

ETHNIC ENCLAVES AND IMMIGRANT LABOR MARKET OUTCOMES: QUASI-EXPERIMENTAL EVIDENCE¹

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Spatial concentration of ethnic groups may theoretically have positive or negative effects on the economic performance of those groups. I examine the effects of the ethnic enclave size on labor market outcomes of immigrants. I account for ability-sorting into ethnic enclaves by exploiting a Danish spatial dispersal policy under which new refugees were randomly dispersed across locations, conditional on three observed individual attributes. First, I find strong evidence that refugees with unfavorable unobserved characteristics self-select into ethnic enclaves. Second, a relative standard deviation increase in the ethnic enclave size increases annual earnings by 18 percent on average, irrespective of skill level. Third, the paper proposes an explanation for the earnings gain of ethnic enclave members. Enclave members benefit from more access to ethnic networks because ethnic networks disseminate job information which increases the job-worker match quality and thereby the hourly wage rate.

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I. Introduction

Immigrants in advanced societies tend to live spatially concentrated in the larger cities, see for instance Bartel (1989) or Borjas (1998) for US evidence. Residential segregation of immigrants is commonly believed to hamper integration of immigrants. This is a key reason why many Western European countries spatially disperse refugees and asylum seekers. Migration researchers agree that integration of immigrants into the labor market is of major importance for overall integration of immigrants into the society. It is therefore important to know how residence in ethnic enclaves affects labor market outcomes of immigrants.

At least three theories exist on how living in an ethnic enclave affects earnings of immigrants. According to one theory, living in an ethnic enclave hampers economic assimilation of recent immigrants by decreasing the rate of acquisition of host-country-specific human capital (Chiswick 1991; Lazear 1999). According to theories which emphasize social networks effects, living in an ethnic enclave may hinder or promote earnings of immigrants depending on the nature of the spillover of information (see e.g. Portes 1998; Bertrand, Luttmer and Mullainathan 2000) and social norms in the ethnic community (see e.g. Coleman et al. 1966; Wilson 1987; Case and Katz 1991; Borjas 1995; Glaeser, Sacerdote and Scheinkman 1996; Bertrand et al. 2000). According to a third hypothesis, residence in an ethnic enclave decreases the reservation wage due to decreased costs of consumption of ethnic goods (Chiswick and Miller 2005). A lower reservation wage increases the job offer acceptance probability. The overall effect on earnings is therefore ambiguous. In this paper, I investigate the effect of ethnic enclave size on earnings empirically.

Empirical evidence of the effect of ethnic enclave size on economic success of immigrants is scarce. This is due to difficulties in identifying the effect of ethnic enclave size. Difficulties arise if individuals sort into cities and neighborhoods based on unobserved personal characteristics that also affect their labor market outcomes. Recent research has made progress in addressing this issue. Cutler and Glaeser (1997) and Bertrand et al. (2000) exploit the variation across a larger geographical area to avoid within-city sorting by ability. They find that blacks and immigrants, respectively, are hurt

by residential segregation. This approach does not avoid the issue of sorting by ability across cities. The ideal approach would be to exploit evidence from an experiment in which ethnic minorities are randomly distributed across locations and persuaded to stay in the location of assignment for a considerable period of time.

The Danish spatial dispersal policy on refugees and asylum seekers 1986-1998 is such an experiment and can be exploited to obtain quasi-experimental evidence on the return to living in an ethnic enclave. A similar identification strategy is used by Edin, Fredriksson and Åslund (2003) who exploit a former Swedish spatial dispersal policy on refugees and asylum seekers to obtain quasi-experimental evidence on the effect of ethnic enclave size on annual earnings. Edin et al. (2003) measure the ethnic enclave size by the number of co-nationals living in individual i 's current area of residence. They instrument the ethnic enclave size by the number of co-nationals living in individual i 's area of assignment in the year of assignment, i.e. by the initial local ethnic *stock*. Taking account of sorting into ethnic enclaves, the earnings gain associated with a standard deviation increase in the local ethnic stock is 13 percent.

The implicit exogeneity assumption in Edin et al. (2003) is invalid if the stock of immigrants of a particular descent is driven by ethnic group-specific selection into areas, e.g. areas providing better job opportunities for the group in question. In that case, assignment to an area with a relatively large local ethnic stock implies assignment to an area with relatively favorable ethnic group-specific earnings opportunities for earlier cohorts. Therefore, the finding the positive IV-estimate of the ethnic enclave size on annual earnings may not be evidence of a positive causal effect of ethnic enclave size on annual earnings. It may instead capture the tendency for earlier cohorts of co-nationals to settle in areas with favorable ethnic group-specific earnings opportunities.

My study handles this potential problem of ethnic group-specific selection into areas of earlier cohorts by using the *inflow* of *placed* co-nationals to individual i 's location of assignment since the year of implementation of the dispersal policy until the (end of the) year of immigration of individual i as an instrument for the stock of co-nationals in individual i 's current area of residence.

The paper provides new empirical results. First, I find strong negative ability sorting into ethnic enclaves. Second, taking account of sorting, seven years after immigration a

relative standard deviation increase in the local ethnic stock increases annual earnings by 18 percent, irrespective of skill level. Third, taking account of sorting, an increase in the ethnic enclave size decreases the employment probability of high-skilled refugees and reduces the probability of full-time work for high-skilled wage-earners; the estimated effects are insignificant for low-skilled refugees. These findings suggest that living in an ethnic enclave increases annual earnings by increasing the hourly wage rate rather than by increasing annual hours worked. The findings are consistent with information spillover within the ethnic network which increases the job-worker match quality and thereby the hourly wage rate. Fourth, in line with such information spillover, I find weak evidence that the return to living in an ethnic enclave increases with the quality of the ethnic enclave. Finally, descriptive evidence on the ethnic concentration at the workplace of private-sector refugees renders probable that a considerable share of refugees have found their job through their ethnic network.

The next section briefly reviews existing theories. Section III provides background on the Danish spatial dispersal policy on refugees and asylum seekers. Section IV describes the administrative records on refugees used in the empirical analysis and discusses the instrument. Section V presents my results on the effect of ethnic enclave size on earnings. Section VI looks at the reason why living in an ethnic enclave increases earnings. Section VII offers conclusions.

II. Theories on the Return to Living in an Ethnic Enclave

Many researchers believe that ethnic enclaves create closer social networks between people of a common ethnicity living in geographical proximity of each other, henceforth referred to as ethnic networks. As noted by Bertrand et al. (2000), social networks affect individual behavior through two potentially important channels: information and norms.³ The informational channel operates through contacts with valuable knowledge of various kinds. Contacts may have knowledge about job vacancies, for instance in ethnic businesses or ethnic niches, or valuable information for establishment of own business such as knowledge about business and loan opportunities and knowledge about

³ For theoretical analyses, see Banerjee (1992) and Bikhchandani, Hirshleifer and Welch (1992) for the informational channel and Akerlof (1980) for the norms channel.

disciplined co-ethnic workers searching for a job (Portes 1998).⁴ Alternatively, contacts may disseminate information about income alternatives to employment, such as welfare eligibility (Bertrand et al. 2000). Turning to the social norms channel, social norms may influence employment status directly (e.g. work ethics, self-employment traditions, attitudes towards receipt of social benefits and division of labor between spouses) and indirectly (e.g. norms regarding early marriage which may affect the fertility rate and the level of educational attainment of women) (see e.g. Coleman et al. 1966; Wilson 1987; Case and Katz 1991; Borjas 1995; Glaeser et al. 1996; Bertrand et al. 2000). Residence in an ethnic enclave may, therefore, promote or hinder economic success of immigrants depending on the nature of the spillover of information and social norms in the ethnic community. According to another hypothesis, living in an ethnic enclave hampers economic assimilation of recent immigrants by decreasing the rate of acquisition of host-country-specific human capital (e.g. language) due to reduced social interaction with natives which reduces the incentive to acquire host-country-specific human capital such as host-country language skills (Chiswick 1991; Lazear 1999). Furthermore, Chiswick and Miller (2005) speculate that ethnic minorities will be willing to accept a job at a lower wage rate if the job is located in an ethnic enclave, because residence in an ethnic enclave reduces the cost of consumption of ethnic goods and services such as traditional food products from the source country, clubs for co-nationals and places for practicing religion. In standard search models, a relatively low reservation wage implies a relatively high job offer acceptance probability. In that case, the short-run effect of living in an ethnic enclave on individual annual earnings is ambiguous, because annual earnings are the product of hours of work throughout the year - which may increase - and hourly wages - which may decrease. Furthermore, the medium-run effect of living in an ethnic enclave may be unambiguously positive because hourly wages tend to increase with work experience.

The short description of the three theories mentioned above demonstrates that theoretically the effect of residence in an ethnic enclave on labor market outcomes of immigrants is ambiguous in sign. Therefore, the effect of living in an ethnic enclave on

⁴ Studies of Chinatown in New York, Little Havana in Miami and Koreatown in Los Angeles provide empirical evidence that ethnic networks constitute a crucial resource for ethnic businesses (Portes 1998, 13).

labor market outcomes of immigrants must be determined by an empirical analysis to which we now turn.

III. The Danish Spatial Dispersal Policy on Refugees

The mid-eighties saw a surge of refugee applications in Denmark that made it increasingly difficult for the Danish Refugee Council (henceforth referred to as the Council) to satisfy the location preferences of most new refugees for accommodation in the larger cities. As a consequence, the Danish Government urged the Council to implement a spatial dispersal policy. 1986 marks the start of the first Danish spatial dispersal policy on refugees and asylum seekers who had their applications approved.⁵ Henceforth, I refer to such recognized refugees and asylum seekers as “refugees”. The policy was in force until 1999 under the charge of the Council.

Spatial dispersal was a two-stage process. At the country level, the Council tried to allocate an equal number of refugees to counties relative to the number of inhabitants.⁶ Within counties, the Council aimed at attaining an equal number of refugees relative to the number of inhabitants across municipalities (local authority districts) with suitable facilities for reception such as housing, educational institutions, employment opportunities and co-nationals.⁷ One implication of these dispersal criteria was that refugees were provided with permanent housing in cities and towns and to a lesser extent in the rural districts (Ministry of Internal Affairs 1996). Another implication was ethnic clustering; in order to facilitate local refugee reception and refugees’ well-being, the Council aimed at attainment of local ethnic clusters of 70-100 refugees of a particular descent over a three-year period.

In practice, as soon as a refugee was granted asylum, the individual was offered assistance from the Council in finding housing. Approximately 10 days later, the Council

⁵ Until June 2002, Denmark gave asylum to Convention refugees, i.e. persons who were defined as refugees according to the Geneva Convention of 1951, and to foreigners who were not defined as refugees according to the Geneva Convention, but who for similar reasons as stated in the Convention or other weighty reasons should not be required to return to the home country (‘de facto’ refugees) (Coleman and Wadensjö 1999, 249).

⁶ At the regional level, Denmark was divided into two county-municipalities and 14 counties with 324,000 inhabitants per county on average in 1993.

⁷ At the local level, Denmark was divided into 275 municipalities with 19,000 inhabitants per municipality on average.

assigned a refugee to one of 15 counties. Having been provided with temporary housing in the receiving county, local offices of the Council assisted the assigned refugees in finding permanent housing in the county. The local offices were mobile within a county. They typically stayed in the same area for about 3 years.

The take-up rate for housing assistance was extremely high. In an interview, a former placement officer at the Council⁸ says that she does not recall that any refugees rejected the offer of housing search assistance from the Council. I also compare the official figures on the number of residence permits granted to refugees⁹ with the Council's statistics on location assignment of refugees¹⁰. These suggest that over the period 1986-1997 at least 90% of refugees were provided with permanent housing under the terms of the dispersal policy.

Once settled, refugees participated in Danish language courses during an introductory period of 18 months while receiving social assistance. Refugees were urged to stay in the assigned municipality during the entire introductory period. However, there were no relocation restrictions. Refugees could move away from the municipality of assignment at any time, in so far as they could find alternative housing elsewhere. Receipt of welfare was unconditional on residing in the assigned municipality.

The dispersal policy was very successful and led to an equal distribution of refugees across counties (Damm, 2005). A figure from the Council's Annual Report in 1987 shows the distribution of refugees across municipalities (Danish Refugee Council, 1987, p. 30-31). Only two years after the introduction of the dispersal policy refugees lived in 243 out of the 275 municipalities. The number of refugees who were assigned to permanent housing between 1985 and 1987 across municipalities was 33 refugees per 10,000 inhabitants. The number of refugees per 10,000 inhabitants was twice as large as the country average in only 17 municipalities. The effect of the dispersal policy on the settlement pattern of refugees is clearly visible from Table 1 which shows the

⁸ Interview on March 7 2008 with former placement officer Bente Bondebjerg, Chief Consultant, Danish Refugee Council. Note also that the Council had a financial incentive to assist as many refugees as possible in finding housing due to economies of scale and due to receipt of a fixed governmental transfer per refugee assigned to a location.

⁹ Statistical Yearbooks (1992; 1997) and Statistical News 2000(1) on Population and Elections published by Statistics Denmark.

¹⁰ Annual Reports of the Danish Refugee Council 1986-1994 and the Council's internal administrative statistics for 1995-1998.

geographical distribution of the overall population in Denmark, refugees and non-refugee immigrants across the capital area, towns and rural areas in 1993. The geographical distribution of non-refugee immigrants differs greatly from the distribution of the overall population; 71% of non-refugee immigrants live in the capital area where 26% of the overall population live. In contrast, the geographical distribution of refugees closely resembles the distribution of the overall population. Refugees are only slightly overrepresented in the capital area.

[Insert Table 1 around here]

Were refugees randomly distributed across locations under the spatial dispersal policy? Upon asylum, refugees filled in a questionnaire from the Council with a few personal details: the individual's birth date, marital status, number of children, nationality, addresses of potential family relations and friends in Denmark.¹¹ According to interviews with two former placement officers, the Council used the information about nationality to spatially disperse refugees in ethnic clusters and considered wishes of refugees to be assigned to a location near close family members.¹² The information about household composition was used to determine whether to search for housing for a single individual or family in the municipality of assignment. Over time it became increasingly difficult for the Council to find vacant rental housing in the larger and medium-sized towns which led to later arrivals of refugees being more likely to be settled in smaller towns. Therefore, the Council's allocation may have been influenced by nationality, family size and year of immigration – characteristics on which I condition in the analysis.

Due to the way in which the dispersal policy was implemented, municipalities had little opportunity to cream-skim refugees, i.e. to ask for, say, well-educated refugees. Although the Council did not know in advance which groups of asylum seekers would next be granted asylum, it had to provide refugees with temporary housing shortly after receipt of the residence permit. This procedure left little time for negotiation between the Council and municipalities. Moreover, the Council acted as a private agent searching for housing in the local housing market on behalf of refugees who had just received a

¹¹ The question about the addresses of potential family relations replaced a question about location wishes which was asked at the beginning of the dispersal policy period. The question was replaced because the spatial dispersal criteria led to the inability of the Council to comply with location wishes.

¹² Interview on June 8 2001 with former placement officers, Bente Bondebjerg and Morten Iversen.

residence permit. The local authorities were typically not informed about the settlement of a refugee until after a refugee had been provided with housing in the municipality.

IV. Data

A. Data and Sample Selection

The empirical analysis is based on administrative records for the immigrant population in Denmark 1984-2000. Earnings data are obtained from the income tax registers, employment status from the labor force registers, demographic characteristics (country of origin, gender, age, family composition, municipality of residence, date of immigration) from the population registers, Danish education from the integrated pupil registers while education attained prior to immigration comes from a survey-based register. The individual records are linked using a unique person identifier. Real annual labor market earnings, henceforth referred to as real annual earnings, are defined as the sum of wage earnings, profits from own company and sickness benefits deflated by the consumer price index which has 1980 as its base year. An individual is regarded as being employed, if his main occupation is wage employment or self employment. Throughout I use country of origin as a proxy for ethnicity.

Local characteristics are measured at the municipality level. There are 275 municipalities and the median municipality has close to 10,000 inhabitants. I calculate the number of immigrants from a particular source country and use it to represent the size of the ethnic group in a municipality. I use population-counted data from Statistics Denmark to represent other characteristics of the municipalities, including the unemployment rate.

I identify the eleven largest refugee-sending countries in the period 1986-1993 (ranked in descending order): Lebanon, Iran, Iraq, Somalia, Sri Lanka, Vietnam, Poland, Afghanistan, Ethiopia, Rumania and Chile.¹³ I focus on the immigration cohorts during 1986-1993 because labor market outcomes seven years after immigration are not observed for later cohorts in the administrative records which are currently available. An immigrant is a refugee if he/she meets the following two criteria. First, the individual

¹³ I identify the eleven largest refugee-sending countries using official statistics from Statistics Denmark on the total number of residence permits granted to refugees between 1986 and 1993 reported in the Statistical Yearbooks (1992, 1997) and Statistical News 2000(1) on Population and Elections. Residence permits granted to refugees from the eleven refugee-sending countries constitute 94% of the total number of residence permits granted to refugees between 1986 and 1993.

immigrated from one of the eleven largest refugee-sending countries in the period 1986-1993. Second, at the time of immigration, i.e. the year of receipt of a residence permit, the individual was not married to: 1) an individual from a non-refugee-sending country or 2) an immigrant from a refugee-sending country who had immigrated at least one year earlier. The latter criterion is imposed to limit the refugee sample to refugees who were assigned to a location by the Council after receipt of asylum. Only individuals aged 18-59 at the time of immigration are included in the sample. The annual inflow of co-nationals assigned to a particular municipality is calculated from the resulting sample of 16,076 individuals. In the period 1986-1993, refugees were assigned to 248 municipalities, or 90% of municipalities.

The refugee sample used in the earnings and employment analysis is obtained after imposing a final restriction, i.e. annual observations from one year after immigration until seven years after immigration. This results in a balanced panel of 13,927 individuals of which 41% have positive annual earnings seven years after immigration.¹⁴ The subsample of refugees with positive annual earnings seven years after immigration is referred to as the earnings sample.

I identify the municipality of assignment by using the following algorithm based on information on the Council's internal administrative statistics on temporary housing. The first municipality of residence observed in the registers is defined as a municipality of temporary housing if the person relocates to another municipality within the county within one year after receipt of residence permit. This is because refugees may initially have lived in temporary housing in proximity of the municipality to which they were later assigned, on average after 6-7 months and in general after 3 months. Otherwise, the first municipality is defined as the municipality of assignment.

¹⁴ 51 individuals who were observed in the registers seven years after immigration but not annually up to that point are excluded from the sample. The number of permanent return-migrants, i.e. individuals who emigrated prior to seven years of residence in Denmark, amounts to 2,098 individuals. Results from linear regression of an indicator for having emigrated between year t and $t+7$ on a range of initial individual and location characteristics show that singles, older individuals, women and individuals without older children have the highest tendency to emigrate. The economically least successful refugees do not appear to be more likely to emigrate; the effect of real annual earnings in year $t+1$ is negative but insignificant. The estimated effects of location characteristics suggest that individuals emigrate in response to assignment to an unattractive location, i.e. a location with a relatively high unemployment rate and low inflow of assigned co-nationals.

Variable definitions and descriptive statistics are reported in Tables A.1-A.3 in the Appendix.

B. Initial Assignment and Subsequent Mobility

Following Edin et al. (2003), I measure the ethnic enclave size by the local ethnic stock of individual i which is defined as the number of co-nationals living in individual i 's municipality of residence. Hence, implicitly *ethnicity* is measured by country of origin following Borjas (1992, 1995, 1998). Co-nationals are first and second generation immigrants from individual i 's country of origin. The implicit definition of an ethnic enclave underlying the empirical analysis is the following. The individual lives in an ethnic enclave if he lives in a municipality in which the number of co-nationals exceeds a given threshold. As reported in Table A.3 in the Appendix, the mean local ethnic stock seven years after immigration is 1,010, i.e. on average individuals in the sample have 1,009 compatriots in the municipality of residence seven years after immigration.

The instrument I propose to use for the ethnic enclave size seven years after immigration is the inflow of placed co-nationals (aged 18-59) to individual i 's location of assignment since the year of implementation of the dispersal policy, i.e. 1986, until the (end of the) year of immigration of individual i .

Did the spatial dispersal provide random variation in the instrumental variable? To find out, I first divide individuals in the earnings sample into two groups: individuals who were placed in a municipality with a below/above average number of assigned co-nationals since 1986 until the year of immigration of individual i . Table 2 compares the personal characteristics of the two groups in the year of immigration. The two groups are very similar in terms of demographic characteristics and educational attainment.

[Insert Table 2 around here]

Second, for refugees in the earnings sample I regress the log of the number of assigned co-nationals since 1986 until the year of immigration of individual i linearly on education category dummies. None of the education category dummies are significant and the explained variation is virtually zero. In a second regression, I extend the set of explanatory variables with a range of demographic characteristics. The only variables which enter significantly are age, year of immigration, source country and the log of number of co-nationals in Denmark. Henceforth, I refer to the number of co-nationals of

individual i in Denmark as the ethnic stock in Denmark. Not surprisingly, there is a positive relationship between the log of ethnic stock in Denmark and the log of the number of assigned co-nationals. It suggests that refugees with a larger ethnic stock in Denmark were dispersed in larger ethnic clusters. Some ethnic groups were apparently less likely to be assigned to larger cities (e.g. Tamils) than the reference group (Iranian). Earlier cohorts of refugees are assigned to a municipality with a significantly lower number of assigned co-nationals since 1986 until the year of immigration; this captures the fact that earlier cohorts had a higher chance of being assigned to municipalities with no previous inflow of (assigned) co-nationals. I conclude that the inflow of placed co-nationals to individual i 's location of assignment since 1986 until the year of immigration of individual i is random, conditional on year of immigration, source country, age and ethnic stock in Denmark.

In the empirical analysis, I intend to exploit the within variation in the instrument, that is the variation in the local inflow of placed co-nationals that remains after inclusion of municipality of assignment fixed effects which captures the local number of inhabitants. By consequence, I propose to exploit the within variation in the local inflow of placed co-nationals *relative* to the number of inhabitants. Within variation exists in this variable because municipalities tended to receive assigned refugees from source country k over a three-year period. To assess the extent of within variation in the instrument, I calculate the number of assigned refugees from source country k from 1986 until year t per 10,000 inhabitants in the municipality for each source country. Summary statistics for the variable are reported for each source country in Table A.4 in the Appendix. For all source countries, there is less within than between variance, but for the majority of countries the ratio between within and between variance is at least 24%.

A related question is whether some individuals were more likely to realize their preferred location choice than others. I investigate this question by analyzing placed refugees' subsequent migration decision. The results from linear regression of the indicator for having moved out of the municipality of assignment on a range of individual, group and location (demographic, labor market and housing market) characteristics at the time of immigration are shown in Table 3. The effects of demographic characteristics of the individual are quite standard; men, younger

individuals and singles have a significantly higher out-migration rate, probably due to lower costs of moving. By contrast, there are no significant differences in out-migration rates between educational groups. The latter result is reassuring; it suggests that all educational groups had the same chance of realizing their preferred location choice. The characteristics of the municipality of assignment had a substantial influence on the migration decision. For the full sample, the explanatory power increases from 6.2% to 18.1% after inclusion of location characteristics. In particular, the migration probability decreases with the local inflow of assigned co-nationals. This result suggests that placed refugees derive high utility from living in the same location as co-nationals, which is consistent with the ethnic network hypothesis by Piore (1979) and Kobrin and Speare (1983) and the ethnic goods hypothesis by Chiswick and Miller (2005). Movers also seem to escape municipalities with a relatively small number of inhabitants, a high unemployment rate and lack of social housing.

[Insert Table 3 around here]

Further descriptive evidence reveals that after the relocation movers are overrepresented in municipalities with a large local population and a large local ethnic stock and in municipalities in which immigrants constitute a large share of the local population.

Another important issue is whether the local inflow of assigned co-nationals by the end of the year of immigration of individual i should be expected to be a strong predictor of the ethnic stock in the location of residence seven years after immigration. This depends on the extent of subsequent out-migration from the municipality of assignment. Since almost half of the sample (48%) stayed in the assigned municipality, I expect the instrument to have a strong predictive power in the first stage regressions.

V. Model and Empirical Estimates of Effects of Living in an Ethnic Enclave

A. Model

I focus on real annual earnings seven years after immigration, at which time individuals are recent immigrants but have had time for establishment of social networks in the host country and for acquisition of basic skills necessary for job search in the host country.

I employ the following baseline specification:

(1)

$$y_{ijk(t+7)} = \alpha \ln e_{jk(t+7)} + \beta' X_{ikt} + \delta_{j*} + \delta_k + \delta_t + \varepsilon_{ijk(t+7)}$$

where i indexes individuals, j municipalities, k countries of origin and t years of immigration. The parameter of interest is α which measures the average effect of the logarithmic value of the ethnic stock in municipality j at time $t+7$ ($e_{jk(t+7)}$) on real annual earnings in year $t+7$ of individual i living in municipality j from country of origin k ($y_{ijk(t+7)}$). α is obtained by regressing y on e , fixed-effects for j , k and t and a set of controls for observed personal and ethnic group characteristics in year t .¹⁵

The estimate of α based on Equation (1) may still suffer from omitted variables bias. Individuals choose where to live in year $t+7$, i.e. the ethnic enclave size. Individuals with certain unobserved characteristics, e.g. poor abilities or lack of ambitions about socio-economic assimilation in the host country, may therefore be overrepresented in large ethnic enclaves. I account for potential sorting into ethnic enclaves by using instrumental variables methods. The instrument I use for ethnic enclave size in year $t+7$ is the *inflow* of placed co-nationals (aged 18-59) to individual i 's location of assignment since the year of implementation of the dispersal policy until (the end of) year t . The identifying assumption is that the local inflow of assigned co-nationals is random, conditional on age, year of immigration, source country and ethnic stock in Denmark. Evidence in support of this assumption was presented in Sections III and IV.¹⁶

The instrument has the advantage relative to the instrument used by Edin et al. (2003) of being robust to differential sorting of ethnic groups into locations, i.e. that ethnic groups relocate into different locations after initial assignment based on potential group-specific earnings returns to residence in a given local labor market. In case of differential sorting of ethnic groups into locations, the local ethnic stock in year t may not be the result of random assignment of refugees under the dispersal policy. If co-nationals who

¹⁵ Administrative records are missing in year t for 14.7% of the individuals. For these individuals the vector of personal characteristics other than educational attainment refers to year $t+1$. The only exception is educational attainment which refers to year $t+7$ because educational attainment is 'only' missing for 27.4% in year $t+7$ as opposed to 34% in year $t+1$.

¹⁶ The consistency of the earnings result rests on the assumption of no sample selection into the labor force in year $t+7$. To test for and take account of potential sample selection, we need an instrument for labor force participation, i.e. one or more variables that affect the labor force participation decision but not annual earnings. Unfortunately, I have not been able to find such an instrument.

immigrated before the implementation of the dispersal policy settled primarily in areas with relatively favorable group-specific earnings opportunities or if earlier cohorts of assigned co-nationals have subsequently relocated to areas with relatively favorable group-specific earnings opportunities, a relatively large local ethnic stock in year t partly reflects presence of favorable ethnic group-specific earnings opportunities in the past. Therefore, if one estimates the effect of ethnic enclave size on annual earnings according to Equation (1) using the local ethnic *stock* in year t as an instrument for the local ethnic stock in year $t+7$ and finds a positive IV-estimate of the ethnic enclave size on annual earnings, this may not be evidence of a positive causal effect of ethnic enclave size on annual earnings, but evidence that earlier cohorts of co-nationals have settled in areas with favorable ethnic group-specific earnings opportunities.¹⁷

B. Baseline Estimates

The first-stage equations in the IV (2SLS) procedure amount to regressing the log of the local ethnic stock in year $t+7$ on the instrument, the log of the local inflow of assigned co-nationals since 1986 until the end of year t , and on individual, group and location characteristics in year t . The first stage regression estimates are reported in Table 4. The log of local inflow of assigned co-nationals enters the equations with a coefficient of .273 to .308, depending on the skill-group. The instrument has a strong predictive power. The null-hypothesis of a zero effect of the identifying variable is rejected at a 1% significance level for all samples. The t -values range from 7.54 to 2.90. The partial R^2 values which show how much inclusion of the identifying variable improves R^2 of the first stage regression are just above 0.01.

[Insert Tables 4 and 5 around here]

Table 5 reports the estimation results of the earnings model given by Equation (1). Columns (1), (3) and (5) report OLS-estimates of the model whereas columns (2), (4) and (6) give the results of the IV-procedure. According to the OLS-estimate for the full earnings sample (column 1), controlling for other observed characteristics of the individual and for three types of fixed effects, the log of the local ethnic stock in year $t+7$

¹⁷ In case of differential sorting of ethnic groups into locations, the initial local ethnic stock would only be a valid instrument for future ethnic group size if interaction terms between municipality of assignment fixed effects and ethnic group fixed effects were included as controls in Equation (1). In the present study that would reduce the degrees of freedom by 2,673, i.e. 243 municipality of assignment indicator variables times eleven ethnic group indicator variables.

on average has a significantly negative effect on earnings. The t-test for weak exogeneity of the local ethnic stock in year $t+7$ is rejected at a 1% significance level. The negative sign of the estimate of the predicted residual from the first stage regression suggests that individuals with relatively unfavorable personal characteristics sort into ethnic enclaves. As a result, the OLS-estimate of the earnings effect of the local ethnic stock is downward biased. In contrast, the IV-procedure should produce consistent estimates. The IV-estimate of the local ethnic stock on earnings reported for the full earnings sample in column (2) is striking; it is positive and significant, indicating that residence in an ethnic enclave increases annual earnings of refugees.

To interpret the economic significance of the estimate, I calculate the effect of a standard deviation (1,176) increase in the local ethnic stock relative to its mean of 1,010 co-nationals. Such a relative standard deviation increase corresponds to a 116% increase of the local ethnic stock and to a log increase of 0.77. As a result, a relative standard deviation increase in the local ethnic stock seven years after immigration on average increases log earnings by $(0.77*0.216=)$ 0.17, corresponding to a 18% earnings increase.

The finding of negative self-selection into ethnic enclaves is supported by the descriptive evidence on out-migration from the municipality of assignment shown in column 3 in Table 3. Controlling for educational attainment in year $t+7$, demographic, group and location characteristics in year t , individuals with lower annual earnings in year $t+7$ are significantly more likely to have left the municipality of assignment during the first seven years after immigration. A relative standard deviation decrease in real annual earnings is associated with a 1.3 percentage point increase in the out-migration probability.

To explore differences in the return to living in an ethnic enclave across skill-groups, I divide the sample into two sub-samples, for low-educated and high-educated individuals, respectively. Low-educated individuals are individuals with at most an upper-secondary education, i.e. completed less than 13 years of education. High-educated individuals are individuals with a tertiary education, i.e. completed at least thirteen years of education. The OLS- and IV-estimates for the sub-sample of low-educated are given in columns (3) and (4), respectively. The corresponding estimates for high-educated refugees are reported in columns (5) and (6). On average, the local ethnic stock in year

$t+7$ has a significant negative effect on earnings for both sub-samples. That is, according to the OLS-estimates, current residence in an ethnic enclave decreases earnings of refugees, irrespective of educational level. Separate IV-estimations for low- and high-skilled yields estimates of virtually the same magnitude as for the overall sample. I therefore conclude that the earnings return to living in an ethnic enclave is positive and does not vary across educational groups.

The return to living in an ethnic enclave may also vary across gender. However, separate estimations of the model given by Equation (1) for men and women show no significant difference in the return to living in an ethnic enclave.

Finally, the return to living in an ethnic enclave may vary across ethnic groups. I estimate the model given by Equation (1) separately for refugees from each of the four regions of origin: Europe, Africa, the Middle East and Asia. The IV-estimate is positive for all regions except Africa.

As a specification check, I check whether the return to ethnic enclave size is non-linear. I include the squared value of the local ethnic stock in year $t+7$ in Equation (1) and use the squared value of the local inflow of assigned co-nationals since 1986 until year t as an additional identifying variable in the first stage regression of 2SLS. The IV-estimate of the effect of the local ethnic stock in year $t+7$ remains strongly significant and positive after inclusion of the squared value. The IV-estimate of the effect of the squared value of the local ethnic stock in year $t+7$ is negative and strongly significant. This suggests that the return to ethnic enclave size increases with ethnic size but at a decreasing rate.¹⁸

VI. Empirical Investigation of Possible Mechanisms

The empirical analysis presented in Section V shows that living in an ethnic enclave increases annual earnings of refugees seven years after immigration. This result suggests that the potential negative effect of living in an ethnic enclave due to a reduced rate of acquisition of host-country-specific human capital is more than outweighed by a positive effect. Part of the reason may be that the earnings return to host-country language skills is relatively low within the ethnic enclave. A positive earnings return to living in an ethnic

¹⁸ The IV-estimate of the coefficients (std. error) of the log of the local ethnic stock and its squared value are 1.707 (.556) and -.150 (.050), respectively. According to this specification, a relative standard deviation increase in ethnic enclave size (measured around the sample means of the distribution) increases annual earnings by 23%.

enclave can be explained by the ethnic goods consumption hypothesis or, alternatively by spillover of information and/or norms within the ethnic network which promote earnings of enclave members. The goal of this section is to investigate the empirical importance of these two potential explanations for the finding of a positive net effect.

For the positive earnings return to be consistent with the ethnic goods consumption hypothesis, the negative enclave effect on the hourly (reservation) wage must be dominated by a positive enclave effect on annual hours worked. In addition, due to the decrease in the hourly reservation wage we should expect to find a positive enclave effect on the employment probability.

The administrative registers enable me to estimate the effect of enclave size on the employment probability and on the probability of working full-time in year $t+7$. OLS- and IV- (2SLS) estimates of the effect of the log of the local ethnic stock on i) the employment probability in year $t+7$ and ii) the probability of full-time work in year $t+7$ (conditional on being a wage earner) are reported in Tables 6 and 7, respectively.¹⁹ I use the same set of controls as in Equation (1) and the same instrument as in the earnings analysis in Section V.²⁰ By contrast, the administrative registers do not contain information on the hourly wage and annual hours worked.

[Insert Table 6 around here]

According to the OLS-estimates in column (1) of Table 6, the ethnic enclave size has a negative and significant effect on the employment probability in year $t+7$, irrespective of skill level. Comparison with the IV-estimates in column (2) shows that the OLS-estimate is downward biased for low-educated individuals due to negative self-selection into ethnic enclaves but consistent for high-educated individuals due to absence of sorting. Taking account of sorting, the ethnic enclave size has a positive, but insignificant effect on the employment probability of low-educated individuals. For high-educated

¹⁹ I treat the models as linear probability models in order to facilitate interpretation of the estimates. Probit and AGLS yield similar estimates.

²⁰ Descriptive evidence suggests that the overall sample of refugees were initially randomly distributed across locations; in particular, there are no significant differences in educational attainment of refugees assigned to a municipality with below/above average local inflow of assigned co-nationals. The instrument has a strong predictive power. The log of local inflow of assigned co-nationals enters the first stage regressions with a coefficient of .274 to .321, depending on the skill group. The null-hypothesis of a zero effect of the identifying variable is rejected at a 1% significance level for all samples. The t -values range from 5.04 to 9.54.

individuals, one relative standard deviation increase in ethnic enclave size decreases the employment probability by $(0.77*0.027)$ 0.021, i.e. 2.1 percentage points.²¹

Wage-earners are obliged to contribute to a supplementary pension scheme, ATP, as an increasing function of the annual hours worked.²² On the basis of the annual ATP-contribution, I can therefore construct an indicator for full-time work for wage-earners. Full-time work is defined as working on average at least 27 hours per week during the year. It is seen from Table 7 that OLS and IV both yield negative estimates of the effect of ethnic enclave size on the probability of full-time work in year $t+7$, but the IV-estimate is only significant for high-educated wage-earners for whom a relative standard deviation increase in the local ethnic stock reduces the probability of working full-time by 16%.

[Insert Table 7 around here]

The finding of zero (negative) effect of the ethnic enclave size on the probability of working full-time suggests that the ethnic enclave size has zero (negative) effect on the annual hours worked. The implication is that the ethnic enclave size increases annual earnings by increasing the hourly wage rate rather than by increasing annual hours worked. A positive effect of ethnic enclave size on the hourly wage is difficult to reconcile with the ethnic goods consumption hypothesis. So is the negative enclave effect on the employment probability for high-skilled.

Can the results then be explained by spillover of information or norms within the ethnic network? In my view, they cannot be easily explained by norms spillover. In particular, for high-skilled one can rule out spillover of norms which endorse self-sufficiency, because it would increase the job search effort and thereby the employment probability contradicting my findings. By contrast, the results are consistent with information spillover within the ethnic network which increases the job-worker match quality and thereby hourly wages.

If the results are due to such information spillover within the ethnic network, we should expect the following. First, enclave members should gain more from interaction with high-ability and employed workers than low-ability and unemployed workers (see

²¹ Further IV-estimates shown in Table 6 suggest that living in an ethnic enclave worsens the wage-employment chances of high-educated individuals.

²² Zero ATP-contribution if 0-8 weekly hours, 1/3 of the full ATP-contribution if 9-17 weekly hours, 2/3 of the full ATP-contribution if 18-26 weekly hours and the full ATP-contribution (DKK 1,166.40) if 27 weekly hours or more.

e.g. Montgomery 1991; Topa 2001; Calvo-Armengol and Jackson 2002), i.e. the earnings return to living in an ethnic enclave should increase with enclave quality. Second, a considerable share of the refugees should have found their current job through their ethnic network.

I examine whether the earnings return to living in an ethnic enclave does in fact increase with enclave quality along the lines of Bertrand et al. (2000) and Edin et al. (2003). I include an interaction between enclave quality and the log of the local ethnic stock in year $t+7$ in Equation (1). The main effect of enclave quality is not identified separately from the country of origin fixed effects. I use four different measures of enclave quality in 1985, i.e. the year prior to the implementation of the spatial dispersal policy: i) mean annual earnings of the ethnic group, ii) the share of self-employed in the ethnic group, iii) the share of the ethnic group with upper-secondary or tertiary education, i.e. at least 10 years of education and iv) the share of the ethnic group with tertiary education.

[Insert Table 8 around here]

IV-estimates of the main effect of the log of the local ethnic stock in year $t+7$ and the interaction between this variable and enclave quality are reported in Table 8. The instrument for the log of the local ethnic stock in year $t+7$ is the same as in the baseline earnings model, the log of the local inflow of assigned co-nationals. As instrument for the interaction term I use the interaction between quality and the log of the local inflow of assigned co-nationals. The estimated main effect remains positive, but decreases in magnitude and turns insignificant after inclusion of the interaction term. The estimated interaction effects are all positive, but only significant when enclave quality is measured as mean annual earnings of the ethnic group or the share of the ethnic group with upper-secondary or tertiary education. The results provide weak evidence that the return to living in an ethnic enclave increases with enclave quality.²³

Finally, I would like to know the share of employed refugees which has obtained the job through their ethnic network. No precise information exists on the job search channels used to find a job for individuals in the refugee sample. However, the

²³ Evaluated at the sample means of the ethnic group share with upper-secondary or tertiary education, the overall effect of a relative standard deviation increase in the local ethnic stock on earnings is 17%.

administrative registers enable me to calculate the share of private-sector refugee workers who have at least one co-ethnic colleague.²⁴ Refugees who have at least one co-ethnic colleague may potentially have obtained the job through their ethnic network. The first panel of Table 9 shows the distribution of the number of co-nationals at the workplace in year $t+7$ for private-sector refugee workers in the refugee sample.²⁵ 54% of private-sector refugee workers have at least one co-ethnic colleague at the workplace, 36% have at least two co-ethnic colleagues and 16% have at least five co-ethnic colleagues.

[Insert Table 9 around here]

If refugees primarily learn about relevant job vacancies from relatively high-skilled co-ethnic workers, the figures reported in the second and third panels of Table 9 are more relevant than the figures in the first panel. According to the second and third panels, seven years after immigration 27% of low-educated private-sector refugee workers had at least one co-ethnic colleague with upper-secondary or tertiary education and 23% of high-educated private-sector refugee workers had at least one high-educated co-ethnic colleague. These figures render probable that a considerable share of refugees have found their job through their ethnic network. In a Danish immigrant survey conducted in 1999 among 3,616 immigrants from the eight largest source countries, including six refugee-sending countries, 23% of employed immigrants had found their current job through the informal network (friends, relatives and acquaintances) (Schultz-Nielsen 2000).

Overall, the results presented in this section are consistent with the view that the ethnic network passes on information about job vacancies which increases the job-worker match quality and thereby the hourly wage rate.

VII. Conclusion

Estimates based on the Danish spatial dispersal policy on refugees 1986-1998 indicate that seven years after immigration refugees who lived in an ethnic enclave earned

²⁴ I link administrative records on the workplace in Nov., available for the full population of private-sector workers in Denmark in the period 1995-2000, with the population registers in the period 1995-2000. Next, I calculate the number of employees who are immigrants or descendants from source country k . Finally, I link this workplace information with the refugee sample and obtain the number of co-nationals at the workplace in year $t+7$ as the number of immigrants and descendants from individual i 's source country at individual i 's workplace minus 1.

²⁵ Workplace information is available for individuals in the refugee sample who got asylum in the period 1988-1993 and who worked in the private sector in Nov. seven years after immigration. 3,319 individuals of the 1988-1993 cohorts in the refugee sample were employed in year $t+7$. Workplace information exists for 1,185 of these individuals.

substantially more than non-enclave members. A relative standard deviation increase in the local ethnic stock on average increases annual earnings by 18%, irrespective of skill level. Edin et al. (2003) report a similar estimate of the enclave effect on annual earnings for low-skilled as this study, but find a negative and insignificant effect for high-skilled refugees.

This finding of a positive earnings return to ethnic enclave size suggests that the potential negative effect of living in an ethnic enclave on the rate of acquisition of host-country-specific human capital is more than outweighed by a positive effect.

Investigation of theoretical explanations for the positive net effect of ethnic enclave size on annual earnings of refugees reveals the following. First, one relative standard deviation increase in the ethnic enclave size decreases the employment probability of high-skilled individuals by 2.1 percentage points and decreases the probability of working full-time by 16% for high-skilled wage-earners. The ethnic enclave size does neither affect the employment probability of low-skilled individuals nor the probability of working full-time of low-skilled wage-earners. These skill-group differences in the return to living in an ethnic enclave may help explain the finding by LaLonde and Topel (1997) and Borjas (1998) that low-skilled immigrants have a higher tendency to live in ethnic enclaves than high-skilled immigrants. The absence of a positive effect on working hours suggests that the ethnic enclave size increases annual earnings of wage-earners by increasing the hourly wage rate rather than by increasing annual hours worked. A positive effect of enclave size on the hourly wage rate and the negative enclave effect on the employment probability for the high-skill group are difficult to reconcile with the ethnic goods consumption hypothesis but are consistent with spillover of information within the ethnic network which increases the job-worker match quality and thereby the wage rate. Also in line with favorable information spillover within the ethnic network, I find weak evidence that the return to living in an ethnic enclave increases with the quality of the ethnic enclave, in particular with mean annual earnings in the ethnic enclave and the share of enclave members who have upper-secondary or tertiary education. Finally, descriptive evidence on the distribution of the number of co-ethnic workers at the workplace for private-sector refugee workers renders probable that a substantial share of private-sector refugee workers have found their current job through their ethnic network.

Overall, the findings of the study are consistent with the hypothesis that the ethnic network passes on valuable information which increases annual earnings by increasing the job-worker match quality and thereby the hourly wage rate, irrespective of skill level.

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Appendix

[Insert Tables A.1-A.4 around here]

Table 1
Geographical Distribution in 1993

	Total population	Refugees	Non-refugee immigrants
		Per cent	
Capital and its suburbs	26	33	71
Towns	59	56	24
Rural areas	15	11	5

Source: The Danish Refugee Council (1993).

Table 2
 Summary Statistics for Refugees with Positive Earnings Seven Years after Immigration:
 Means and Standard Deviations (Parentheses).

	ln(local inflow of assigned co-nationals)		t-test of difference in means
	Below average	Above average	
Education missing and < 10 years	.47 (.50)	.47 (.50)	1.00
High school	.39 (.49)	.40 (.49)	1.39
University	.13 (.34)	.13 (.33)	.56
Female	.24 (.43)	.21 (.41)	3.37
Age	26.43 (6.36)	26.10 (6.19)	2.98
Number of children	.71 (1.17)	.61 (1.12)	5.08
Married	.35 (.48)	.31 (.46)	5.20
Number of observations	2,631	3,016	

Variables refer to the values in year t , where t is the year of immigration. Mean (standard deviation) of ln(local inflow of assigned co-nationals): 3.45 (1.41).

Table 3
 Estimates. Dependent Variable: Indicator for having moved out of the assigned municipality between year t and $t+7$.

	All		Positive earnings in $t+7$			
	(1)		(2)		(3)	
	OLS		OLS		OLS	
Individual and group characteristics in year $t+7$:						
Education missing and < 10 years					Ref.	
High school					.001	(.014)
University ≤ 2 years					.007	(.024)
University > 2 years					.049**	(.025)
ln(real annual earnings)					-.013***	(.004)
Individual and group characteristics in year t :						
Education missing and < 10 years		Ref.		Ref.		
High school					.003	(.014)
University ≤ 2 years					-.009	(.027)
University > 2 years					.032	(.027)
Female					-.030***	(.009)
Age					-.005***	(.001)
Married					-.090***	(.013)
Young child (0-2 years)					-.004	(.012)
Old child (3-17 years)					-.036***	(.012)
ln(ethnic stock in DK)					-.057**	(.023)
Immigration year dummies		Yes		Yes		Yes
Country of origin dummies		Yes		Yes		Yes
Municipality of assignment characteristics in year t :						
Large		Ref.		Ref.		Ref.
Medium					.252***	(.021)
Small					.340***	(.031)
ln(immigrant stock)					-.003	(.008)
ln(inflow of assigned co-nationals)					-.044***	(.004)
Unemployment rate					.008***	(.003)
% right-wing votes					.000	(.001)
No. of educ. institutions					.003**	(.001)
% social housing					-.007***	(.001)
R ²		.181		.159		.160
Number of observations		13,927		5,647		5,647

The regressions use the linear probability model. Number of movers in full sample: 7,266. Number of movers in earnings sample: 2,953. Standard errors are in parentheses. One, two and three asterisks indicate significance at a 10, 5 and 1% significance level, respectively.

Table 4
First Stage Earnings Regression Estimates of 2SLS.
Dependent Variable: $\ln(\text{local ethnic stock})$.

	Full sample	Low education (12 years or less)	High education (more than 12 years)
	(1) OLS	(2) OLS	(3) OLS
$\ln(\text{local inflow of assigned co-nationals})$.306*** (.041)	.308*** (.042)	.273*** (.094)
Female	.051 (.073)	.021 (.076)	.217 (.132)
Age	.004 (.012)	-.002 (.023)	-.026 (.055)
Age squared	.022 (.021)	-.010 (.039)	.028 (.083)
Married	-.023** (.088)	-.161 (.102)	-.231 (.225)
Married*female	.045 (.122)	-.003 (.136)	-.059 (.288)
Young child (0-2 years)	.005 (.085)	.020 (.100)	-.033 (.196)
Young child*female	-.014 (.095)	.020 (.110)	-.051 (.270)
Old child (3-17 years)	.065 (.093)	-.025 (.106)	.232 (.215)
Old child*female	-.193* (.109)	-.122 (.120)	-.169 (.286)
Education missing and < 10 years	Ref.	Ref.	
High school	.038 (.038)	.044 (.038)	
University ≤ 2 years	.033 (.076)		Ref.
University >2 years	.007 (.084)		-.169 (.286)
$\ln(\text{ethnic stock in DK})$.456*** (.143)	.452*** (.150)	.498 (.419)
Immigration year dummies	Yes	Yes	Yes
Country of origin dummies	Yes	Yes	Yes
Municipality of assignment dummies	Yes	Yes	Yes
R ²	.379	.397	.469
No. of individuals	5,647	4,745	902

Explanatory variables refer to the values in year t , where t is the year of immigration. Standard errors, reported in parentheses, are corrected for heteroskedasticity and clustering of the residuals by municipality of assignment and year of immigration. One, two and three asterisks indicate significance at a 10, 5 and 1% significance level, respectively.

Table 5
Baseline Estimates. Dependent Variable: ln(Earnings).

	Full sample		Low education (12 years or less)		High education (more than 12 years)	
	(1) OLS	(2) IV	(3) OLS	(4) IV	(5) OLS	(6) IV
ln(local ethnic stock)	-.066*** (.015)	.216** (.112)	-.052*** (.017)	.224* (.118)	-.132*** (.037)	.213 (.332)
Female	-.297*** (.080)	-.311*** (.082)	-.345*** (.088)	-.350** (.090)	.099 (.220)	.026 (.262)
Age	.042* (.025)	.042* (.026)	.039 (.028)	.041 (.029)	.090 (.067)	.101 (.070)
Age squared	-.062 (.043)	-.058 (.045)	-.058 (.050)	-.058 (.051)	-.142 (.107)	-.156 (.110)
Married	-.000 (.095)	.049 (.100)	-.067 (.107)	-.034 (.112)	.369* (.218)	.438* (.248)
Married*female	.106 (.120)	.102 (.127)	.215 (.140)	.225 (.147)	-.461 (.300)	-.456 (.330)
Young child (0-2 years)	-.140* (.089)	-.141 (.091)	-.071 (.106)	-.070 (.108)	-.359* (.198)	-.351* (.215)
Young child*female	.216* (.120)	.214* (.122)	.152** (.136)	.138 (.114)	.368 (.103)	.390 (.324)
Old child (3-17 years)	.066 (.098)	.052 (.100)	.127 (.113)	.138 (.114)	-.081 (.192)	.158 (.224)
Old child*female	-.770 (.122)	-.032 (.129)	-.108 (.149)	-.083 (.152)	-.102 (.248)	-.041 (.287)
Educ. missing and < 10 years	Ref.	Ref.	Ref.	Ref.		
High school	.097** (.047)	.088* (.048)	.108** (.047)	.098** (.049)		
University ≤2 years	.106 (.078)	.101 (.086)			Ref.	Ref.
University >2 years	.282*** (.081)	.286*** (.086)			.143 (.099)	.146 (.108)
ln(ethnic stock in DK)	-.363*** (.139)	-.539*** (.165)	-.416*** (.152)	-.588*** (.176)	-.123 (.372)	-.350 (.471)
Immigration year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country of origin dummies	Yes	Yes	Yes	Yes	Yes	Yes
Municipality of assignment dummies	Yes	Yes	Yes	Yes	Yes	Yes
R ²	.093	.025	.098	.035	.270	.182
No. of individuals	5,647		4,745		902	

Explanatory variables refer to the values in year t , where t is the year of immigration. The instrument for the log of the local ethnic stock in year $t+7$ is the log of the inflow of assigned co-nationals to individual i 's municipality of assignment since 1986 until the end of year t . Standard errors, reported in parentheses, are corrected for heteroskedasticity and clustering of the residuals by municipality of assignment and year of

immigration. One, two and three asterisks indicate significance at a 10, 5 and 1% significance level, respectively.

Table 6
Marginal Effect of ln(Local Ethnic Stock) on Pr(Employed), Pr(Wage-Earner) and Pr(Self-Employed) in year $t+7$.

Sample	Dependent variable					
	Pr(employed)		Pr(wage-earner)		Pr(self-employed)	
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	OLS	IV	OLS	IV
Full	-.022*** (.003)	.025 (.023)	-.023*** (.003)	.018 (.023)	.001 (.002)	.008 (.011)
Low-educated	-.021*** (.003)	.036 (.025)	-.021*** (.003)	.031 (.024)	.000 (.002)	.005 (.012)
High-educated	-.027*** (.007)	-.027 (.057)	-.031*** (.008)	-.065 (.057)	.004 (.005)	.038 (.033)

Number of observations: 13,927 of which 5,639 are employed, 4,666 wage-earners and 973 self-employed workers in year $t+7$. Same controls as in Table 6. The instrument for the log of the local ethnic stock in year $t+7$ is the log of the inflow of assigned co-nationals to individual i 's municipality of assignment since 1986 until the end of year t . The regressions use the linear probability model. Standard errors, reported in parentheses, are corrected for heteroskedasticity and clustering of the residuals by municipality of assignment and year of immigration. One, two and three asterisks indicate significance at a 10, 5 and 1% significance level, respectively.

Table 7
Marginal Effect of ln(Local Ethnic Stock) on Pr(Full-Time Work) in year $t+7$. Wage-Earners only.

	Full sample		Low-educated		High-educated	
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	OLS	IV	OLS	IV
ln(local ethnic stock)	-.017 (.005)***	-.045 (.028)	-.017 (.006)***	-.030 (.031)	-.005 (.018)	-.206 (.120)*
R ²	.106	.098	.111	.110	.236	.048
No. of individuals	4,666		3,950		716	

Same controls as in Table 6. The share of wage-earners who work full-time, i.e. on average at least 27 hours per week during the year, is 23.47% for the full sample, 22.81% for low-educated wage-earners and 27.09% for high-educated wage-earners. The instrument for the log of the local ethnic stock in year $t+7$ is the log of the inflow of assigned co-nationals to individual i 's municipality of assignment since 1986 until the end of year t . The regressions use the linear probability model. Standard errors, reported in parentheses, are corrected for heteroskedasticity and clustering of the residuals by municipality of assignment and year of immigration. One, two and three asterisks indicate significance at a 10, 5 and 1% significance level, respectively.

Table 8
The “Quality” of Enclaves. Dependent Variable: ln(Earnings).

	Full sample				Low education (12 years or less)				High education (more than 12 years)			
	(1) IV	(2) IV	(3) IV	(4) IV	(5) IV	(6) IV	(7) IV	(8) IV	(9) IV	(10) IV	(11) IV	(12) IV
ln(local ethnic stock)	.07 (.15)	.13 (.15)	.06 (.17)	.11 (.15)	.06 (.16)	.18 (.16)	.05 (.19)	.14 (.16)	.26 (.45)	.10 (.42)	.26 (.48)	.08 (.43)
ln(local ethnic stock) *ethnic earnings (*10 ⁻⁴)	.07** (.03)				.08* (.04)				-.02 (.08)			
ln(local ethnic stock) *ethnic self- employment rate		2.67 (2.28)				1.49 (2.60)				3.62 (5.36)		
ln(local ethnic stock) *ethnic group share with at least 10 years of education			.55* (.33)				.61 (.40)				-.15 (.75)	
ln(local ethnic stock)* ethnic group share with at least 13 years of education				1.32 (.97)				1.10 (1.13)				1.21 (1.83)
R ²	.026	.022	.033	.028	.032	.033	.042	.035	.176	.182	.175	.199
No. of individuals		5,647				4,745				902		

Same controls as in Table 6. The instrument for the log of the local ethnic stock in year $t+7$ is the log of the inflow of assigned co-nationals to individual i 's municipality of assignment since 1986 until the end of year t . The instrument for the interaction between quality and the log of the local ethnic stock in year $t+7$ is the interaction between quality and the log of the inflow of assigned co-nationals to individual i 's municipality of assignment since 1986 until the end of year t . Standard errors, reported in parentheses, are corrected for heteroskedasticity and clustering of the residuals by municipality of assignment and year of immigration. One, two and three asterisks indicate significance at a 10, 5 and 1% significance level, respectively.

Table 9
Distribution of the Number of Co-nationals at the Workplace in year $t+7$.

	Number of employed individuals	Number of co-nationals at work place					
		0	1	2-4	5-9	10-29	30 or more
		%					
Low-educated	989	43.78	18.81	19.92	7.99	5.56	3.94
High-educated	196	54.59	16.33	18.88	3.57	3.06	3.57
All	1,185	45.57	18.40	19.75	7.26	5.15	3.88

	Number of employed individuals	Number of co-nationals with at least 10 years of education at workplace					
		0	1	2-4	5-9	10-29	30 or more
		%					
Low-educated	989	73.31	9.91	10.41	2.12	4.15	0.10

	Number of employed individuals	Number of co-nationals with at least 13 years of education at workplace					
		0	1	2-4	5-9	10-29	30 or more
		%					
High-educated	196	77.04	14.80	5.10	3.06	0	0

Private-sector workers in refugee sample, 1986 and 1987 cohorts excluded.

Table A.1
Variable Definitions and Primary Data Sources. Part A.

Variable	Definition	Primary data source
Individual characteristics:		
Employment status	Dummy for having one of the following types of main occupation during the year: 1) wage-earner or 2) self-employed.	Register-based labor force statistics, Statistics Denmark (DST)
Annual earnings	The sum of income from work and income from business in 1980-prices. All transfers unrelated to the employment position are excluded.	Income tax registers, DST
Female	Dummy for sex.	Population register, DST.
Age	Age.	Population register, DST.
Married	Dummy for being married.	Population register, DST.
Young child	Dummy for presence of children between 0 and 2 years of age in the household.	Population register, DST.
Old child	Dummy for presence of children between 3 and 17 years of age in the household.	Population register, DST.
Country of origin	Dummy for immigrant source country.	Population register, DST.
Immigration year	Dummy for first year of receipt of residence permit.	Population register, DST.
Basic schooling	Dummy for 0-9 years of education constructed from an education code of highest degree attained.	Survey-based register on immigrants' education level attained prior to immigration and integrated pupil register, DST.
High school	Dummy for 10-12 years of education constructed from an education code of highest degree attained.	Survey-based register on immigrants' education level attained prior to immigration and integrated pupil register, DST.
University	Dummy for 13 or more years of education constructed from an education code of highest degree attained.	Survey-based register on immigrants' education level attained prior to immigration and integrated pupil register, DST.
Unknown education	Dummy for lack of information on highest degree attained.	Survey-based register on immigrants' education level attained prior to immigration and integrated pupil register, DST.
Group characteristics:		
Ethnic stock in DK	Number of immigrants and descendants from source country k in Denmark.	Population register, DST. Author's calculations based on the 100 percent sample of immigrants.
Local ethnic stock	Number of immigrants and descendants of immigrants from source country k residing in municipality j .	Population register, DST. Author's calculations based on the 100 percent sample of immigrants.
Local inflow of assigned co-nationals	Sum of the number of immigrants from source country k assigned to municipality j by the authorities since 1986 until (the end of) year t , where t refers to the year of immigration of individual i .	Population register, DST. Author's calculations based on the 100 percent sample of immigrants.

Table A.1
Variable Definitions and Primary Data Sources. Part B.

Variable	Definition	Primary data source
Group characteristics:		
Ethnic earnings	Mean real annual earnings in 1985 (including zeros and in 1980-prices) of immigrants and descendants aged 18-59 from source county k .	Income tax registers linked with population statistics, DST. Author's calculations.
Ethnic self-employment rate	Share of immigrants and descendants aged 18-59 from source country k with main occupation as self-employed in 1985.	Register-based labor force statistics linked with population statistics, DST. Author's calculations.
Ethnic group share with at least 10 years of education	Share of immigrants and descendants aged 18-59 from source country k with at least 10 (imputed) years of education in 1985.	Information on immigrants' educational attainment from surveys and the integrated pupil register linked with population statistics, DST. Author's calculations.
Ethnic group share with at least 13 years of education	Share of immigrants and descendants aged 18-59 from source country k with at least 13 (imputed) years of education in 1985.	Information on immigrants' educational attainment from surveys and the integrated pupil register linked with population statistics, DST. Author's calculations.
Municipality characteristics:		
No. of inhabitants	Number of inhabitants in municipality j .	Population statistics (population counted data), DST.
Immigrant stock	Number of immigrants and descendants of immigrants residing in municipality j .	Population register, DST. Author's calculations based on the 100 percent sample of immigrants.
Unemployment rate	The unemployment rate in a radius of DKK 60 (approx. USD 10) of transport around the largest post office in municipality j .	Unemployment register (population counted data), DST, and statistics on the cost of transport, the Ministry of Transport. Constructed by Local Government Studies.
% right-wing votes	Sum of votes for the Liberal Party and the Conservative People's Party in percent of the sum of votes for the Liberal Party, the Conservative People's Party, the Social Democratic Party and the Socialist People's Party at the latest municipal election. The two former parties are traditional right-wing parties whereas the latter two are traditional left-wing parties.	Election statistics, DST.
Number of educ. institutions	Number of institutions for vocational and higher education in municipality j .	Integrated pupil register (population counted data), DST.
% social housing	Number of social housing dwellings for all-year residence in percent of the total number of dwellings for all-year residence in municipality j .	Buildings and housing statistics (population counted data), DST.

Table A.2
Summary Statistics: Means and Standard Deviations (Parentheses). Part A.

	All	Positive earnings in $t+7$	Stayers	Movers	Permanent Return- Migrants
Individual characteristics:					
Female	.34 (.47)	.23 (.42)	.39 (.49)	.29 (.46)	.39 (.49)
Age	27.86 (7.60)	26.25 (6.27)	28.87 (8.08)	26.94 (7.00)	32.39 (13.08)
Married	.44 (.50)	.33 (.47)	.51 (.50)	.37 (.48)	.40 (.49)
Young child (0-2 years)	.24 (.43)	.15 (.35)	.24 (.43)	.19 (.39)	.13 (.33)
Old child (3-17 years)	.34 (.47)	.21 (.41)	.36 (.48)	.25 (.43)	.23 (.42)
Poland	.03 (.17)	.04 (.20)	.03 (.18)	.03 (.16)	.05 (.22)
Rumania	.02 (.12)	.03 (.16)	.02 (.14)	.01 (.11)	.01 (.10)
Ethiopia	.01 (.10)	.01 (.11)	.01 (.11)	.01 (.10)	.03 (.17)
Somalia	.06 (.24)	.06 (.23)	.06 (.23)	.07 (.25)	.06 (.23)
Chile	.002 (.04)	.002 (.05)	.002 (.04)	.002 (.04)	.003 (.06)
Afghanistan	.02 (.14)	.02 (.14)	.02 (.14)	.02 (.14)	.01 (.11)
Iraq	.16 (.37)	.14 (.35)	.15 (.35)	.17 (.38)	.12 (.32)
Iran	.20 (.40)	.22 (.41)	.18 (.39)	.22 (.42)	.24 (.43)
Lebanon	.28 (.45)	.16 (.37)	.26 (.44)	.29 (.46)	.21 (.41)
Vietnam	.10 (.29)	.11 (.31)	.14 (.34)	.06 (.24)	.11 (.32)
Sri Lanka	.13 (.33)	.22 (.41)	.14 (.35)	.12 (.32)	.15 (.36)
Immigration year 1986	.26 (.44)	.33 (.47)	.24 (.43)	.29 (.45)	.28 (.45)
Immigration year 1987	.13 (.34)	.13 (.33)	.13 (.34)	.14 (.35)	.14 (.35)
Immigration year 1988	.10 (.30)	.10 (.29)	.10 (.29)	.11 (.31)	.13 (.33)
Immigration year 1989	.12 (.32)	.10 (.30)	.12 (.32)	.12 (.33)	.11 (.32)
Immigration year 1990	.09 (.28)	.07 (.26)	.19 (.29)	.08 (.27)	.08 (.27)
Immigration year 1991	.10 (.30)	.09 (.28)	.10 (.30)	.09 (.29)	.09 (.29)
Immigration year 1992	.11 (.32)	.11 (.31)	.13 (.34)	.07 (.26)	.09 (.29)
Immigration year 1993	.09 (.28)	.09 (.28)	.10 (.30)	.07 (.26)	.08 (.28)
Basic schooling	.14 (.34)	.10 (.30)	.15 (.36)	.13 (.34)	.01 (.10)
High school	.39 (.49)	.40 (.49)	.39 (.49)	.39 (.49)	.04 (.49)
University	.13 (.34)	.13 (.34)	.13 (.34)	.13 (.34)	.01 (.11)
Unknown education	.34 (.48)	.37 (.48)	.33 (.47)	.36 (.48)	.94 (.23)

Table A.2
Summary Statistics: Means and Standard Deviations (Parentheses). Part B.

	All	Positive earnings in $t+7$	Stayers	Movers	Permanent Return-Migrants
Group characteristics:					
ln(ethnic stock in DK)	8.02 (.72)	7.99 (.72)	8.05 (.71)	7.99 (.72)	8.05 (.73)
ln(local ethnic stock)	4.81 (1.54)	4.71 (1.53)	5.32 (1.41)	4.34 (1.50)	4.77 (1.53)
ln(local inflow of assigned co-nationals)	3.45 (1.41)	3.35 (1.41)	3.84 (1.35)	3.09 (.137)	3.32 (1.46)
Municipality characteristics:					
No. of inhabitants	111,669 (136,851)	105,171 (134,241)	139,415 (138,574)	86,234 (130,168)	113,358 (141,279)
Large ($\geq 100,000$ inhabitants)	.32 (.47)	.29 (.45)	.44 (.50)	.20 (.40)	.30 (.46)
Medium (10,000- 99,999 inhabitants)	.59 (.49)	.61 (.49)	.52 (.50)	.66 (.47)	.61 (.49)
Small ($< 10,000$ inhabitants)	.09 (.29)	.10 (.30)	.04 (.19)	.15 (.35)	.09 (.28)
Immigrant stock	8,759 (15,784)	8,141 (15,522)	10,759 (16,322)	6,925 (15,044)	9,093 (16,483)
Unemployment rate	10.21 (2.40)	10.07 (2.45)	10.48 (2.34)	9.96 (2.43)	10.01 (2.43)
% right-wing votes	40.21 (12.16)	40.78 (12.36)	37.93 (10.39)	42.31 (13.25)	40.45 (12.89)
No. of educ. institutions	9.14 (10.03)	8.64 (9.83)	11.55 (10.10)	6.92 (9.44)	9.22 (10.20)
% social housing	20.35 (9.96)	19.79 (9.85)	22.53 (8.84)	18.35 (10.49)	20.51 (10.27)
Number of observations	13,927	5,647	6,661	7,266	2,098

Variables refer to the values in year t , where t is the year of immigration. “Stayers” are those who stayed on in the assigned municipality between t and $t+7$. “Movers” are those who moved between these two time points.

Table A.3
Summary Statistics for Dependent Variables and Key Explanatory Variables: Means and Standard Deviations (Parentheses).

	All	Positive earnings in $t+7$
Mean real annual earnings	20,276 (36,863)	50,774 (41,848)
Employment rate	.40 (.49)	.81 (.40)
Wage-employment rate	.33 (.47)	.70 (.46)
Self-employment rate	.07 (.25)	.10 (.30)
Mean local ethnic stock	1,010 (1,177)	825 (182)
Mean real annual earnings in 1985*	22,753 (12,548)	21,932 (13,110)
Self-employment rate in 1985*	.04 (.02)	.03 (.02)
Share with at least 10 years of education in 1985*	.26 (.12)	.26 (.13)
Share with at least 13 years of education in 1985*	.08 (.04)	.08 (.05)
Number of observations	13,927	5,647

Unless otherwise stated, variables refer to the values in year $t+7$, where t is the year of immigration. Real annual earnings (in 1980-prices) are reported in the Danish currency, Danish Kroner (DKK). In the period 1994-2000, mean real annual earnings conditional on having positive earnings of the overall Danish population aged 18-59 was 124,533 DKK for men and 84,118 DKK for women. In the same period the average employment rate of the overall Danish population aged 18-59 was 85% for men and 77% for women.

*Data source: Longitudinal administrative registers from Statistics Denmark on the immigrant population in Denmark 1985.

Table A.4
 Summary Statistics of the Local Inflow of Assigned Refugees of Descent k from 1986
 until the End of Year t per 10,000 Inhabitants: Means, Standard Deviations and Variance
 Decomposition.

	Mean	Standard deviation	Number of municipalities of assignment	Mean number of years	Within variance relative to between variance
Source country k :					
Poland (1986-1989)	1.87	1.99	100	1.58	26%
Rumania (1986-1991)	2.06	2.56	36	1.69	3%
Ethiopia (1986-1990)	1.08	.78	27	2	40%
Somalia (1989-1993)	2.88	3.64	68	2.04	55%
Chile (1986-1988)	.55	.65	10	1.50	5%
Afghanistan (1986-1993)	1.40	1.46	44	2.07	78%
Iraq (1986-1993)	4.68	4.85	135	3.01	71%
Iran (1986-1993)	7.81	7.14	144	3.41	40%
Lebanon (1986-1993)	10.19	11.40	183	3.56	10%
Sri Lanka (1986-1993)	10.80	10.73	145	2.45	9%
Vietnam (1986-1993)	6.84	9.93	66	3.32	24%

Year t refers to the years 1986-1993. The years in parentheses in column 1 refer to the period (within the observation period) during which source country k was a refugee-sending country.