International Migration and the Welfare State

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to Enni

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Contents

Introduction

Major part of the research on international migration has been on migration from poor or developing countries to rich countries, and public discussion on migration in many rich countries is centered around issues related to immigration. Less attention has been paid to the fact that migration from rich countries takes place as well. According to the United Nations (2013), 21.9 million persons from EU15 countries lived outside their birthplace, with 42 percent of these migrants living in other EU15 countries and an additional 13 percent living in the United States. The essays in this dissertation aim to shed light on some central questions concerning migration in and from European countries. Since economic returns to individual skills are relatively low in many European welfare states, it is of policy relevance to study whether differences in skill prices or taxation are reasons behind migration from these countries.

Perhaps the most fundamental question in economics of migration concerns self-selection of migrants. The notion that migrants are not randomly selected from the populations of the sending countries is a central result in economics of migration, and beginning with Borjas (1987), there has been a great deal of interest in deriving and empirically testing models that predict how migrants differ from non-migrants. The question is of relevance, since the nature of the non-random selection of migrants affects the level and the distribution of welfare in both sending and receiving countries. However, most of the contemporary empirical evidence on self-selection of migrants concerns migration from Mexico to the United States, and there is not much empirical evidence on what kinds of people actually migrate from Western-European countries. Chapter 1 of this thesis aims to address this deficit by studying self-selection of long-term migrants from Denmark, a rich and a highly redistributive European welfare state. In addition to addressing the need for empirical knowledge of selection of migrants from a rich European country the chapter also introduces a novel theoretical contribution as it is shown that the Roy model has more precise predictions about the self-selection of migrants than has been previously realized. The same conditions that have been shown to result in positive or negative selection in terms of expected earnings also imply a stochastic dominance relationship between the earnings or skill distributions of migrants and non-migrants. Using Danish full-population register data we are able find strong support for the theoretical considerations; migrants from Denmark are positively selected both in terms of age-year standardized pre-emigration earnings and in terms of wage regression residuals that serve as a measure of unobserved earnings ability. Further, we also find strong support for the stochastic dominance prediction.

The second chapter of the thesis uses unique survey data on Danish long-term migrants to study what determines their preferences for redistribution of income in Denmark. The question is relevant because, as the results in chapter one reveal, migrants from Denmark are positively self-selected in terms of their earnings ability. As the income taxes in Denmark are high in international comparison, it would be also of policy interest to know whether Danish emigrants left the country because of taxation. One of the main findings of

the chapter is that migrants who live in destinations outside Nordic countries, where the societies are relatively similar to Denmark in terms of taxation and returns to skills, are more opposed to a suggestion of increasing redistribution of income in Denmark. Further, those who migrated for work-related reasons are more opposed to the suggestion. We are not able to show whether those who dislike high taxes in Denmark self-select to non-Nordic destinations, or whether migrants to these destinations have assimilated to the values prevailing in the host country.

The third chapter of the dissertation studies whether trust towards institutions is a cultural trait that migrants bring with them from their countries of origin, or whether it tends to change rapidly. The main finding is that unlike more general trust towards other people, trust towards institutions seems to change when an individual migrates from one country to the other. Trust towards institutions is widely considered to be an essential feature of European welfare states. According to the findings it is possible for a culture where public institutions are highly trusted to persist also with increasing flows of international migration.

Chapter 1.

Self-Selection of Emigrants: Theory and Evidence on Stochastic Dominance in Observable and Unobservable Characteristics

This chapter is based on joint work with George Borjas and Panu Poutvaara

1.1 Introduction

A central finding in the economic literature on international migration is that emigrants are not randomly selected from the population of the source countries. The nature of the non-random selection affects the level and the distribution of welfare through two major channels. First, the skill distribution of migrants affects the wage structure in both sending and receiving countries (Borjas 2003). A second effect takes place through the public sector. Immigration creates a fiscal surplus in the receiving country if and only if the net present value of the tax payments of immigrants exceeds the net present value of the costs they impose. Both the immigration of net recipients and the emigration of net payers pose a challenge to the public treasury (Wildasin 1991; Sinn 1997).

Beginning with Borjas (1987), there has been a great deal of interest in deriving and empirically testing models that predict how migrants differ from non-migrants. Many of these studies rely on an application of the Roy model of occupational self-selection. As long as skills are sufficiently transferable across countries, the sorting of persons across countries is mainly determined by international differences in the rate of return to skills. A country like the United States would then attract high-skilled workers from more egalitarian countries (i.e., countries offering relatively low rates of return to skills) and low-skilled workers from countries with greater income inequality than in the United States (i.e., countries offering higher rates of return to skills). The evidence indeed suggests a negative cross-section correlation between the earnings of immigrants in the United States and the extent of income inequality in the source countries.[1]

Although the existing literature on immigrant selection focuses either on the U.S. context or on migration flows from poor to rich countries, there are also sizable migration flows between rich countries.[2] According to the United Nations (2013), 21.9 million persons from

[1] Related cross-country studies include Cobb-Clark (1993) and Bratsberg (1995).

[2] Studies of the selection of migrants across developed countries include Lundborg (1991), Pirttilä (2004), Kleven et al. (2014), and Junge et al. (2014). Many studies also examine selection issues in a historical context; see Wegge (1999, 2002), Abramitzky and Braggion (2006), Abramitzky, Boustan, and Eriksson (2012), Ferrie (1996), and Margo (1990).

EU15 countries now live outside their birthplace, with 42 percent of these migrants living in other EU15 countries and an additional 13 percent living in the United States.[3]

This paper examines the self-selection of emigrants from Denmark, one of the richest and most redistributive European welfare states. In 2013, over a quarter million Danes lived outside Denmark (corresponding to about 5 percent of the Danish-born population), with 50 percent of the migrants living in other EU15 countries and 13 percent in the United States (United Nations, Department of Economic and Social Affairs 2013). Because the returns to skills in Denmark are relatively low, the canonical Roy model predicts that the emigrants should be positively selected in the sense that the expected earnings of the migrants exceed the expected earnings of the stayers.[4] However, there have not been any prior studies that examine the self-selection of migrants from a relatively egalitarian country to see whether this is indeed the case.

Our theoretical analysis distinguishes between selection in observable and selection in unobservable characteristics. In addition, we show that the canonical framework does not only have predictions about the difference between the expected earnings of migrants and non-migrants, which is the basis for the standard definition of positive or negative selection in the literature, but also about the stochastic ordering of the two earnings distributions. We show that the same conditions that predict that migrants are positively self-selected in the sense of a difference in expected incomes also predict that the income distribution of the migrants will first-order stochastically dominate the income distribution of the non-migrants.

Our empirical analysis uses the Danish full population register data to analyze how migrants and non-migrants differ in their pre-emigration earnings and other observable characteristics. To shed light on the role of unobservable characteristics in the selection process, we investigate how migrants and non-migrants differ in terms of unobservable earnings ability, measured by residuals from Mincerian earnings regressions. Our empirical results are in line with the predictions of the model: Danish emigrants are indeed positively self-selected both in terms of earnings and in terms of residuals from the wage regressions. Following our reframing of the canonical Roy framework in terms of the concept of stochastic dominance, our study specifically tests for whether the earnings distribution of the emigrants stochastically dominates that of the stayers (as would be predicted by the model). The evidence confirms this strong theoretical prediction over most of the support of the earnings distribution.

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[3] The EU15 countries refer to the member states of the European Union prior to the expansion in May 1, 2004.

[4] For comparisons of gross wage premia from tertiary education across countries see Boarini and Straus (2010). A recent paper studying returns to cognitive skills is Hanushek et al. (2015). The study finds significant cross-country differences. Moreover, the returns are relatively low in Denmark as well as in other Nordic countries, and high in the United States, Germany and the United Kingdom, which also are among the most popular destinations of Danish migrants.

Our analysis is related to the flurry of recent papers that examine the selection of migrants from Mexico to the United States. The pioneering analysis of Chiquiar and Hanson (2005) merged information from the U.S. census on the characteristics of the Mexican migrants with information from the Mexican census on the characteristics of the Mexican non-migrants. Because the merged data did not report the earnings of migrants *prior* to the move, pre-migration earnings were predicted based on observable characteristics of the migrants. This "counterfactual" empirical exercise suggested that Mexican emigrants were located in the medium-high range of the Mexican wage distribution. The finding of intermediate selection in the Mexican context does not seem consistent with the basic implications of the Roy model because the rate of return to skills is far larger in Mexico than in the United States. More recent studies by Fernández-Huertas Moraga (2011) and Kaestner and Malamud (2014) use survey data that report the *actual* pre-migration earnings and find evidence of negative selection. They also conclude that part of the negative selection can be traced to the unobservable characteristics that determine a migrant's earnings.

The important role played by unobservable characteristics implies that constructing a counterfactual earnings distribution for the migrants based on observable characteristics can greatly bias the nature of the selection revealed by the data. Our findings suggest that the use of such a counterfactual distribution will tend to *understate* the true selection in earnings, so that the selection implied by the counterfactual distribution is far weaker than the true selection—regardless of whether there is positive or negative selection. The numerical bias that results from using the counterfactual estimation is sizable in the Danish context: more than half of the difference between the earnings distributions of migrants and non-migrants arises because of differences in unobserved characteristics.

The paper is organized as follows. Section 2 sketches the economic theory underlying the analysis and derives theoretical predictions concerning the self-selection of emigrants, using the notion of stochastic dominance as a unifying concept. Section 3 introduces and describes the unique population data that we use and reports some summary statistics. Sections 4 and 5 present the main empirical findings. In section 4, we examine the selection in terms of observed pre-migration earnings. We present a statistical method for testing the theoretical implication that the earnings distribution of the emigrants should stochastically dominate the corresponding distribution of the non-migrants. Section 5 extends the empirical work by examining the selection that occurs in the unobserved component of earnings. We also evaluate the bias that results from predicting the pre-migration earnings of emigrants from the earnings distribution of non-migrants. Section 6 examines whether the selection of persons moving to other EU15 countries differs from the selection of migrants moving to countries where immigration restrictions come into play. We find that immigration restrictions have little effect on the selection of emigrants. Finally, Section 7 summarizes the study and draws some lessons for future research.

1.2 Theoretical framework

Previous literature on the self-selection of migrants has focused on the conditional expectations of earnings distributions among migrants and stayers. In this section, we derive a novel result: the Roy model implies that under certain conditions, the earnings distribution of migrants first-order stochastically dominates, or is stochastically dominated by, the earnings distribution of stayers. In a bivariate normal framework, it turns out that the conditions required for stochastic dominance are identical to the conditions that determine the nature of self-selection in terms of expected earnings.

We also decompose self-selection into two components, one that is determined by differences in returns to observable skills between source and host country, and one that is determined by differences in unobservable skills. The distinction between observable and unobservable skills, of course, depends on the empirical framework and on the data that is being used; observable skills include the variables explaining earnings that are included in the data, while the component of earnings that is left unexplained by the data is the unobservable skill component. Even though the content of the two components differs among data sets, we show that it is likely that a major part of migrant self-selection is determined by the unobservable component simply because "observables" tend to explain a relatively small fraction of the variance in earnings.

We take as our starting point the migration decision faced by potential migrants in a two-country framework, in line with Borjas (1987) and subsequent literature. Residents of the source country (country 0) consider migrating to the destination country (country 1), and the migration decision is assumed to be irreversible. To simplify the presentation, we focus on a single observed skill characteristic s and suppress the subscript that indexes a particular individual. For concreteness, the variable s can be thought of as giving the worker's years of educational attainment, but it includes all the characteristics affecting individual's income that are observed in a given set of data. Residents of the source country face the earnings distribution:

$$\log w_0 = \alpha_0 + r_0 s + \varepsilon_0, \tag{1.1}$$

where w_0 gives the wage in the source country; r_0 gives the rate of return to observable skills; and the random variable ε_0 measures individual-specific productivity shocks resulting from unobserved characteristics and is normally distributed with mean zero and variance σ_0^2. The distribution of observable skills in the source country's population is given by $s = \mu_s + \varepsilon_s$, where the random variable ε_s is also assumed to be normally distributed with mean zero and variance σ_S^2.

If the entire population of the source country were to migrate, this population would face the earnings distribution:

(1.2) $$\log w_1 = \alpha_1 + r_1 s + \varepsilon_1,$$

where the random variable ε_1 is normally distributed with mean zero and variance σ_1^2.

For analytical convenience, we assume that $Cov(\varepsilon_0, \varepsilon_s) = Cov(\varepsilon_1, \varepsilon_s) = 0$, so that the individual-specific unobserved productivity shocks (i.e., the "residuals" from the regression line) are independent from observable characteristics.[5] The correlation coefficient between ε_0 and ε_1 equals ρ_{01}. It is also worth noticing that the random variable ε_s is individual-specific and has the same value for the same individual in both countries, whereas ε_0 and ε_1 are both individual- and country-specific.

Equations (1.1) and (1.2) completely describe the earnings opportunities available to persons born in the source country. Assume that the migration decision is determined by a comparison of earnings opportunities across countries net of migration costs *C*. Define the index function:

(1.3) $$I = \log\left(\frac{w_1}{w_0 + C}\right) \approx [(\alpha_1 - \alpha_0) + (r_1 - r_0)\mu_s - \pi] + [(r_1\varepsilon_s + \varepsilon_1) - (r_0\varepsilon_s + \varepsilon_0)]$$
$$= \Delta\mu + (v_1 - v_0),$$

where π gives a "time-equivalent" measure of migration costs ($\pi = C/w_0$). The cross-country difference in earnings net of the time-equivalent migration cost for an individual with average observed and unobserved characteristics is given by
$\Delta\mu = [(\alpha_1 - \alpha_0) + (r_1 - r_0)\ \mu_s - \pi]$. The difference in earnings attributable to individual deviation from average characteristics is given by $(v_1 - v_0)$, where $v_i = (r_i\ \varepsilon_s + \varepsilon_i)$. A person emigrates if the index $I > 0$, and remains in the origin country otherwise.

Migration costs probably vary among persons — but the sign of the correlation between costs (whether in dollars or in time-equivalent terms) and skills (both observed and unobserved) is ambiguous and difficult to determine. The heterogeneity in migration costs can be incorporated to the model by assuming that the distribution of the random variable π in the source country's population is given by $\pi = \mu_\pi + \varepsilon_\pi$, where μ_π is the mean level of migration costs in the population, and ε_π is a normally distributed random variable with mean zero and variance σ_π^2. However, Borjas (1987) and Chiquiar and Hanson (2005) show that time-equivalent migration costs do not play a role in the algorithm that determines the selection of emigrants if either those costs are constant (so that $\sigma_\pi^2 = 0$), or if the costs are uncorrelated with skills. For analytical convenience, we assume that time-equivalent

[5] A more realistic assumption would be that the correlation between observed and unobserved skills is positive. However, allowing for positive correlation does not change the qualitative predictions of the model.

migration costs are constant, so that $\pi = \mu_{\pi}$.[6] The outmigration rate from the source country is then given by:

$$(1.4) \qquad P(I > 0) = Pr[v^* > -\Delta\mu^*] = 1 - \Phi(-\Delta\mu^*),$$

where $v^* = (v_1 - v_0)/\sigma_v$ is a standard normal random variable; $\Delta\mu^* = \Delta\mu/\sigma_v$; $\sigma_v^2 = Var(v_1 - v_0)$; and Φ is the standard normal distribution function.[7]

In addition to identifying the determinants of the outmigration rate in equation (1.4), the Roy model lets us examine *which* persons find it most worthwhile to leave the source country.[8] In the following, we examine the self-selection of emigrants along two dimensions: selection in terms of observable skills *s* and selection in terms of unobservable skills ε_0, which together combine into selection in terms of total productivity or earnings, as measured by $\log w_0$.

Let $\mathbf{F_M}(z)$ and $\mathbf{F_N}(z)$ represent the (cumulative) probability distributions of skills or earnings for migrants and non-migrants in the source country, respectively, where z denotes a particular measure of skills (e.g., observable or unobservable characteristics or income). By definition, the probability distribution of migrants $\mathbf{F_M}(z)$ first-order stochastically dominates that of stayers $\mathbf{F_N}(z)$ if:[9]

$$(1.5) \qquad \boldsymbol{F_M}(z) \leq \boldsymbol{F_N}(z) \forall\, z,$$

and there is at least one value of z for which a strict inequality holds. From now on, whenever we refer to stochastic dominance, we mean first-order stochastic dominance.

Equation (1.5) implies that a larger fraction of the migrants have skills *above* any threshold z^*. Put differently, for any level of skills z^*, the population described by the probability

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[6] If π were negatively correlated with skills, the negative correlation would tend to induce the more skilled to migrate, creating a positively selected migrant flow. This would strengthen positive self-selection, and weaken negative self-selection.

[7] It is straightforward to study equation (1.4) to confirm that the migration rate rises, when mean income in the source country falls, mean income in the host country rises, returns to observed skills in the source country fall, returns to observed skills in the host country rise, time-equivalent migration costs fall and when mean observed skills rise if $r_1 > r_0$ or fall if $r_1 < r_0$.

[8] Throughout the analysis, we assume that $\Delta\mu^*$ is constant. The migration flow is effectively assumed to be sufficiently small that there are no feedback effects on the labor markets of either the source or destination countries.

[9] An alternative and perhaps more intuitive definition of stochastic dominance is in terms of quantiles. Let $Q_M(P)$ and $Q_N(P)$ be the quantile functions of order P of the skill distributions of migrants and non-migrants. $\mathbf{F_M}(z)$ stochastically dominates $\mathbf{F_N}(z)$ if and only if $Q_M(P) \geq Q_N(P)$ for all $0 \leq P \leq 1$ and there is at least one value of P for which a strict inequality holds.

distribution $\mathbf{F_M}$ is more skilled because a larger fraction of the group exceeds that threshold. The migrants, in short, are positively selected. Negative selection, of course, would occur if the reverse was true and $\mathbf{F_N}(z) \leq \mathbf{F_M}(z)\ \forall\ z$, with a strict inequality holding for at least one value of z.

If the skill distribution of migrants stochastically dominates that of non-migrants, the stochastic dominance then also implies the typical definition of positive selection that is based on conditional expectations:

(1.6) $$E(z|I > 0) > E(z|I \leq 0),$$

so that migrants, on average, are more skilled than stayers. Conversely, if the probability distribution of stayers stochastically dominates that of migrants, and there was negative selection, it would also follow that $E(z|I > 0) < E(z|I \leq 0)$. The converse, however, is not true for a general distribution: A claim of positive selection in expectations, as defined by equation (1.6), does not imply that the skill distribution of migrants stochastically dominates that of non-migrants.

To derive the stochastic ordering of the skill distributions of migrants and non-migrants, let $f(x, v)$ be a bivariate normal density function, with means (μ_x, μ_v), variances (σ_x^2, σ_v^2) and correlation coefficient ρ. Further, let the random variable v be truncated from below at point a and from above at point b. Arnold et al. (1993, p.473) show that the (marginal) moment generating function of the standardized random variable $(x - \mu_x)/\sigma_x$, given the truncation of v, is given by:

(1.7) $$m(t) = \left[\frac{\Phi(\beta-\rho t)-\Phi(\alpha-\rho t)}{\Phi(\beta)-\Phi(\alpha)}\right] e^{t^2/2},$$

where $\alpha = (a - \mu_v)/\sigma_v$; and $\beta = (b - \mu_v)/\sigma_v$.

In terms of the migration decision, the truncation in the random variable $v = v_1 - v_0$ in the sample of migrants is from below and implies that $\alpha = -\Delta\mu^* = k$, and $\beta = \infty$, where k is the truncation point. In the sample of stayers, the truncation in v is from above, and the truncation points are $\alpha = -\infty$ and $\beta = k$. By substituting these definitions into equation (1.7), it can be shown that the moment generating functions for the random variable giving the conditional distribution of skill characteristic x for migrants and stayers reduce to:

(1.8)
$$m_F(t) = \left[\frac{1 - \Phi(k - \rho t)}{1 - \Phi(k)}\right] e^{t^2/2}$$

and

(1.9)
$$m_G(t) = \left[\frac{\Phi(k-\rho t)}{\Phi(k)}\right] e^{t^2/2}.$$

Consider any two normal distribution functions **F**(z) and **G**(z). Thistle (1993, p. 307) shows that **F** will stochastically dominate **G** if and only if:

(1.10) $$m_F(-t) < m_G(-t), \forall\, t > 0,$$

where m_F is the moment generating function associated with distribution **F**; m_G is the moment generating function associated with **G**.

The ranking of the moment generating functions in equation (1.10) implies we can determine the stochastic ranking of the two distributions by simply solving for the relevant correlation coefficient ρ, and comparing equations (1.8) and (1.9). Such a comparison implies that:

(1.11) $$\begin{aligned} \boldsymbol{F_M}(z) &< \boldsymbol{F_N}(z), \quad if \quad \rho > 0 \\ \boldsymbol{F_M}(z) &> \boldsymbol{F_N}(z), \quad if \quad \rho < 0. \end{aligned}$$

In other words, migrants are positively selected if ρ > 0, and are negatively selected otherwise. Consider initially the stochastic ranking in observable characteristics. The random variable $x = \varepsilon_s$, and the relevant correlation coefficient ρ is defined by:

(1.12) $$\rho = Corr(\varepsilon_s, v_1 - v_0) = \frac{r_0\sigma_s}{\sigma_v}\left(\frac{r_1}{r_0} - 1\right).$$

Equation (1.12) shows that the stochastic ordering of the distributions of observable skills of migrants and non-migrants depends only on international differences in the rate of return to observable skills. The skill distribution of migrants will stochastically dominate that of stayers when the rate of return to skills is higher abroad. Conversely, the skill distribution for non-migrants will stochastically dominate the distribution for migrants if the rate of return to observable skills is larger at home.

Consider next the stochastic ordering in the conditional distributions of unobservable skills ε_0. The relevant correlation for determining this type of selection is given by:

(1.13) $$\rho = Corr\,(\varepsilon_0, v_1 - v_0) = \frac{\sigma_0}{\sigma_v}\left(\rho_{01}\frac{\sigma_1}{\sigma_0} - 1\right).$$

It follows that the distribution of unobservable skills for migrants stochastically dominates that for non-migrants when $\rho_{01}\frac{\sigma_1}{\sigma_0} > 1$. Note that the necessary condition for positive selection has two components. First, the unobserved characteristics must be "transferable" across countries, so that ρ_{01} is sufficiently high. Second, the residual variance in earnings is larger in the destination country than in the source country. The residual variances σ_0^2 and σ_1^2, of course, measure the "price" of unobserved characteristics: the greater the rewards to unobserved skills, the larger the residual inequality in wages.[10] As long as unobserved characteristics are sufficiently transferable across countries, emigrants are positively selected when the rate of return to unobservable skills is higher in the destination.

Finally, consider the stochastic ranking in "total" productivity. The earnings distribution in the source country given by equation (1.1) can be rewritten as:

$$\log w_0 = (\alpha_0 + r_0 \mu_s) + (r_0 \varepsilon_s + \varepsilon_0) = (\alpha_0 + r_0 \mu_s) + v_0, \tag{1.14}$$

where the normally distributed random variable v_0 has mean zero and variance σ_{v0}^2. The relevant correlation for determining the stochastic ranking of the earnings distributions of migrants and non-migrants is:

$$\rho = Corr(v_0, v_1 - v_0) = \frac{\sigma_{v0}}{\sigma_v}\left[\gamma\left(\frac{r_1}{r_0} - 1\right) + (1-\gamma)\left(\rho_{01}\frac{\sigma_1}{\sigma_0} - 1\right)\right], \tag{1.15}$$

where $\gamma = r_0^2\sigma_s^2/\sigma_{v0}^2$ and $1 - \gamma = \sigma_0^2/\sigma_{v0}^2$.

The sign of the correlation in equation (1.15), which determines the nature of the selection in pre-migration earnings, depends on the sign of a weighted average of the selection that occurs in observable and unobservable characteristics. Interestingly, the weight is the fraction of the variance in earnings that can be attributed to differences in observable and unobservable characteristics, respectively.

If there is positive (negative) selection in both "primitive" types of skills, there will then be positive (negative) selection in pre-migration earnings. If, however, there are different types of selection in the two types of skills, the selection in each type is weighted by its importance in creating the variance of the earnings distribution. It is well known that observable characteristics (such as educational attainment) explain a relatively small fraction of the variance in earnings (perhaps less than a third). As a result, equation (1.15) implies that it is the selection in *unobservables* that is most likely to determine the nature of the selection in the pre-migration earnings of emigrants. This implication plays an

[10] This interpretation of the variances follows from the definition of the log wage distribution in the host country in terms of what the population of the source country would earn if the entire population migrated there. This definition effectively holds constant the distribution of skills.

important role in explaining why the evidence reported in Fernández-Huertas Moraga (2011) and Kaestner and Malamud (2014) conflicts with that of Chiquiar and Hanson (2005).

As mentioned earlier, the stochastic dominance results necessarily imply selection in terms of conditional expectations. In the case of bivariate normal distributions, it follows that the expectation of the earnings distribution of migrants $E(\log w_0 \mid v^* > -\Delta\mu^*)$ is given by:

$$(1.16)\quad E(logw_0|v^* > -\Delta\mu^*) = \alpha_0 + r_0\mu_s + \frac{r_0\sigma_s^2}{\sigma_v}\left(\frac{r_1}{r_0} - 1\right)\lambda(-\Delta\mu^*) + \frac{\sigma_0^2}{\sigma_v}\left(\rho_{01}\frac{\sigma_1}{\sigma_0} - 1\right)\lambda(-\Delta\mu^*),$$

where $\lambda(-\Delta\mu^*) = \phi(-\Delta\mu^*)/[1 - \Phi(-\Delta\mu^*)] > 0$, and ϕ is the density of the standard normal distribution. As can be seen by examining equation (1.16), the conditions that determine the quality of self-selection in terms of expectations are the same as the conditions that determine the stochastic ordering of the skill distributions of migrants and non-migrants. In the normal distribution framework that underlies the canonical Roy model, stochastic dominance implies selection in expectations, and vice versa.

In empirical applications, however, the prediction of stochastic dominance is likely to be much less robust than the predictions concerning expectations and testing for stochastic dominance will require a more rigorous test than simply comparing the average incomes or skills of migrants and non-migrants. If one just compares the averages to find out how migrants are self-selected, the findings can be compatible with the predictions of the Roy-model even if a large number of individuals in the data behave against the stochastic dominance predictions of the model. As a result, establishing an empirical pattern of stochastic dominance provides very strong evidence that differences in skill prices are indeed important in migration decisions.

1.3 Data

Our analysis uses register data for the entire Danish population from 1995 to 2001. The data is maintained and provided by Statistics Denmark and it derives from the administrative registers of governmental agencies that are merged using a unique social security number.[11]

For each year between 1995 and 2004, we identified all Danish citizens aged 25-54 who lived in Denmark during the entire calendar year.[12] We restrict the analysis to persons who

[11] All residents in Denmark are legally required to have a social security number. This number is necessary to many activities in daily life, including opening a bank account, receiving wages and salaries or social assistance, obtaining health care, and enrolling in school.

[12] A person's age is measured as of January 1st the year after the reference year.

worked full time.[13] Migration decisions of part-time workers or of workers outside the labor force may be driven by different factors, and the observed income of these workers may not be indicative of their true earnings potential. The income variable for each year is constructed by adding the worker's annual gross labor income and positive values of freelance income.[14]

We merged this information with data from the migration register for the years 1995 through 2006. The migration register reports the date of emigration and the country of destination. Even though it is possible for Danish citizens to emigrate without registering, we expect that the numbers of persons who do so is small as it is mandatory for Danish citizens to report emigration decisions. Danish tax laws provide further incentives for migrants to register emigration decisions.

After identifying the population of interest, we determined for each person whether he or she emigrated from Denmark during the following calendar year. If we found that a particular person emigrated, we searched for the person in the migration register for subsequent years to determine if the migrant returned to Denmark at some point in the future, and recorded the date of possible return migration. The migration register includes near-complete information on return migration, as registration in Denmark is required for the return migrant to be eligible for income transfers and to be covered by national health insurance.

To focus on migration decisions that are permanent in nature, we restrict the analysis to migration spells that are at least five years long.[15] We define a migrant as an individual who is found in one of the 1995-2004 cross-sections, who emigrates from Denmark during the following year to destinations outside Greenland or the Faroe Islands, and who stays abroad for at least five years.[16] Individuals who emigrated for less than five years were

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[13] The administrative data allows the calculation of a variable that measures the amount of "work experienced gained" during the calendar year. The maximum possible value for this variable is 1,000. We restrict our sample to workers who have a value of 900 or above, so that our sample roughly consists of persons who worked full time at least 90 percent of the year. In order to measure the work experience gained during a given year, we subtract the value from the previous year from the current value of the variable. Persons who had a missing value for work experience in either of the two years were dropped from the sample. Missing values in this variable typically indicate that the person spent time abroad.

[14] The information on earnings is taken from the tax records for each calendar year. Also this variable is considered to be of high quality by Statistics Denmark. Some persons also report negative values for freelance income. These negative values are likely to be due to losses arising from investments and do not reflect the productive characteristics of the individual.

[15] Having stayed abroad for five years predicts longer migration spells. For example 72% of men and 71% of women who left Denmark in 1996 and were still abroad after five years were also abroad after ten years.

[16] Greenland and the Faroe Islands are autonomous regions but still part of Denmark. We have excluded these destinations as many of these migrants could have originated in Greenland or Faroe Islands, and many would actually be returning home rather than emigrating from Denmark. The exact duration requirements were 1,825 days or longer for long-term migrants.

removed from the data, and the rest of the population is then classified as non-migrants[17] The analysis of both migrants and non-migrants is further restricted to only include Danish citizens who do not have an "immigration background."[18]

Table 1.1 reports summary statistics from the Danish register data. The panel data set contains over 6.4 million male and 5.1 million female non-migrants. The construction of the data implies that non-migrants appear in the data multiple times (potentially once in each cross-section between 1995 and 2004). We were able to identify 7323 male and 3436 female migrants. By construction, these migrants are persons who we first observe residing in Denmark and who left the country at some point between 1996 and 2005. As Table 1.1 shows, the Danish emigrants are younger than the non-migrants, regardless of gender. Despite the age difference, the emigrants earned higher annual incomes in the year prior to the migration than the non-migrants.

We construct a simple measure of "standardized earnings" that adjusts for differences in age, gender, and period effects. Standardized earnings are defined by the ratio of a worker's annual gross earnings to the mean gross earnings of workers of the same age and gender during the calendar year.[19] Table 1.1 shows that emigrants earn more than non-migrants in terms of standardized earnings. In particular, male emigrants earn about 30 percent more than non-migrants, and female emigrants earn about 20 percent more.

Table 1.2 reports the number of emigrants moving to different destinations. The largest destinations for both men and women are two other Nordic countries, Sweden and Norway, as well as the United States, the United Kingdom and Germany.[20] These five countries account for 57 percent of all emigration.

Finally, it is also interesting to summarize the link between education and emigration. Table 1.3 reports the education distributions for non-migrants and migrants. It is evident that the migrants tend to be more educated than the non-migrants, among both men and women. For example, 50 percent of Danish (male) non-migrants have a vocational education, as compared to only 30 percent of emigrants to non-Nordic destinations. Similarly, the fraction of male migrants to non-Nordic destinations with a Master's degree is 24 percent, whereas only 7 percent of male non-migrants have a master's degree.

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[17] We also examined the selection of short-term migrants and the qualitative results are similar to those reported below, although the intensity of selection is weaker.

[18] Statistics Denmark defines a person to have "no immigrant background" if at least one of the parents was born in Denmark and the person is/was a Danish citizen. We searched the population registers from 1980 to 2010 for the parents of the persons in our sample, and if a parent was found he or she was required to be a Dane with no immigrant background as well.

[19] Both migrants and non-migrants, as well as shorter-term migrants, are included in these calculations.

[20] If we relax the constraints on labor market status and age to enter the sample, the United Kingdom emerges as the largest destination because of the large number of Danish students who pursue their education there.

In order to add time dimension, we compute the difference between the average of the log standardized earnings, or a degree of selection, for migrants and non-migrants for each year from 1995 to 2004 for men and women separately. The results are reported in figures 1.1a and 1.1b. There is a downward trend in the difference for both men and women. The finding makes sense: when the migrants are positively self-selected and the emigration rate gets bigger the average standardized earnings of migrants should get smaller. The variation across years is however small, so pooling the data is justified. The evolution of the emigration rate is presented in figure 1.2a for men and in figure 1.2b for women separately for the whole population and for those with higher education and those without higher education. As we are looking at long-term migration, the emigration rates are small, but there is an upward trend. The rate is higher for men and for those with higher education.

To summarize, the descriptive findings suggest a strong degree of positive selection -at least as measured by education and differences in the conditional means of earnings.

1.4 Selection in pre-migration earnings

This section presents empirical evidence on the self-selection of emigrants from Denmark in terms of standardized pre-emigration earnings. The main empirical finding is that long-term emigrants from Denmark were, in general, much more productive prior to their migration than individuals who chose to stay.

Of course, the summary statistics reported in Table 1.1 already suggest positive selection among emigrants because their standardized earnings exceeded those of non-migrants. However, differences in conditional averages could be masking substantial differences between the underlying probability distributions. Our theoretical framework predicts that the distribution of earnings for migrants should stochastically dominate that of non-migrants. As a result, our empirical analysis will mainly consist of comparing cumulative distributions of standardized earnings between migrants and non-migrants. An advantage of simply graphing and examining the cumulative distributions is that the analysis does not require any type of kernel density estimation, and that we do not need to impose any statistical assumptions or parametric structure on the data. We will also present kernel density estimates of the earnings density functions as an alternative way of presenting the key insights. Finally, we will derive and report statistical tests to determine if the data support the theoretical prediction of stochastic dominance.

Figure 1.3a illustrates the cumulative earnings distributions for male migrants to Nordic countries, male migrants to destinations outside Nordic countries, and for male non-migrants. The values of the standardized earnings are truncated at -2 and 2 to make the graphs more tractable. The figure confirms that migrants were positively selected during the study period. The cumulative distribution function of standardized earnings of migrants to destinations outside the Nordic countries is clearly located to the right of the corresponding cumulative distribution for non-migrants, as would be the case if the cumulative distribution of migrants stochastically dominates that of non-migrants. The

figure also shows that the distribution function for migrants to other Nordic countries is located to the right of that for non-migrants. However the selection of the migrants to Nordic countries seems weaker. This weaker selection may arise because the rate of return to skills in Nordic countries is relatively low when compared to that in other potential destinations.[21] Figure 1.3b presents corresponding evidence for women. The main findings are qualitatively similar, but the positive selection seems weaker.

Figure 1.4a presents the corresponding kernel estimates of the density functions of the logarithm of standardized earnings for men, while Figure 1.4b presents the respective graphs for women.[22] The density functions again reveal the positive selection of migrants moving outside the Nordic countries, both for men and women.

As is evident from the figures, Kolmogorov-Smirnov tests comparing the earnings distributions for different groups rejected the hypothesis that the underlying earnings distributions are the same at a highly significant level. In addition to showing that the cumulative distributions are different, it is also important to determine if the evidence statistically supports the theoretical prediction that the cumulative distribution function of migrants stochastically dominates that of non-migrants. Statistical tests for first-order stochastic dominance are highly sensitive to small changes in the underlying distributions, making it difficult to rank distributions in many empirical applications.[23] As noted by Davidson and Duclos (2013), it may be impossible to infer stochastic dominance over the full support of empirical distributions if the distributions are continuous in the tails, simply because there is not enough information in the tails for meaningful testing of any statistical hypothesis. It would then make sense to focus on testing stochastic dominance over a restricted range of the distribution. We apply an approach that characterizes the range over which the value of cumulative distribution function for non-migrants is statistically significantly bigger than that of non-migrants.

In particular, we calculate the difference between the cumulative distribution functions with confidence intervals. To calculate the confidence intervals we use tools that were introduced in Araar (2006) and Araar et al. (2009).[24] More formally, we test the following null hypothesis for each $w \in U$, where U is the joint support of the two distributions:

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[21] Moreover, some Danes may live in southern Sweden but work in Denmark. As this type of migration is not related to returns to skills in the destination country this should decrease the estimated selection to Nordic countries.

[22] Following Leibbrandt et al. (2005) and Fernandes-Huertas Moraga (2011), we use Silverman's reference bandwidth multiplied by 0.75 to prevent over-smoothing. The same bandwidth is used also in all the kernel density estimates reported in subsequent calculations.

[23] This can lead to difficulties in empirical work, and less restrictive concepts such as *restricted first order stochastic dominance* (Atkinson, 1987) and *almost stochastic dominance* (Leshno and Levy, 2002) have been proposed.

[24] The calculations are implemented using the DASP Stata module presented in Araar and Duclos (2013).

(1.17) $\quad H_0: \Delta(w) = \mathbf{F_N}(w) - \mathbf{F_M}(w) < 0,$

against the alternative hypothesis

(1.17′) $\quad H_1: \Delta(w) = \mathbf{F_N}(w) - \mathbf{F_M}(w) \geq 0$

and characterize any relevant range of w where we are able to reject the null.

Let $\hat{\sigma}(w)$ be the standard deviation of the estimator $\hat{\Delta}(w)$, and let $z(\theta)$ be the $(1 - \theta)^{th}$ quantile of the standard normal distribution.[25] Davidson and Duclos (2000) show that the estimator $\hat{\Delta}(w)$ is consistent and asymptotically normally distributed. We can then define the lower bound for a one-sided confidence interval for $\Delta(w)$ as:[26]

(1.18) $$\widehat{LB}_{\Delta(\mathbf{F}(w))} = \hat{\Delta}(\mathbf{F}(w)) - \hat{\sigma}(w)z(\theta).$$

We estimate the standard errors using a Taylor linearization and allow for clustering at the individual level. We then implement the procedure by calculating the lower bounds of the confidence intervals for the estimate $\hat{\Delta}(\mathbf{F}(w))$ defined in equation (1.18).

Table 1.4 reports the relevant ranges where the $\widehat{LB}_{\Delta(\mathbf{F}(w))}$ is positive, as well as the shares of migrants and non-migrants whose earnings are outside the range. Consider first the distributions of non-migrant men and men migrating to destinations outside the Nordic countries. Although it is not clearly visible from figure 1.3a, table 1.4 shows that the cumulative distribution functions cross near the lower tails of the distributions. Figure 1.5a depicts $\hat{\Delta}(\mathbf{F}(w))$ and lower and upper bounds for a 95% confidence interval. The lower bound of the confidence interval is positive on most of the range covering the supports of the distributions. Only 1.3 percent of the migrants and 1.6 percent of the non-migrants lie below the lower bound of the range where the lower bound of the confidence interval is positive. Put differently, earnings of over 98 percent of male migrants to destinations outside Nordic countries are on the range where the cumulative distribution function for non-migrants is statistically significantly above the function for migrants.

Figure 1.5b depicts $\hat{\Delta}(\mathbf{F}(w))$ and the bounds for a 95% confidence interval for non-migrant women and women migrating to destinations outside Nordic countries. Only 2.0 percent of the migrants and 2.5 percent of the non-migrants have earnings below the range where the lower bound of the confidence interval is positive, and an even smaller 0.2 percent of the migrants and 0.01 percent of the non-migrants have earnings above this range. We interpret these findings as support for the stochastic dominance prediction for both men and women migrating outside Nordic countries.

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[25] The asymptotic variance of $\hat{\Delta}(w)$ is derived in Araar et al. (2009).

[26] Chow (1989) proved the theorem for the case of independent samples. Davidson and Duclos (2000) show that the results also extend to the case of paired incomes from the same population.

Figures 1.6a and 1.6b and the bottom panel of table 1.4 present a corresponding analysis by comparing the cumulative distributions of persons who migrate to other Nordic countries with that of non-migrants. Almost 10 percent of male migrants and 12 percent of male non-migrants have earnings that lie below the range where $\widehat{LB}_{\Delta(w)}$ is positive, and another 0.9 percent of the migrants and 0.5 percent of the non-migrants have earnings above the range. Put differently, about 90 percent of the male migrants to Nordic countries have incomes on the range where $\widehat{LB}_{\Delta(\mathbf{F}(w))}$ is positive. For women, it can be seen in Table 1.4 that almost 97 percent of the migrants going to Nordic countries have earnings on the range where $\widehat{LB}_{\Delta(\mathbf{F}(w))}$ is positive. To sum up, the findings offer support to the stochastic dominance prediction for male and female migrants regardless of their destination, although the evidence is weaker for men who migrated to Nordic countries.

Additional support for our theory comes from Mexico. Our theory predicts that earnings distribution of migrants from Mexico to the United States should be stochastically dominated by the earnings distribution of non-migrants. Fernández-Huertas Moraga (2011) presents these distributions for men. Although he does not present confidence intervals as we do, the figures suggest a pattern that mirrors what we find for Denmark, reversing the curves for migrants and non-migrants. In Mexico, the wage distribution of non-migrants stochastically dominates that of migrants, apart from an overlap for a few percent at the bottom and converging at the top.

1.5 Selection in unobservable characteristics

In the previous section, we documented the selection that characterizes the migrants using the total pre-migration earnings (after adjusting for age and year). We now examine a specific component of earnings, namely the component due to unobserved characteristics. In particular, we now adjust for differences in educational attainment between migrants and non-migrants (as well as other observable variables) by running earnings regressions, and determine whether the distribution of the residuals differs between the two groups.[27]

By construction, the residuals from a Mincerian wage regression reflect the part of earnings that is uncorrelated with the observed measures of skill. Obviously, the decomposition is somewhat arbitrary because it depends on the characteristics that are observed and can be included as regressors in the wage equation. Nevertheless, the study of emigrant selection in terms of wage residuals is important for a number of reasons.

First, selection in terms of unobservable characteristics sheds light on the importance of the quality of job matches relative to the skill component that is internationally transferable. The theory predicts that the nature of the selection in unobservable characteristics depends on the magnitude of the correlation coefficient measuring how the source and destination countries value these types of skills. As long as this correlation is

[27] In the earnings regressions we use non-standardized annual earnings as the dependent variable. We include age and year fixed effects and run the regressions separately for men and women.

strongly positive (so that unobserved characteristics are easily transferable across countries), Danish emigrants would be positively selected in unobservables. After all, the payoff to these types of skills is likely to be greater in the destination countries. However, it could be argued that the correlation between the wage residuals in Denmark and abroad may be "small". For example, the residuals from the wage regression may be largely reflecting the quality of the existing job match in the Danish labor market, rather than measuring the worker's innate productivity. To the extent that the quality of the job match plays an important role in generating the residual, the correlation in this residual across countries would be expected to be weak (in fact, a pure random matching model would suggest that it would be zero). As a result, there would be negative selection in unobserved characteristics simply because Danish workers with good job matches (and hence high values of the residual) would not move.

Second, the theory also suggests that the nature of the selection in pre-migration earnings depends on a weighted average of the selection that occurs in observable and unobservable characteristics, with the weights being the fraction of earnings variance attributable to each type of skill. Because observable characteristics play only a limited role in explaining the variance of earnings in the population, it is crucial to precisely delineate the nature of selection in unobservable characteristics.

Table 1.5 reports the Mincerian wage regressions that we use to calculate the residuals. The sample includes the whole population of prime aged full time workers pooled over the entire 1995-2004 period. In addition to vectors of fixed effects giving the worker's age and educational attainment, we also include the worker's marital status and number of children. The regressions are estimated separately for men and women.

Figure 1.7a presents the cumulative distributions of wage residuals for male migrants to Nordic countries, male migrants to destinations outside Nordic countries, and male non-migrants. The values of the residuals are truncated at -2 and 2, a range that covers practically all of the population. The cumulative distribution function of residuals for emigrants who moved outside the Nordic countries is located to the right of the cumulative distribution for migrants to Nordic countries, which in turn is located to the right of the cumulative distribution of the non-migrants. The visual evidence, therefore, provides a strong indication that migrants are positively selected in terms of unobserved characteristics. Figure 1.7b presents the analogous evidence for women. The figure shows that female migrants are also positively selected in terms of wage residuals. As was the case when comparing the measure of pre-migration earnings in the previous section, the selection in unobserved characteristics is less pronounced for women than for men. One explanation for this could be that men are typically primary earners in couples.

We also performed Kolmogorov-Smirnov tests on the distributions of residuals for non-migrants and migrants to other Nordic countries and for migrants to other destinations

(separately for men and women). All the tests clearly rejected the null hypothesis, confirming that the distributions of residuals indeed differ among the groups.[28]

The evidence on the positive selection of migrants in unobserved characteristics obviously implies that the selection in pre-migration earnings documented in the previous section cannot be attributed solely to the fact that migrants are more educated. Instead, we find that there is positive selection *within* education groups. This result also has implications on interpretation of earnings regression residuals in general. The residuals from wage regressions are sometimes interpreted as reflecting the value of the job match between the worker and the employer. If a high value for the residual only reflects a good match, we would then expect to find that workers with large residuals would be less likely to change jobs and less prone to migrate. Our findings clearly reject this interpretation. Comparing results on the self-selection to other Nordic countries and the rest of the world suggests that search for a better job match to those who have a bad job match in Denmark is more pronounced among migrants to other Nordic countries.[29]

As in the previous section, we also calculated the difference between the cumulative distribution functions with confidence intervals to determine whether empirical evidence supports the stochastic dominance prediction. The test results are summarized in Table 1.6 Figure 1.8a depicts $\hat{\Delta}(\mathbf{F}(w))$ and the lower and upper bounds for a 95% confidence interval for the comparison between non-migrant men and men migrating to destinations outside Nordic countries. The lower bound of the 95% confidence interval is positive on the range of residuals covering most of the support of the two distributions. And the cumulative distribution function cross only ion the lower tails of the distributions. Although we cannot conclusively reject the null hypothesis of no stochastic dominance (because the distribution functions cross in the tails), only 5.6 percent of the migrants and 6.2 percent of the non-migrants have wage residuals below the lower bound of this range. In short, there is strong evidence of stochastic dominance for the vast majority of male migrants.[30]

Figure 1. 9a depicts $\hat{\Delta}(\mathbf{F}(w))$ and the bounds for a 95% confidence interval for non-migrant men and men migrating to other Nordic countries. A 12 percent share of migrants and 14 percent of non-migrants have values of the wage residual that are below the lower bound of the range where the lower bound of the 95% confidence interval is positive, and an additional 1 percent or so of both groups have values of the residual that would place them

[28] The *p*-value for the test between women migrating to other Nordic countries and to other destinations was 0.015 and all the other *p*-values were 0.000, so that all tests clearly reject the hypothesis that the observations are drawn from the same distribution.

[29] For this group, returns to unobserved productivity is not as important criterion for self-selection as among migrants to the rest of the world, as differences in returns to skills between Denmark and other Nordic countries are minor. As a result, the mechanism of searching for a better match quality is more pronounced.

[30] For women, 12 percent of migrants and 14 percent of non-migrants have earnings residuals below the lower bound of the range where the lower bound of the confidence interval is positive, and shares of migrants and non-migrants above the range are less than less than one percent.

above this range. Put differently, we find statistically significant evidence of stochastic dominance in unobserved characteristics in the range of the distribution that includes around 86 percent of all observations.[31] Interestingly, there is an area in the left tail of the distribution of residuals where the upper bound of the confidence interval is negative. An 8 % share of migrants and 6 % share of non-migrants have residuals in this area, and the interpretation would be that male migrants to other Nordic countries are negatively selected in terms of residuals in the left tail of the distribution.

We conclude by summarizing the evidence as follows: there is strong positive selection in unobservable characteristics in the sample of migrants that moved outside the Nordic countries and weaker evidence of positive selection in the sample of migrants who moved to other Nordic countries.

1.6 Bias in counterfactual predictions

The fact that emigrants are self-selected in their unobserved characteristics implies that using the observable characteristics of migrants to predict their counterfactual earnings had they chosen not to migrate will lead to biased results. Due to data constraints, this is precisely the empirical exercise conducted by Chiquiar and Hanson (2005),who adopt the methodology introduced by DiNardo, Fortin, and Lemieux (1996) and build a counterfactual wage density of what the Mexican immigrants would have earned in Mexico had they stayed. The actual wage density of Mexican "stayers" is then compared to the counterfactual density for migrants. By construction, this approach ignores the role of unobservable characteristics in the estimation of the counterfactual wage distribution.

A clear advantage of the Danish register data is that the earnings of emigrants can be observed before they emigrate, so there is no need to build a counterfactual density. One just needs to compare the earnings distribution of non-migrants to the actual distribution of future migrants, as we have done in the preceding analysis. The register data allows us to precisely measure the extent of the bias resulting from carrying out a counterfactual exercise as in Chiquiar and Hanson (2005). In particular, we can contrast the predicted counterfactual wage distribution of migrants had they not moved to the actual wage distribution of migrants prior to their move. We carry out this exercise by precisely replicating the various steps in the Chiquiar-Hanson calculations. It is worth emphasizing that this type of bias will arise not only in studies that examine the selection of migrants, but in any study that relies on observables to predict a counterfactual wage distribution.

Let w represent the logarithm of standardized annual earnings as defined earlier (i.e. earnings adjusted for age, gender, and year effects). Let $f(w|x)$ be the density function of wages in Denmark, conditional on a set of observable characteristics x. Also, let I be an

[31] For women, 14 percent of migrants and 17 percent of non-migrants have earnings residuals below the lower bound of the range where the lower bound of the confidence interval is positive, and shares of migrants and non-migrants above the range are less than less than four percent and two percent.

indicator variable equal to one if the individual migrates the following year and equal to zero otherwise. Define further $h(x|I=0)$ as the conditional density of observed characteristics among workers in Denmark who choose not to migrate, and $h(x|I=1)$ be the corresponding conditional density among migrants. The observed wage density for the non-migrants is

(1.19) $$g(w|I=0) = \int f(w|x, I=0)h(x|I=0)\,dx.$$

Similarly, the observed density for the migrants is

(1.20) $$g(w|I=1) = \int f(w|x, I=1)h(x|I=1)\,dx.$$

Up to this point, the analysis reported in this paper consists of directly estimating and comparing the distribution functions associated with the densities in (1.19) and (1.20). Suppose that the pre-migration earnings density for non-migrants were not available. We would instead attempt to estimate it from the observable characteristics of the migrants. The implied counterfactual distribution is:

(1.21) $$\hat{g}(w|I=1) = \int f(w|x, I=0)h(x|I=1)\,dx.$$

Equation (1.21) corresponds to the density of income for non-migrants, but it is instead integrated over the density of observable characteristics for migrants. Note that the counterfactual density in (21) can be rewritten as:

(1.22)
$$\hat{g}(w|I=1) = \int f(w|x, I=0)h(x|I=0)\frac{h(x|I=1)}{h(x|I=0)}dx$$
$$= \int \theta f(w|x, I=0)h(x|I=0)\,dx,$$

where $\theta = \frac{h(x|I=1)}{h(x|I=0)}$. To compute θ, we use Bayes' law to write:

(1.23) $$h(x) = \frac{h(x|I=0)Pr(I=0)}{\Pr(I=0|x)} \text{ and } h(x) = \frac{h(x|I=1)Pr(I=1)}{\Pr(I=1|x)},$$

where $h(x)$ is the unconditional density of observed characteristics.

We can then combine these two equations to solve for θ:

(1.24)
$$\theta = \frac{Pr(I=1|x)}{1-Pr(I=1|x)}\,\frac{Pr(I=0)}{Pr(I=1)}.$$

The proportion $Pr(I = 0)/Pr(I = 1)$ is a constant related to the proportion of migrants in the data. It can be set to one in Kernel density estimation without loss of generality. The weight we use in the estimation is then given by:

(1.25)

$$\theta^e = \frac{Pr(I = 1|x)}{1 - Pr(I = 1|x)}.$$

As in Chiquiar and Hanson (2005), the individual weights θ^e are calculated by estimating a logit model where the dependent variable indicates if a person emigrated. The regressors include a vector of age fixed effects, a vector of schooling fixed effects, variables indicating whether the worker is married and the number of children (and an interaction between these two variables), and a vector of year fixed effects.[32] Table 1.7 reports the logit regressions estimated separately by gender. The coefficients are then used to compute the weights for each non-migrant person in the sample.[33] Figures 1.10a and 1.10b present the resulting counterfactual density functions of the logarithm of standardized earnings as well as the actual distributions for migrants and non-migrants.[34]

The difference between the actual density for non-migrants and the counterfactual density for migrants reflects the part of self-selection that is due to observable characteristics. Similarly, the difference between the counterfactual and actual densities for migrants reflects the part of selection that is due to unobserved characteristics (i.e., all those variables that could not be included in the logit model).

A simple way of quantifying these distributional differences is to compute the averages of the various distributions. These calculations are reported in Table 1.8. Consider initially the results in the male sample. The difference between the mean of the actual distributions for migrants and non-migrants is 0.245 log points, but the difference between the counterfactual distribution and the distribution for non-migrants is 0.073. This implies that only about 30 percent of the positive selection in pre-migration earnings can be attributed to the observable characteristics included in the logit model, while about 70 percent is attributable to unobservable determinants of productivity.

The calculations in the female sample yield a difference of 0.157 log points between the means of the actual distributions for migrants and non-migrants and a difference of 0.074 points between the counterfactual distribution and the distribution for non-migrants. As a result, observable and unobservable characteristics each account for about half of the

[32] We also tried specifications with age, age squared and interactions of explanatory variables, but we do not report these analyses as the resulting counterfactual distributions did not practically differ from the distributions resulting from this simpler specification.

[33] As earlier, we use Silverman's reference bandwidth multiplied by 0.75.

[34] To conduct the counterfactual analysis we pool the sample of all migrants (regardless of whether they moved to Nordic countries or not).

positive self-selection in the pre-migration earnings of women.[35] The key lesson is clear: Selection in unobservable characteristics plays a crucial role in determining the skill composition of emigrants.

The distinct role of observables and unobservables in determining the selection in the pre-migration earnings of migrants is evident if we return to the Roy model and the equation (1.16) presenting the conditional expectation $E(\log w_0 \mid v^* > -\Delta\mu^*)$.

Equation (1.16) yields an interesting and potentially important insight. The nature of the selection in pre-migration earnings, of course, is given by the sum of the selection in observables and the selection in unobservables. Note, however, that each of these selection terms has a weighting coefficient that represents the variance in earnings attributable to observable characteristics ($r_0^2\sigma_0^2$) or to unobservable characteristics (σ_0^2). As noted earlier, observable characteristics explain a relatively small fraction of the variance in earnings. Put differently, equation (1.7) implies that it is the selection in *unobservables* that is most likely to determine the nature of the selection that characterizes the emigrant sample.

To the extent that both types of selections (i.e., in observables and unobservables) work in the same direction, the counterfactual exercise described in this section will inevitably underestimate the true extent of positive selection in pre-migration earnings. Conversely, the counterfactual exercise will also attenuate the extent of "true" negative selection if there is negative selection in both components of skills. In fact, Fernández-Huertas Moraga (2011) presents a corresponding analysis using survey data from Mexico and finds that counterfactual estimates greatly underestimate the extent of negative selection in the pre-migration earnings of Mexicans who move to the United States. Put differently, the counterfactual exercise may lead to qualitatively right conclusions about the nature of the selection, but it may also generate a sizable bias, greatly underestimating the true extent of selection.

1.7 Selection and immigration restrictions

As applied in the immigration literature, the Roy model focuses solely on the economic factors that motivate labor flows across international borders. The modeling typically ignores the fact that these flows occur within a policy framework where some receiving countries enact detailed restrictions specifying which potential migrants are admissible and which are not.

We can use the register data from Denmark, combined with the unique political circumstances that guarantee free migration within Europe, to partially address the

[35] The component of self-selection that is due to unobservable characteristics plays a somewhat smaller role for women. One reason could be that women are more often tied migrants, and the migration decision may be mainly based on the skills of the spouse. The variance in income is also smaller for women, which also makes the selection both in terms of observable and unobservable characteristics weaker.

question of whether immigration policy affects selection all that much. Specifically, we can subdivide the group of migrants who moved outside Nordic countries into two groups: those who moved to a country in the EU15 or to Switzerland, and those who moved to a country outside the EU15 and Switzerland. Movement of labor was unrestricted within Denmark and EU15 countries and Switzerland in the period under study, but was obviously restricted by immigration regulations to destinations outside the EU15, such as the United States.

It turns out that these different immigration policies pursued by the EU15 and Switzerland and the rest of the world barely matter in determining the selection of Danish emigrants. Figure 11.1a depicts the cumulative distribution functions of the logarithm of standardized annual income for men and figure 1.11b for women. It is evident that the distribution functions of standardized earnings are very similar for the two groups of migrants. We also conducted the analysis using the wage residuals (not shown), and the distributions of residuals are also similar between the two groups.

There is an important sense in which these policy restrictions cannot matter much. Suppose, for example, that a receiving country enacts a policy that limits entry only to high-skill immigrants. If the high-skill immigrants from a sending country do not find it optimal to move, the policy cannot force those high-skill workers to migrate. All the policy can do is essentially cut the migration flow from that particular sending country down to zero. The low-skill workers would like to move but are not admitted, and the high skill workers are admissible but they do not want to move.

In sum, the positive self-selection that is so evident in the Danish emigrant data cannot be explained by the possibility that migration costs or immigration restrictions differ by destination. Even though labor flows to the EU15 were unrestricted and were probably relatively cheap for Danish emigrants, there is no evidence of weaker positive selection to the European Union sphere during the period under study.

1.8 Conclusion

This article shows that the Roy model has more dramatic predictions on the self-selection of emigrants than previously realized. The same conditions that have been shown to result in emigrants being positively (negatively) self-selected in terms of their average earnings actually imply that the earnings distribution of emigrants first-order stochastically dominates (or is first-order stochastically dominated by) the earnings distribution of non-migrants. Our theoretical analysis also distinguishes between selection in observable and selection in unobservable characteristics.

Our empirical analysis uses the Danish full population register data to analyze the self-selection of emigrants, in terms of education, earnings and unobservable ability, measured by residuals from Mincerian earnings regressions. The results are in line with the theory; the migrants are better educated and both pre-emigration earnings and wage regression residuals of migrants stochastically dominate those of non-migrants over most of the

support of the distributions. Consider, for example, the case of full-time workers aged 25-54. For 98 percent of both men and women who migrate outside other Nordic countries the cumulative earnings distribution in the year before emigration stochastically dominates that of non-migrants with a 95% confidence interval. The difference between the cumulative distributions is not statistically significantly different in either direction for the remaining 2 percent.

Decomposing the self-selection in total earnings into self-selection in observable characteristics and self-selection in unobservable characteristics (as measured by residuals from Mincerian wage regressions), reveals that unobserved abilities play a dominant role. For men, about 70 percent of the positive self-selection in pre-migration earnings is attributable to unobservable determinants of productivity. For women, the fraction is about 50 percent. This suggests that relying on counterfactual distributions, based on observed characteristics, would strongly underestimate positive self-selection. This result complements the Fernández-Huertas Moraga (2011) finding that counterfactual estimates also greatly underestimate the extent of negative selection in the pre-migration earnings of Mexicans who move to the United States. In short, the use of counterfactual earnings distributions based on observable characteristics greatly understate the true extent of selection in total earnings. Strong positive self-selection in residuals also suggests that unobserved abilities play a much bigger role in migration decisions than match quality.

Our findings also have implications for immigration policies. Receiving countries can only base their admission policies on skill variables that are observed, whereas much of the selection of immigrants is "hidden" in their unobserved characteristics. It can be expected that migrants will be self-selected in terms of unobserved characteristics even when admission restrictions are applied, and the self-selection among those fulfilling admission criteria can be expected to reflect relative skill prices. This raises a question about the effectiveness of point systems that are necessarily based on observable characteristics. The importance of relative skill prices is also supported by our separate analyses of self-selection of Danes migrating to the countries belonging to common European labor market (excluding other Nordic countries that have skill prices similar to Denmark) and not having any immigration restrictions, and the self-selection to the rest of the world. There is virtually no difference in the self-selection to these destination areas, the main difference being that men to other European countries are slightly more strongly self-selected at the upper parts of the skill distribution. If immigration restrictions were to have played an important role in determining the skill composition of the immigrant flow, the opposite should have been the case.

Chapter 2.

Preferences for Redistribution among Emigrants from a Welfare State

This chapter is based on joint work with Panu Poutvaara

2.1 Introduction

Economists usually assume that international migration is motivated by earnings differentials across countries. Economic analysis of internal migration dates back at least to 1776. In *An Inquiry into the Nature and Causes of the Wealth of Nations*, Adam Smith notes that the wage differences in the United Kingdom were much larger than price differences, concluding that "it appears evidently from experience that a man is of all sorts of luggage the most difficult to be transported." Subsequently, Hicks (1932) concluded that the differences in economic advantages are the main causes for migration. Sjaastad (1962) made a connection between migration and investment in human capital, arguing that the prospective migrant should choose the destination that maximizes the net present value of lifetime earnings, net of the migration costs. Tiebout (1956) argued that if there are many jurisdictions and migration is costless, migrants tend to sort into jurisdictions that provide their preferred mix of public goods. This Tiebout equilibrium is derived under a number of restrictive assumptions, including that the governments can levy lump-sum taxes to finance public goods and that there are no economies of scale or mobility costs. In a Tiebout framework, net contributors to redistribution could always emigrate to jurisdictions that do not redistribute income.

In a seminal contribution, Borjas' (1987) analyzed the effect of cross-country differences in income distribution on the self-selection and earnings of immigrants. His main thesis was that immigrants to the United States tend to come from the upper end of the income distribution if there is sufficiently high correlation between individual earnings in the country of origin and expected earnings in the United States, in case of migrating there, and if the country of origin has more equal income distribution than the United States. Subsequently, Dahl (2002) has analyzed self-selected migration inside the United States and Chiquiar and Hanson (2005) migration from Mexico to the United States.

Denmark and other Scandinavian welfare states have relatively high taxes, generous welfare services and small income differences. Borjas (1987) hypothesis predicts that Danes with high earnings capability should be more likely to migrate to rich countries with lower taxes and wider income distribution, like the United States and the United Kingdom. This suggests that emigration decisions and preferences for redistribution might also be related. High-earners have self-interest to oppose redistribution, and to choose less redistributive countries.

The causality could also go the other way. Besides wider income differences than in European welfare states, the United States also has a culture that is more oriented towards risk-taking and personal responsibility (Alesina and Angeletos 2005; Piketty 1995). This

may attract high-achievers, independently of their attitude towards redistribution. It could be that having lived in the United States results, on average, in more American attitudes towards redistribution. Or the other way round: Danes living in the United States might become more leftist if they find the income differences unfair.

In this paper, we analyze the attitudes of Danish emigrants towards income redistribution and the determinants of individual success, and compare this to the attitudes of Danes living in Denmark, measured in the European Social Survey (ESS). We use unique survey data on Danes who had emigrated in selected years between 1987 and 2002 and had not returned to Denmark by 2007. The surveys were planned by Martin D. Munk (Aalborg University's Copenhagen campus) and Poutvaara within the project "Danes Abroad: Economic and Social Motivations for Emigration and Return Migration", financed by the Danish Social Science Research Council. The survey was implemented by Statistics Denmark, with the help of register data. It asked respondents to state their attitudes towards income redistribution and the determinants of individual success. We study to what extent gender, age, education, and family situation explain attitudes towards redistribution in Denmark and among Danes abroad. We also study how attitudes towards redistribution differ among Danes who migrated to other Nordic countries, the United States, other English-speaking countries, the rest of Western Europe and the rest of the world, and whether such differences are robust to adding socioeconomic and demographic controls, opinions about the determinants of individual success, and generalized trust.

There is a body of both theoretical and empirical economic literature on how preferences for redistribution are formed. The standard theoretical approach is to assume that individual preferences for redistribution are determined by whether the individual would gain or lose from it, following the seminal contribution by Meltzer and Richards (1981). The static model was extended by Benabou and Ok (2001), whose dynamic model allows for social mobility. Whereas in the former model individuals only care about their current income, they also take their future income into account in the latter.

A further extension is to assume that individuals do not only care about their own consumption, but that there is some measure of income distribution as an argument in the utility function. Alesina and Giuliano (2011) distinguish between two cases. First, some measure of income distribution can be in the utility function indirectly. In this case individuals do not care about inequality per se but only about its effect on one's own consumption. Externalities in education and crime have been proposed as channels through which people in the upper end of the income distribution could be negatively affected by inequality. Additionally, it can be argued that more inequality creates incentives to exercise more effort, and this can work in favour of society as a whole. Second, a measure of income distribution can be in the utility function directly. In this case, individuals have preferences on distribution of income per se instead of caring only about how it affects their own consumption.

People can make a distinction between income that is acquired by luck and income acquired by own work and effort, and this distinction can be related to preferences of redistribution of income (Alesina and Angeletos 2005). Using survey data, Fong (2001)

finds that preferences for redistribution are indeed strongly correlated with individual beliefs about the extent to which individuals have control over their material well-being. It has also been found that preferences for redistribution vary across countries in a systematic way. People in European countries tend to prefer more redistribution than those in the United States (Alesina et. al. 2001, Alesina and Glaeser 2004), and people in former socialist countries prefer more redistribution than those in Western countries (Corneo and Grüner 2002). This finding suggests that there might be an important cultural component in preferences for redistribution (Corneo 2001, Alesina and Glaeser 2004).

Studying the determinants of preferences for redistribution among immigrants has been a way to separate the effect of culture from the economic and institutional context (Alesina and Giuliano 2011, Luttmer and Singhal 2011). Using survey evidence Luttmer and Singhal (2011) found a strong and positive relationship between immigrants' redistributive preferences and the preference in the country of origin. The effect is robust to a set of controls and persists into the second generation. Unlike these previous papers, we study migrants living in several destination countries but who all come from the same country of origin. Although we are not able to draw causal conclusions, our findings shed light on whether it is reasonable to assume that migrants with different attitudes are self-selected to different destinations.

The paper is organized as follows. Section 2 sketches the economic theory underlying the analysis and derives some theoretical predictions. Section 3 introduces the data sets that will be used in the empirical analysis. Section 4 introduces the variable used to measure preferences for redistribution of income and presents the distributions of the variable for different groups of migrants, and section 5 does the same for the measures of beliefs about what determines individual success and generalized trust. The econometric analysis is reported in section 6, and section 7 concludes.

2.2 Theoretical Framework

As was discussed in the introduction, individual preferences towards income redistribution are likely to reflect a variety of factors, ranging from self-interest and altruistic considerations towards one's family to social preferences on what constitutes a just society. We take the type of income transfers in each country as given, and focus on the preferences concerning the extent of income redistribution, captured by the wage tax rate τ_n, $\tau_n \in [0,1]$ in country n. There are N, $N \in \{2,3,4 \dots\}$ countries. Tax revenue is used to finance income redistribution towards low-income people in the country where the tax is collected.

We denote individual i's wage rate in period t by w_{it}. Note that the individual's wage rate does not have a country index; instead, country of residence is a characteristic of individual *i*. This allows us to present the model so that it covers both the case in which individual *i* lives in his or her country of origin (n=H for home), as well as a case in which individual has migrated and has preferences towards taxation both in the country of origin (n=O) and in the country of residence (n=R). We use separate indices H and O to capture different incentives facing those who stay in their country of origin and those who have emigrated.

Vector $\boldsymbol{\tau}$ denotes the tax rates in different countries, including H for those who have not migrated and R and O for those who have migrated.

Taking into account government's budget constraint and the fact that taxes may distort labor supply, we can write individual's expected lifetime utility as

$$(2.1) \quad EU_i = \sum_{t=0}^{T_i} \beta^t Eu(w_{it}, \boldsymbol{\tau}) + \sum_{t=0}^{T_i^F} \sum_{k=1}^{K} \beta^t \alpha_k Eu(w_{kt}, \boldsymbol{\tau}) + SWF_i(\boldsymbol{\tau}) .$$

Here, β denotes the individual discount factor, T_i denotes the number of periods of remaining lifetime for individual i after the current period 0, and $u(w_{it}, \boldsymbol{\tau})$ is the periodic utility from own consumption and leisure that depends on the current wage rate and the wage tax rate in the country of residence. Therefore, the first term reflects the net present value of individual's utility from own consumption and leisure. The effects of increasing the wage tax rate are positive to those whose net gains from additional income redistribution exceed distortions associated with higher wage taxation. The welfare effect of higher taxes through own consumption is always negative to net payers to the redistribution. However, net recipients from income redistribution also have to balance gains from additional redistribution against additional distortions from ever higher tax rates. This means that the preferred tax rate is limited for everyone.

The second term is related to altruistic considerations towards one's family and close friends, with T_i^F denoting how many periods into the future individual's altruistic considerations towards one's family and friends extend. In case of no migration, family and friends live in one's home country. In case of migration, an individual may have family and friends both in the country of origin and the country of residence. Individual *i* cares about expected private utility of K, $K \in \{0,1,2, \dots\}$ other persons, attaching utility weight $\alpha_k, \alpha_k \geq 0$ to their utility from private consumption and leisure. K=0 would refer to an individual who does not attach a positive weight to any other individual person.

Finally, the last term refers to social preferences, related to one's views about what constitutes a just society. Social welfare function discounts the future that the individual cares about with respect to each country; this allows individuals to care also about future beyond their lifetime, as well as to have a different discount rate with respect to social welfare than with respect to their own utility.

We denote the expected net present value of taxation and redistribution to individual *i* in terms of private consumption by $B_i(\boldsymbol{\tau})$. Note that only the tax rate of the country of residence counts; tax rates in other countries have no effect on *i*'s income. A positive value implies that the individual is net beneficiary from redistribution, a negative value that the sum of tax payments and distortions exceeds the value of benefits. The private valuation of the effects of redistribution on family and close friends is denoted by $F_i(\boldsymbol{\tau})$. We assume that B, F and SWF are concave and single-peaked with respect to each tax rate the individual cares about, and flat with respect to tax rates the individual does not care about. The expected total utility from redistribution is given by $EU_i = B_i(\boldsymbol{\tau}) + F_i(\boldsymbol{\tau}) + SWF_i(\boldsymbol{\tau})$. The welfare effect of an increase in taxation in country n is given by

(2.2) $\frac{\partial U_i}{\partial \tau_n} = \frac{\partial B_i(\boldsymbol{\tau})}{\partial \tau_n} + \frac{\partial F_i(\boldsymbol{\tau})}{\partial \tau_n} + \frac{\partial SWF_i(\boldsymbol{\tau})}{\partial \tau_n}$.

Our model allows preferences towards redistribution to enter the individual utility function both through pecuniary concerns and directly, along the lines discussed in the introduction. However, we also extend the model in Alesina and Giuliano (2011) by allowing individuals to care directly about the welfare of a subgroup of other individuals close to them (term F), instead of caring just about their own utility (term B), and that of the society as a whole (term SWF).

Individual's preferred level of taxation in country n is found by setting the right-hand side of (2.2) equal to zero and solving for τ_n; the second-order condition is satisfied by the concavity of B, F and SWF. In case of no migration, individual's preferred tax rate is found by setting n=H in equation (2.2) and setting the right-hand side equal to zero. As taxes are paid and transfers received only in the country of residence, for migrants $B_i^O(\tau_O) = 0$ and

(2.3) $\frac{\partial U_i}{\partial \tau_O} = \frac{\partial F_i(\boldsymbol{\tau})}{\partial \tau_O} + \frac{\partial SWF_i(\boldsymbol{\tau})}{\partial \tau_n}$;

(2.4) $\frac{\partial U_i}{\partial \tau_R} = \frac{\partial B_i(\boldsymbol{\tau})}{\partial \tau_R} + \frac{\partial F_i(\boldsymbol{\tau})}{\partial \tau_R} + \frac{\partial SWF_i(\boldsymbol{\tau})}{\partial \tau_R}$.

Equations (2.3) and (2.4) generate a number of testable predictions.

First, the preferred tax rate in one's country of residence, whether it be the home country in case of no migration or the destination country in case of migration, should be decreasing in one's income and increasing in one's age. The positive effect of age on support for redistribution arises as many of the benefits that the welfare state provides are received after retirement, while remaining working life during which costs are paid is shorter for older individuals. Furthermore, net payers to the redistribution who think that a more redistributive society would be more just attach a lower weight on B_i relative to SWF_i as they become older, pushing towards higher preferred tax rate. We also expect women to support higher taxes in their country of residence, given that women earn typically less than men. If not controlling for income, we expect the support for redistribution to be lower among the high-skilled, who are typically those with higher education.[36] Relatedly, it can be expected that one's support for redistribution in one's country of residence is lower in case one's partner's income is higher. Such an effect can be expected to be especially strong for women, given that men still usually earn more than women. In case of migrants in the survey data, this effect should be further amplified by the fact that women are most often tied migrants. Based on this, we expect that having a partner should reduce women's support for redistribution, while it is not clear whether there should be an effect for men. Although Junge et al. (2014) find that the likelihood that

[36] Education can serve as a proxy for income and hence as a measure of self-interest. However, the relationship between education and preferences for redistribution is more complex, and education may also make people more positive towards redistribution. See Alesina and Giuliano (2011).

a dual-earner couple emigrates from Denmark is strongly responsive to the primary earner's income, regardless of whether the primary earner is male or female, the primary earner is in most cases male.

Second, high-income individuals should prefer a higher tax rate for their country of origin in case of emigrating than in case of staying. The reason for this is that in case of staying, they would have to pay for redistribution, which results in balancing one's private costs of redistribution with potential benefits to one's family and society at large.

Third, having family members or relatives who benefit from income transfers can be expected to increase one's support for redistribution in the country in which they live.

Fourth, we expect that those highlighting the role of own work and choices are more negative towards redistribution, while those viewing also luck and family background to play an important role are more positive. This should hold both in the country or residence, as well as in the case of migration with respect to one's country of origin. Already Fong (2001) provides support for such a view in the absence of migration. Furthermore, we expect those with lower trust to be more negative towards redistribution as they are likely to be more worried about fraudulent behavior among transfer recipients.

Fifth, in the presence of multiple destinations, we expect high-income earners and those who are more negative towards redistribution to be more likely to be living in countries with lower taxation and higher returns to skills. The idea of the high-skilled choosing countries with higher returns to skills is in line with Borjas (1987); Borjas et al. (2015) present evidence that the emigrants from Denmark are strongly positively self-selected not only in terms of their earnings, but also in terms of residual earnings. As that paper relies on register data, it cannot shed light on the role that preferences towards redistribution may play in the self-selection of emigrants. Those preferring a lower level of redistribution than in their country of origin may vote with their feet, migrating to less redistributive countries. This suggests that countries like the United States may succeed in attracting emigrants with especially high earnings, while relatively egalitarian countries are likely to suffer from the emigration of the high-income earners.

Sixth, those planning to return to their country of origin in the future should have more negative views towards redistribution there in case they expect to be net payers towards redistribution at the time of returning.

Seventh, among migrants who do not plan to return to their country of origin and do not differ with respect to their concerns for family and friends, attitudes towards taxation in the country of origin should depend only about views towards a just society, and not on their own income (any link between own income and attitudes towards redistribution should reflect a correlation between income and those views).

2.3 Data

Statistics Denmark used full population registers from 1987 to 2007 to identify all Danish citizens who had emigrated in 1987, 1988, 1992, 1993, 1997, 1998, 2001 or 2002 and who were still abroad in 2007.[37] Emigrants had to be aged 18 or more when they emigrated, and at most 59 in 2007. They also had to have at least one parent who was born in Denmark. Statistics Denmark contacted first their parents or siblings to request their contact information abroad. Subsequently, they were asked to answer a web scheme in a survey that took place in June 2008. The overall response rate among stayers who could be contacted was 62 percent. In the analysis of migrants we concentrate on Danes who migrated to destinations outside Greenland and the Faroe Islands.[38] We also drop survey respondents who report having returned to Denmark when the survey took place. With these restrictions, we ended up with a sample of 1979 male and 2089 female migrants.[39] In the following analysis the number of observations changes slightly due to missing observations in different survey questions.
Table 2.1 reports the number of respondents who stay abroad, according to the destination country group.

The five most important residence countries for men are the United States, the United Kingdom, Norway, Sweden and Germany. For Danish women, the order is slightly different: the United Kingdom, the United States, Norway, Germany, and Sweden. Together, these five countries account for 60 percent of respondents. Of these five countries, Sweden and Norway are culturally, economically and politically closest to Denmark by far. The languages are closely related and present-day Southern Sweden was part of Denmark for centuries. All three are highly redistributive and rich welfare states. All in all, this means that migrating to Sweden or Norway is very easy even for the less educated. The societies in the United States and the United Kingdom, on the other hand, place a much higher responsibility on individuals themselves, and have lower taxes, less generous transfers, and wider income differences. One can also argue that work is more central in the Anglo-Saxon countries.

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[37] This effectively limits the analysis to migrants who have stayed abroad for at least five years. Having stayed abroad for five years predicts longer migration spells. For example, according to Danish population registers 72% of men and 71% of women who left Denmark in 1996 and were still abroad after five years were also abroad after ten years.

[38] Greenland and the Faroe Islands are autonomous regions but still part of Denmark. We have excluded these destinations as many of these migrants could have originated in Greenland or the Faroe Islands, and many would actually be returning home rather than emigrating from Denmark.

[39] It should be noted that the observations are unweighted in the following analysis, and their distributions do not reflect the distributions in the underlying target population directly. However, as the target population can be identified in the Danish population registers, it can be confirmed that the distributions of the main individual sociodemographic characteristics from the year before emigration reflect those of the target population fairly well.

Based on these considerations, we classify destination countries into other Nordic countries, the United States, the United Kingdom or Ireland, Canada, Australia or New Zealand, the rest of Western Europe and the rest of the world. We study different English-speaking countries in most analyses separately, in order to identify whether the United States stands out as the land of opportunities, and whether migrants to the United Kingdom and Ireland differ in their attitudes from migrants to other European countries less than migrants to the United States, Canada, Australia and New Zealand. Most respondents are living in English-speaking countries, which account for 38 percent of men and 40 percent of women. Other Nordic countries accommodate 21 percent of both men and women, and rest of Europe 28 percent of men and 33 percent of women. Only 6 percent of women and 13 percent of men live in the rest of the world.

To compare emigrants with Danes living in Denmark, we use data from round 4 of the European Social Survey (ESS), conducted in 2008/2009. The response rate for the survey in Denmark was 53.8%. We restrict our sample to those who were at least 24 or at most 60 years old when the survey took place, to have the same age group as respondents in the survey to emigrants. With this restriction, we end up with a sample of 939 ESS respondents.

2.4 Attitudes towards Income Redistribution

In this section, we show how attitudes of Danish emigrants compare with Danes who live in Denmark in their attitudes towards income redistribution. We also study how attitudes differ between migrants to different destinations. Our hypothesis is that migrants would, on average, self-select themselves into different countries also according to their redistributive preferences. This would imply that those migrating to less redistributive countries would have more negative attitudes towards redistribution, even after controlling for education and socio-economic status.

As discussed in the previous sections, preferences for redistribution are likely to reflect both self-interest and fairness considerations. In order to focus on fairness considerations, we asked in our survey Danes living abroad to state their opinion regarding the suggestion to increase income redistribution in Denmark. Another advantage from focusing on Denmark is that this guarantees a common point of reference to respondents living in various countries, and allows a comparison with attitudes of Danes living in Denmark. In the European Social Survey, attitudes towards income redistribution were measured by asking respondents to state whether they agree strongly, agree, neither agree not disagree, disagree or disagree strongly with the statement “The government should take measures to reduce differences in income levels.” Table 2.2 presents the distribution of answers separately for men and women.

Table 2.2 shows that 39 percent of men and 45 percent of women are in favor of government taking measures to reduce income differences, and 42 percent of men and 34 percent of women are against. Therefore, women are more left-wing, in line with findings by Edlund and Pande (2002), although differences are not very big.

In our survey for Danes living abroad, preferences for redistribution in Denmark were measured with the following question: "What is your opinion of a suggestion to increase taxes on those with high incomes in Denmark, and distribute the money to those with low incomes?" We used a 5-point scale from "Strongly in favor" to "Strongly against". Table 2.3a below reports the answers by men and table 2.3b answers by women, according to the destination country group.

Tables 2.3a and 2.3b reveal that there is a big gender difference in attitudes towards income redistribution. The majority of men oppose a suggestion to increase income redistribution in Denmark, whereas the majority of women support it. The majority of Danish men in all other destinations than other Nordic countries are against a suggestion to increase redistribution in Denmark. The majority of women in all destinations are in favor of increasing redistribution in Denmark. Among both men and women, those living in other Nordic countries are most positive towards increasing redistribution in Denmark. This is not too surprising: one would expect those who are most in favor of redistribution to be more likely to live in a highly redistributive country.

Both men and women living abroad are more polarized in their opinions than Danes living in Denmark. Although part of this may reflect subtle differences in the formulation of questions (our survey asked directly about redistributing income, ESS about "taking measures to reduce differences in income levels"), there is also a general pattern that women living abroad are more positive towards increasing redistribution in Denmark than women who live in Denmark, while men living abroad are more negative than men living in Denmark.

2.5 Opinions about the Determinants of Success and General Trust in People

Fong (2001) finds that individuals prefer more redistribution if they believe that poverty is exogenously determined, and Corneo and Grüner (2002) find that individuals who believe that hard work is important for getting ahead in life are less in favor of redistribution. Also trust can be expected to affect attitudes towards income redistribution. Those with a low level of generalized trust are likely to view also welfare benefit claimants more suspiciously, and thus have a more negative attitude towards redistribution. To account for these links, our survey asked for opinions about the determinants of individual success and also an attitude question measuring generalized trust. This allows us to test later whether different attitudes towards redistribution in different destinations reflect different opinions about the determinants of individual success, or differences in generalized trust.

The measure of beliefs on the determinants of success is based on the survey question: "*Which of the following describes your standpoint when it comes to the determinants of material success?*" The answer alternatives were "*Success is mainly determined by own work and choices*", "*Success is about equally determined by own work and choices as well as luck or parental background*", "*Success is mainly determined by luck*", and "*Success is mainly determined by parental background*." As the last two categories had only few respondents, they are combined in the subsequent analysis.

The measure of perceptions on general trustworthiness of people is based on the question: "*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*" The answer alternatives were "*Most people can be trusted*", "*Don't know*", and "*Need to be very careful*".

Tables 2.4a and 2.4b report findings concerning opinions on what determines individual success. The majority of Danes in all destinations replied that success depends about equally on own work and choices, as well as luck or parental background. 37 to 48 percent of men and 29 to 44 percent of women were of the opinion that success is determined primarily by own work and choices, and only 0-2 percent that it depends mainly on luck and parental background. Overall, men highlighted own work and choices somewhat more than women. Those who migrated to the United States highlighted own work and choices most, followed by those going to other Anglo-Saxon countries and to other Nordic countries. The emphasis on own work and choices in English-speaking countries is in line with Alesina and Angeletos (2005) who studied differences between the United States and Europe, finding that the United States is also perceived as a land of opportunities.

Tables 2.5a and 2.5b report generalized trust in people. Respondents living in other Nordic countries seem to be more trustful than those living in other destinations.

2.6 Explaining Attitudes

2.6.1 Preferences for redistribution

The descriptive statistics in previous sections suggest that women are more positive towards redistribution than men, and that those who migrated to other Nordic countries are more positive than others. We next study to what extent attitudes towards redistribution can be explained by the residence country group, when controlling for characteristics that have been shown earlier to affect attitudes towards redistribution. To do this we run ordered logit regression models[40] controlling for gender, age, family situation and education. Since the variable to be explained is discrete and ordinal, we use an ordered logit regression.

As a point of comparison, we first report as table 2.6 ordered logit analysis on to what extent age, family situation (measured by an indicator variable for being married or having a registered partner, and an indicator for having children) and dummies for two education categories (*short or medium higher education* and *master's degree or higher*) explain attitudes towards income equalization among Danes living in Denmark. Among men, only age has an effect that is statistically significant at the 5-percent level, with support for redistribution increasing in age (in the age group 24 to 60).The point estimate for the effect

[40] Heteroskedasticity robust standard errors are used in all the regressions in the paper. We report regression coefficients in tables and refer to marginal effects in the discussion where appropriate.

of having a master's degree or more is clearly negative, but does not reach statistical significance. Among women, being married reduced support for redistribution.

Table 2.7 presents a corresponding analysis for Danish emigrants with the same explanatory variables. Among men who have emigrated, both short and medium degree higher education and master's degree or more clearly and statistically significantly reduce support for redistribution. The broad gender differences are similar among Danes who have stayed in Denmark and among emigrants: being more educated reduces support for redistribution among men, and being married among women.

Table 2.8 introduces migration related variables by including destination country group dummies with *Nordic Countries* as the omitted category, dummies *family related* and *work related* for the purpose of migration and additional controls for occupational category (*medium skilled* and *high skilled*)[41].

The coefficients for controls in the regression for men are in line with earlier results known from the literature. The coefficient for the occupation category *high skilled* is large and negative, and those with higher education are more negative. Further, men migrating for work-related reasons are more negative towards redistribution. Male migrants to Anglo-Saxon countries, the rest of Western Europe and the rest of the world are more negative towards increasing redistribution in Denmark than migrants to other Nordic countries. Surprisingly, the negative coefficients for other English-speaking countries (Australia, Canada, Ireland, New Zealand and the United Kingdom) are bigger than the coefficient for the United States. If migrants self-select to countries that offer the highest after-tax income level, one would expect those most negative toward redistribution to be more likely to migrate to the Unites States. Since comparison of coefficient sizes can be misleading due to non-linearity of the ordered logit model we also calculated marginal effects. Residing in the United States makes the latent support for redistribution variable 0.06 standard deviations smaller than residing in the Nordic countries, holding all other variables constant. For comparison, residing in the UK or Ireland makes the latent variable 0.09 standard deviations smaller. Work-related reason for migrating makes the latent variable 0.11 standard deviations smaller holding all other variables constant. Having a high-skilled occupation is the most significant determinant of preferences as having a high-skilled occupation instead of a low-skilled one makes the the latent variable 0.17 standard deviations smaller in comparison to having a low-skilled occupation. The main finding is that the men migrating for work-related reasons and men residing in destinations outside Nordic countries are more negative towards redistribution of income, but this effects are smaller in size than the effects of own occupation.

In the regression for women in the second column of table 2.8, age of the respondent has a significant positive coefficient as was the case in the regression for men. Being married is associated with more negative attitudes towards redistribution. As in the regression for men the occupation category *high skilled* has a large and highly significant negative

[41] The category *high skilled* includes those who are self-employed in a profession (e.g. doctor, dentist, lawyer), working in top management and high skilled workers (e.g. physicists, engineers, doctors and architects).

coefficient and being a *medium skilled* worker has a positive coefficient. In general, the estimated effects for women are much weaker than in the corresponding regression for men. The dummies for the educational level have insignificant coefficients, and more importantly, the coefficients for destination country group are all insignificant.

A possible explanation for the gender differences in destination country dummies is that many of the women in the data are so called tied migrants who have migrated because their spouse obtained a job abroad. A possible interpretation could then be that their occupation does not reflect their education as well as with men. It is also possible that their migration decisions are not related to their attitudes towards redistribution for the same reason. If this is the case, then occupation of the spouse could perform better in predicting their attitudes than their individual characteristics. 2.9 extends the set of explanatory variables to include indicator variables for the occupation of the spouse. The estimated effects of spousal occupation for men's attitude towards redistribution do not differ statistically significantly from zero. In the regression for women the estimated coefficient for having a *high skilled* spouse is negative, large and highly significant, and the coefficient for *medium skilled* spouse is positive and significant. The estimated effect of spousal high-skilled occupation is for women larger than the effect of their own high-skilled occupation, which even loses its statistical significance among married women when spousal occupation is controlled for.

In order to test directly the effect of being a tied migrant, we ran regressions separately for women who migrated for work reasons, and for women who migrated for family reasons. The results, that are reported in table 2.10 reveal that own occupation is more important for women who migrated for work reasons and spousal occupation for those who migrated for family reasons. It should be noted that the coefficients for spousal occupations include also the general effect of having a spouse, with reference category being those without a spouse.

2.6.2 The effects of trust and opinions on the determinants of success

As beliefs on the determinants of success and trust on people can be related to preferences for redistribution, we include controls for these attitudes to the analysis. This allows us to test whether differences between different destinations are driven by such attitude differences, or persist even after controlling for them. For example, it could be that those who are most convinced that individual success is determined by individual effort would be most likely to migrate to the United States and other English-speaking countries, resulting in more negative attitudes towards income redistribution there even if attitudes towards redistribution would not be directly related to the destination choice.

The variables measuring these beliefs and attitudes are based on the corresponding survey questions that were discussed in section 2.5. To control for beliefs on the determinants of success we include a dummy variable for the option "*Success is mainly determined by own*

work and choices", and to control for general trust on people we include a dummy variable for the option "*Need to be very careful*".

Table 2.11 presents the regression results. Comparing tables 2.8 and 2.11, we see that most of the coefficients in the regressions seem to be robust for the new explanatory variables. The most notable change is that the destination country dummy for the United States loses statistical significance in the regression for men. A possible interpretation could be that migrants who trust in own work and effort as determinants of success tend to self-select to the United States.

In line with Fong (2001), both men and women are more likely to be against increasing redistribution if they are of the opinion that individual success depends mainly on own work and choices. For men, looking at the marginal effects the effect is of the same magnitude as the effect of migrating for work-related reasons. For women, the coefficient is larger than the coefficient of being married or differences between different destinations. Looking at marginal effects for women, the belief that own work and choices determine success makes the latent preference variable 0.13 standard deviations smaller holding other variables constant, which makes the belief the most important determinant of preferences for redistribution for women. Those with a high level of generalized trust are more positive towards redistribution, the difference being somewhat larger for women.

2.6.3 The effect of altruism towards siblings in Denmark

Since the respondents are themselves living abroad, the level of redistribution in Denmark does not affect their own economic situation directly. However, the respondents could care more deeply about the economic situation of their relatives than about non-relatives. We expect persons whose close ones benefit from income redistribution to be more positive towards it. One possible explanation for this is evolutionary biological. Hamilton (1964a, b) argues that individuals compare benefits of their actions to their kin with the private cost, weighting the benefit by genetic closeness. To test this, we study whether those who have a sibling who clearly benefits from redistribution prefer more redistribution in Denmark. We searched respondents' siblings from the Danish population register, and ran regression using an indicator variable *benefit* for having a sibling who resided in Denmark and was unemployed or on early retirement in 2007. Unemployment and retirement status are measured at the end of November each year, so the last calendar year before the survey took place was used. As reported in table 2.12, the coefficient for the indicator variable *benefit* is statistically insignificant for men, but large and significant for women. The findings suggest that women's support for redistribution is to a greater extent driven by the interest of their kin than men's support. Possible interpretation could be that women are in general more altruistic than men, even though it is not obvious from evolutionary perspective whether kin selection should be viewed as altruism.

2.6.4 Selection or assimilation?

Different attitudes towards redistribution among emigrants in different destination countries may result from migrant selection or from migrants assimilating and adapting to values that are prevalent in their new home country. To shed light on the issue of causality we study whether age at migration and time spent in the destination country are related to preferences for redistribution.

Alesina and Giuliano (2011) point out, that according to psychological literature, political and economic beliefs are formed mostly during youth and early adulthood and are resistant to change afterwards. Krosnick and Alwin, (1989) have found evidence of significant socialization between 18 and 25 years of age. If assimilation is more important than selection, and if younger migrants are more prone to assimilate, we would expect to find stronger association between preferences and destination countries for those who have migrated at a young age. A testable implication of this hypothesis is that those who migrated to the United States and to other English-speaking countries at young age should have more negative attitudes towards redistribution than those who migrated at an older age. To see if this is the case we fit separate regression models for emigrant men in different destination country groups and include an indicator variable for young migration age.

Tables 2.13a and 2.13b present regression results for men and women who have emigrated to other Nordic countries, to United States, to UK or Ireland, or to Canada, Australia, or New Zealand.

Overall, the results do not offer support for the hypothesis that younger migrants would be assimilating to political values prevalent in the host country. The coefficients for age at migration in the regression for the United States are statistically insignificant for both men and women, although the signs for the point estimates are negative as the hypothesis suggests. Moreover, the coefficients for young migration age are positive and significant for male migrants to UK or Ireland.

2.6.5 Plans to return to Denmark

As was discussed in the theory section, among migrants who do not plan to return, attitudes towards taxation in the country of origin should depend only on views towards a just society, and not on self-interest or pecuniary considerations. And the other way around, among those who plan to return self-interest considerations should be more important. We study whether this is the case by running separate regressions for those who plan to return to Denmark.

In the survey, the respondents were asked about possible plans of returning to Denmark with a question “Do you plan to go back to Denmark within the next decade?”. The answer options were “no”, “probably no”, “uncertain”, “yes”, “probably yes” and “don’t know”. We

run our regression model separately for those who chose “yes” or “probably yes” and for those who chose other options. The regression results for men are reported in table 2.14a and the results for women in table 2.14b. As expected, the coefficients for age and having a high skilled occupation are significant for both men and women who plan to return to Denmark, but insignificant for those who do not plan to return. For men, the coefficients for the destination country groups are significant for both those who are planning to return and those who don’t. A possible interpretation for this finding could be that self-interest considerations are indeed more important in determining the preferences of those who plan to return to Denmark.

2.7 Conclusions

In this paper, we have studied the attitudes towards income redistribution among Danes living in Denmark and Danish emigrants. Our empirical findings are in line with the earlier literature and with our theoretical considerations.

We found a remarkable gender difference among emigrants: the majority of men are against increasing redistribution, and the majority of women are in favor. Women are somewhat more positive towards redistribution also in Denmark, but the gender difference is much smaller than among emigrants. Among men, support for redistribution is stronger among those who migrate to other Nordic countries and weaker among those who migrate to other destinations and the support is weaker among men who have migrated for work-related reasons. However, destination country group or purpose of migration do not have a significant effect for women. A priori, the difference between destination country groups among men could be caused by self-selection of migrants according to their preferences for redistribution, or it could be that migrants assimilate to values and opinions prevalent in their countries of residence. However, we do not find evidence of assimilation to political values prevalent in the new home country.
Women who had a sibling who benefited from redistribution are more positive towards redistribution than women who did not have such a sibling, but a similar effect is not found for men. Further, we find evidence that pecuniary self-interest factors are associated with preferences for redistribution in Denmark only for those who plan to return to the country.

We also examined individual opinions on the determinants of individual success. The majority of respondents were of the opinion that both own work and choices as well as luck and family background play an important role. More than a third credited success to own work and choices, and less than two percent primarily to luck or family background. As one would expect, those who highlighted the role of individual choices and effort as determinants of individual success are more negative towards redistribution, as are those who have a lower trust in people in general. Still, even after controlling for different attitudes, we find that Danes who migrate to other Nordic countries are more positive towards increasing income redistribution than Danish men who migrate to any other destination. Among women, the association between redistributive preferences and destination choice is much weaker. Instead, spousal occupation plays a big role, with

women whose spouse is high skilled being much more negative towards income redistribution.

Chapter 3.

Trust towards Institutions among European Immigrants

3.1 Introduction

This chapter studies individual trust towards police among migrants residing in European countries using data from the European Social Survey. It is well established in the literature that individual trust towards other people is culturally transmitted from the countries of origin of immigrants, and the purpose is to shed light on whether a similar pattern can be established for trust towards institutions.

Empirical evidence also suggests that trust is associated with important economic and social outcomes. Trust has for instance been shown to correlate with indicators of good government (La Porta et al., 1997, 1999) as well as with such favorable economic outcomes as higher and more equal incomes and better institutions (Knack and Keefer, 1997). However, the causal relationship between trust and institutions or economic outcomes is ambiguous. In recent studies Tabellini (2008, 2010) uses instrumental variables to show that historical political institutions transmit trust, and that this inherited trust affects income. The link between trust and macro economy is established by Algan and Cahuc (2010), who use the trust levels of different waves of immigrants to the United States to estimate how changes in the general trust level have affected economic growth. The paper also provides evidence of intergenerational transmission of trust by showing that trust of descendants of immigrants is related to the trust in the countries of origin.

Also other papers have found that trust is persistent in time and is transmitted from one generation to the next. Dohmen et al. (2012) use data from the German Socio-Economic Panel (SOEP) to study intergenerational transmission of trust in the family. Using a sample of parents and their grown up children, they find a strong positive correlation between trust of parents and their children. Evidence of intergenerational transmission of trust has also been found in a number of other papers using data on immigrants. Guiso et. Al (2006) find that trust of immigrants in the United States is correlated with region or country of ancestry fixed effects and Uslaner (2008) finds that trust in nine countries of origin explains a significant share of the trust of immigrants residing in the United States. Moschion and Tabasso (2013) study descendants of immigrants in Australia and the United States. They find that trust in the country of origin of the parent is a determinant of the trust of second generation immigrants, but that the social and economic conditions in the country of residence also play a role. Dinesen (2013) uses data on immigrants residing in Western European countries and finds that both the trust level in country of origin and the institutional quality in the country of residence affect the generalized trust of immigrants.

Finally, Ljunge (2014) studies intergenerational transmission of trust using data from the European Social Survey and World Values Survey. The paper studies children of immigrants in 29 European countries and estimates a strong intergenerational transmission of trust from the country of origin of the mother, whereas the transmission

from the father's side is not statistically significant. Individual trust level of the migrant is explained by regressing it on the trust level in the country of origin of the parent to establish intergenerational transmission of trust. The trust level in the country of origin of the parent was measured as the share of people in the country answering that most people can be trusted in a corresponding question in the integrated European Values Survey and the World Values Survey. A similar survey question has also been included in various US surveys such as the General Social Survey, and most of the earlier literature doing cross-country comparisons or studying migrants has based the measure of trust on it.[42] However, the question concerns a special type of trust that can be called *generalized trust*. As Bjørnskov (2006) points out, it is not clear to respondents, what kinds of people, situations and circumstances the question refers to. Because of this ambiquity, the question might pick up culturally specific perceptions of the context the respondents assume it to refer to.

This paper, instead, uses survey data on individuals with immigration background to study a more particular form of trust, namely turst towards police. The main interest is on trust in police among immigrants, but samples of native residents and descendants of immigrants are also analyzed to provide a point of comparison. Intergenerational and cultural transmission of generalized trust is already well established in the empirical literature, but less is known about the transmission of this type of particularized trust towards a specific institution. It could for instance be the case that a more particular type of trust would not be as strongly transmitted from the origin as generalized trust is according to results of Ljunge (2014). One reason for this could be, that immigrants gather information about the of the institutions and their trustworthiness in the country of residence and adjust their trust towards the institutions according to this new information. The transmission of trust towards a particular institution would then be more weakly transmitted from the country of origin and between generations than generalized trust.

Following Ljunge (2014), the paper uses a method of regressing individual characteristics on country of origin values to study trust towards specific institutions. This so called epidemiological approach is discussed in detail by Fernandez (2010), and it has been used in studies of several topics including women's labor supply and fertility (see e.g., Guinnane et al., 2006; Alesina and Giuliano, 2010), mobility and employment of youth (Alesina and Giuliano, 2010), political participation (Alesina and Giuliano, 2011) and preferences for redistribution of income (Luttmer and Singhal, 2011).

According to the findings, individual trust towards police is associated with the trust levels in the countries of origin of European immigrants, but in a surprising way; individuals originating from countries with low trust in police tend to be more trustful. I further find that the result is driven by migrants who come from countries of origin where average trust in police is lower than in the country of residence. Analyzing the sample of the children of immigrants, I don’t find evidence of intergenerational transmission of trust in

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[42] As was mentioned, the answer options are on a scale fro one to ten in the European Social Survey. In most surveys, however, there are only two answer option: ”Most people can be trusted” and “Can’t be too careful”.

police in the country of origin of the parent. In addition to trust in police, also generalized trust is analyzed. Even though Ljunge (2014) provides a thorough analysis of the transmission of generalized trust, similar regressions are presented to highlight the differences between results concerning generalized trust and trust towards a specific institution.

The rest of the paper is structured as follows. Section 2 discusses the empirical specification, and the data is described in section 3. Section 4 presents the econometric analysis and the empirical results and section 5 concludes.

3.2 Empirical specification

As was noted earlier, the empirical specification follows closely the method used by Luttmer and Singhal (2011) and Ljunge (2014). The analysis is based on a model of the form

$$(3.1) \qquad Trust_{icat} = \beta_0 + \beta_1 Mean\_Trust_a + \beta_2 X_{icat} + \gamma_c + \delta_t + \varepsilon_{icat}.$$

The dependent variable $Trust_{icat}$ is the trust of individual i, residing in country c with origin in country a in period t. The variable of main interest is the average level of trust among natives in the country of origin $Mean\_Trust_a$. Mean trust is a characteristics of the country of origin and is as such common to all individuals who were born in a given country and it reflects both objective characteristics and cultural influences of the country of origin. The same model can be used for studying both first generation migrants and their descendants. In the case of first generation migrants country a refers to the country of birth of the migrant, whereas in the case of descendants of migrants it refers to the country of birth of the parent who has migrated from the country. X_{icat}captures such individual characteristics as age, gender, marital status, income and education that may affect trust. Further, the residence country fixed effect γ_c captures such characteristics of the residence country as the quality of political institutions that may affect individual trust, but also the effect of cultural influences. Due to the country fixed effect all the unobserved differences that affect all residents of a given country are accounted for. δ_t is a time fixed effect and ε_{icat} is the error term.[43] The estimation is done using ordinary least squares regression, and the standard errors allow for clustering over the country of origin for migrants and over the country of origin of a parent for the descendants of migrants.[44]

3.3 Data

The data set that is used consist of rounds 4, 5 and 6 of the European Social Survey (ESS) that were collected correspondingly in 2008, 2010 and 2012 . The survey includes a broad range of questions about sociodemographic characteristics of respondents, as well as questions on beliefs and attitudes. The survey also asks about the country of birth of the

[43] Country-by-year fixed effects were tried as well but this did not alter the results.

[44] The main results are robust to using ordered logit or ordered probit estimator.

respondents as well as about the country of birth of both parents, which allows identifying migrants and their children, as well as the countries of origin. As such, the data allows studying individuals living in and originating from or being children of a parent/parents originating from 34 countries.

The main focus is on a sample of immigrants, that consist of individuals who were born in a survey country different from the country of residence. For comparison, also a sample of natives and a sample of children of immigrants are analyzed. The sample of natives consists of respondents who were born in the country of residence, and the sample of the children of immigrants consists of respondents who have at least one parent who was born in a different survey country. If both parents were migrants but were born in different countries the individual was dropped from the sample. The migration flows of immigrants in the data are described in Table 3.1 that shows the numbers of migrants having been born in different countries of origin, as well as the biggest destinations for each origin.

The variable of main interest, trust in police, is based on the European Social Survey question about trust in different institutions, where police is one of the institutions that is mentioned to the respondent. The question reads: ”Using this card, please tell me on a score of 0-10 how much you personally trust each of the institutions I read out. 0 means you do not trust an institution at all, and 10 means you have complete trust.” The same coding to the answer is used in the analysis, so that a higher value means that the respondent expresses a stronger agreement with the statement. Generalized trust in others is measured with the question on whether most people can be trusted that was already used by Ljunge (2014).

The explanatory variable of main interest is average trust in police in the country of origin in case of the sample of immigrants, and trust in police in the parent’s country of birth when the sample of children of immigrants is analyzed. The average trust is computed across the three waves of the European Values Survey. The corresponding measures of average generalized trust are computed in a similar manner.

In addition, a rich set of control variables is used in the analysis. Age, gender, presence of children at home, marital status, labor market status, education and religious affiliation are observed in the data. In the regressions, marital status is captured by indicator variables for being divorced, widowed or having never been married, and education level by indicator variables for tertiary and primary education. For labor market status, indicator variables for having been unemployed and for having done paid work the week before the survey interview are included, and the omitted category is having been outside the labor force. The income measure being used is based on income deciles in the country of residence. The indicator variable for low income stands for the bottom three deciles in the income distribution in the country of residence, whereas the indicator variable for high income stands for the top three deciles.

3.4 Econometric analysis

Results from the regressions explaining generalized trust for the samples of natives,

immigrants and the children of immigrants are presented in Table 3.2 For the immigrant sample, the coefficient for the average trust in the birth country is positive and significant, as is the coefficient for the average trust in the country of birth of a parent in the sample of children of descendants. This evidence of transmission of trust is in line with the findings by Ljunge (2014). Coefficients for controls are relatively similar in all three samples.

Results from the regression explaining trust in police are reported in table 3.3 Concentrating first on the sample of natives, the comparison with the corresponding regression explaining generalized trust reveals some interesting differences. Women and those with primary education tend to be more trustful towards police and less trustful towards other people in general. Similarly, the coefficient for being widowed is negative in the regression explaining generalized trust but positive in the regression explaining trust in police and living in a big city is associated with more trust towards other people in general and with less trust towards police.

For the sample of immigrants, the coefficient for the average trust in the birth country has a statistically significant negative coefficient meaning that immigrants originating from countries where the average trust in police is low tend to be more trustful. Further, no significant effect of the trust level in the country of birth of the parent is found for the children of immigrants. The latter result is more intuitive, as the interpretation could be that trust towards a particular institution would be based on information on the true trustworthiness of the institution. If this was the case, then individual trust in police could be based on knowledge of the trustworthiness of police in the country of residence, and average trust in the country of birth of the parent would not play a role in determining individual trust.

A possible interpretation for the negative coefficient for the average trust in the country of origin for the immigrants could be that migrants who come from countries where the average trust in police is low but who reside in countries where police is considered to be more trustworthy would value the trustworthiness relatively high. I study whether this is the case by splitting the sample of immigrants based on whether the individual has migrated from a lower trust country to a country with higher average trust in police or the other way around. The coefficients for average trust in police in the country of origin are reported in table 3.4 The coefficient for the sample of immigrants who have migrated from a lower trust country to a higher trust country is indeed statistically significant and larger than the coefficient that was estimated from the pooled sample, whereas the coefficient for the migrants from higher trust countries is non-significant.

3.5 Conclusion

In this paper, I have studied transmission of trust towards police across countries and generations among immigrants and their children. The relationship between average trust in police in the country of origin and individual trust in police among immigrants and their children is strikingly different from the corresponding findings concerning generalized trust. In case of generalized trust, the levels of trust in the countries of origin are positively correlated with individual trust levels of immigrants and the effect persists to the second

generation. However, the average trust in police in the country of origin has a negative effect on individual trust among immigrants, and no effect at all on the trust levels of the children of immigrants. The effect on the trust level of immigrants is driven by immigrants residing in countries where trust in police is higher than in the country of origin. One explanation for these findings could be, that generalized trust is a cultural trait that immigrants bring with them from the country of origin and that it is as such also inherited by the second generation, whereas trust on a specific institution might be determined by knowledge of the actual trustworthiness of the institution.

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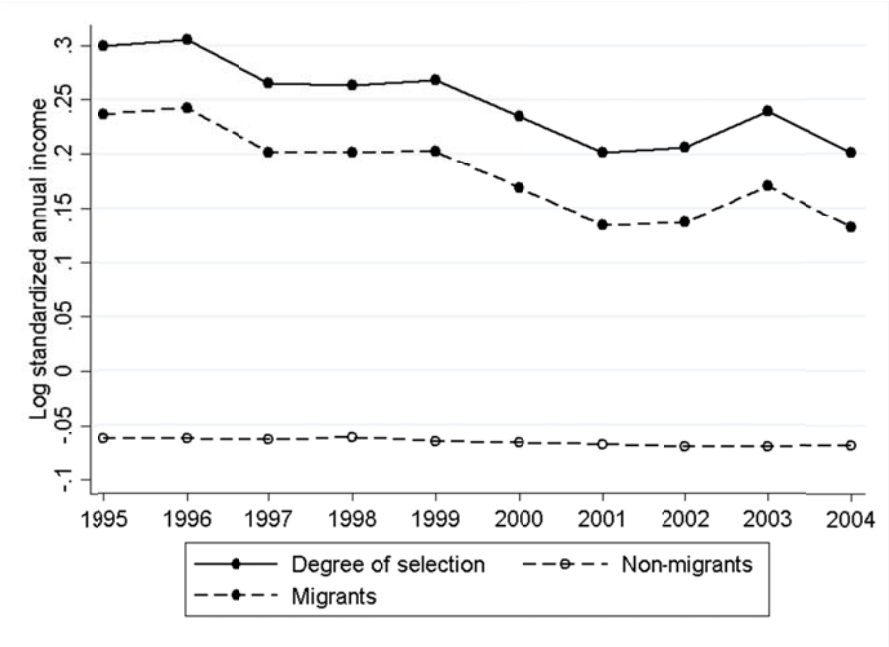
FIGURES

Figure 1.1 Evolution of the difference between average log standardized earnings of migrants and non-migrants

a. Men



b. Women

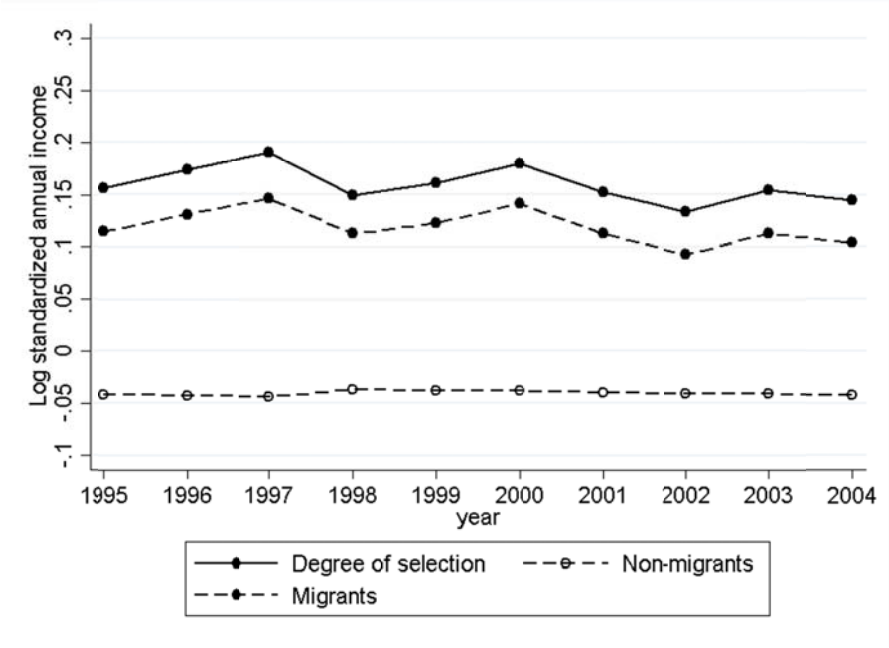
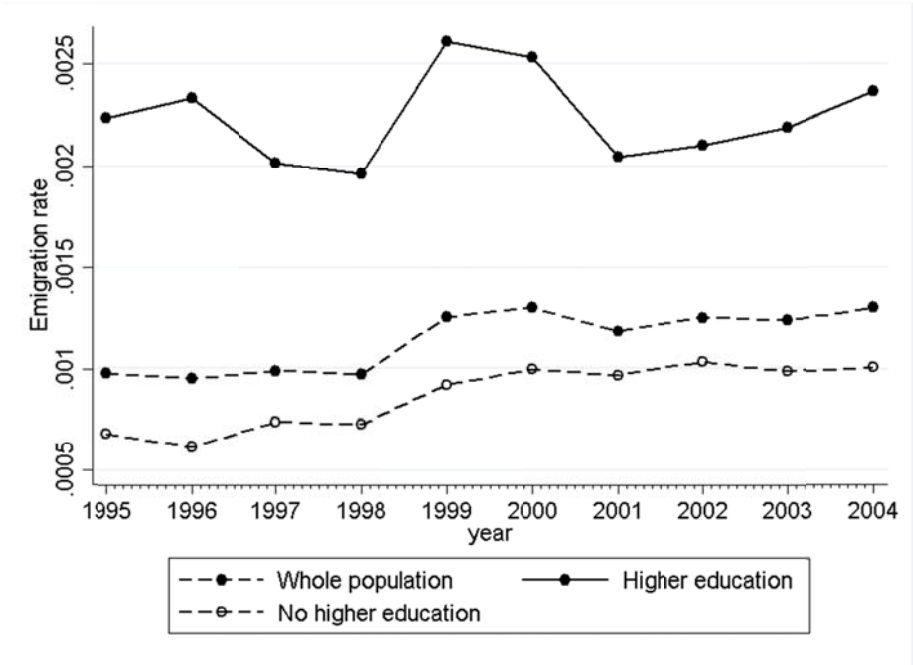


Figure 1.2 Evolution of the emigration rate

a. Men



b. Women

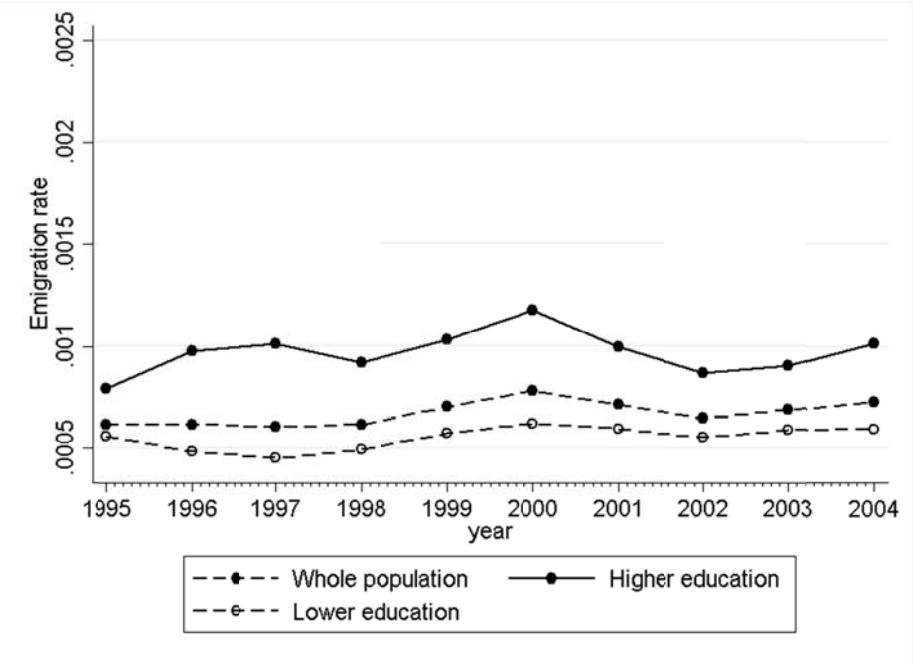
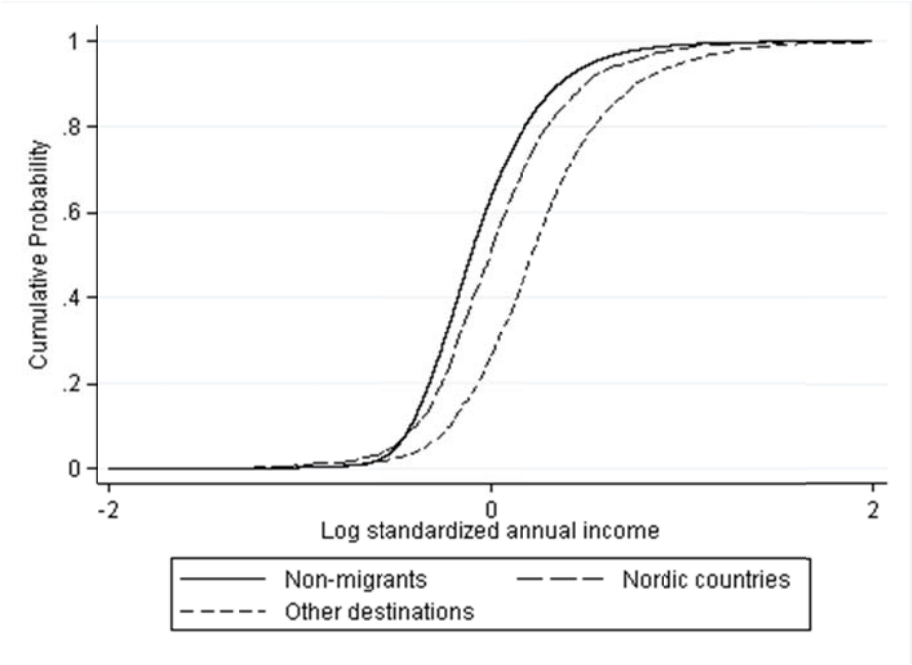


Figure 1.3 Distribution functions of standardized annual earnings for migrants and non-migrants

a. Men



b. Women

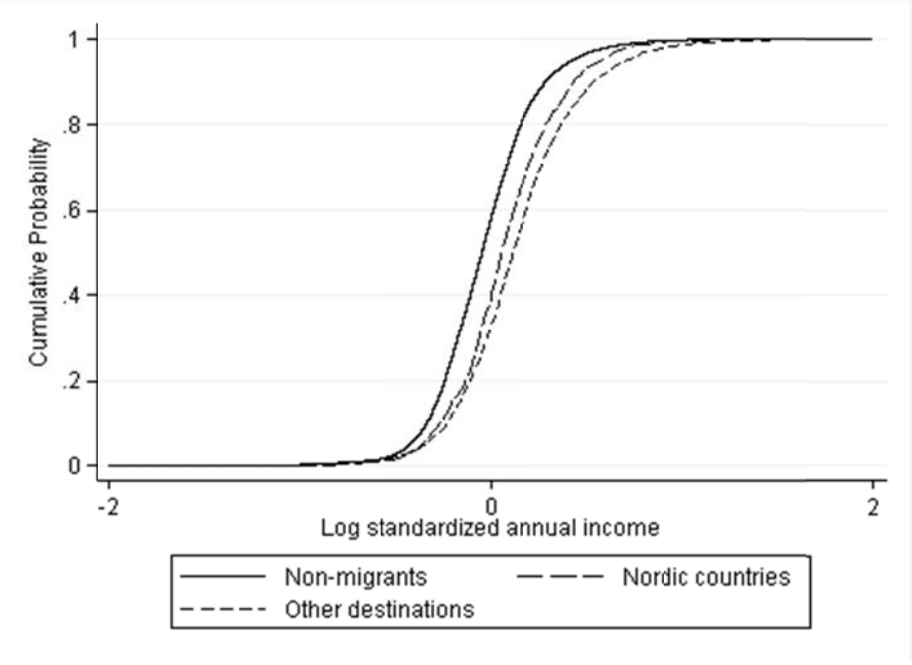
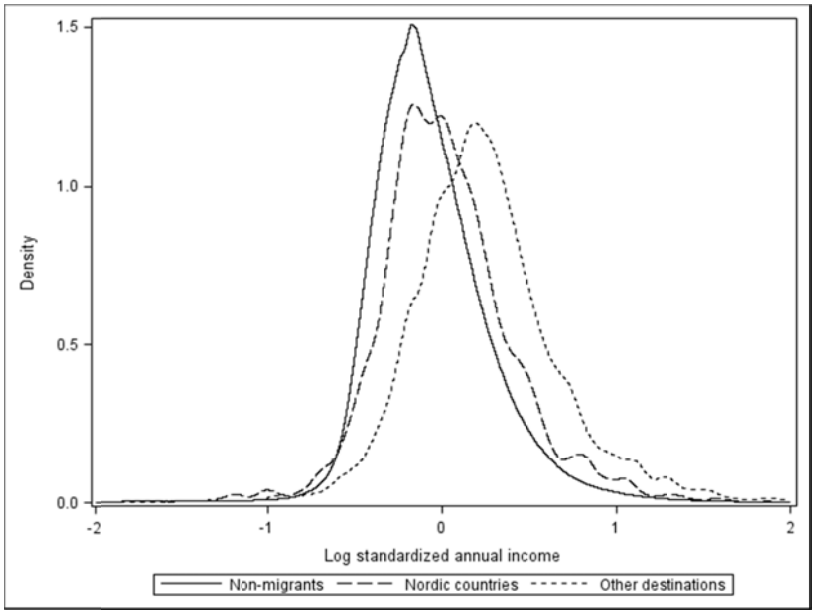


Figure 1.4 Density functions for standardized earnings for migrants and non-migrants

a. Men



b. Women

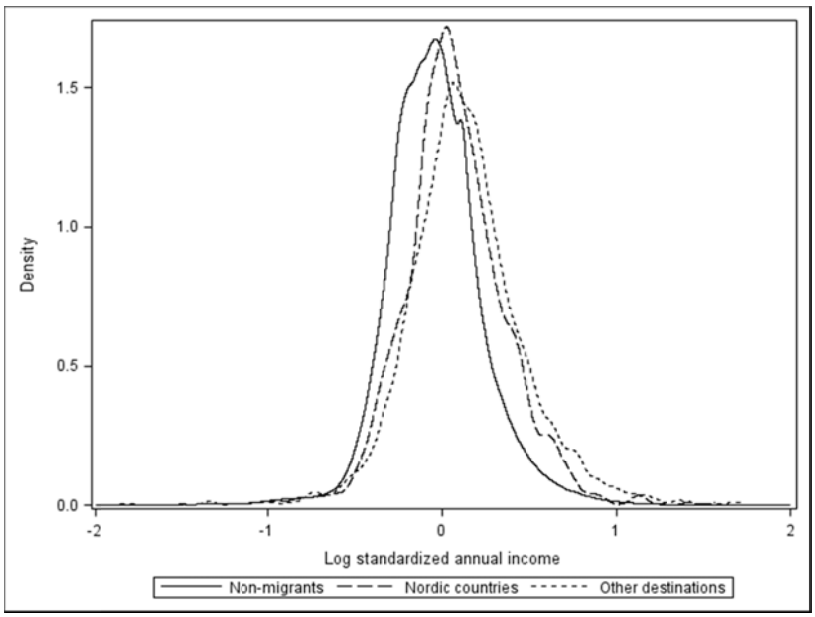
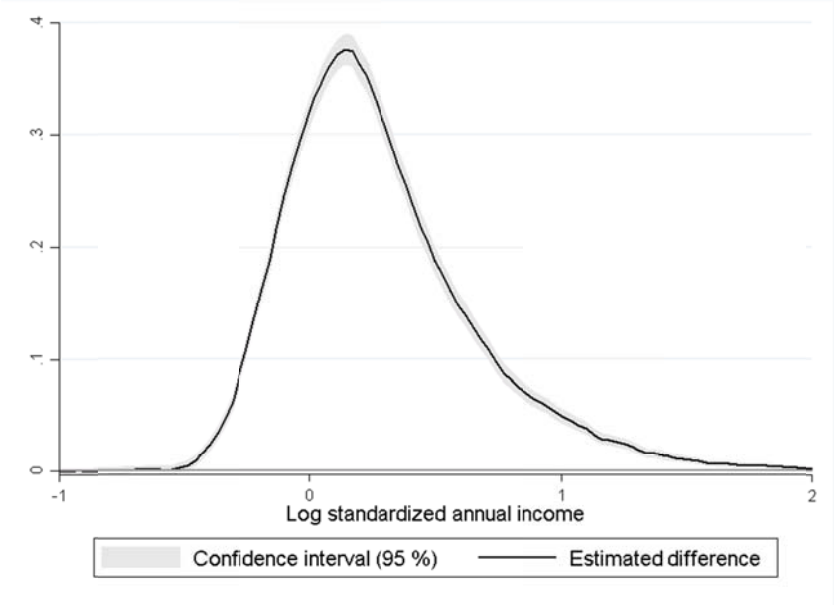


Figure 1.5 Difference of the cumulative distribution functions for pre-migration earnings between migrants moving outside Nordic countries and non-migrants

a. Men



b. Women

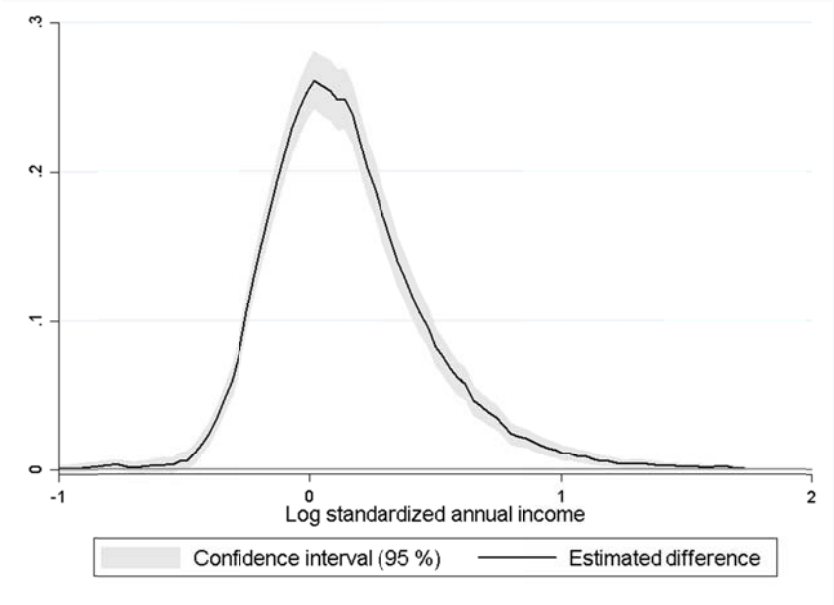
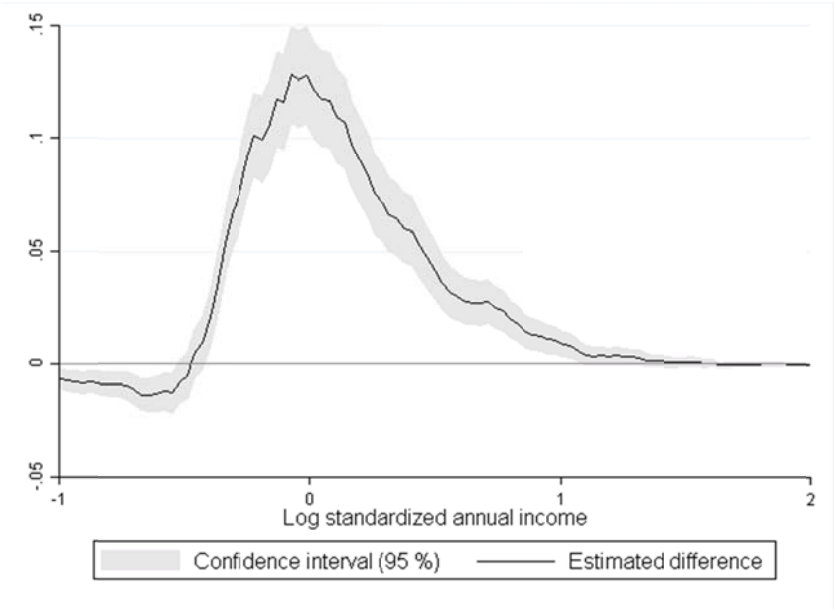


Figure 1.6 Difference of the cumulative distribution functions for pre-migration earnings of migrants going to other Nordic Countries and non-migrants

a. Men



b. Women

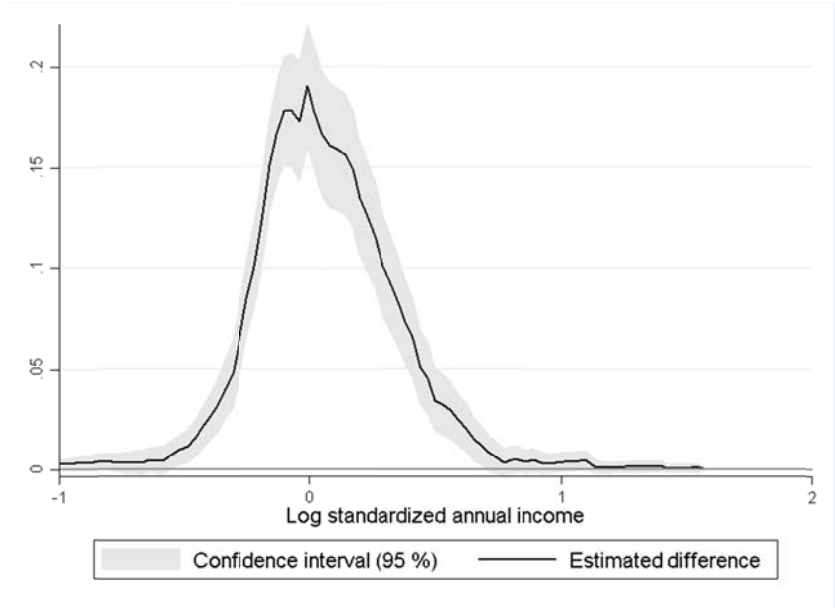
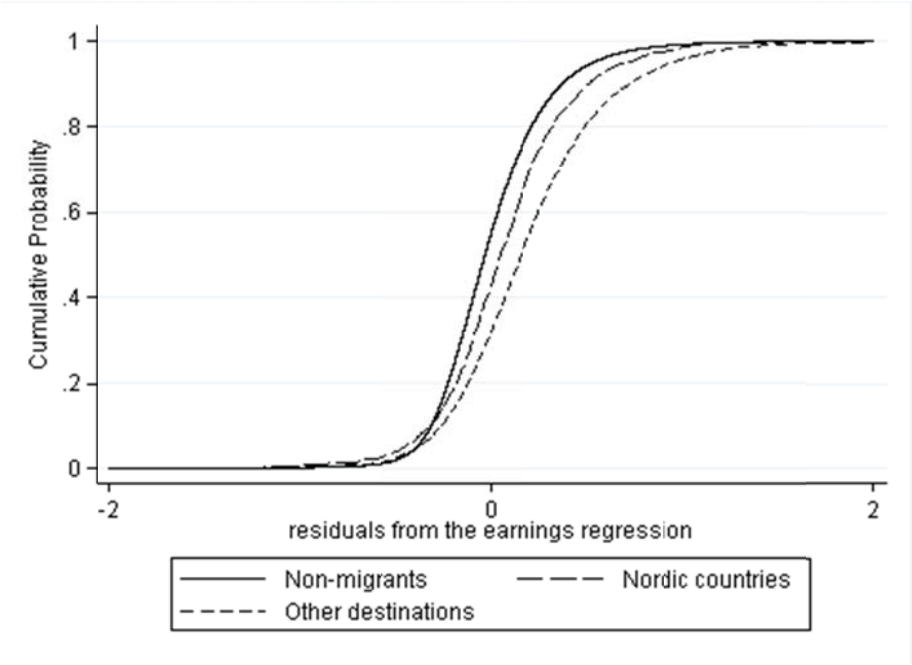


Figure 1.7 Distribution functions of residuals from earnings regression for migrants and non-migrants

a. Men



b. Women

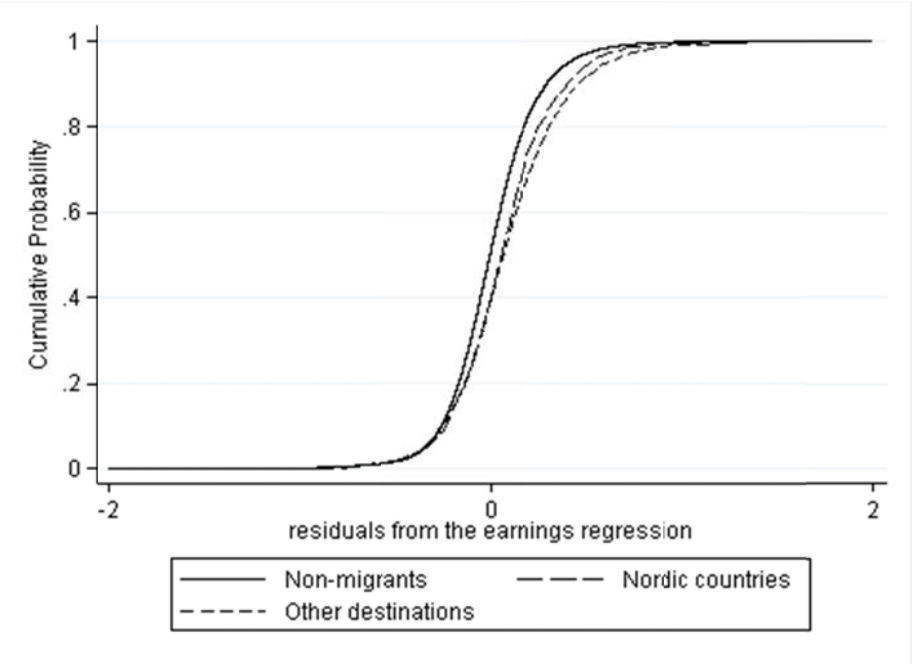
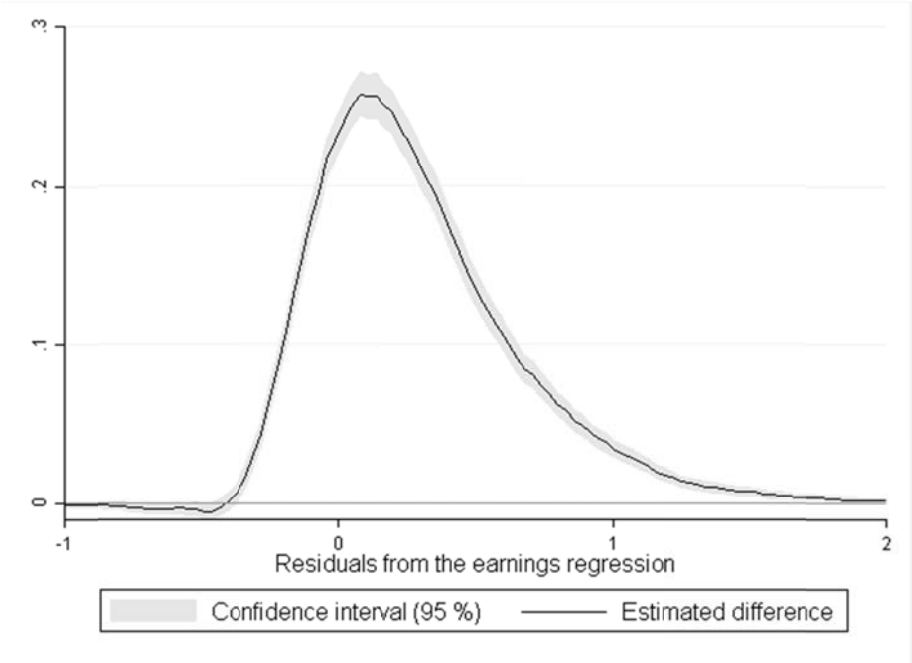


Figure 1.8 Difference of the cumulative distribution functions of residuals for migrants going outside other Nordic Countries and non-migrants

a. Men



b. Women

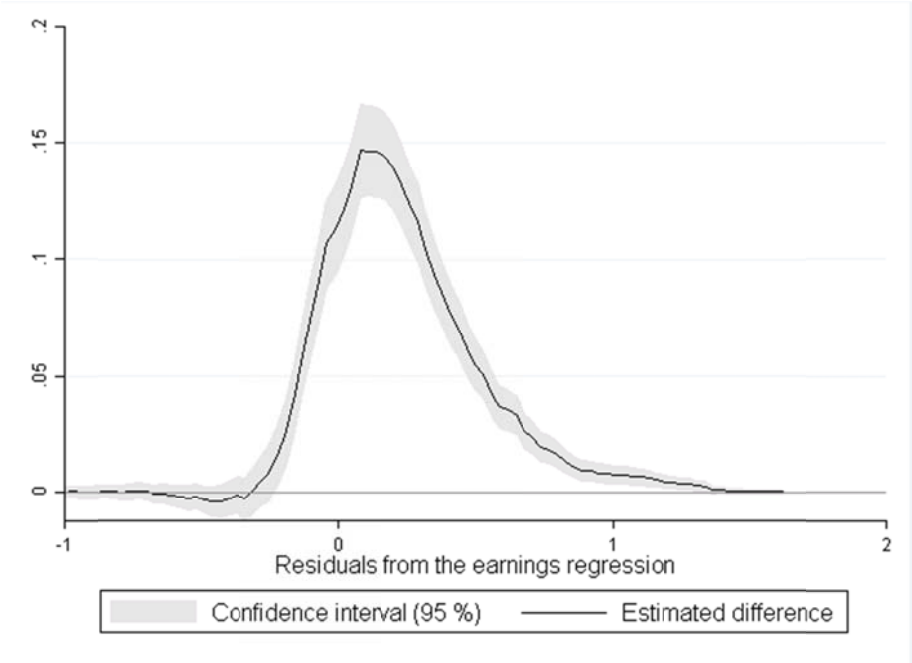
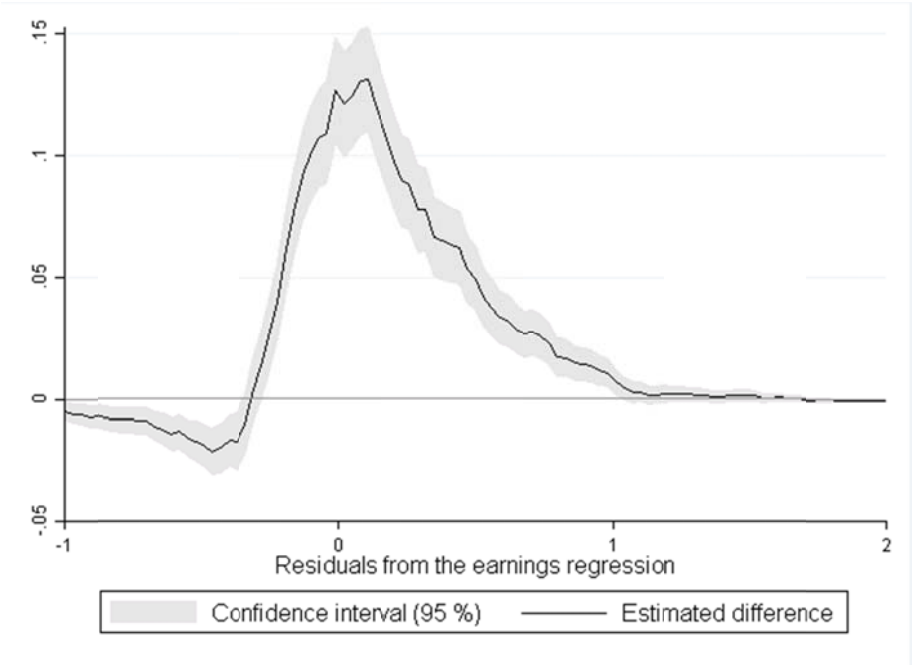


Figure 1.9 Difference of the cumulative distribution functions of residuals for migrants going to other Nordic Countries and non-migrants

a. Men



b. Women

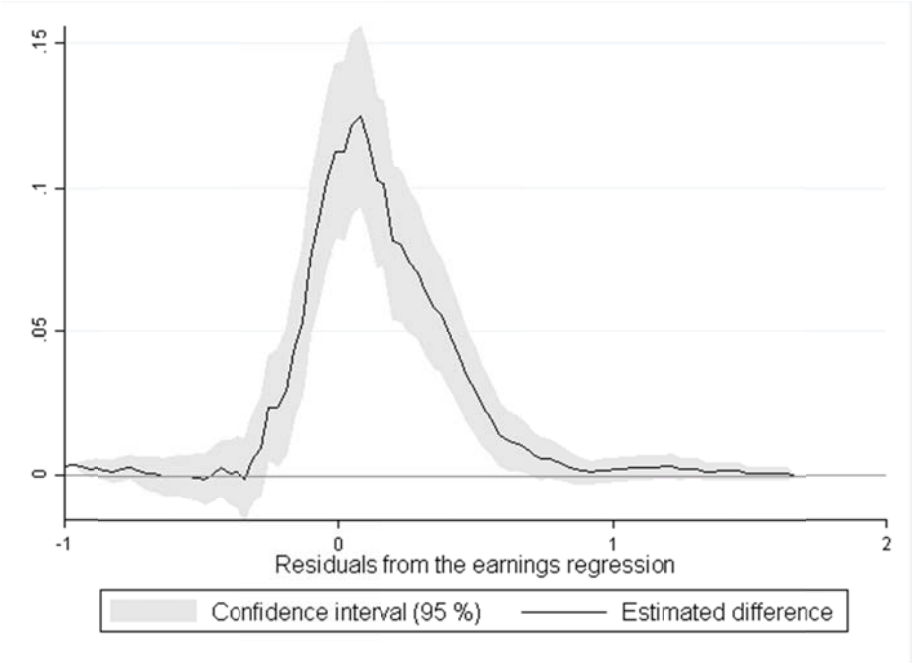
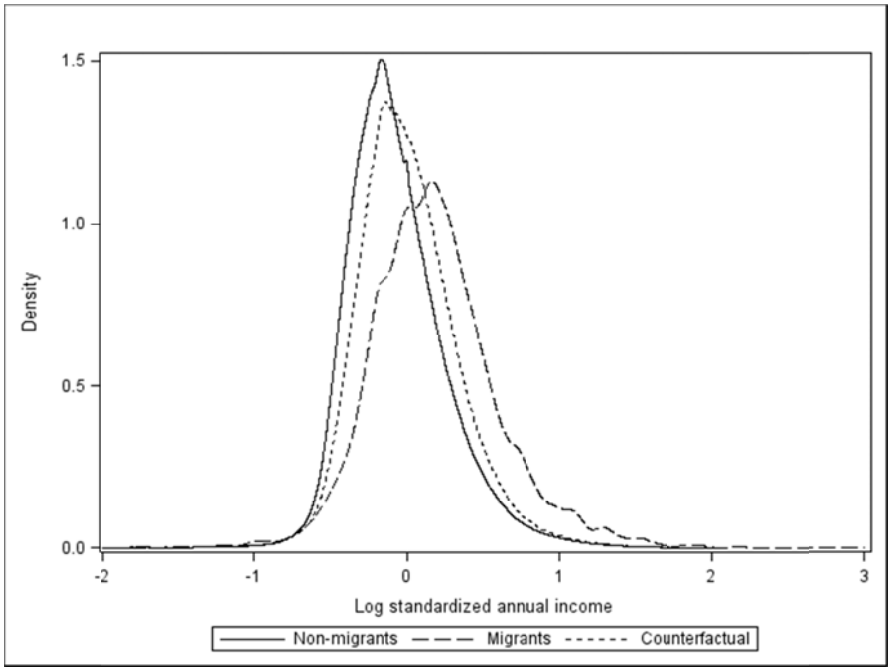


Figure 1.10 Counterfactual and actual densities of standardized gross earnings

a. Men



b. Women

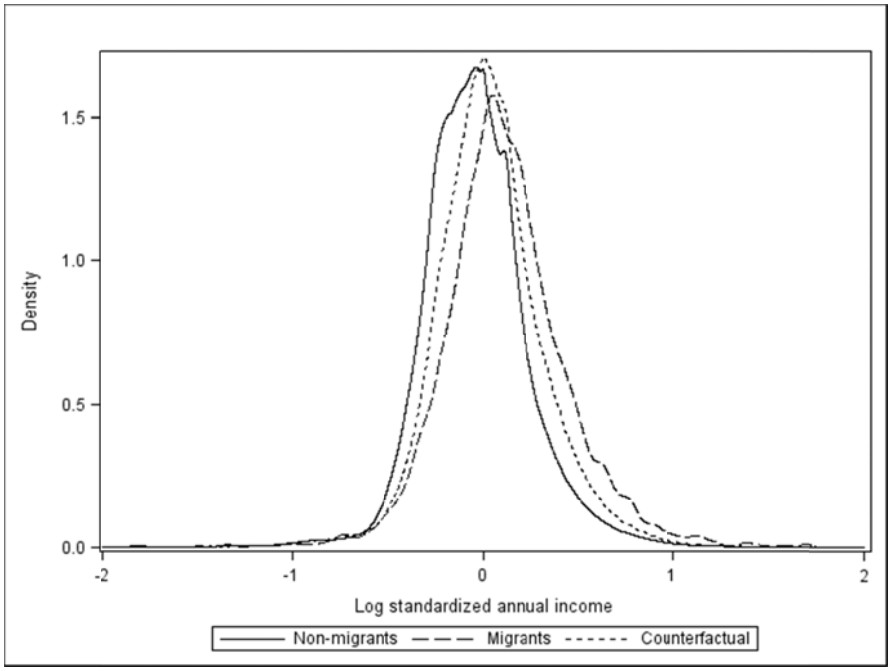
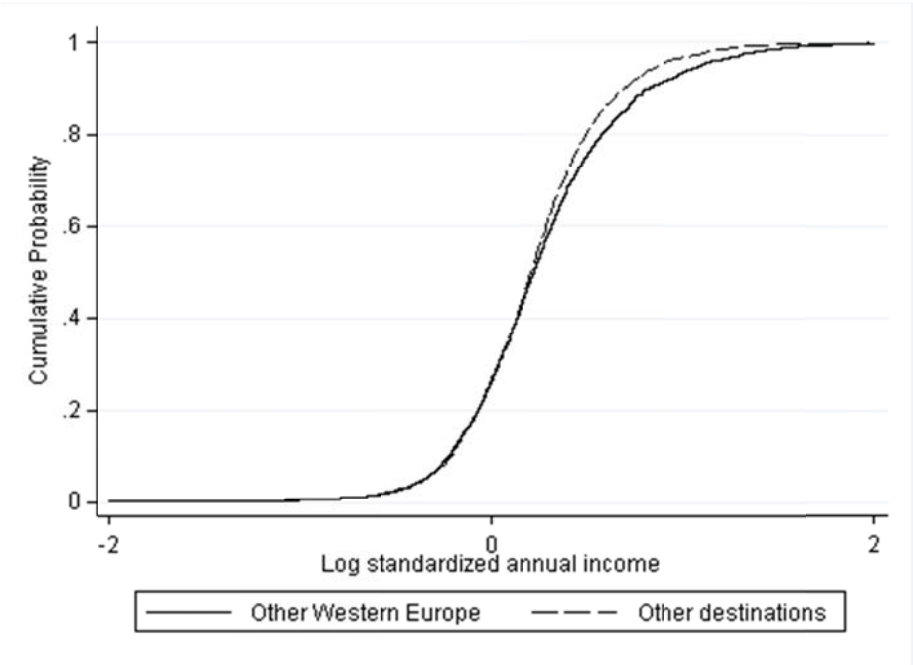
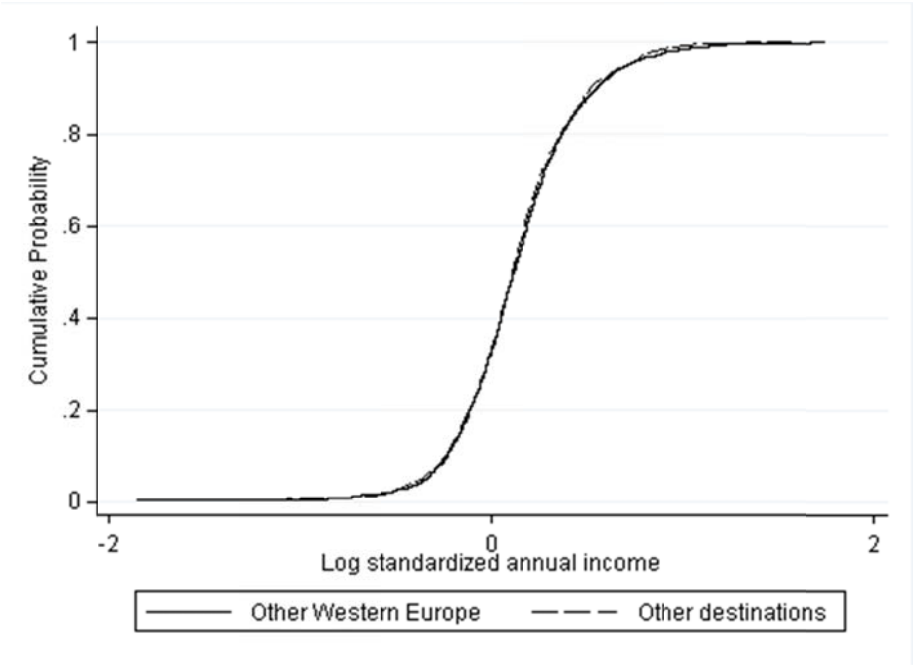


Figure 1.11 Distribution functions of annual gross earnings for migrants to the EU15 and migrants to other destinations

a. Men



b. Women



TABLES

Table 1.1 Summary Statistics

	Non-migrant men	Migrant men	Non-migrant women	Migrant women
Observations	6450665	7323	5163129	3436
Age				
Average	39.8	33.0	40.2	35
Median	40	35.4	40	33
Annual earnings in 2010 euros				
Average	52725	68151	40299	46412
Median	46675	57350	37976	42393
Standardized annual earnings				
Average	1.0	1.3	1.0	1.2
Median	0.9	1.2	0.95	1.1

Table 1.2 Numbers of migrants, by destination

	Men	Women
Sweden	1466	699
The United States	763	363
The United Kingdom	725	432
Germany	560	249
Norway	576	273
Spain	255	147
Switzerland	233	118
France	222	156
Other	2523	999

Table 1.3 Education levels of non-migrants and migrants going to Nordic countries or to other destinations

	Men			Women		
	status			Status		
Education	Non-migrants	Nordic countries	Other destinations	Non-migrants	Nordic countries	Other destinations
Comprehensive school	21.4	19.8	8.3	21.5	15.7	8.9
High school	3.2	7.8	8.6	3.1	6.9	8.9
Vocational school	49.8	43.5	30.3	41.8	36.5	30.8
Advanced vocational	5.6	5.7	6.6	4.9	5.1	7.8
Bachelor or equivalent	12.2	11.6	20.6	23.3	22.9	25.4
Master's or equivalent	7.3	10.6	23.9	5.1	12.3	17.6
Doctoral or equivalent	0.5	1.0	1.7	0.2	0.7	0.7

Notes: The category "advanced vocational" includes all the tertiary education programs below the level of a Bachelor's program or equivalent. Programs on this level may be referred to for instance with such terms as community college education, advanced vocational training or associate degree.

Table 1.4 Summary of tests of stochastic dominance in distributions of standardized pre-migration earnings

Distributions being compared:	Percent of sample below lower bound		Percent of sample above upper bound	
	Migrants	Non-migrants	Migrants	Non-migrants
Migrants outside Nordic Zone and non-migrants				
Male	1.3	1.6	0.0	0.0
Female	2.0	2.5	0.2	0.0
Migrants to Nordic Zone and non-migrants				
Male	9.9	11.9	0.9	0.5
Female	1.3	2.1	2.0	1.2

Notes: The range over which the migrant distribution stochastically dominates at a 95 percent confidence interval.

Table 1.5 Mincerian earnings regressions, by gender

	(1) men		(2) women	
	b	se	B	se
Married	0.068***\	(0.00)	-0.016***	(0.00)
Children	0.025***	(0.00)	-0.048***	(0.00)
High school	0.224***	(0.00)	0.190***	(0.00)
Vocational school	0.092***	(0.00)	0.089***	(0.00)
Advanced vocational	0.186***	(0.00)	0.198***	(0.00)
Bachelor	0.298***	(0.00)	0.225***	(0.00)
Master's	0.498***	(0.00)	0.536***	(0.00)
PhD	0.490***	(0.00)	0.622***	(0.00)
1996	0.020***	(0.00)	0.017***	(0.00)
1997	0.043***	(0.00)	0.041***	(0.00)
1998	0.078***	(0.00)	0.083***	(0.00)
1999	0.103***	(0.00)	0.112***	(0.00)
2000	0.141***	(0.00)	0.143***	(0.00)
2001	0.175***	(0.00)	0.175***	(0.00)
2002	0.207***	(0.00)	0.210***	(0.00)
2oo3	0.236***	(0.00)	0.235***	(0.00)
2004	0.252***	(0.00)	0.258***	(0.00)
Constant	12.131***	(0.00)	11.931***	(0.00)
Age fixed effects	Yes		Yes	
N	6470720		5173706	
R-squared	0.2597		0.3062	
*p<0.05, ** p<0.01, *** p<0.001				

The table reports OLS results for the log annual earnings.
Individually clustered standard errors are in parentheses.
Coefficients for the age dummies are not shown.

Table 1.6 Summary of tests of stochastic dominance in distributions of residuals

Distributions being compared:	Percent of sample below lower bound		Percent of sample above upper bound	
	Migrants	Non-migrants	Migrants	Non-migrants
Migrants outside Nordic Zone and non-migrants				
Male	5.6	6.2	0.0	0.0
Female	12.4	14.0	0.3	0.0
Migrants to Nordic Zone and non-migrants				
Male	12.0	13.4	1.1	0.7
Female	8.8	0.9	1.6	11.1

Table 1.7 Logit estimates of the probability of emigration, by gender

	(1) men		(2) women	
	b	se	B	se
Married	-0.110**	(0.04)	-0.191***	(0.05)
Children	-1.137***	(0.05)	-1.232***	(0.07)
Married*children	0.460***	(0.07)	0.374***	(0.09)
High school	1.377***	(0.05)	1.158***	(0.08)
Vocational school	0.186***	(0.04)	0.159**	(0.06)
Advanced vocational	0.648***	(0.06)	0.714***	(0.08)
Bachelor	1.097***	(0.04)	0.581***	(0.06)
Master's	1.652***	(0.04)	1.444***	(0.07)
PhD	1.723***	(0.10)	1.655***	(0.21)
y1996	-0.032	(0.06)	-0.001	(0.08)
y1997	0.002	(0.06)	-0.016	(0.08)
y1998	-0.024	(0.06)	-0.001	(0.08)
y1999	0.230***	(0.05)	0.131	(0.08)
y2000	0.260***	(0.06)	0.238**	(0.09)
y2001	0.161**	(0.05)	0.146	(0.08)
y2002	0.208***	(0.05)	0.046	(0.08)
y2003	0.198***	(0.05)	0.112	(0.08)
y2004	0.246***	(0.05)	0.178*	(0.08)
Constant	-6.700***	(0.08)	-6.951***	(0.12)
N	6470720		5173706	
Pseudo R^2	0.0540		0.0557	
*p<0.05, ** p<0.01, *** p<0.001				

The table reports logit results for the long-term emigration.
Individually clustered standard errors are in parentheses.
Coefficients for the age fixed effects are not shown.

Table 1.8 Actual and counterfactual differences between the average log standardized earnings of migrants and non-migrants

	Men	Women
Non-migrant average	-0,065	-0,040
Estimated average for migrants	0,008	0,034
True average for migrants	0,180	0,117
True difference	0,245	0,157
Counterfactual difference	0,073	0,074
Share of the actual difference explained by obervable characteristics, %	29,6	47,0

Table 2.1 Number of respondents by destination country group

	Men	Women
Other Nordic countries	409	445
The United States	338	285
UK or Ireland	285	418
Canada, Australia, or New Zealand	128	128
Rest of Western Europe	561	700
Rest of the world	258	113
total	1979	2089

Source: stayers survey

Table 2.2 Attitudes towards increasing redistribution among men and women living in Denmark

	Strongly against Row %	Somewhat against Row %	Neutral Row %	Somewhat in favor Row %	Strongly in favor Row %
Men	10	32	19	28	11
Women	4	30	21	32	13

Source: European Social Survey

Table 2.3a Men's attitudes towards increasing redistribution in Denmark

	Strongly against Row %	Somewhat against Row %	Neutral Row %	Somewhat in favor Row %	Strongly in favor Row %
Other Nordic countries	25	17	11	29	27
The United States	32	23	12	22	11
UK or Ireland	40	19	10	19	12
Canada, Australia, or New Zealand	34	19	12	20	15
Rest of Western Europe	38	22	8	23	9
Rest of the world	40	26	6	15	12

Source: stayers survey

Table 2.3b Women's attitudes towards increasing redistribution in Denmark

	Strongly against Row %	Somewhat against Row %	Neutral Row %	Somewhat in favor Row %	Strongly in favor Row %
Other Nordic countries	15	16	11	33	25
The United States	19	19	11	29	21
UK or Ireland	15	17	13	32	23
Canada, Australia, or New Zealand	12	19	11	38	20
Rest of Western Europe	15	20	13	33	19
Rest of the world	16	24	10	29	22

Source: stayers survey

Table 2.4a Men's opinions on the determinants of material success

	Own work and choices Row %	Both Row %	Luck or parental background Row %
Other Nordic countries	39	58	2
The United States	48	51	0
UK or Ireland	41	59	0
Canada, Australia, or New Zealand	47	53	0
Rest of Western Europe	37	62	1
Rest of the world	37	63	0

Source: stayers survey

Table 2.4b Women's opinions on the determinants of material success

	Own work and choices Row %	Both Row %	Luck or parental background Row %
Other Nordic countries	36	62	2
The United States	39	61	0
UK or Ireland	37	63	0
Canada, Australia, or New Zealand	44	56	0
Rest of Western Europe	29	70	2
Rest of the world	32	66	2

Source: stayers survey

Table 2.5a General trust in people among men

	Need to be very careful Row %	Don't know Row %	Most people can be trusted Row %
Other Nordic countries	11	3	86
The United States	17	6	78
UK or Ireland	17	5	78
Canada, Australia, or New Zealand	20	4	77
Rest of Western Europe	17	5	78
Rest of the world	23	3	74

Source: stayers survey

Table 2.5b General trust in people among women

	Need to be very careful Row %	Don't know Row %	Most people can be trusted Row %
Other Nordic countries	9	3	88
The United States	16	7	77
UK or Ireland	14	5	81
Canada, Australia, or New Zealand	17	5	78
Rest of Western Europe	16	7	77
Rest of the world	15	8	77

Source: stayers survey

Table 2.6 Attitudes of men and women living in Denmark

	Men b/se	Women b/se
Age	0.018*	0.020*
	(0.01)	(0.01)
Married	0.074	-0.535**
	(0.20)	(0.19)
Children	-0.124	0.108
	(0.19)	(0.20)
Short or medium higher	0.078	-0.168
education	(0.19)	(0.18)
Master's degree or higher	-0.398	0.068
	(0.27)	(0.27)
N	457	480
pseudo R-squared	0.0074	0.0089

*p<0.05, ** p<0.01, *** p<0.001

Source: European Social Survey

Table 2.7 Attitudes of men and women living abroad

	Men b/se	Women b/se
Age	0.016*	0.027***
	(0.01)	(0.01)
Married	-0.059	-0.302**
	(0.10)	(0.10)
Children	-0.026	-0.023
	(0.10)	(0.10)
Short or medium higher	-0.344***	0.013
education	(0.10)	(0.10)
Master's degree or higher	-0.414***	-0.144
	(0.10)	(0.11)
N	1891	1891
pseudo R-squared	0.0040	0.0045

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.8 Explaining attitudes

	Men b/se	Women b/se
Age	0.021**	0.032***
	(0.01)	(0.01)
Married	0.052	-0.263**
	(0.10)	(0.10)
Children	-0.070	-0.036
	(0.10)	(0.10)
Short or medium higher education	-0.232*	-0.006
	(0.11)	(0.10)
Master's degree or higher	-0.042	0.016
	(0.11)	(0.12)
Medium skilled	0.233	0.212
	(0.13)	(0.12)
High skilled	-0.663***	-0.427***
	(0.10)	(0.12)
US	-0.305*	-0.214
	(0.13)	(0.15)
UK or Ireland	-0.499***	-0.019
	(0.15)	(0.13)
CA, AU or NZ	-0.584**	0.017
	(0.20)	(0.18)
Rest of Europe	-0.495***	-0.143
	(0.12)	(0.12)
Rest of the World	-0.488**	-0.161
	(0.15)	(0.21)
Work related	-0.433***	-0.118
	(0.10)	(0.12)
Partner or family related	0.216	-0.156
	(0.12)	(0.10)
N	1891	1891
pseudo R-squared	0.0324	0.0091

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers surve

Table 2.9 Explaining attitudes with the skill level of the spouse

	Men b/se	Women b/se
Age	0.028**	0.033***
	(0.01)	(0.01)
Children	-0.163	-0.047
	(0.12)	(0.15)
Short or medium higher education	-0.190	-0.022
	(0.13)	(0.13)
Master's degree or higher	0.042	0.185
	(0.13)	(0.15)
Medium skilled	0.438**	0.324*
	(0.16)	(0.15)
High skilled	-0.639***	-0.255
	(0.12)	(0.15)
Spouse medium skilled	0.290*	0.304*
	(0.14)	(0.15)
Spouse high skilled	-0.095	-0.424***
	(0.13)	(0.12)
US	-0.318*	-0.154
	(0.16)	(0.18)
UK or Ireland	-0.428*	-0.038
	(0.18)	(0.17)
CA, AU or NZ	-0.627**	0.200
	(0.23)	(0.23)
Rest of Europe	-0.522***	-0.013
	(0.16)	(0.14)
Rest of the World	-0.338	-0.035
	(0.18)	(0.24)
Work related	-0.464***	-0.064
	(0.13)	(0.16)
Partner or family related	0.114	-0.065
	(0.15)	(0.12)
N	1268	1277
pseudo R-squared	0.0351	0.0146

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.10 Women's attitudes by purpose of migration

	Men b/se	Women b/se
Age	0.052**	0.026*
	(0.02)	(0.01)
Children	0.025	-0.096
	(0.20)	(0.18)
Short or medium higher	-0.524*	-0.013
education	(0.24)	(0.16)
Master's degree or higher	0.012	-0.074
	(0.24)	(0.18)
Medium skilled	0.527*	0.135
	(0.26)	(0.17)
High skilled	-0.486*	-0.371
	(0.22)	(0.20)
Spouse*spouse low skilled	-0.010	0.018
	(0.22)	(0.18)
Spouse*spouse medium	-0.375	0.372
skilled	(0.30)	(0.21)
Spouse*spouse high skilled	-0.316	-0.476**
	(0.25)	(0.17)
US	-0.141	-0.368
	(0.36)	(0.22)
UK or Ireland	-0.509	-0.114
	(0.31)	(0.19)
CA, AU or NZ	-0.854*	0.207
	(0.36)	(0.24)
Rest of Western Europe	-0.384	-0.183
	(0.23)	(0.17)
Rest of the world	0.148	-0.513
	(0.37)	(0.28)
N	436	899
pseudo R-squared	0.0275	0.0183

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.11 Explaining attitudes with opinion variables

	Men b/se	Women b/se
Age	0.018*	0.030***
	(0.01)	(0.01)
Married	0.041	-0.265**
	(0.10)	(0.10)
Children	-0.057	-0.030
	(0.10)	(0.10)
Short or medium higher education	-0.270*	-0.081
	(0.11)	(0.11)
Master's degree or higher	-0.121	-0.117
	(0.11)	(0.12)
Medium skilled	0.175	0.179
	(0.13)	(0.12)
High skilled	-0.658***	-0.413***
	(0.10)	(0.12)
Own work and choices	-0.465***	-0.495***
	(0.09)	(0.09)
Low trust	-0.240*	-0.425***
	(0.11)	(0.12)
US	-0.244	-0.198
	(0.13)	(0.15)
UK or Ireland	-0.496***	-0.019
	(0.15)	(0.13)
CA, AU or NZ	-0.536**	0.054
	(0.20)	(0.18)
Rest of Europe	-0.504***	-0.168
	(0.12)	(0.12)
Rest of the World	-0.488**	-0.137
	(0.15)	(0.21)
Work related	-0.437***	-0.110
	(0.10)	(0.12)
Partner or family related	0.187	-0.179
	(0.12)	(0.10)
N	1891	1891
pseudo R-squared	0.0384	0.0168

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.12 Explaining attitudes with altruism towards a sibling

	Men b/se	Women b/se
Age	0.021**	0.032***
	(0.01)	(0.01)
Married	0.051	-0.260**
	(0.10)	(0.10)
Children	-0.070	-0.035
	(0.10)	(0.10)
Short or medium higher education	-0.232*	0.008
	(0.10)	(0.10)
Master's degree or higher	-0.043	0.031
	(0.11)	(0.12)
Medium skilled	0.231	0.215
	(0.13)	(0.12)
High skilled	-0.662***	-0.431***
	(0.10)	(0.12)
US	-0.304*	-0.222
	(0.13)	(0.15)
UK or Ireland	-0.494***	-0.015
	(0.15)	(0.13)
CA, AU or NZ	-0.580**	0.028
	(0.20)	(0.18)
Rest of Europe	-0.493***	-0.143
	(0.12)	(0.12)
Rest of the World	-0.486**	-0.166
	(0.15)	(0.21)
Work related	-0.433***	-0.115
	(0.10)	(0.12)
Partner or family related	0.216	-0.152
	(0.12)	(0.10)
Benefit	0.131	0.540*
	(0.23)	(0.24)
N	1891	1891
pseudo R-squared	0.0325	0.0100

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.13a Explaining attitudes with age at migration for men

	Nordic	US	UK or IE	CA, AU or NZ	Other western
	b/se	b/se	b/se	b/se	b/se
Age	0.019	0.038*	0.030	0.027	0.010
	(0.01)	(0.02)	(0.02)	(0.03)	(0.02)
Married	-0.117	-0.027	0.297	-0.196	-0.074
	(0.21)	(0.26)	(0.26)	(0.48)	(0.19)
Children	0.244	-0.119	-0.124	0.078	-0.013
	(0.24)	(0.24)	(0.25)	(0.40)	(0.19)
Short or medium	-0.146	-0.545	-0.007	-0.514	-0.247
higher education	(0.23)	(0.29)	(0.30)	(0.44)	(0.21)
Master's degree or	0.417	-0.097	-0.326	-0.363	0.031
higher	(0.25)	(0.30)	(0.27)	(0.45)	(0.23)
Medium skilled	0.001	0.285	0.657	1.039	0.066
	(0.29)	(0.29)	(0.38)	(0.59)	(0.23)
High skilled	-1.057***	-0.757**	-0.770**	0.095	-0.605**
	(0.24)	(0.25)	(0.26)	(0.40)	(0.20)
Work related	-0.681**	0.034	-0.600*	0.165	-0.473*
	(0.25)	(0.24)	(0.30)	(0.40)	(0.19)
Partner or family	0.043	0.895**	0.073	0.561	0.324
related	(0.26)	(0.28)	(0.46)	(0.42)	(0.27)
Young migration age	-0.313	-0.136	0.663*	0.790	0.220
	(0.28)	(0.32)	(0.31)	(0.61)	(0.26)
N	392	320	271	123	532
pseudo R-squared	0.0405	0.0398	0.0560	0.0241	0.0256

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.13b Explaining attitudes with age at migration for women

	Nordic	US	UK or IE	CA, AU or NZ	Other western
	b/se	b/se	b/se	b/se	b/se
Age	0.079***	0.034	0.010	0.012	0.027
	(0.02)	(0.03)	(0.02)	(0.03)	(0.02)
Married	-0.418*	-0.313	-0.459*	-0.228	0.007
	(0.20)	(0.30)	(0.19)	(0.51)	(0.19)
Children	0.091	-0.442	-0.102	0.544	-0.062
	(0.25)	(0.27)	(0.19)	(0.46)	(0.21)
Short or medium	0.165	-0.022	0.016	-0.046	0.025
higher education	(0.26)	(0.28)	(0.22)	(0.40)	(0.18)
Master's degree or	0.210	-0.078	0.018	0.602	-0.044
higher	(0.29)	(0.32)	(0.26)	(0.55)	(0.21)
Medium skilled	0.003	0.136	0.384	-0.621	0.460*
	(0.24)	(0.40)	(0.26)	(0.53)	(0.22)
High skilled	-0.947***	0.145	-0.513*	-0.332	-0.247
	(0.26)	(0.33)	(0.26)	(0.49)	(0.22)
Work related	0.398	-0.069	-0.585*	-1.018	-0.143
	(0.26)	(0.34)	(0.29)	(0.54)	(0.21)
Partner or family	0.114	-0.264	-0.258	0.157	-0.099
related	(0.23)	(0.26)	(0.21)	(0.46)	(0.18)
Young migration age	0.495	-0.060	0.347	-0.358	0.186
	(0.27)	(0.29)	(0.22)	(0.54)	(0.17)
N	409	260	392	118	614
pseudo R-squared	0.0371	0.0108	0.0208	0.0345	0.0073

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.14a Explaining attitudes according to whether one plans to return to DK for men

	Plans to return b/se	No plans to return b/se
Age	0.017*	0.036
	(0.01)	(0.02)
Married	0.135	-0.363
	(0.11)	(0.26)
Children	-0.008	-0.469
	(0.11)	(0.28)
Short or medium higher education	-0.242*	-0.256
	(0.11)	(0.30)
Master's degree or higher	0.025	-0.482
	(0.12)	(0.29)
Medium skilled	0.218	0.176
	(0.13)	(0.49)
High skilled	-0.701***	-0.482
	(0.11)	(0.25)
US	-0.308*	-0.394
	(0.14)	(0.40)
UK or Ireland	-0.408*	-1.007*
	(0.16)	(0.40)
CA, AU or NZ	-0.461*	-1.547*
	(0.21)	(0.65)
Rest of Europe	-0.447***	-0.904**
	(0.13)	(0.33)
Rest of the World	-0.450**	-0.904*
	(0.17)	(0.42)
Work related	-0.382***	-0.673*
	(0.11)	(0.28)
Partner or family related	0.255	-0.048
	(0.13)	(0.35)
N	1596	295
pseudo R-squared	0.0306	0.0592

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 2.14b Explaining attitudes according to whether one plans to return to DK for women

	Plans to return b/se	No plans to return b/se
Age	0.034***	0.022
	(0.01)	(0.02)
Married	-0.217*	-0.576*
	(0.11)	(0.24)
Children	-0.015	-0.215
	(0.12)	(0.25)
Short or medium higher education	-0.047	0.277
	(0.11)	(0.27)
Master's degree or higher	0.063	-0.233
	(0.13)	(0.32)
Medium skilled	0.206	0.231
	(0.13)	(0.32)
High skilled	-0.504***	0.116
	(0.13)	(0.33)
US	-0.357*	0.746
	(0.17)	(0.40)
UK or Ireland	-0.117	0.543
	(0.14)	(0.36)
CA, AU or NZ	0.059	-0.121
	(0.21)	(0.40)
Rest of Europe	-0.167	0.013
	(0.12)	(0.35)
Rest of the World	-0.383	0.625
	(0.24)	(0.46)
Work related	-0.129	-0.020
	(0.13)	(0.35)
Partner or family related	-0.165	-0.079
	(0.11)	(0.27)
N	1593	298
pseudo R-squared	0.0107	0.0233

*p<0.05, ** p<0.01, *** p<0.001

Source: stayers survey

Table 3.1 Immigration flows by country of birth

Country of origin	Number of migrants from the country	Biggest destination	Number of migrants to the biggest destination
Albania	212	Greece	185
Belgia	65	Netherlands	17
Bulgaria	133	Cyprus	32
Switzerland	44	France	8
Cyprus	12	Greece	6
Czeck Republic	145	Slovakia	82
Germany	622	Switzerland	219
Denmark	61	Sweden	22
Estonia	46	Finland	21
Spain	105	Switzerland	26
Finland	131	Sweden	106
France	347	Switzerland	82
United Kingdom	573	Ireland	369
Greece	106	Cyprus	63
Croatia	140	Slovenia	90
Hungary	98	Israel	23
Ireland	58	United Kingdom	44
Israel	11	Switzerland	4
Iceland	20	Denmark	8
Italy	279	Switzerland	93
Lithuania	109	Ireland	34
Latvia	85	Ireland	22
Netherlands	122	Belgium	58
Norway	51	Sweden	32
Poland	610	Ireland	190
Portugal	152	Switzerland	56
Romania	475	Israel	137
Russia	1880	Estonia	660
Sweden	129	Norway	52
Slovenia	39	Croatia	24
Slovakia	115	Czeck Republic	83
Turkey	314	Germany	82
Ukraine	564	Israel	221
Kosovo	35	Switzerland	22

Source: European Social Survey

Table 3.2 Explaining generalized trust

	Natives b/se	Immigrants b/se	Descendants b/se
Trust, birth country		0.203***	
		(0.042)	
Trust, parent's birth country			0.175***
			(0.052)
Age	-0.020***	0.002	-0.047***
	(0.002)	(0.015)	(0.012)
Age squared/100	0.019***	0.000	0.051***
	(0.002)	(0.015)	(0.012)
Female	-0.040***	-0.016	0.084
	(0.013)	(0.044)	(0.079)
Children home	-0.007	-0.171**	0.069
	(0.015)	(0.083)	(0.080)
Now divorced	-0.147***	-0.206*	-0.066
	(0.023)	(0.102)	(0.130)
Widowed	-0.086***	0.111	-0.100
	(0.025)	(0.179)	(0.129)
Never married	0.059***	-0.095	0.082
	(0.021)	(0.079)	(0.118)
Low income	-0.262***	-0.222***	-0.223*
	(0.018)	(0.069)	(0.113)
High income	0.164***	0.265***	0.212***
	(0.019)	(0.093)	(0.067)
Tertiary	0.490***	0.462***	0.510***
	(0.018)	(0.101)	(0.070)
Primary	-0.248***	-0.187**	-0.437***
	(0.016)	(0.071)	(0.089)
Paid work last week	-0.017	0.096	-0.030
	(0.017)	(0.078)	(0.089)
Unemployed	-0.267***	0.002	-0.166
	(0.028)	(0.105)	(0.164)
Live in a big city	0.055***	-0.029	0.017
	(0.014)	(0.051)	(0.082)
Catholic	0.073***	-0.012	-0.113
	(0.020)	(0.054)	(0.129)
Protestant	0.232***	0.078	0.148
	(0.023)	(0.099)	(0.146)
Orthodox	0.027	0.168**	-0.124
	(0.032)	(0.068)	(0.075)
Islamic	0.053	-0.028	-0.307
	(0.050)	(0.195)	(0.223)
Constant	4.292***	3.558***	3.033**
	(0.096)	(0.541)	(1.250)
Residence country fixed effects	Yes	Yes	Yes
Indicator variables for ESS round	Yes	Yes	Yes
Indicator variables for missing data	Yes	Yes	Yes
N	132663	7151	4279
R-squared	0.184	0.109	0.158

*p<0.10, ** p<0.05, *** p<0.010

Source: European Social Survey

Table 3.3 Explaining trust in police

	Natives b/se	Immigrants b/se	Descendants b/se
Trust, birth country		-0.291**	
		(0.125)	
Trust, parent's birth country			-0.089
			(0.165)
Age	-0.112***	-0.156***	-0.096**
	(0.009)	(0.050)	(0.044)
Age squared/100	0.129***	0.171***	0.127**
	(0.010)	(0.053)	(0.049)
Female	0.702***	0.933***	0.898**
	(0.054)	(0.208)	(0.358)
Children home	0.152**	0.082	0.172
	(0.064)	(0.340)	(0.211)
Now divorced	-0.179*	-0.307	0.370
	(0.096)	(0.374)	(0.447)
Widowed	0.399***	-0.723	0.723
	(0.102)	(0.627)	(0.949)
Never married	0.025	-0.579	0.271
	(0.086)	(0.368)	(0.542)
Low income	0.049	0.993**	0.011
	(0.074)	(0.394)	(0.272)
High income	0.147*	0.342	-0.131
	(0.078)	(0.270)	(0.323)
Tertiary	0.030	0.267	0.050
	(0.073)	(0.320)	(0.407)
Primary	0.473***	0.919**	0.370
	(0.067)	(0.441)	(0.366)
Paid work last week	-0.011	0.212	0.228
	(0.069)	(0.280)	(0.356)
Unemployed	-0.379***	-0.460	-0.592
	(0.116)	(0.618)	(0.408)
Live in a big city	-0.182***	0.343	-0.284
	(0.058)	(0.270)	(0.331)
Catholic	0.135*	0.684	-0.058
	(0.081)	(0.540)	(0.278)
Protestant	0.238**	0.063	-0.275
	(0.095)	(0.514)	(0.223)
Orthodox	0.336**	-0.786	1.971***
	(0.133)	(0.835)	(0.387)
Islamic	3.048***	1.022*	0.637*
	(0.206)	(0.580)	(0.321)
Constant	5.130***	12.593***	7.164***
	(0.399)	(4.460)	(1.477)
Residence country fixed effects	Yes	Yes	Yes
Indicator variables for ESS round	Yes	Yes	Yes
Indicator variables for missing data	Yes	Yes	Yes
N	132663	7151	4279
R-squared	0.015	0.018	0.029

*p<0.10, ** p<0.05, *** p<0.010

Source: European Social Survey

Table 3.4 Effects of the average trust in police in the country of origin according to whether migration was from a country with lower trust

	Higher trust in destination b/se	Lower trust in destination b/se
Trust in police, birth country	-0.528**	-0.026
	(0.232)	(0.801)
Individual controls	Yes	Yes
Residence country fixed effects	Yes	Yes
Indicator variables for ESS round	Yes	Yes
Indicator variables for missing data	Yes	Yes
N	5086	2065
R-squared	0.022	0.029

*p<0.10, ** p<0.05, *** p<0.010

Source: European Social Survey

EIDESSTATTLICHE VERSICHERUNG

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