | 0.0547*** |
| | (0.0126) | (0.0101) | (0.00986) | (0.00930) |
| Immigrant_b_o | 0.116*** | 0.104*** | 0.0890*** | 0.0811*** |
| | (0.0262) | (0.0213) | (0.0188) | (0.0169) |
| Demographic controls | | Yes | Yes | Yes |
| Occupation controls | | | Yes | Yes |
| Labor market circumstances | | | | Yes |
| Country-fixed effects | Yes | Yes | Yes | Yes |
| Constant | 0.0247*** | 0.233*** | 0.179*** | 0.153*** |
| | (0.00283) | (0.0226) | (0.0189) | (0.0161) |
| Observations | 65,603 | 65,603 | 65,603 | 65,603 |
| R-squared | 0.025 | 0.085 | 0.098 | 0.113 |

Cluster-robust standard errors in parentheses. Confidence levels: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The reference category for the Education dummies is high-level education. The reference category for the Occupation dummies is professional occupation.

Overall discussion of the results

I would here like to re-emphasize that the research described in this paper was not designed to establish a causal relationship between immigrant status and low household income, or in-work poverty. The potential shortcomings of the estimations include the fact that being working poor may be caused by other, omitted variables that are also correlated with immigrant status. Another potential problem is the existence of spurious correlations or non-linear relationships between household income and the explanatory variables. Apart from the general pitfalls of linear regression models, linear probability models may predict probabilities of below 0 or above 1; estimations are moreover often biased and inconsistent (Horrace – Oaxaca 2006).

Country natives (locally born, regardless of ethnicity) cannot be regarded as a coherent group against which to compare immigrants (a heterogeneous pool of

foreign born from all around the world) due to unobserved heterogeneity. Omitted variables that may explain the remaining income gap between immigrants and natives include ethnicity, cultural differences, poor language proficiency, weaker social networks in the host country, and lower rates of benefit take-up. Many of these factors may be related to time spent in the host country (Kahanec – Zimmermann 2008), which in this research effort is unknown and unaccounted for. Accordingly, the cross-sectional analysis does not account for cohort effects; namely the fact that immigrants and host country policies may be different at different times of arrival (Borjas 1985 in Kahanec and Zimmermann 2008).

Additionally, immigrants are a self-selected group. They may be more motivated to compete on the labor market than their native peers (Borjas 1987; Chiquiar – Hanson 2002). The higher employment rate of immigrants (especially new-comers) than natives emphasizes the existence of positive selection in many European countries (Kahanec – Zimmermann 2008). Despite this fact, temporary immigrants may only take up short-term, lower-skilled jobs in order to quickly enter the labor market. These intrinsic characteristics (i.e. the motivation of immigrants regarding employment and work incentives) remain an important source of unidentified heterogeneity among immigrants and natives, and the probability of accounting for such variance by matching based on EU-SILC data is very low. Therefore the unexplained difference between immigrants and natives in terms of poverty should not be interpreted as evidence of discrimination against the foreign born.

Nonetheless, the gap is considerable, a finding which is in line with other estimations of immigrant-native gaps in occupational distribution and earnings (Dustmann – Frattini 2011). Some (less than half) of the raw differences between the income and poverty outcomes of immigrants and natives are explained by the micro-level controls, though a considerable part of the gap remains unexplained, which suggests that foreign-born residents either behave differently, or are treated differently to natives. Apart from the motivational differences mentioned above, immigrants may be treated differently on the labor market or otherwise be affected in different ways by welfare systems. Keeping in mind the limits of the conclusions that emerge from the results, and with no intention of implying causality, it is still justifiable to claim that there is room for convergence between the household income of the foreign and locally-born populations.

Concluding remarks

The research described in this paper has identified the gap between the household incomes of working immigrants and natives, even when the observable compositional differences between the two groups are controlled for. Based on a cross-sectional regression analysis using the EU-SILC database of 2012 it can be stated that immigrants have on average a 10 p.p. lower income and are 7 p.p. more likely to

be working poor, all else being equal. There are probably several explanations for the unexplained part of this income gap, including the fact that the foreign born and natives have different unobserved motivations and behavior. Also, they may be treated differently on the labor market, or be differently affected by welfare systems.

The policy implications of the finding that working immigrants are poorer on average than working natives are numerous. The income gap indicates that immigrants should be better socially integrated, especially those who are more vulnerable, and less well educated. The unexplained part of the difference in the estimations which remains after observable compositional differences are controlled for suggests that immigrants are a distinct group, and thus would benefit from targeted policy interventions, in addition to the general policy tools that are employed to reduce in-work poverty. Immigrant integration policies should be designed and implemented with due consideration of several elements: economic (the costs and benefits of immigrants on the labor market in ageing societies), political (the political feasibility of policies) and moral (social solidarity and justice), keeping in mind the cross-country differences in Europe. Activation policies could be complemented by policies that are designed to foster better utilization of the skills of immigrants by recognizing as well as upgrading their human capital assets. Language education and vocational training may help lift the working foreign born out of poverty, especially those whose income is at the lower end of the income distribution and are characterized by having weaker skillsets. Careful tailoring of immigration policy to the specific country context in order to make use of immigrants' economic potential in a politically feasible manner, and in line with high moral standards, is likely to remain a challenge in Europe for the coming decades.

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Appendix

Table 1. *Micro-level explanatory variables of in-work poverty.*

| Variable | Operationalization |
|--|--|
| Individual level | |
| Age | Year of survey (rb010) minus Year of birth (rb080) |
| Gender | Sex (rb090) 0=Male, 1=Female |
| Immigrant status | Country of birth (pb210) is different to country of residence. 0=native, 1=immigrant; 'immigrant_o' stands for immigrant from a non-EU country, 'immigrant_eu' for an immigrant from an EU country. |
| Marital status | Based on Marital status (pb190) 0=Never married or Married, 1= Separated or Widowed or Divorced |
| Education | Based on Highest ISCED level attained (pe040) 0=higher than post-secondary education, labelled High level education; 1=upper secondary education, labelled Mid-level education; 2=lower secondary or lower education level, labelled Low level education. |
| Household level | |
| Number dependent members | Number of household members who are younger than 18 years of age, or between 18 and 24 and studying (based on self-defined current economic status (pl031) pupil, student, further training, unpaid work experience) or above 64 years |
| Number of employed members working full time | Number of household members who are employees or self-employed, working full time (based on self-defined current economic status (pl031)) |
| Number of employed members working part time | Number of household members who are employees or self-employed, working part time (based on self-defined current economic status (pl031)) |
| Labor market circumstance | |
| Occupation | Variables based on Occupation (ISCO-08) (pl051) codes. Professional (0) stands for codes: 1=Managers, 2=Professionals; Technician (1) for code: 3=Technicians and associate professionals. Support/service (2) for codes: 4=Clerical support workers, 5=Service and sales workers, 6=Skilled agricultural, forestry and fishery workers, 7=Craft and related trades workers, 8=Plant and machine operators, and assemblers, Elementary for code: 9=Elementary occupations. |
| Working time | Based on self-defined current economic status (pl031) 0=employee or self-employed working full time, 1=employee or self-employed working part time |
| Employment status | Based on self-defined current economic status (pl031) 0=employee working full or part time, 1=self-employed working full or part time |
| Type of contract | Based on Type of contract (pl140) 0=permanent job, 1=temporary job |

Table 2. Macro level explanatory variables of in-work poverty.

| Variable | Operationalization | Data Source |
|---|--|---|
| Labor market institutions | | |
| Coordination of wage setting | The coordination of wage setting is an indicator that uses values from 1 to 5 (from least to most coordination) summarizing many aspects of wage coordination, like bargaining coverage, level and type of coordination, predominant level of bargaining, the average length of agreements, government intervention, grades of administrative extension of agreements, minimum wage setting, employer organization and union centralization, etc. The indicator comes from the Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 countries between 1960 and 2012 (ICTWSS), created by Jelle Visser, Amsterdam Institute for Advanced Labour Studies (AIAS). | Visser, Jelle 2012. "Database on Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts in 34 countries between 1960 and 2012." http://www.uva-aias.net/208 |
| Qualificational composition of labor force | Share of low educated (ISCED 0-2) among working age (18-64) population | EU-SILC-2012 (author's own calculation) |
| Welfare regime | | |
| Unemployment replacement rate | Net replacement rates for a married single-earner couple with 2 children, 67% of the average wage in the initial phase of unemployment (2011) | OECD Benefits and Wages Statistics |
| % of cash benefits paid to the lowest quintile | Percentage of public social benefits in cash paid to the lowest income quintiles of the total population (2011) | OECD Social Expenditure database |
| Family cash benefits as % of GDP | Family cash transferred public spending, % of GDP (2011) | OECD Social Expenditure database |
| Public expenditure on child-care and pre-school as % of GDP | Public expenditure on childcare and pre-school as % of GDP (2011) | OECD Social Expenditure database |
| Public childcare availability | Average number of weekly hours of formal care from 3 years to minimum compulsory school age - Children with or without formal care (2011) | Eurostat |
| Female employment | Female unemployment rate, annual average, % (2011) | Eurostat |
| Intergenerational dependency | Share of young unemployed (20-29 years) living in parents' (mother's and/or father's) household | EU-SILC-2012 (own calculation) |
| Economic controls | | |
| Unemployment rate | Unemployment rate, annual average, % (2011) | Eurostat |
| Economic growth (real, %) | Real GDP growth rate, volume, percentage change on previous year (2011) | Eurostat |

Table 3. Regression results of Model (1) on a subsample of EU15 (Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom), EU5 (Germany, Spain, Italy, United Kingdom and France) and Mediterranean countries (Greece, Spain, Italy and Portugal).

| Household income (% of median) | EU15 | | EU5 | | Mediterranean countries | |
|--------------------------------|-----------|-----------|----------|----------|-------------------------|-----------|
| | M1.3 | M1.3 | M1.3 | M1.3 | M1.3 | M1.3 |
| Immigrant | -0.108*** | | -0.117** | | -0.175* | |
| | (0.0272) | | (0.0417) | | (0.0471) | |
| Immigrant_eu | | -0.102*** | | -0.0957* | | -0.147*** |
| | | (0.0318) | | (0.0389) | | (0.00564) |
| Immigrant_o | | -0.113*** | | -0.125* | | -0.189 |
| | | (0.0320) | | (0.0483) | | (0.0698) |
| Demographic controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Occupation controls | Yes | Yes | Yes | Yes | Yes | Yes |
| Labor market circumstances | Yes | Yes | Yes | Yes | Yes | Yes |
| Country-fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Constant | 0.276** | 0.275** | 0.270 | 0.271 | 0.280*** | 0.279*** |
| | (0.0943) | (0.0947) | (0.155) | (0.154) | (0.0214) | (0.0227) |
| Observations | 49,601 | 49,601 | 27,817 | 27,817 | 13,682 | 13,682 |
| R-squared | 0.288 | 0.288 | 0.240 | 0.240 | 0.406 | 0.406 |

Cluster-robust standard errors in parentheses. Confidence levels: *** p<0.01, ** p<0.05, * p<0.1. The reference category for the Immigrant dummies is Native.

Table 4. Multilevel random-effects logistic regression estimated for a sample of 22 EU member states.

| Working poverty | M2.4 |
|-------------------------------------|-----------|
| Immigrant | 0.857*** |
| | (0.0451) |
| Micro-level controls | Yes |
| Labor market institutions variables | Yes |
| Welfare regime variables | Yes |
| Economic control variables | Yes |
| Constant | 4.222 |
| | (3.033) |
| Observations | 50,672 |
| Insig2u | -2.303*** |
| Sigma_u | 0.316*** |
| Rho | 0.029*** |

Confidence levels: *** p<0.01, ** p<0.05, * p<0.1. Likelihood-ratio test of rho=0: chibar2(01) = 119.77 Prob >= chibar2 = 0.000.