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What is Behind Native-Immigrant Social Income Gaps?

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Abstract

The recent EU expansion raised fears of potential migration motivated by welfare receipt. In this paper we use comparable data from five countries - Sweden, Belgium, Germany, Norway and the U.S. - to ask whether immigrants benefit more from social support than natives. Looking at the European countries, we distinguish between migrants within and from outside the EU and find that within - EU migrants are similar to natives both in terms of their characteristics and social support receipt. On the other hand, we confirm the existence of large social income gaps in favor of non - EU immigrants, but these gaps are mainly due to the fact that immigrants' families have more children, fewer earners and are more likely to have no wage income. Household characteristics play a key role in 'explaining' the gap in Scandinavian countries, while individual characteristics are equally important in Belgium. In contrast to the European situation, U.S. immigrants receive less social income than natives and this is attributable mainly to their different individual characteristics.

Keywords: Immigration, European Union, Social Benefits

JEL classification: J6; J61

I. Introduction

The increasing share of immigrants in Europe in the last decade has attracted the interest of both policy makers and economists. The recent EU expansion, which is often associated with potentially large migration flows further motivates the research on what drives migration and how immigrants differ from natives. A key concern associated with migration, once the transition period limiting the free movement of persons ends, is that substantial welfare migration[1] might take place and force the EU countries to adopt restrictive labour market policies and adjust their social benefits policy. The size and nature of recent migration flows into the EU already urged the European authorities to design a common welfare policy regarding migrants (CEC, 2002/703) [2].

Many studies on migration i.e. Bird et al.(1999), Borjas and Hilton (1996), Sinn (2002) confirm that social income (income including any type of welfare benefits apart from pensions and labour income) constitutes a substantial part of immigrants' gross income; immigrants often receive higher social benefits and consequently rely on welfare more than natives. However, the existing literature has paid so far only limited attention to the importance of welfare in determining migrants' income within the EU. Most of the available studies are limited to only one country (Bird et al., 1999; Sinn, 2002; Baker and Benjamin, 1995; Gustafsson and Osterberg, 2001), while a thorough analysis of the EU migration requires ideally taking into consideration and comparing all EU member states. We make a step forward in this respect since in our study we consider four EU countries known for their high immigration rates, namely Germany, Belgium, Sweden and Norway.[3] We also cover the U.S. which is a useful benchmark, given the large amount of

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[1] By welfare migration we mean migration driven by potential recipience of high welfare benefits due to the generosity of the welfare regime across countries.

[2] The total net annual in-migration into the EU is close to 1 million persons during 2000-2002. The number of legal immigrants into the EU reached a peak of 1.2 million in 1992, mainly due to a large influx of refugees from former Yugoslavia. Most of the voluntary migration in recent decades is characterized by temporary labour migrants who are generally low-skilled, low-paid and depend extensively on welfare benefits (Eurostat 2000)

[3] Norway, although not a member of the EU, has access to the EU internal market through the European Economic Area Agreement (EEA). The Agreement commits Norway to implement all EU-legislation related to the internal market. A number of programs and related activities, such as the Social Exclusion Program and the Anti-Discrimination Program, were added to the Agreement at a later stage.

US literature on welfare take-ups of immigrants (see Section II). Our analysis relies on the Luxembourg Income Study data, which provide extensive information on all types of social benefits and have not been used by researchers for comparing immigrants to natives. Therefore, we believe that our work serves as a complement to studies based on data from the European Household Panel Survey (Buchel & Frick, 2003) or German Socio-Economic Panel (Riphahn, 1998).

It is important to note that when studying welfare and its impact on immigrants in the EU, one should consider non-EU and EU immigrants separately. Since the Maastricht Treaty (1992), the European Union guarantees free movement of people within its borders and according to a proposal by the European Commission, all workers with EU citizenship are "entitled to the full social security benefits of whatever EU country they are employed in and these benefits would be transferred from one member state to another in case the worker moved" (COM, 2003/596). However, non-EU immigrants who immigrate to a certain EU country are subject to the immigration and welfare policies of that particular country.

The main novelty introduced in our paper however, is that we focus on social income as opposed to gross income. The analysis of social income gaps across different countries and their decomposition with respect to family and individual characteristics may be useful in addressing future immigration and social policy issues. While much research has been done on the wage differential between immigrants and natives (Lang, 2000), there are only a few studies considering the existence of a social income gap between these two groups and the factors behind this gap.[4]

In this paper, we therefore ask the following questions: (i) how do social-economic characteristics (age, gender, education, household size, etc.) of immigrants differ with respect to those of natives? (ii) how does social income differ between immigrants and natives across countries, given specific household structure (number of children and earn-

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[4]Riphahn (1998) estimates the probability of welfare dependence of immigrants versus natives in Germany. The author claims that this probability rises for immigrants with the time spent in the host country. She find that the most important determinants of immigrant welfare dependence are the labour force status and the age at immigration.

ers in the family)? (iii) what part of the social income gap is explained by the difference in household characteristics (wage income, number of children, number of earners in the family)?

We find that non-EU immigrants are younger, live in larger families with fewer earners and have more children, while EU immigrants seem to be similar to natives. The social income gaps between the non-EU migrants and natives are substantially larger than those between natives and within-EU migrants. A substantial part of the gap in Sweden, Norway and Belgium is due to the fact that non-EU immigrants live in families with fewer earners, have more children and are more likely not to have any labor income. The social income gap in Germany is negligible, while the US provides higher social income to natives.

The paper is organized as follows. Section II provides a literature survey of the recent legal developments in the EU and its immigration policy as well as the existing research on welfare migration. Section III describes the data and the relevant variables. Section IV consists of a descriptive analysis of the raw social income gaps and household structure of both immigrants and natives. The section explains the estimation methodology, and the sixth one presents the results of the regression analysis. Section VII concludes with the main findings and future research plans.

II. Recent Legal Developments in the EU concerning Mobility and Immigration and Literature Review

The Treaty of Amsterdam 1999, which covers wide range of EU issues such as the policy on asylum, visa policy, the free movement of persons, rules on crossing EU external borders, immigration policy, the rights of nationals of third countries, is a symbol of the steps toward common asylum and immigration policy of the European Union. Since then, various regulations by the Commission, the Council and the Court of Justice have strengthened even further the basis of the Amsterdam treaty (EUROSTAT, 2002). The European Employment Strategy focused on facilitating labour mobility within the EU

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and providing access to lifelong earnings.[5] The Stockholm European Council in 2001 enhanced also mobility by endorsing the strategy to foster the development of the New European Labour Markets.[6] In the field of social security there have been several initiatives in order to improve coordination and provide more opportunities for workers and job seekers to make use of their right to free movement. The new European Strategy to promote social inclusion emerged naturally due to the National Action Plans of several member states which feared the higher risk of social exclusion for ethnic minorities and immigrants due to the growing ethnic and cultural diversities in the EU.[7] In line with conclusions of the Tampere European Council (October 1999), the Commission proposed a coordinated approach on how to manage the migration flows and fight illegal immigration. This has been followed by various integration and anti-discrimination policies in the host countries which called for equal treatment irrespective of ethnic or race origin.[8]

Within the European regulations, a key distinction is currently being made between individuals who migrate from within the EU and third country immigrants. While the EU migrant workers have the same rights and obligations as the host country nationals with respect to the social security (Kvist, 2004), third country migrants are clearly a different category despite all the co-ordination regulations in immigration and asylum policies.[9]

Since the EU enlargement in May 2004, which welcomed ten new member states, almost all EU countries adopted a transitional period measure against the new member states (with the exception of Cyprus and Malta) of at least 2 years in restricting the free movement of workers across the EU.[10] Now that the first two years are close to an end, possible migration both within the EU and from outside the EU based on differences in

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[5]Guidelines For Member States Employment Policies for the year 2002 - COM(2001) 511.

[6]New European Labour Market: Open to All with Access to All - COM(2001) 116.

[7]Joint Inclusion Report by the Council and the Commission, adopted by the Council on 3/12/2001.

[8]Implementation of the principle of equal treatment between persons irrespective of race or ethnic origin. Directive 2000/43/EC.

[9]EU migrants can transfer benefits, eligibility periods at different times can be aggregated, the setting of benefits could be accumulated on the basis of time spent in the host country. Council Regulation 1408/71.

[10]Germany - transitional period of 7 years; Sweden - temporary resident permits dependent on offer of job of a certain length; Belgium - transitional period of 2 years. See Kvist (2004).

generosity of the welfare systems or the so-called welfare migration, has raised concerns for social policies race to the bottom[11] and eventual erosion of the national welfare states. In our paper, we shed light on exploring the social income differences between natives and migrants in some of the old EU member states in the year 2000 and observing how migrants are treated vis-a-vis natives in countries implementing different types of welfare policies. The first step of our analysis requires a review of the existing literature on that matter.

Since the take-up of welfare benefits and the phenomenon of 'welfare migration' are closely connected to our research we concentrate only on that strand of literature, though there are many other migration studies addressing different policy issues. There is extensive research on welfare-driven migration based on US data. Enchautegui (1997) finds a positive correlation between welfare and migration in the United Sates. This premise is supported by a range of studies on U.S. data such as those by Blau (1984), Borjas and Trejo (1991), Borjas and Hilton (1996), and Hu (1998). Borjas and Hilton (1996) document the extent to which immigrants participate in welfare programs. They suggest the existence of a large 'welfare gap'. U.S. immigrants experience more and longer unemployment spells, and there is a positive correlation between the types of welfare benefits received by earlier immigrants and those obtained by recently arrived immigrants.

Siklos and Marr (1998) find that immigrants in Canada are more likely to receive social benefits, while according to Baker and Benjamin (1995) it is the local population who benefits primarily from the social welfare system. Gustman and Steinmeir (1998) conclude that immigrants receive much higher social benefits relative to US born workers with identical earnings but these transfers do not result from low incomes of immigrants. The immigrants with high earnings who have been working in the US for up to two decades are found to benefit the most from public transfers. Although, foreign born workers have a higher return to their social security taxes, US born workers still prefer that immigrants participate in the social security program since the retired immigrants

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[11]Downward bias in benefit levels caused by each state not being as generous as it would have been without concerns over welfare migration.

contribute more to social security taxes in comparison to the amount of the received benefits.

There is also some literature on 'welfare migrants' in the EU that concentrates mainly on Germany. Bird et al. (1999) use data from the German Socio-Economic Panel Study (GSOEP) to test whether immigrants in Germany, given their eligibility, are more likely to claim welfare benefits than natives. The authors find positive evidence of immigrants receiving more welfare benefits in comparison to natives mainly because of two reasons: first, there is a higher probability of immigrants being eligible to receive benefits, and second, the immigrants who are eligible are more likely to actually claim these benefits. Riphahn (1998) who focuses on the higher welfare dependence of immigrants in Germany using the German Socio-Economic Panel, finds that the difference in aggregate welfare dependence between natives and foreigners appears to be due to their characteristics, where the household head's labor market status and single parent status are central.

The study of Buchel and Frick (2003), which is closely related to our research, compares the immigrants' pre-tax to after tax income across eight European Union countries using the European Household Panel Survey. They find persistent differences across the examined countries in the relative economic performance (gross income) of immigrants in comparison to the local population. The authors explain this heterogeneity both by the variation of entry conditions to the EU and country-specific institutional aspects.

Given the existing literature, a novelty introduced in our paper (to our knowledge this possibility has not been explored yet) in comparing immigrants to natives, is that we analyze the social income (any kind of benefits apart from pensions and labour income) gap between the above-mentioned groups. We also examine whether and to what extent the differences in social income between EU/non-EU immigrants and natives could be explained by the difference in their socio-economic characteristics. The explicit separation of EU and non-EU immigrants helps us to account for the existing legal differences in the current regulations in the EU countries. Furthermore, the database of the Luxembourg Income Study, which we use, provides extensive information on all types of social benefits

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and has not been used by researchers in comparing immigrants to natives. Therefore, it serves as a good complement to studies based on data from the European Household Panel Survey or the German Socio-Economic Panel.

III. The Data

We use the Luxembourg Income Study (LIS).[12] The LIS is a micro-database collected from a large range of industrialized countries. It provides demographic, labor market, income and expenditure data, both at the household and individual level. At the household level, the LIS includes such demographic variables as age, marital status, number of income earners in a family, number of children, education, ethnicity, migration status, labor force status, etc. Income variables contain gross income, disposable income and a detailed classification of social income. This classification is appropriate for our analysis of the determinants of immigrants' social income since we can examine directly the types of benefits that both natives and immigrants receive. The database covers twenty-nine countries and its main objective is to provide comparable data that can be considered as a reliable source of cross-country analysis.

In our study we include Norway, Sweden, Belgium, Germany and the USA for the year 2000.[13] The advantage of this data is that it is comparable across countries because the original data files are transformed into a harmonized LIS data format. For example, the cash transfer variables (sick pay, accident pay, social retirement benefits, child and family allowances, etc.) contain the same information for each country, which allows us to compare the social incomes across counties.

We work with annual cross-sectional data for each of the five countries. The unit of analysis is an individual in the household context, since some welfare benefits are reported only at the household level (particularly those related to means-tested cash

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[12]Available at www.lisproject.org

[13]Data on immigration status is missing for the Netherlands, United Kingdom, France and Italy; the total number of immigrants is too small for Austria (95) and Ireland (58). Thus these countries are excluded from the study

benefits like housing subsidies, social assistance, unemployment assistance and near cash benefits such as food benefits, housing benefits, cash medical benefits, heating benefits, etc.). An important assumption made in our study, similar to other studies e.g. Buchel and Frick (2003), is that families pool resources and share the utility of income, derived partly because of the 'family' status. Thus, although we analyze social income at the individual level, income information in the LIS is provided at the household level. In order to normalize the variables in use, we employ an equivalence scale which takes the square root of the total size of the family.[14]

One of the family members is called by the LIS the 'head' of the family, that is the main breadwinner in the family. We include only individuals in the family aged between 18 and 60. In such a way we avoid the retired population, whose pension income varies across countries and depends on different factors than the income of working age people.

The LIS provides the variable 'immigrant status' which shows whether an individual is foreign-born, or born in the host country. Buchel and Frick (2003) point out that defining immigrants as foreign-born is more appropriate than using a citizen-based immigration definition since it avoids the differences in country-specific citizenship legislation. Borjas and Hilton (1996), Shields and Price (1998) and Bell (1997) also employ this definition of immigrant status. However, the definition of the immigrant status does not provide information on the country of origin. That is why we use 'ethnicity' status in our analysis, which defines the country of origin and allows us to make a clear distinction between EU and non-EU migrants.[15] The LIS does not offer information on the number of years since migrants' arrival in the host country which is a weak point. However, in our analysis we consider families who receive social income support, which indicates that the head of the family has spent at least 2 or 3 years in the host country (depending on eligibility criteria in different countries).

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[14]We also applied the modified OECD equivalence scale, which gives weights of 1.0 to the head, 0.5 to other adult member, and 0.3 to children. The results were not significantly different.

[15]We compare to what extent the variables immigrant status and ethnicity overlap for each country. We find that for all countries the number of foreign-born is the same as the number of individuals assigned with ethnicity different than that of natives.

In order to verify how representative the LIS data on migrants actually is, we compare the proportion of foreign born migrants in the countries of analysis with the 2000 population census data provided by the statistical office of the EU (Eurostat). As we can see from figure 1 below, the percentage of immigrants provided by the two datasources is quite similar, which allows us to confirm the that our sample of immigrants is representative, since the fraction of immigrants in the LIS data is close to the population one.
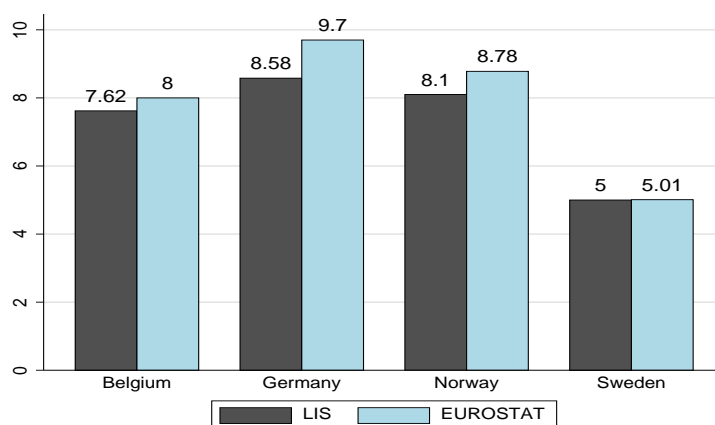

Figure 1: Immigrants (Foreign-Born) as a Proportion of Total Population (in percentage)

The variable social income requires a clear definition since there is no harmonized social system across the EU and each country is free to define differently the eligibility criteria and the components of its social protection program.[16] The social income variable provided by the LIS and used in our study includes all possible types of social protection expenditure (social retirement benefits, child and family benefits, unemployment compensation, sick pay, accident pay, disability pay, maternity pay, means-tested cash benefits, near-cash benefits,etc.) apart from pensions and labour income. However, these social income variables are fully comparable as a result of the harmonization by the LIS for each country. In our paper we use gross social income since in some countries benefits are taxed and in others they are not (Cornelisse and Goudswaard, 2002).

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[16]Benefits may be provided by public and /or market institutions. Still market provisions could be regulated by the government so that it is equivalent to public provision.

IV. Descriptive Analysis

Raw Social Income Gaps

Table 1 summarizes the average social income of the family head (in US dollars - base year 2000) for the EU, non-EU migrants and natives. It is constructed by adjusting the annual household social income with the household size using the equivalence scale specified earlier. On average Germany turns out to be the country with the highest social income expenditure with respect to all the groups (EU, non-EU immigrants and natives) in the sample, followed by Sweden, Belgium, Norway and the US[17]. We test whether the social income gaps between the EU/non-EU migrants and natives are significantly different from zero, since their existence would allow us to explore further how certain socio-economic individual and family characteristics could explain these differentials. The table shows that for all the countries but Germany, the gap between the non-EU migrants and natives is highly significant and is in favor of the migrants except for Germany and USA. Belgium, Sweden and the US exhibit an dramatic social income gap of 50%, which falls to 30% in the case of Norway, and almost disappears at 5% for Germany.

Exploring table 1 further, one can clearly notice that the social income gap between non-EU immigrants and natives is substantially larger than that between EU migrants and natives. The latter is significant only in Sweden and Norway and represents 22% and 9% in favor of immigrants respectively. USA is the only country to have a significant social income gap which benefits the native population. The existence of large disparities between the social support for immigrants (especially non-EU ones) and natives poses the relevant question of whether this is correlated with the different welfare regimes across countries (Esping-Andersen, 1990), and to what extent the individual and family characteristics of the immigrants and natives could shed light on this phenomenon.

Household and Individual Characteristics

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[17]We do not consider EU/Non-EU migrants in the US.

Table 2 shows the average demographic characteristics for natives, EU immigrants and non-EU immigrants in all countries. The table confirms the differences in personal and employment characteristics that other researchers have documented (Borjas 1995; Buchel and Frick, 2003; SOPEMI, 2001): compared to natives, immigrants are younger, less educated, and live in larger families with fewer income earners. While previous studies confirm this tendency for immigrants in general, we observe that it holds mainly for the non-EU immigrants and less so for the EU immigrants. For example, let us consider the average age of the three groups. In all the countries non-EU immigrants are younger on average than natives (for USA all migrants are in one group). This is not the case for the EU immigrants though since in Sweden, Belgium and Germany they are slightly older than the locals (the difference is less than a year on average except in Germany). It seems that according to the age, the natives and EU immigrants share similar age structure; non-EU immigrants however, are younger. In the descriptive analysis we define the education as 'low' in case person has no college and/or university degree and 'high' if she does.[18] In all the countries of analysis except Noway, the share of natives with high education is larger than that of non-EU immigrants.

Comparing the household size, we find a similar tendency. The non-EU immigrants have larger families than both the natives and the EU immigrants. The families of the non-EU immigrants are largest in Belgium and Germany with average household size of 4.12 and 4.4 respectively. On average the non-EU families have fewer earners than natives for all counties. Sweden records the lowest number of earners and Norway the highest (1.36 and 1.8 respectively). The tendency of fewer earners in the non-EU immigrants' family increases its chances for receiving higher social income. Similarly to previous studies (Borjas, 1995; Hu, 1998), we assume that the number of earners in a family explains a substantial part of the social income variation. Another factor that influences the family social income is the number of children in a family (Buchel and Frick, 2003; Borjas and Hilton, 1996). For all the countries the non-EU immigrants have on average

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[18]LIS does not report years of education and follows the local classification system of education, which makes the comparison across countries difficult.

more children than locals and the EU migrants. We expect that the number of children is positively related to the social income.

The analysis so far reveals two important patterns. Firstly, our descriptive results confirm the existing research studies with respect to the characteristics of the non-EU immigrants (Borjas, 1995; Buchel and Frick, 2003; SOPEMI, 2001), they are younger, live in bigger families with less earners and have more children, while the EU immigrants seem to be similar to natives. Secondly, the non-EU immigrants and locals differ in their relative social incomes across the welfare regimes in all the countries. The social income gaps between the non-EU migrants and natives are substantially larger than those between natives and the EU movers. The current migration literature has paid little attention to the social income of EU and non-EU immigrants in the Union. We expect that the differences in the social income gaps between EU/non-EU immigrants and natives are to a large extent due to different EU/non-EU migrants' characteristics. The distinction between EU and non-EU immigrants is an important one since it would allow us to analyze the social income gaps between the non-EU immigrants and natives excluding the EU migrants who share similar characteristics with the natives and the joint consideration of all the immigrants could blur the results. The fact the EU and non-EU migrants have different rights and obligations within the EU might help to explain the origin of the social income gap and the factors driving this gap.

V. Estimation methodology

We perform an OLS regression analysis that allows us to ask to what extent social income is 'explained' in each country, and to compare the social income impact of each explanatory variable. We consider two separate samples namely the EU immigrants and natives on one hand, and the non-EU immigrants and natives on the other hand. In order to distinguish between household and individual characteristics and see to what extent family characteristics contribute towards explaining the social income gap, we estimate two different specifications. The first one includes only the household specifics, while the

second one accounts for all the characteristics simultaneously. The general form of the regression equation is the following:

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\begin{aligned}
LnY_{ji} = {} & \alpha_{j0} + \beta_{j0}ImmigrantStatus_{ji} + \beta_{j1}Age_{ji} + \beta_{j2}Age_{ji}^2 + \beta_{j3}Gender_{ji} + \\
& + \beta_{j4}Education_{ji} + \beta_{j5}NoWageIncome_{ji} + \beta_{j6}Earners_{ji} + \\
& + \beta_{j7}Children_{ji} + \beta_{j8}Region_{ji} + \epsilon_{ji}
\end{aligned}
$$

where j shows the the number of observations and i indicates the EU or non-EU immigrant status. LnY_{ji} is the social income, *Immigrant Status* is a dummy, which equals to one in case of immigrant and zero in case of native status. The explanatory variable *No Wage Income* is a dummy equal to one if the whole household has zero average gross wage income and zero otherwise[19]; *Age*, *Earners* and *Children* are linear variables which can be attributed to immigrants or natives depending on the specification. *Education* is a dummy variable, which takes the value of one when the head of the family has a college or university degree; *Gender* is an indicator variable-one for male and zero for female. The *Region* dummies account for regional specificities across countries. The dependent variables are measured in PPP-adjusted U.S. dollars[20] and are transformed logarithmically. We include the age of the head of the family together with the age squared as a regressor in the social income equation in order to control for experience even though we acknowledge that this is not a precise measure.[21] Assuming that the age of the head is positively correlated with the number children, controlling for age serves as an insurance against omitted variable bias. The education variable serves as a rough proxy for the ability of the head of the family.

We are aware that the exogeneity of the number of earners and the number of chil-

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[19]In the study we assume that the welfare regime does not affect the choice of employment. Rather, we want to analyze how the welfare state 'rewards' the household in the case all its members are unemployed compared to their employed counterparts. Specifically we run probit regressions of the choice to work or not on the social income and social-economic characteristics. We document that social income' coefficient estimates are not significant.

[20]OECD Purchasing Power Parities.

[21]We could use the popular approximation for experience, however, the LIS does not include years of education.

dren in the regression equation may be violated for at least two reasons: there may be unobserved factors that affect social income propensities and at the same time, social income take-up and fertility decisions may be simultaneously determined. We therefore regard our approach more as a correlation analysis rather than as a causal one. To avoid systematic correlation between the incomes of family members, we restrict our sample to heads of family applying the modified OECD equivalence scale.

Based on the descriptive analysis we expect that the number of children has a different effect on the social income of EU and non-EU migrants in different countries. The number of earners also seems important for the household's social income, and we reckon that its impact will differ across countries. Using a dummy variable reflecting whether the family receives any wage income or not allows us to account for the possible impact of the presence of wage income on the social income. Therefore, our analysis focuses mainly on these three variables.

VI. Regression Analysis

Using OLS regression analysis we explore the relationship between the social income gap of EU/non-EU immigrants and natives on one hand and their socio-economic characteristics on the other hand. We estimate two different specifications for each of the two samples: EU immigrants vs. natives and non-EU immigrants vs. natives. In the first specification we explore the effect of the household characteristics (number of children, number of earners and family wage dummy), while in the second we account simultaneously for the effect of household and individual (age, gender and education of the head of the family) characteristics.

The Role of Non-EU Immigrant Status

The dependent variable of all the regressions in Table 3 is the logarithm of the social income of the non-EU immigrants and natives. In the first specification for each country we explore the change in the existing gap due to different household characteristics. In

Sweden the raw gap of 50% is reduced to 18% after including the household variables, which suggests that around 32 percentage points of the gap could be due to the fact that the immigrants have less earners, more children and are more likely to have no wage income in the family. Belgium exhibits very similar pattern to Sweden and we can see that the family characteristics contribute for closing the social income gap from 52% to 24%. In Norway the impact of the household structure is less pronounced than in Sweden and Belgium. At most a fifth of the 30% gap or only 6% points can be explained by the household characteristics. Shifting our attention to one of the largest economies in the EU, surprisingly we find that the gap between non-EU immigrants and natives in Germany is only 5% and is not statistically significant. In the US the natives take higher level of social benefits although immigrant families have more children but surprisingly they have more earners in a family than the natives. The 52% of social income gap is reduced by only 8 percentage points due to the differences in family structure.

The second specification in Table 3 controls simultaneously for the individual and household characteristics. In Sweden and Norway the gap increases slightly after controlling for age, gender and education of the family head, suggesting that the non-EU immigrants' characteristics are not that relevant for receiving higher social income. In Belgium the tendency is the opposite, namely that after adding the individual specifics, the unexplained gap is reduced from 24% to 19%. Germany is the only country that exhibits statistically insignificant social income differential between the non-EU immigrants and natives. One of the possible reasons is that the sample of non-EU immigrants consists mainly of Turkish immigrants (70%)(see Geddes, 2003). They have arrived mainly in the early 60s as guest-workers and many research studies point out that they are socially integrated and exhibit little socio-economic variation compared to the native German population. In the US though the gap falls from 44% to 30%, the natives still take more social income than immigrants once we control for all characteristics.

Overall, in all the countries the household variables prove to be important in explaining the social income differential between non-EU immigrants and natives. It seems that

a substantial part of the gap in Sweden, Norway and Belgium is due to the fact that non-EU immigrants live in families with less earners, have more children and are more likely not to have any labor income. Further on (see Section 5.3), we examine the effect of each of these characteristics separately in explaining the existing social income gap.

The Role of EU Immigrant Status

It is interesting to note that the raw social income gap between the EU immigrants and natives is much smaller than the the non-EU/natives' one. In fact, the gap in Belgium and Germany is not significant. This tendency could be explained by the similarity of the household structure between natives and the EU immigrants. We perform similar estimation of the gap by controlling first for household variables and then adding the individual characteristics. Table 4 shows the results. Approximately half of the gap in Sweden, or 9 percentage points, can be accounted for by the higher number of children and less earners in EU migrants' families than those in local ones. The age, education and gender of the head does not help much to explain the gap. In Norway, both specifications have very small impact on the EU/natives gap since they reduce it by only 1 percentage point.

In sum, we document that the household and individual characteristics have different explanatory contribution for the income gap among EU/Non-EU immigrants and natives across countries. This might suggest that different social policies reward differently certain household characteristics such as number of children or earners in the family. In the view of a potential welfare migration from the newly-accepted members of the EU following the implementation of the principle of free movement of persons, it will be useful to see what the specific impact of each household characteristic is on receiving social income and how the immigrants are treated with respect to natives. Another interesting issue is whether a country's welfare system rewards specific types of family structures and whether it could serve as a welfare magnet for such households. We therefore proceed with a close examination of the Oaxaca-Blinder decomposition in order to further explore the impact of the family characteristics.

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Robustness Checks

Many studies on migration suggest that one might face the problem of skewed distribution i.e. the immigrant status is likely to have a strong influence on the people that appear in the upper part of the social income distribution and much smaller effect in the lower tail of the distribution. We perform quantile regressions as a form of robustness check to our results coming from the OLS regression analysis. Buchinsky (1998) points out that the estimated coefficient vector in median regression analysis is not sensitive to outliers in the dependent variable, and this estimator could be more efficient in the case of non-normal error.[22]

Table 5 presents the median regression results of the immigrants' dummy estimates. We control for both individual and household characteristics and estimate a specification similar to specification (2) from table 3 and table 4 for non-EU and EU immigrants respectively. The coefficient of the non-EU immigrants' dummy in the median regressions for Sweden, Belgium and the US is quite similar to that of the OLS analysis (0.23 vs. 0.29; 0.20 vs. 0.17; 0.30 vs. 0.29). The difference between the median and OLS estimates is slightly bigger in Norway (0.25 versus 0.35), while the gap in the average social income in Germany is not significant at 1% or 5 % significance level no matter which regression method is employed.[23] The social income gap estimates for EU immigrants are not significant for Germany and Belgium using both regression analyses, while for Norway the median estimate is higher (0.08 vs. 0.19) than the OLS one. Overall, the median and OLS estimates are very similar which confirms the robustness of the OLS estimates and allows us to use the Oaxaca-Blinder decomposition with no concerns.

The goal of the decomposition is to compare the social income of EU/non-EU immigrants and natives with similar characteristics. Given the low representation of EU/non-EU immigrants in the sample there could be a significant share of immigrants for whom no 'comparable' natives will be observed. Such lack of 'common support' can be further

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[22]We have performed the chi-square test for normality, which suggests that the errors are not normal at the 1% significance level.

[23]We do not perform an analysis of the median social income, since Oaxaca-Blinder assume decomposition of the average incomes.

strengthened by immigrant-related sorting into specific types of families. Linear regression models used by the Oaxaca-Blinder technique will therefore project the conditional social income distribution of immigrants onto regions of the native social income distribution in which immigrants are virtually nonexistent. Recent work by Nopo (2004) and Black et al. (2003) studying gender wage gaps, suggests that such parametric assumptions lead to over-estimation of the 'unexplained' component of the gap, i.e. the part of the gap attributable to differences due to characteristics and often interpreted as an upper bound on the extent of gender discrimination. In our paper, we employ a nonparametric matching approach, which accounts for the differences in the 'support' of individual and household characteristics and does not impose linear functional form of the conditional social income.

Table 6 presents the estimates of the average treatment effect on the treated (ATT) with bootstrapped standard errors.[24] Following the accepted classification in the policy evaluation literature[25], we denote the treatment to be the immigrant status (EU/Non-EU), treated group are the EU/non-EU immigrants and the untreated or the control group are the natives. We estimate the social income effects using kernel matching procedure.[26] Overall, the employed method leads to estimates of ATT that diverge slightly from the OLS-based Oaxaca-Blinder decomposition. For non-EU/native group the results from the matching are 0.20, 0.17, -0.17 and 0.10 for Sweden, Norway, Germany and Belgium respectively, while the unexplained part of the regression decomposition is 0.22, 0.23, -0.062 and 0.19. This shows that once we control for the bias on observables induced by the non-random sample selection there are still advantages for non-EU immigrants (except Germany and USA). We can regard these results as supportive to

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[24]See Appendix 2 for theoretical background.

[25]See Heckman et al. (1997, 1998, 1999)

[26]In the first step we estimate logit model with highly flexible functional form allowing for interaction terms and stepwise functions. Particularly age (stepwise function with 5 year interval), education of head, gender, region dummy variables, number of children, number of earners and family wage dummy. We perform kernel matching, experimenting with different kernel functions and bandwidth parameters ranging from 0.01 to 0.11 and find that the choice of kernel and bandwidth make little difference on ATT. Therefore the reported results are based on a Epanchnikov kernel using its optimal bandwidth 0.06.

the regression-based decomposition with Oaxaca-Blinder methodology.[27]   Table 6 also

shows the matching rate. Namely, the very high matching rate in all cases suggests that

the treated group is matched with 'comparable' observations from the untreated group.

Therefore, the OLS does not seem to identify effects, coming from projections into regions

with no data points.

Social Income Decomposition: Oaxaca - Blinder

We use the Oaxaca-Blinder decomposition method (e.g., Oaxaca and Ransom, 1994)

to account for the social income differential between non-EU immigrants and natives

on one hand, and EU immigrants and natives on the other. This method decomposes

the overall gap into a part that is due to differences in observable factors (age, gender,

education, wage income dummy, number of earners, and number of children) and a part

that remains unexplained. We run separate OLS regressions for natives, EU and non-EU

immigrants, and then we describe the social income gap as written below:

$$\overline{LnY_j} - \overline{LnY_n} \ = \ \overline{X_j}'\left(\hat{\beta}_j - \beta^*\right) + \overline{X_n}'\left(\beta^* - \hat{\beta}_n\right) + \left(\overline{X_j} - \overline{X_n}\right)'\beta^*$$

where j denotes EU/non-EU immigrants and n denotes natives, $\overline{LnY}$ is the immigrants/natives

mean of the natural logarithm of social income, and $\overline{X}$ represents the respective vectors

of mean values of explanatory variables for immigrants and natives. Finally, $\hat{\beta}$ is the

corresponding vector of estimated coefficients and β^* represents the nondiscriminatory

welfare effect. We obtain it from the pooled sample of immigrants and natives.[28] Since

EU and non-EU immigrants are treated differently by the host country (law restrictions

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[27]In order to access the matching quality we perform two-sample t-test of means inequality before and after matching. The results show that there is no evidence of disparity in the means once the kernel matching has been performed, thus confirming the validity of the balancing property and the matching procedure. The results are available upon request.

[28]In the original approaches developed by Oaxaca (1973) and Blinder (1973), it is assumed that the wage structure (in this paper the social income structure) of the advantageous group (non-EU immigrants) would prevail in the absence of discrimination, i.e., $\beta^* = \beta_n$. However, later research suggests that this assumption is ad hoc and Neumark (1988), Oaxaca and Ransom (1994) advance the idea that the nondiscriminatory productivity factor estimates fall between the two groups; hence, they are the weighted average of each group's social income.

such as residence, work permits, etc.), we consider two separate decompositions: non-EU/ natives and EU/natives. As non-EU immigrants have socio-economic characteristics that are likely to call for higher social income than the natives and the EU immigrants (see Table 2), we expect that the size of the social income differential between natives and non-EU immigrants would be larger than that between the EU immigrants and natives.

The decomposition of non-EU immigrants/natives' log social income differential is presented in Table 7. Large portion of the gaps in Sweden, Belgium and the US is due to observable factors which account for 57%, 63% and 55% respectively. Since the gap in Germany is not significant we will not focus on it. Norway which is not an EU member but participates in the European Free Trade Association exhibits quite different pattern since the observable characteristics account for only 26% of the gap.

Looking at the impact of the household characteristics versus individual ones, the family structure plays an important role in Sweden, Norway and Belgium. The individual characteristics are of little importance in Sweden and Norway but equally important to the family characteristics in Belgium and of utmost significance in the US. The negative sign of all the values for USA indicate that the natives take higher social income than the immigrants. Taking a closer look at the significance of each household characteristic we observe that the number of earners is the most important factor in explaining the social income gap in all the countries with the exception of the US. Regarding the individual characteristics the factor age is crucial for the natives in the US in order to get high social income.

Table 8 shows the results for the Oaxaca decomposition of the log social income gap between the EU immigrants and natives. Sweden and Norway are the only two countries for which the gaps are significantly different from zero. One can clearly notice that the values of the income gaps in both countries are substantially smaller than their counterparts in table 5. This supports the premise that the EU immigrants are similar to natives, a fact suggested also by the descriptive analysis earlier on. The observable characteristics in Sweden and Norway account for respectively 36% and 22% of their

social income gaps.

The above results are to a large extent in accordance with the Esping-Andersen classification of welfare systems: the socio-economic welfare system (Sweden, Norway) where the state cares for social equality and the family characteristics are important; the corporate system (Belgium, Germany) where the state supports the main bread-earner in the family so the individual characteristics matter, and the liberal system (USA) with minimal state support.

VII. Conclusion

While there is much research on welfare migration, no empirical studies examine the social income differences among EU/non-EU immigrants and natives. The main goal of this paper is to find out whether natives and immigrants' social income differs within a country and across groups of countries. We find, in accordance with previous studies, that non-EU immigrants tend to be younger, live in larger families with fewer earners and more children than native families. EU immigrants share similar characteristics with natives. Social income gaps between non-EU immigrants and natives are larger than those between EU immigrants and natives. The USA exhibits a very different tendency by providing natives with higher social income than immigrants. Overall, we find that the wage income, the number of earners in the family and the presence of children are the main factors for the existence of the social income gap between natives and non-EU immigrants.

The main finding of this paper is that in Sweden and Norway, a large part of the the non-EU immigrants/natives' social income gap is explained by the family characteristics, while in Belgium family and individual characteristics are equally important. The social income gap in Germany is negligible, while the US provides higher social income to natives based on individual characteristics. The decomposition analysis reveals that that the results are to a large extent in accordance with the Esping-Andersen (1990) description of the *socio-economic* (Sweden, Norway) welfare system where the state cares for social

equality and the family characteristics are important; the *corporate* system (Belgium, Germany) where the state supports the main bread-earner in the family so the individual characteristics matter as well, and the *liberal* system (USA) with minimal state support.

Overall, the main contribution of the paper to the existing literature is the proof of the existence of a social income differential that favors immigrants to natives in some of the developed European countries. The second valuable point that we make is that one cannot consider immigrants without differentiating between EU and non-EU ones. EU immigrants are treated by the welfare systems almost as locals, which is due to the special regulations of the EU regarding European citizens. Non-EU immigrants benefit much more than natives from the different welfare policies. Certain household characteristics such as children, earners and wage income in the family explain the social income gap in the Scandinavian economies, while individual characteristics are equally important in corporate states and vital for the US.

An avenue for future research is to address the issues of endogeneity of the regressors. We are aware that variables like number of children, education and number of earners in the family are also choice variables which might be influenced by the social income. A useful exercise that would test the robustness of our results would be to include more EU countries in the analysis. Further research could also focus on the nature of the immigration flows and how the welfare states determine these flows. Additional analysis on migrants' characteristics: reason for migration (family reunification); assimilation and occupational choice would provide valuable insights for explaining the nature of migration flows.

References

[1] Baker, M. & Benjamin, D. (1995) "The receipt of Transfer Payments by Immigrants to Canada", The Journal of Human Resources 30(4), 650-676.

[2] Bell, B.D. (1997) "The performance of Immigrants in the United Kingdom: Evidence From the GHS", Economic Journal, 107 (441), 333-344.

[3] Benefits and Wages (2002), OECD Indicators.

[4] Bird, Kayser, Frick and Wagner (1999) "The Immigrant Welfare effect: Take-up or Eligibility?", IZA Discussion Paper Series No. 66.

[5] Black, D. and Smith, J. and Berger, M. and Noel, B. (2003) "Is the Treat of Reemployment Services More Effective Than the Services Themselves? Evidence From Random Assignment in the UI System", American Economic Review, Vol.93, 1313-1327.

[6] Blau, F. D. (1984) "The Use of Transfer Payments by Immigrants", Industrial and Labor Relations Review, 37(2), 222-239.

[7] Borjas, G. J. (1995) "Assimilation and Changes in Cohort Quality Revised: What happened to Immigrant earnings in the 1980s?", Journal of Labor Economics, Vol. 13(2), 201-245.

[8] Borjas, G. J. and Hilton, L. (1996) "Immigration and the Welfare state. Immigrant Participation in Means-tested Entitlement Programs", The Quarterly Journal of Economics, 111(2), 575-604.

[9] Borjas, G. J. and Trejo, S. J. (1991) "Immigrant Participation in the Welfare System", Industrial & Labor Relations Review, 44(2), 195-211.

[10] Buchel, F. and Frick, J. R. (2003) "Immigrants' Economic Performance Across Europe-Does Immigration Policy Matter?", European Panel Analysis Group, Working Paper No. 42.

[11] Buchinsky, M. (1998) "Recent advances in Quintile Regression Models," Journal of Human Resources, Vol.33 (1), 88-126.

[12] Cornelisse, P. A. and Goudswaard, K. P. (2002) "On the Convergence of Social Protection Systems in the European Union", International Social Security Review, Vol.55, No. 3.

[13] Dehejia R.H. and Wahba (1999) "Causal Effects in Non-experimental Studies: Re-evaluating the Evaluation of Training Programmes", Journal of the American Statistical Association, 94, 1053-1062.

[14] Enchautegui, M. E. (1997) "Immigration and Country Employment Growth", Population Research and Policy Review, 16(5), 493-511.

[15] Esping-Andersen, G. (1990) "The Three Worlds of Welfare Capitalism", Princeton, NJ: Princeton University Press.

[16] Eurostat, (2002) "The Social Situation in the European Union"

[17] Geddes, A. (2003) "The Politics of Migration and Immigration in Europe", London, Sage.

[18] Gustafsson, B. and Osterberg, T. (2001) "Immigrants and the Public Sector Budget-accounting", Journal of Population Economics 14, 689-708.

[19] Gustman, A. L. and Steinmeier, T. L. (1998) "Social Security Benefits of Immigrants and US born", Cambridge, MA, National Bureau of Economic Research, Working Paper 6478.

[20] Heckman, J.J., H. Ichimura and P. Todd (1997) "Matching As An Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Program", Review of Economic Studies (64), 605-654.

[21] Heckman, J.J., H. Ichimura and P. Todd (1998) "Matching As An Econometric Evaluation Estimator", Review of Economic Studies (65), 261-294.

[22] Heckman, J.J, R. LaLonde, and J. Smith (1999) "The Economics and Econometrics of Active Labor market Programs", in Handbook of Labor Economics, III, ed. by Ashenfelter and D. Card, 1865-2097, Elsevier.

[23] Kvist J., (2004) "Does EU Enlargement Start a Race to the Bottom? Strategic Interaction Among EU Member States in Social Policy", Journal of European Social Policy, 14(3), 301-318.

[24] Lang G., (2000) "Native-Immigrant Wage Differential in Germany: Assimilation, Discrimination, or Human Capital?", University of Augsburg, Working Paper.

[25] Lehner, M. (2000) "A Note on the Common Support Problem in Applied Evaluation Studies", Discussion Paper, SIAW.

[26] Neumark, D. (1988) "Employers' Discrimination Behavior and the Estimation of Wage Discrimination", Journal of Human Resources, 23, 279-295.

[27] Nopo, H. (2004) "Matching as a Tool to Decompose Wage Gaps", Institute for the Study of Labour (IZA), IZA Discussion Papers 981.

[28] Oaxaca, Ronald (1973) "Male-Female Wage Differentials in Urban Labor Markets", International Economic Review, 14, 693-709.

[29] Oaxaca, R. and Ransom M. (1994) "On Discrimination and the Decomposition of Wage Differentials", Journal of Econometrics, Vol. 61, 5-21.

[30] Riphahn, Regina T. (1998) "Immigrant Participation in the German Welfare Program", Finanzarchiv N.F., 55 (2), 163-185.

[31] Rosenbaum, P. and Rubin, D. (1985) "Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score", The American Statistician, Vol.39, 33-38.

[32] Siklos, Pierre L. and William L. Marr (1998) "The Unemployment Insurance Compensation Experience of Immigrants in Canada", 1980-1988, Journal of Population Economics, 11, 127-147.

[33] Shields M. and W. Price (1998) "The Earnings of Male Immigrants in England-Evidence From the Quarterly LFS", Applied Economics, 30 (9) 1157-1168.

[34] Smith, J. and Todd, P. (2001) "Reconciling Conflicting Evidence on the Perfomance of the Propensity Score Matching Methods", American Economic Review Papers and Proceedings, Vol.91 (2), 112-118.

[35] SOPEMI, 2001, Trends in International Migration, OECD, Paris.

Table 1. Summary Statistics For the Annual Average Social Family Income

	Non-EU/Natives Gap				EU/Natives Gap			
	Non-EU Immigrants	Natives	Abs. Gap	Raw[c] Gap	EU Immigrants	Natives	Abs. Gap	Raw Gap
Sweden	6808 (4033)[a]	5012 (4731)	1796 (0.00)[b]	0.50 (0.00)	6116 (5627)	5012 (4731)	1104 (0.00)	0.22 (0.00)
Norway	5018 (4571)	3652 (4355)	1366 (0.00)	0.31 (0.00)	4000 (4193)	3652 (4355)	348 (0.10)	0.09 (0.05)
Belgium	6097 (3994)	4269 (4623)	1827.42 (0.03)	0.52 (0.00)	4678.73 (3975)	4270 (4623)	409 (0.52)	0.13 (0.23)
Germany	7350 (5328.61)	8071 (8159.24)	-722 (0.08)	0.05 (0.20)	7243 (7399.98)	8071 (8159.24)	-8282 (0.30)	-0.09 (0.15)
USA[d]	2741 (4715)	4127 (4937)	-1386 (0.00)	-0.52 (0.00)				

Source: The data is from the Luxembourg Income Study for 2000.
Notes: [a]Standard Errors in Parentheses; [b]P-value for the gap in sample means between non-EU and natives, and EU and natives; [c] The gap is reported in log points; Social income are reported in U.S. dollars; [d] We do not distinguish between EU/Non-EU immigrants.

Table 2. Descriptive Statistics for Natives, EU and Non-EU Immigrants by Country

	Sweden			Norway			Belgium			Germany			USA	
	Natives	EU Immigr.	Non-EU Immigr.	Natives	EU Immigr.	Non-EU Immigr.	Natives	EU Immigr.	Non-EU Immigr.	Natives	EU Immigr.	Non-EU Immigr.	Natives	Immigr.
Age of Family Head	42.6 (10.51)	43.06 (9.75)	37.9 (8.77)	42.06 (10.92)	41.03 (10.16)	40.04 (9.75)	43.64 (9.25)	48.24 (9.15)	42.30 (8.15)	44.76 (10.57)	46.13 (10.33)	42.75 (11.08)	41.76 (12.02)	37.72 (10.29)
Household Size	3.32 (1.38)	3.33 (1.36)	3.69 (1.71)	3.14 (1.45)	3.51 (1.63)	3.71 (1.75)	3.63 (1.31)	3.63 (1.40)	4.13 (1.31)	3.3 (1.27)	4.03 (1.68)	4.4 (1.76)	3.72 (1.75)	4.81 (2.00)
Number of Earners	1.93 (0.87)	1.76 (0.89)	1.36 (0.93)	1.97 (0.95)	1.84 (0.93)	1.8 (1.06)	1.66 (0.89)	1.22 (1.00)	1.63 (1.10)	1.65 (0.95)	1.92 (0.93)	1.52 (0.97)	1.75 (1.08)	1.97 (1.19)
Number of Children	1.33 (1.2)	1.4 (1.23)	1.8 (1.47)	1.14 (1.19)	1.45 (1.34)	1.6 (1.41)	1.42 (1.24)	1.21 (1.25)	1.78 (1.04)	1.08 (1.07)	1.51 (1.44)	1.88 (1.41)	1.48 (1.45)	2.09 (1.6)
Education[a]	0.29 (0.45)	0.27 (0.44)	0.22 (0.42)	0.31 (0.46)	0.41 (0.49)	0.35 (0.48)	0.54 (0.50)	0.44 (0.50)	0.53 (0.50)	0.23 (0.33)	0.16 (0.42)	0.19 (0.40)	0.46 (0.50)	0.22 (0.41)
Female	0.85 (0.36)	0.85 (0.36)	0.79 (0.41)	0.85 (0.36)	0.85 (0.35)	0.85 (0.36)	0.88 (0.32)	0.89 (0.32)	0.94 (0.25)	0.89 (0.31)	0.95 (0.21)	0.94 (0.24)	0.71 (0.46)	0.8 (0.40)
Observations	7258	200	189	10320	579	466	1390	98	80	5242	218	395	14953	1793

Source: The data is from the Luxembourg Income Study for 2000.
Notes: All means are weighted with the LIS sampling weight and include heads of families between 18-60 years; [a]Low(less than college or university degree) is the reference group

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Table 3. Estimated Social Income Gaps for the Non-EU Immigrants and Natives

Independent variables	Sweden (1)	Sweden (2)	Norway (1)	Norway (2)	Germany (1)	Germany (2)	Belgium (1)	Belgium (2)	USA (1)	USA (2)
Non-EU Immigrant[a]	0.18***	0.23***	0.24***	0.25***	-0.03	-0.07	0.24**	0.20*	-0.44***	-0.30***
	(0.06)	(0.06)	(0.05)	(0.05)	(0.08)	(0.07)	(0.05)	(0.11)	(0.04)	(0.05)
No-Wage Dummy[b]	0.48***	0.38***	0.83***	0.59***	0.59***	0.38***	0.90***	0.58***	0.73***	0.55***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.05)	(0.12)	(0.11)	(0.04)	(0.05)
Number of Earners	-0.36***	-0.36***	-0.29***	-0.26***	-0.31***	-0.24***	-0.30***	-0.37***	-0.13***	-0.12***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.05)	(0.02)	(0.02)
Number of Children	0.14***	0.21***	0.07***	0.21***	-0.05***	0.12***	-0.003	0.18***	-0.1***	-0.03**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)
Age of Family Head		-0.04***		-0.09***		-0.11***		-0.10***		-0.05***
		(0.01)		(0.01)		(0.02)		(0.02)		(0.01)
Age of Family Head Squared		0.001***		0.001***		0.002***		0.002***		0.001***
		(0.0001)		(0.0001)		(0.0001)		(0.0002)		(0.0001)
Female Family Head[c]		-0.18***		-0.45***		-0.12***		-0.40***		-0.36***
		(0.03)		(0.04)		(0.04)		(0.08)		(0.03)
Education Dummies		Yes		Yes		Yes		Yes		Yes
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	8.57***	9.11***	8.62***	9.93***	9.09***	10.63***	8.42***	9.63***	7.90***	8.52***
	(0.03)	(0.17)	(0.07)	(0.3)	(0.05)	(0.23)	(0.15)	(0.47)	(0.05)	(0.14)
R2	0.13	0.17	0.16	0.25	0.25	0.36	0.32	0.44	0.09	0.14
Number of observations	7 447	7 417	7 961	7 961	5 637	5 475	1 308	1 308	16 746	16 746

Source: The data is from Luxembourg Income Study for 2000

Notes: *** Statistically significant at the 0.01 level; ** at the 0.05 level; * at the 0.10 level; [a]Native is the reference group; [b]Non-zero family income is the reference group; [c]Male is the reference group.

Table 4. Estimated Social Income Gap for the EU Immigrants and Natives

Independent variables	Sweden		Norway		Germany		Belgium	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
EU Immigrant[a]	0.13***	0.14***	0.06	0.08*	-0.04	-0.11	-0.03	0.03
	(0.07)	(0.07)	(0.06)	(0.05)	(0.11)	(0.09)	(0.15)	(0.13)
No-Wage Dummy[b]	0.55***	0.43***	0.86***	0.61***	0.58***	0.38***	0.99	0.67
	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.11)	(0.10)
Number of Earners	-0.36***	-0.36***	-0.29***	-0.26***	-0.33***	-0.27***	-0.51***	-0.21***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.04)	(0.05)
Number of Children	0.14***	0.22***	0.07***	0.21***	-0.04***	0.12***	0.02	0.19***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.03)	(0.03)
Age of Family Head		-0.04***		-0.10***		-0.13***		-0.10***
		(0.01)		(0.01)		(0.01)		(0.02)
Age of Family Head Squared		0.001***		0.001***		0.002***		0.001***
		(0.0001)		(0.0001)		(0.0001)		(0.0002)
Female Family Head[c]		-0.18		-0.47***		-0.11***		-0.43***
		(0.03)		(0.04)		(0.01)		(0.08)
Education Dummies		Yes		Yes		Yes		Yes
Region Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	8.59***	9.20***	8.62***	10.22***	9.21***	11.1***	8.40***	9.77***
	(0.03)	(0.17)	(0.07)	(0.32)	(0.05)	(0.24)	(0.15)	(0.46)
R2	0.13	0.17	0.16	0.25	0.29	0.37	0.31	0.39
Number of observations	7458	7434	8 022	8 022	5368	5368	1294	1294

Source: The data is from the Luxembourg Income Study for 2000
Notes: *** Statistically significant at the 0.01 level; ** at the 0.05 level; * at the 0.10 level; [a]Native is the reference group; [b]Non-zero income family is the reference group; [c]Male is the reference group.

Table 5. Robustness Check - Median Regressions

	Sweden	Norway	Germany	Belgium	USA
Non-EU	0.29***	0.35***	0.02	0.17*	-0.29***
	(0.12)	(0.06)	(0.08)	(0.09)	(0.04)
EU	0.05	0.19***	-0.16	0.11	
	(0.11)	(0.05)	(0.10)	(0.09)	

Source: The data is from the Luxembourg Income Study for 2000
Notes: The table presents immigrant-dummy (native is the reference group) estimates from a series of regressions controlling simultaneously for individual and family characteristics; *** Statistically significant at the 0.01 level; ** at the 0.05 level;* at the 0.10 level.

Table 6. Matching Results: Average Treatment on the Treated

	Non-EU Immigrants			EU Immigrants		
	ATT	Treated	Untreated	ATT	Treated	Untreated
Sweden	0.20***	99%	94%	0.20***	100%	97%
	(0.06)			(0.05)		
Norway	0.17***	98%	99%	0.02	98%	96%
	(0.05)			(0.13)		
Germany	-0.17***	99%	90%	0.26	99%	99%
	(0.04)			(0.17)		
Belgium	0.10***	99%	100%	0.03	100%	100%
	(0.06)			(0.18)		
USA	-0.32***	97%	100%			
	(0.04)					

Source: The data is from the Luxembourg Income Study for 2000
Notes: The standard errors are bootstrapped. ***Statistically significant at the 0.01 level; ** at the 0.05 level;* at the 0.10 level.

Table 7. Decomposition of Non-EU Immigrants and Natives' Social Income Gap[a]

	Sweden	Norway	Belgium	Germany	USA
Raw Social Income Gap	0.501	0.309	0.52	0.048	-0.524
Unexplained Gap	0.220	0.230	0.191	-0.062	-0.230
Explained Contribution	0.285	0.078	0.328	0.11	-0.290
Relative Contribution (%)	57	25	62		55
Effect of Household and Individual Characteristics					
Household	0.334	0.133	0.151	0.105	-0.063
Number of Earners	0.192	0.054	0.157	0.032	-0.024
Number of Children	0.090	0.067	-0.016	0.093	-0.015
No-Wage Dummy	0.057	0.018	0.001	-0.004	-0.018
Individual	-0.050	-0.054	0.176	0.007	-0.229

Notes: [a]The table reports the Oaxaca-Blinder decomposition of the log annual social income gap. The effect of age, age squared, gender, education and region is not reported; [b] The positive gap indicates that the non-EU immigrants' social income is higher than that for natives.

Table 8. Decomposition of EU Immigrants and Natives' Social Income Gap[a]

	Sweden	Norway
Raw Social Income Gap	0.220	0.090
Unexplained Gap	0.140	0.070
Explained Gap	0.080	0.018
Relative Contribution (%)	36	20
Effect of Household and Individual Characteristics		
Household	0.066	0.088
Number of Earners	0.061	0.039
Number of Children	0.000	0.057
No-Wage Dummy	0.015	0.005
Individual	0.011	-0.067

Notes: [a] The table reports Oaxaca-Blinder decomposition of the log annual social income gap. The effect of age, age squared, gender, education and region is not reported; [b] The positive gap indicates that EU immigrants social income is higher.

Appendix

Variables description

Age - It represents the age in years at the moment of the interview. We consider heads of family between 18 and 60 years old.

Gender - It indicates whether the head of the family is male or female.

Household Size - It gives the total number of persons in household (includes children or any other individuals not included in individual-level survey).

Education Level - Whenever possible this variable gives the highest attained level of education. We have created a dummy variable taking value of one whenever the individual has college or university degree.

Region - This variable includes the region of residence (state, province, district, etc.). For countries within the EU, the NUTS-classification is used whenever the coding in the original dataset allows for it (usually NUTS 2 or 3).

Ethnicity - The content of this variable is not uniform. Preferably it includes ethnicity or nationality, but if this information is not available in the original survey, it can also contain country of birth, race, ancestry or mother tongue.

Immigration Status - This variable shows whether an individual is born in the country or has an immigrant background, how recently he/she arrived or other immigration status information as available.

Number of Children under age 18 - If possible, the LIS avoids to include married children under age eighteen. The head and spouse under eighteen are also excluded.

Number of Earners - As a rule, an individual is considered an earner if he/she receives any income from labour.

Family Wage Income - This household variable includes any cash wage and salary income including employer bonuses, 13th month bonus, etc. It is recorded gross of employee social insurance contributions/taxes but net of employer social insurance contributions/taxes. In our study we create a dummy variable which takes value of one if

the family wage income is zero.

Social Income - This variable includes the following variables; **Social Retirement Benefits** includes cash social security benefits for old age or survivors (widows/widowers), in other words the first pillar in a 3-tired pension system; **Child or family Allowances** includes cash payments for child or family allowances not relating to maternity/paternity; **Unemployment Compensation** includes non-means tested cash social insurance benefits in case of unemployment where severance pay is excluded; **Sick pay** includes cash benefits due to short-term sickness or non-occupational injury, and related medical benefits and services; **Accident pay** includes cash accidents or injury payments; **Disability pay** includes cash benefits for partial or total permanent disability (i.e. long term illness); **Maternity pay** includes cash payments for maternity or paternity; **Military/Veteran/War Benefits** includes cash veteran's benefit or military benefits for old age, military disability and war separations; **Other Social Insurance** includes other cash or near cash benefits that are not included in the more specific cash benefit variables; **Means-Tested Cash Benefits** includes means-tested benefits or so called 'emergency' benefits. LIS includes also mandatory cash transfers NOT tied to some form of in-kind benefit (e.g. not tied to food or education); **Near-Cash Benefits** includes all forms of transfers that are, in a strict sense, in-kind payments (i.e. they are tied to a specific requirement such as school attendance) but have a cash equivalent value equal or nearly equal to the market value, including near-cash housing benefits; **Alimony or Child Support** includes alimony received from non-household members; **Other Regular Private Income** includes regular cash private transfers.

Appendix 2

The total social income gap is defined as the difference between immigrant and natives conditional expected social income receipts:

$$Gap = E(lnY_1|D=1) - E(lnY_0|D=0)$$

where lnY is the natural logarithm of the social income. We let immigrants to be the treatment group $(D=1)$ and natives be the comparison or the control $(D=0)$ group. The question that we try to answer is how much immigrants would take from the state by having the same observable characteristics and being 'rewarded' the same amount as natives are, in other words as if they were natives. The non-parametric matching method allows us to estimate the missing counterfactuals. By matching immigrants and natives with the same observable characteristics, we can evaluate how much immigrant would have earned if she were a native. Immigrants and natives with the same characteristics are sorted into a same cell k. Then the overall average social income of immigrants is $E(lnY_1|D=1) = \sum_{k=1}^{n} p_k E(lnY_1|D=1,k)$, where $E(lnY|D=1,k)$ is the expected social income for immigrant in k^{th} cell and p_k is the proportion of immigrants in k^{th} cell. Similarly, the overall average social income of natives is $E(lnY_0|D=0) = \sum_{k=1}^{n} q_k E(lnY_0|D=0,k)$, where q_k is the proportion of natives in k^{th} cell. Thus the social income gap can be rewritten as:

$$Gap = \sum_{k=1}^{n} p_k E(lnY_1|D=1,k) - \sum_{k=1}^{n} q_k E(lnY_0|D=0,k)$$

In order to estimate the counterfactual incomes of immigrants as if they were natives, adding and subtracting $\sum_{k=1}^{n} p_k E(lnY_0|D=0,k)$ gives us:

$$Gap = \sum_{k=1}^{n} p_k [E(lnY_1|D=1,k) - E(lnY_0|D=0,k)] + \sum_{k=1}^{n} (p_k - q_k) E(lnY_0|D=0,k)$$

The first term in the equation describes how much less would immigrants earn if they

share the same observable characteristics as natives, which is the unexplained wage gap. Our focus is on the impact of 'treatment on the treated' that we estimate both parametrically (regression-based) and non-parametrically (matching). The second term in the above equation is the social income gap caused by the differences in proportions of immigrants and natives across cells, or that is the proportion of the gap that can be explained by differences in characteristics.

Matching eliminates two of the three selection bias sources identified by Heckman et al. (1998): the bias resulting from having different ranges of X (characteristics) for the treated and control samples (comparing non-comparable individuals) and the bias resulting from having different distributions of X across their common support (weighting comparable individuals incomparably). The remaining source of the bias, differences on unobservables across groups, is ruled out by the matching assumption. Particularly this assumption is known as conditional independence assumption (CIA) and states that all information that influences the 'participation' decisions and the outcome simultaneously is observed and controlled for.

Even though a variety of matching procedures are possible each scheme includes several key decisions. First, we should choose the covariates to be used for stratification and matching. Matching directly the vector of covariates could be computationally demanding, especially when the number of covariates is large. The number of 'cells' into which the data has to be divided would then augment exponentially and it may be quite unlikely that a match between all people in the female (treatment) and male (treated) group would be found for every combination of the covariates (the 'curse of dimensionality'; see Heckman et al., 1997). Rosenbaum and Rubin (1985) demonstrate that matching can be done on the conditional probability of 'participation' (in our context 'of being an immigrant') known as the propensity score, which considerably reduces the dimensionality problem since the conditioning is done on a scalar rather than on a vector. Second, if the number of controls (natives) that are to be matched within a fixed distance to treated

(immigrants) varies, then the distance should be chosen.[29]

Third, an appropriate weight function to associate the set of untreated to each treated has to be selected. The most common functions, that we also apply, include the unity weight to the nearest person and zero to the others, and kernel weights, which reduce the weight for distant observations in terms of the propensity score. Finally, matching can be performed with or without replacement, meaning to use or not the untreated families more than once in order to form the comparison group. In the first case the matching quality can be improved but at the cost of increased standard error of the estimated effect.[30]

A basic requirement for a bias removing implementation of the matching algorithm is a sufficiently large overlap between the distribution of the propensity scores of the treated and untreated individuals. It is known as common support condition and in the current application means that for every immigrant a sufficient number of 'similar' natives should be available. This condition is essential for the matching estimator but not for the parametric techniques as OLS. The last can be used to predict the expected outcome even in regions of variables where no observations appear (Lechner, 2000).

The assessment of the matching quality includes checking if the matching procedure is able to balance the distribution of the relevant variables in both the control and treatment group. The basic idea of all approaches is to compare the situation before and after matching and check whether any differences remain after conditioning on the propensity score.[31] If differences exist, matching was not completely successful and remedial measures have to be done, for example including interaction-terms in the estimation of the propensity score. We perform two-sample t-test to check if there are significant

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[29]For example, the neighbourhood may be a singelton set (one-to-one matching: nearest neighbour or within a caliper) or a multiple set (n-nearest neighbours, radius matching, kernel and local linear regression). See Heckman et al. (1999) and Smith and Todd (2001) for a detailed description of different matching estimators.

[30]Dehejia and Whaba (1999) find that the performance of simple matching with replacement vary satisfactory when compared to more complex matching without replacement.

[31]Rosenbaum and Rubin (1985) suggest to calculate the standardized bias (the distance in marginal distribution of the covariates) before and after matching. Alternatively, the authors propose two sample t-test between the treated and untreated before and after matching.

differences in covaraite means for both groups (Rosenbaum and Rubin, 1985). Before matching differences are expected, but after matching the covariates should be balanced in both groups and hence no significant differences should be found.