INTERNAL MIGRATION AND INCOME OF IMMIGRANT FAMILIES

by

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Abstract

Using a longitudinal dataset from the years 1995 and 2000, respectively, this study examines whether migration within the host country of Sweden generates higher total annual income for (two-earner) immigrant families. The empirical findings indicate that internal migration generates a positive outcome in terms of higher family income for newly arrived refugee-immigrant families. Further, with the length of residence in the host country, the monetary gain accruing from internal migration decreases. On the other hand, I could not find similar results for immigrant families from the Nordic countries, Europe and Asia.

Keywords: Internal migration; family income; immigrant, family migration

JEL classification: C33; J61; R23

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1 INTRODUCTION

This study deals with the economic outcome of internal migration among immigrant families in Sweden. Previous studies on the labor market performance of immigrants indicate that immigrants' income/earnings grow with increasing residence time in the host country (see Borjas, 1999a, for a survey).[1] This pattern is explained by the accumulation of host country-specific human capital such as knowledge of the host country's language (see e.g. Chiswick & Miller, 1995) and acquisition of formal education (see e.g. Borjas, 1982; Rooth, 1999). However, there is reason to believe that the immigrants' geographical mobility within the host country, i.e. internal migration, is another aspect of importance for their income development. This idea constitutes the starting point of the present paper.

A newly arrived immigrant often lacks relevant knowledge about institutional and other characteristics in the host country. This suggests that the initial choice of location in the host country need not necessarily be optimal in a longer time perspective. For instance, the initial location of residence in the host country might not be optimal from the point of view of the skill and/or labor market experience of the immigrant. As a consequence, when the immigrant learns more about the labor market and/or other institutions in the host country, he/she may choose to migrate internally in order to match his/her skills with the labor demand. This argument is further strengthened by referring to mobility costs: an immigrant who has spent a relatively short time in the host country will not yet have built a strong attachment to a specific location.[2]

The aim of this study is to examine whether migration within the host country, in this case Sweden, affects the income of immigrants. More specifically, the study examines whether internal migration among immigrants generates a direct monetary outcome in terms of higher total (disposable) income. I have chosen the family as the unit of analysis because the rate of labor market participation among men as well as women is fairly high, which implies that

[1] See also e.g. Borjas (1985) for a discussion of the methodological issues involved in estimating how the time of residence in the host country affects earnings.
[2] See Borjas (2001) for a similar argument.

migration decisions are likely to take (at least) two earners into consideration (see Mont, 1989).

Previous studies on internal migration among immigrants focus almost exclusively on the determinants of residence location. Bartell (1989), Bartell & Koch (1991), Belanger & Rogers (1992), and Zavodny (1999) conclude that "ethnic concentration", i.e. the stock of people with a similar ethnic background, is a significant determinant of the US immigrants' location decisions. On the other hand, Buckley (1996), Borjas (1999b), and Dodson (2001) find that newly arrived immigrants in general, and refugee-immigrants in particular, tend to live in regions with "generous" welfare programs. In the case of Sweden, Rephann & Vencatasawmy (2000) show that immigrants tend to migrate to regions with a large foreign-born population. Åslund (2001) finds that both the presence of other immigrants and the level of ethnic concentration are factors of significance for immigrants' location choices.

Few studies have found support for the idea that economic motivation plays a significant role in immigrants' location choices. Beenstock (1997) uses Israeli data for the years 1969-1972 and finds that during the first three years after arrival, job-seeking is the key factor that motivates newly arrived immigrants to migrate internally. Thereafter, housing will be the key motivation for internal migration. Using data from 1950 to 1990, Borjas (2001) finds that newly arrived immigrants tend to live in states where the wage for the skills these immigrants have to offer is the highest. Moreover, Borjas' results indicate that the location decision of newly arrived immigrants differs from that of comparable native-born citizens and, more important, earlier arrived immigrants. Another study of interest is Edin *et al*. (2003), which suggests that newly arrived immigrants in Sweden tend to live in "ethnic enclaves" in metropolitan regions, and that these ethnic enclaves generate higher income (up to 4-5 percent), but only for immigrants with relatively low income.

These earlier studies have neither examined the potential outcome in terms of the monetary return from internal migration among immigrants, nor have they

considered the role of the family in the decision to migrate.[3] Hence, this paper contributes by both considering the migration of the *family* as a whole and by examining the direct monetary outcome of internal migration for immigrant families.

The remainder of this paper is structured as follows: The theoretical framework will be developed in section 2, and in section 3, the empirical analysis, including a review of the data, the model, and the estimation method, is presented. The estimation results are presented in section 4, and section 5 concludes the paper.

2 FRAMEWORK

The theoretical framework used in this paper is, to a large extent, based on Mincer (1978) and Borjas (2001). As noted earlier, the high rates of labor market participation among men and women means that most families are composed of two earners.[4] Therefore, in this paper, the economic situation of both spouses will be considered in terms of a family decision to migrate. Following Mincer (1978), the basic assumption is that family migration decisions (internal as well as international) are motivated by the maximization of the expected future lifetime income[5] for the whole family, and not for the individual members. This implies that family migration may take place even though only *one* spouse gains from the move in terms of higher earnings. Mincer (1978) refers to those individuals who move (stay), even though it is not gainful for them personally, as tied-mover (tied-stayer). In these situations, the potential personal losses are assumed to be compensated by redistribution within the family.

[3] Borjas (1999b) analyzes the choice of residence location among immigrant families. Except that his study has a different focus than mine, our studies differ in two important ways. Firstly, Borjas only considers individual characteristics associated with the head of the household. Secondly, he identifies an immigrant family as such, if the head of the household is an immigrant.

[4] See Mont (1989).

[5] It is important to point out that the general economic analysis of migration is based on the assumption that agents maximize net benefits, i.e. the expected stream of benefits net of migratory costs is the underlying motivating force for migration (see Sjaastad, 1962). The net benefit, however, is not observable for researchers as it includes not only consumption, but also other factors, such as leisure. Therefore, it is convenient to follow the convention in Borjas (1985, 1987, 1999a, 2001) and assume that migration is motivated by income-maximization.

We assume that income maximizing immigrant families choose to reside in the region where the family expects that its income (or consumption) will be the highest. However, newly arrived immigrant families are likely to face problems such as language barriers and limited knowledge about institutional and other characteristics in the host country, including relevant information about regional differences in the host county's labor market. These types of obstacles decrease the likelihood of finding the optimal region upon arrival.[6] However, when the immigrant families have overcome those initial obstacles and learnt more about the host country's labor market, they can migrate internally in order to find a more suitable location, where the labor market matches their skills best.

Generally, migration costs are believed to reduce the probability to move. Apart from monetary costs related to the move itself, migration is associated with other costs, such as the disutility of leaving relatives and friends behind. However, newly arrived immigrant families have, by definition, already borne these mobility costs (at least) once, and since they have only lived in the host country a short time, they presumably have not yet developed a strong attachment to any particular region or location. In other words, there is reason to believe that new immigrants' internal migration costs are relatively low, and that this makes it easy for them to move.

The theory discussed above has several implications. Firstly, we may expect that families who migrate internally a relatively short time after arrival are likely to attain higher total family income, than otherwise comparable families who do not migrate. Secondly, we may expect to observe a negative correlation between the monetary gain of internal migration and the length of residence in the host country. The reason is that immigrant families who have lived in the host country for a long time are more likely to have found a good skills match in the labor

[6] Note that in Sweden, refugee-immigrants who arrived during the period 1985 to 1989 were not free to choose their initial region of residence. Instead, they were directed to regions chosen by Swedish authorities. The objective of this policy, which is known as the "whole of Sweden Strategy", was to allocate the immigrants more equally among different regions in the country and facilitate assimilation in general. Although the initial intention was to take the labor market situation in the placement regions into account, in practice, the supply of housing deterred the selection of some regions (see Edin *et al.*, 2003 for more details). It should be kept in mind that this policy could affect the refugee-immigrants' internal migration decision. However, empirical results by Åslund (2001) show that this policy exerted only a weak effect on the refugee-immigrants' internal migration probability.

market than those who arrived recently. However, it is reasonable to anticipate that there may also be a counteracting effect, i.e. a positive correlation between the time of residence in the host country and the monetary gain from internal migration. The reason is that the longer an immigrant family lives in a particular area, the more likely it is to become attached to that location and hence the greater will become the cost associated with leaving the area. Thus, as a consequence, the size of the monetary outcome required to stimulate the family to migrate internally is likely to increase. Hence, because of this possibility, the correlation between the monetary gain from internal migration and the length of residence in the host country is likely to be nonlinear.

Moreover, the strength of the effects discussed above may vary between immigrant groups. Variations in geographical and cultural distances between Sweden and the country of origin may mean that knowledge about the host country will vary between different immigrant groups upon arrival. As a result, the possible outcome of internal migration is also expected to vary between immigrant families from different origins.

3 EMPIRICAL ANALYSIS

Data

The empirical analysis is based on the LOUISE-database, supplemented by data on internal migration from the Swedish national statistics office, Statistics Sweden. LOUISE contains longitudinal individual information on, for example, demographic characteristics, income, and education. In addition, for immigrants, the database provides information on the world region of birth and the year of arrival in Sweden. The data to which I have access are observed at two different points in time, 1995 and 2000. The data on internal migration also provides current information, by date, on "location changes" for the entire population.

The dataset used is composed of the total population of immigrants, defined as foreign-born people living in Sweden by the 31st December 1995 and 2000. In order to control for possible differences among immigrant groups, I wanted to group immigrants according to their country of birth. Unfortunately, the LOUISE

dataset, for security reasons, does not provide such information. On the other hand, information on the world region of birth is available. Based on this information four groups are identified for the purposes of this paper: Nordic, European, Asian, and "Refugee" immigrants.[7] Note that "refugees" refer to all immigrants who originate from the main refugee-sending countries.

The sub-sampling process is completed in the following steps; (1) married or cohabitant husband-wife families are identified.[8] Families are required to be stable, i.e. they should be married or cohabitating both in 1995 and 2000.[9] Note that a Nordic immigrant family is identified as such if both spouses were born in the Nordic countries and similarly for families from other regions. (2) Families with zero disposable income during one period of observation, 1995 or 2000, are excluded. (3) As the length of residence in the host country is of significance in this analysis, immigrant families with no information on the year of arrival are excluded. Moreover, because the income variable is defined on an annual basis, it is convenient to include those immigrant families who have lived in Sweden a full year (12 months) during 1995. To do so, only families where both spouses have arrived in Sweden prior to 1995 are included. (4) For the same reason, families who changed location *during* the years under analysis, i.e. 1995 and/or 2000 are excluded as well. (5) In order to minimize the incidence of non-labor related migration, families with, at least, one spouse younger than 20 years of age in 1995, or older than 64 years in 2000, are filtered out. In addition, families where at least one spouse is a "full-time" student during 1995 and/or 2000 are also excluded. Note that a full-time student is defined as a person who, according to LOUISE, receives a study-loan, and who has a disposable income of less than 35 700 SEK per year.[10]

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[7] Nordic includes Norway, Denmark, Iceland, and Finland. Europe includes all countries in Europe except the Nordic countries. Refugee-countries include Iran, Iraq, former Yugoslavia, Peru, Somalia, Afghanistan, Syria, Turkey, Chile, Ethiopia, Eritrea, Lebanon, and "Palestine". Asia includes all Asian countries except those, which are included in the former definition.

[8] Note that cohabitants without common children cannot be linked to each other and hence cannot be included in these analyses.

[9] Implicitly, I assume that the migration process itself dose not cause any change in the composition of the household, e.g. divorce, which is in line with the majority of existing research.

[10] According to a practice followed by Statistics Sweden, 35 700 SEK (called "basbelopp" and the amount refers to the situation in 1995) corresponds, approximately, to three months of employment.

According to the data on internal migration, family migration is defined as a ”change of municipality”. However, our main concern is labor market related moves, and labor markets rarely follow the boundaries of administrative units, such as municipalities. One way to consider labor market related migration might be to use an alternative regional classification, known as labor market areas (LA-regions). These regions are comprised of neighboring municipalities with sufficient commuting opportunities. Moreover, these regions' boundaries are selected in such a way that most people can find both a place to live and a place to work.[11] One advantage of using LA-regions as geographical units in the migration analysis is that we may limit the inclusion of migration due to reasons other than labor market opportunities.[12] However, the weakness with this approach is that we will fail to observe migration between municipalities within LA-regions that might be labor market related. Another way to consider labor market related migration is used in Axelsson & Westerlund (1998), where only relocation at a distance of 30 km or more is classified as migration. To summarize, migrants are classified as families who during 1996-1999 migrated from one LA-region to another and all others are classified as non-migrants.

The family income variable is defined as the total annual disposable income available for consumption and saving after deducting for final taxes from gross income and adding tax-free transfers (see Table 1). The income variables are expressed in 1995 prices, and the calculations are based on the national consumer price index (CPI). As an alternative, I will also try to utilize regional differences in consumer prices. Following Axelsson & Westerlund (1998), this is done by using a weighted sum of the consumer price index and a regional housing price.[13] Table 2 compares the mean values of the characteristics of migrant and non-migrant families within different groups. The table shows that the proportion of

[11] Note that by 1998, Sweden was divided into 100 LA-regions, which will be followed in this analysis. For a detailed description of the construction of LA-regions see e.g. Carlsson *et al.* (1993).

[12] LA-region divisions are also used in Rephann & Vencatasawmy (2000) and Eliasson *et al.* (2001).

[13] Our index *I* for region *j* at *t* is calculated as follows; $I_{tj} = w_t.(\ell_{tj} / \bar{\ell}_t) + (1 - w_t)p_t$, where *w* is the (national) share of income spent on housing, ℓ_j denotes the average housing price in region *j*, $\bar{\ell}$ denotes the national average housing price, and *p* is the national consumer price index (data source: Statistics Sweden).

Table 1 Variable definition

Variable	Definition
INCOME (y)	Family's annual gross income after deducting for final taxes and adding tax-free transfers, i.e. income available for consumption and saving; disposable income.
M	Dummy variable =1 if family migrate from one *LA-region* to another during the period 1996 to 1999, and zero otherwise.[1]
YSI	The husband's time of residence in the host country in years.
AGE	The husband's age in years.
EDU	Dummy variables =1 if husband's and wife's, respectively, length of schooling = 12 years (secondary school), 13,5 years (post-secondary school < 2 years), or ≥ 15,7 years (post-secondary school ≥ 2 years) or more, and zero otherwise. The length of schooling of the reference group is between 0 to 9 years.[#]
CHILD	Number of children younger than 15 years living at home.
EMP	Dummy variable =1 if husband and wife, respectively, were employed during the survey week in November, and zero otherwise.
U	Number of unemployed people at the LA-region of origin[*].[2]
V	Number of vacancies at the LA-region of origin[*].[2]
MOVDEN	The percentage of people who moved into and out of the LA-region of origin[*].[2]
POP	Number of people (in log) living in the LA-region of origin[*].[1]
IMDEN	Share of foreign born people in the LA-region of origin[*].[3]
ETHDEN	Share of people, born in the same world region, in the LA-region of origin .[3]

[1)]Statistics Sweden. [2)] The National Labor Market Board. [3)] LOUISE, Statistics Sweden.[*] Refers to the region of residence in 1995. [#] These calculations are based on a specific method, which is developed by Statistics Sweden in order to make foreign and Swedish schooling systems comparable.

migrant families is greater among refugee-immigrants (10%) and Asian-immigrants (6,4%) than among immigrants from the Nordic countries (2,3%) and Europe (2,6%). Within each group, the initial income level, i.e. in 1995, is lower among migrants than among non-migrants, but the income growth for migrants is higher than for non-migrants. This is more pronounced in the case of refugee-immigrants and Asian-immigrants than for the other groups. On the other hand, the spouses in the migrant families are younger, have lived in Sweden a shorter time, and are employed to a lesser extent than those in the non-migrant families.

Table 2 Descriptive statistics.

		Nordic		Europe		Asia		Refugee	
Variable	**Year**	*Migrant*	*Non-Migrant*	*Migrant*	*Non-Migrant*	*Migrant*	*Non-Migrant*	*Migrant*	*Non-Migrant*
INCOME (y)	95	249 319	273 684	196 770	237 949	171 737	199 977	175 308	199 197
	00	273 367	302 552	240 369	287 650	249 098	256 760	236 227	249 903
$\Delta \ln(y)$		0,09	0,10	0,20	0,19	0,37	0,25	0,30	0,23
AGE	95	47	48	42	46	36	41	37	41
YSI	95	18,5	23	11	16	7	11	3	10
EDU^H	95	10,2	9,5	11,5	11	10,9	10,5	10,7	10,2
	00	12,5	11,5	14	13	13,4	12,7	13	12,5
$\Delta\ EDU^H$		2,3	2	2,5	2	2,5	2,2	2,4	2,2
EDU^W	95	10	9,7	11,5	11	9,8	9,7	9,3	9,4
	00	12,2	11,7	14	13	12,8	12,1	11,8	11,6
$\Delta\ EDU^W$		2,3	2	2,5	2	3	2,4	2,5	2,2
EMP^H	95	0,61	0,78	0,61	0,71	0,52	0,64	0,19	0,45
EMP^W	95	0,56	0,75	0,48	0,65	0,30	0,46	0,10	0,32
CHILD	95	1,1	1,1	1,2	1,3	1,7	2	2,2	2
	00	0,9	0,8	1,2	1,1	2	2,1	2,4	2
U/V	95	0,81	0,83	0,85	0,85	0,86	0,87	0,8	0,8
	00	2,4	3	2,4	3,1	2,3	3,4	2,0	3
MOVDEN	95	0,09	0,09	0,087	0,10	0,08	0,10	0,08	0,10
POP (log)	95	12	12,6	12	13	12,01	13,2	11,6	13
IMDEN	95	0,11	0,12	0,10	0,13	0,09	0,13	0,08	0,12
ETHDEN	95	0,05	0,05	0,01	0,02	0,007	0,008	0,03	0,04
N-OBS.		377	15 852	228	8 457	211	3 066	3 339	28 793
Share of migrants		0,023		0,026		0,064		0,10	

Note: AGE and *YSI* refer to the husband. *INCOME* is measured in SEK and it is expressed in 1995 prices. $\Delta \ln(y)$ denotes the change in the logarithm of the family's annual disposable income between 1995 and 2000.

The Model

In order to analyze how internal migration affects immigrants' income, we may apply an extended version of the human capital model, where individual and family attributes are taken in account. It is also important that the model allows us to control for unobserved time-invariant family-specific and cohort-specific fixed effects. Controlling for cohort-effects is essential in order to identify the effect of the time of residence in the host country, which is of significance in the present study. The reason is that differences in earnings between cohorts who arrived in

different years are not only the result of the fact that they differ with respect to the time of residence (time-effect). It is also likely that differences in earnings are a consequence of differences in unobservable characteristics, such as ability and motivation, between different cohorts (cohort-effects).[14]

Thus, an appropriate model may be formulated in terms of the first-difference between two income equations, one for each point in time.[15] Such an income change equation for immigrant family *i* originating from (world) region *j* may be expressed as follows

$$\begin{aligned}\Delta \ln(y_{ij}) = {} & \gamma_j + \kappa_j \Delta CHILD_{ij} + \delta_j y_{0ij} + \beta_j^H \Delta EDU_{ij}^H + \beta_j^W \Delta EDU_{ij}^W + \\ & + \tau_{1j} AGE_{0ij} + \tau_{2j} (AGE_{0ij} - \overline{AGE}_{0j})^2 + \theta_{1j} YSI_{0ij} + \theta_{2j} (YSI_{0ij} - \overline{YSI}_{0j})^2 + \\ & + \alpha_j M_{ij} [1 + \mu_{1j} YSI_{0ij} + \mu_{2j} (YSI_{0ij} - \overline{YSI}_{0j})^2] + \varepsilon_{ij} \\ & i = 1,\ldots, I \text{ and } j = 1,\ldots, J \end{aligned} \quad (1)$$

where $\Delta \ln(y_{ij}) = \ln(y_{1ij}) - \ln(y_{0ij})$, y_{0ij} and y_{1ij} denote the disposable family income in 1995 prices, at time *t=0* and *t=1*, respectively, and $\Delta \ln(y_{ij})$ represents the relative (percentage) income change between *t=0* and *t=1*.[16] ΔEDU_{ij}^H and ΔEDU_{ij}^W denote changes in the level of formal education between *t=0* and *t=1* for husband (*H*) and wife (*W*), respectively. As the correlation between the spouses' ages as well as the spouses' time of residence is fairly strong, the model only contains the husband's age and time of residence. The choice of using this information for the husband instead of the wife is that the husband is more likely to be the main income earner. Following common practice, AGE_{ij} is used as a proxy for general work-experience at *t = 0*, whereas YSI_{ij} represents the number of years that family *i* has resided in the host county at *t = 0*. In addition, we allow for a quadratic effect of the time of residence on the change in the family income by

[14] This issue has been stressed and analyzed in numerous studies (see e.g. Borjas, 1985, 1987, 1989 and LaLonde & Topel, 1992).
[15] A similar model is applied in Axelsson & Westerlund (1998) and Widerstedt (1998).
[16] Since equation (1) reflects two separate income equations and each one, by tradition, has a semi-log functional form, the change in the depended variable (income) in equation (1) is, thus, expressed as the difference between the logarithms of the income variables.

including the variable $(YSI_{ij} - \overline{YSI}_j)^2$, where $\overline{YSI}_j$ denotes the average value in the sample of immigrant families (husbands) originating from *j*. This construction makes it possible to avoid multicollinearity, which can arise when YSI_{ij} and its quadrate are used. This approach which allows for nonlinearities is also used for the variable *AGE*. Further, M_{ij} is a dummy variable, which is equal to one if family *i* moves from one location (LA-region) to another at any time between *t=0* and *t=1* and zero otherwise. ε_{ij} is a normally distributed error term.

In the formulation of equation (1), the change in income due to the family's internal migration is captured by the parameter α_j, and its variation with time in the host country is captured by the parameters μ_{1j} and μ_{2j}. The model also controls for other sources of income changes. Change due to: the spouses' host country-specific human capital investments (such as learning the host country's language) are captured by θ_{1j} and θ_{2j};[17] investments in the spouses' formal education are captured by β_j^H and β_j^W; and aging is captured by τ_{1j} and τ_{2j}. Moreover, potential changes in family income resulting from economy-wide changes between 1995 and 2000, i.e. the so-called period-effect, are captured by the intercept γ_j. Note that the unobserved time-invariant family-specific and cohort-specific fixed effects in the intercept are cancelled out.

Two other control variables are also included. Changes in the number of children living at home are represented by $\Delta CHILD_{ij}$. Moreover, there is reason to believe that the amount of potential growth in family income differs depending on the family's initial income level, i.e. in 1995; the higher the initial income, the lower may be the growth. κ_j and δ_j are associated parameters. Note also that, with the exception of migration, the effects of all other variables are assumed to be the same within group *j* for both migrant and non-migrant families.

In accordance with the discussion in section 2, internal migration increases the family income if $\alpha_j > 0$, and this effect decreases with increasing length of residence time in the host country if $\mu_{1j} < 0$. Potential nonlinearities in the

[17] This approach is common in the immigration research (see Chiswick, 1978).

relationship between the monetary outcome of internal migration and the time of residence in the host country are captured by the parameter μ_{2j}. Furthermore, we may expect that these effects differ between immigrant groups in accordance with geographical and cultural distance between Sweden and the country of origin.

Estimation Method

A potential, and a quite common, problem with this type of analysis is that the migration decision and the income difference in equation (1) may be determined simultaneously. The reason is that expected income differences associated with mobility may affect the decision of whether to move or stay. Consequently, the indicator of migration is not necessarily uncorrelated with the error term in equation (1). Therefore, direct estimation of equation (1) may provide biased parameter estimates. A widely applied approach to solve this problem is to use the instrumental variables method. This enables a predictor for observed migratory status among families to be created (see Greene, 2003). I do this by estimating a logit model, where the dependent variable equals unity if family *i* migrates and zero otherwise. The predicted probability of a positive outcome, i.e. migration, replaces the migration dummy variable (*M*) in the income change equation, equation (1). The income change equation is then estimated using Nonlinear Least Squares.

To create the predictor of family migratory status, a migration decision model is used, which takes the following form

$$M_{ij}^{*} = Z_{ij}\boldsymbol{\lambda}_{j} + \eta_{ij} \tag{2}$$

where

$M_{ij} = 1$ if $M_{ij}^{*} > 0$

$M_{ij} = 0$ if $M_{ij}^{*} \leq 0$

M_{ij}^{*} represents the propensity of family *i* originating from *j* to migrate, which is latent, and M_{ij} is the observable migration decision. Z_{ij} denotes a set of

explanatory variables, which include family and spouses' personal characteristics as well as regional attributes (discussed below). $\boldsymbol{\lambda}_j$ is a vector of associated parameters, and η_{ij} is the random error term.

A large empirical literature (see Greenwood, 1975, 1997 for a survey) attempts to verify which variables best predict the migration decision. The migration probability is expected to decrease with age as the period over which the returns accruing from migration can be reaped will be shorter. Education is expected to have a positive effect on migration partly because more highly educated people may be more efficient at gathering information on alternative regions, and partly because it is possible that the skills of highly educated people are more transferable between regions than those of people with a low level of education. According to the discussion in Section 2, we may expect that the migration probability decreases with the length of residence time in Sweden (*YSI*).[18] It is evident in several studies (see e.g. Holmlund, 1984) that those in employment have a lower propensity to migrate than those who are unemployed. Since family migration has to consider both spouses' employment opportunities, we may expect that the spouses' employment status (*EMP*) decreases the family migration probability (see Mincer, 1978).[19] In terms of the number of children (*CHILD*), especially school-age children, the family size is also likely to reduce the migration probability (see Long, 1974 and Mincer, 1978).

Note that these attributes are also used as explanatory variables in the income change equation. By not incorporating additional variables in the migration part of the model, an identification problem may arise. Hence, I include several regional attributes that could explain the migration decision. One indicator of the level of labor market activity in the region of origin (i.e. the region of residence in 1995 in our case) is the number of unemployed per vacancy (*U/V*). It is thought to reflect the demand for labor in the regional market. In densely

[18] As noted before, *YSI* may also capture potential cohort-effects. Unfortunately, identification of these two effects is not possible as the migration decision equation is estimated by using cross-sectional data from one single year (i.e. 1995, in our case). Nevertheless, *YSI* may account for the combined effects of residence time and cohort on the migration decision.

[19] Although we consider the spouses' employment status that precedes migration, we cannot fully exclude the probability that this variable is still endogenous.

populated regions, the opportunity to find a good match, i.e. the right job with the right wage is presumably higher than in sparsely populated regions. Thus, the size of the population (*POP*) in the region of residence is expected to have a negative effect on family migration.[20]

It is likely that inhabitants in certain regions experience higher mobility turnover than inhabitants in other regions. This may be due to unobservable regional attributes, such as the environment or geographical location. These regional attributes will be considered through the variable (*MOVDEN*) measuring the share of gross migration, i.e. the percentage of people migrating out of and into region *j*.[21] Thus, a family that lives in a region where the gross mobility is relatively high is expected to be more likely to migrate than otherwise. Finally, as noted in the introduction, several studies find that immigrants are attracted to regions with a high density of immigrants from a similar origin as well as other immigrants. Accordingly, the density of other immigrants (*IMDEN*) and the density of immigrants from the same world region (*ETHDEN*) in the originating region of residence are expected to be negatively correlated to family migration.

The results of the estimation of equation (2) are reported in Table A1 in the appendix. As expected, the results indicate that the length of residence time affects the families' propensity to migrate in a negative way; immigrant families tend to move a relatively short time after arrival, but with time, their propensity to migrate declines. This effect is more apparent for refugee-immigrants and Asian-immigrants. It is important to keep in mind that the effect of residence time may be over- or underestimated as potential cohort-effects are not identified.

The table also shows that the effects of all regional attributes on family migration are significant and have the anticipated signs only for refugee-immigrants. For European-immigrants, the effects of both (*IMDEN)* and (*POP)* are significant, whereas only (*POP)* is significant for the remaining groups. However, a *Wald-test* indicates that the linear combination of the coefficients for the regional attributes used in the study is significant for all the immigrant groups,

[20] See e.g. Axelsson & Westerlund (1998) for similar treatment.
[21] Another variable of interest is the occurrence of earlier (internal) migration; a person who migrates once may be more likely to migrate again than a person with no previous experience of migration. Unfortunately, we lack such information in our data.

except for Asian-immigrants. For this group, only the linear combination of the coefficients for (*POP*) and (*IMDEN*) is significant.

The estimation results, reported in Table A1, are used to calculate the predicted probability of family migration according to the following formulation: $M_{ij}^{PV} = \exp(Z_{ij}\hat{\boldsymbol{\lambda}}_j)/[1+\exp(Z_{ij}\hat{\boldsymbol{\lambda}}_j)]$, where $\hat{\boldsymbol{\lambda}}$ denotes the estimated parameters. M_{ij}^{PV} will be inserted in the income change equation, equation (1), and serves as an instrument for family migration.

4 ESTIMATION RESULTS

Table 3 contains the results from the instrumental variables (IV) estimation of the income change equation, equation (1), for different immigrant groups. For purposes of comparison, we also include the NLSQ estimates when the migration variable is treated as exogenous in the income change equation. As can be seen in the table (row 2), the effect of migration on refugee-immigrant families' income change is positive and significant. This indicates that the total income grows relatively faster for migrant families than for otherwise similar non-migrant families. Further, the table shows (row 3) that the effect of the interaction between migration and residence time is negative and significant, indicating that the monetary gain from internal migration decreases as the time of residence in the host country increases. The table (row 4) also indicates that the monetary outcome of migration decreases with time of residence at a decreasing rate, since the coefficient corresponding to the quadratic term is significantly positive. These results are also confirmed by a *Wald-test* for joint significance of $\alpha_j.\mu_{1j}$ and $\alpha_j.\mu_{2j}$. The table also shows that the effect of migration is positive for Asian-immigrants and negative for immigrant families from the Nordic countries and from Europe. However, these effects are not significant at conventional levels, implying that we cannot reject that the income growth is the same for both migrant and non-migrant families among these groups. Further, the effect of the time of residence is not significant for these groups.

Table 3 Parameter estimates in the income chance equation (s.e. within parentheses).

Variable	Nordic		Europe		Asia		Refugee	
	NLSQ	IV		IV	NLSQ	IV	NLSQ	IV
Constant	0,65* (0,02)	0,66* (0,02)	0,69* (0,03)	0,67* (0,03)	0,60* (0,07)	0,53* (0,08)	0,76* (0,01)	0,73* (0,014)
M (α)	-0,013 (0,03)	-0,27 (0,28)	NLSQ (0,06)	-0,21 (0,33)	0,10 (0,9)	0,08 (0,20)	0,03* (0,01)	0,23* (0,023)
YSI (μ_1)	0,29 (0,86)	0,28 (0,32)	0,08 (0,13)	0,48 (0,80)	0,04 (0,10)	0,07 (0,45)	-0,33* (0,08)	-0,35* (0,037)
$(YSI-\overline{YSI})^2$ (μ_2)	-0,03 (0,08)	-0,003 (0,002)	-0,006 (0,005)	0,03 (0,04)	-0,02 (0,01)	0,12 (0,031)	0,013* (0,005)	0,013* (0,003)
YSI (θ_1)	0,001* (0,0003)	0,001* (0,0005)	-0,0007 (0,0006)	0,001 (0,001)	0,003* (0,002)	0,004** (0,002)	0,0015* (0,0004)	0,005* (0,0005)
$(YSI-\overline{YSI})^2/100$($\theta_2$)	0,007* (0,002)	0,007* (0,003)	0,01* (0,005)	0,01* (0,007)	-0,001 (0,02)	-0,01 (0,02)	0,01* (0,003)	-0,01* (0,004)
AGE	-0,009* (0,0004)	-0,008* (0,0004)	-0,005* (0,0007)	-0,005* (0,0007)	0.0004 (0,002)	0,001 (0,002)	-0,004* (0,0003)	-0,004* (0,0003)
$(AGE-\overline{AGE})^2/100$	-0,052* (0,004)	-0,048* (0,004)	-0,035* (0,006)	-0,04* (0,006)	0,003 (0,01)	0,004 (0,01)	-0,04* (0,003)	-0,04* (0,003)
ΔEDU^H	-0,001 (0,002)	0,0007 (0,002)	0,0006 (0,003)	0,0007 (0,003)	-0,01* (0,004)	-0,01* (0,004)	-0,002 (0,001)	-0,001 (0,001)
ΔEDU^W	0,02* (0,002)	0,021* (0,002)	0,009* (0,003)	0,009* (0,003)	0,007** (0,002)	0,007** (0,002)	0,002 (0,001)	0,002 (0,001)
$\Delta CHILD$	0,13* (0,003)	0,13* (0,003)	0,11* (0,007)	0,11* (0,007)	0,07* (0,01)	0,07* (0,01)	0,067* (0,003)	0,069* (0,003)
y_{t-1} (1995)	-0,016* (0,0009)	-0,02* (0,0009)	-0,03* (0,002)	-0,03* (0,002)	-0,06* (0,004)	-0,06* (0,004)	-0,06* (0,001)	-0,06* (0,001)
Adj. R^2	0,15	0,16	0,10	0,11	0,11	0,12	0,19	0,20
N.Obs.	16 229		8 685		3 277		32 132	

Note: * significant at 5 percent and ** significant at 10 percent. The estimations are corrected for heteroscedasticity. *AGE* and *YSI* refer to the husband. The dependent variable is measured as the change in the logarithm of the family disposable income between 1995 and 2000.

Using the alternative consumer price index that recognizes differences in housing prices between regions, the results (reported in Table A2) indicate the same pattern, i.e. migration has a positive, but with time declining, effect on family income growth only in the case of refugee-immigrants. However, the outcome, when it is significant, seems to be smaller than in the former case, which

indicates that immigrants migrate to regions where the "consumer prices" are relatively high.

Turning to the influences of the other variables, investments in additional formal education among immigrant wives appear to increase their earnings and, thus, the income of the family. In contrast, the husbands' educational investments do not seem to have a similar effect on family income growth. However, these conclusions do not apply to refugee-immigrant wives as the effect in their cases is insignificant. Asian husbands also constitute an exception because the effect of their educational investments on family income is, surprisingly, negative.

Despite differences between immigrant groups, the change in the number of children living at home appears to have positive and significant influence on the change in family income. A possible explanation is that the spouse with the highest earnings increases his/her labor supply, which may, along with child-related allowances exceed the loss in income caused by parental leave. As expected, the results indicate that the rate of growth in family income declines as the level of initial income, i.e. the income in 1995, increases. Finally, in general, family income growth seems to increase with the length of residence in Sweden, whereas it appears to decrease with increasing age (of the husband).

5 CONCLUSIONS

This study examines whether internal migration among newly arrived immigrant families affects their total annual disposable income. Immigrants are defined as foreign-born people living in Sweden both on 31st December 1995 and 2000. Four immigrant groups are defined; Nordic, European, Asian and immigrants who originate from the main refugee-dispatching countries ("refugee-immigrants"). Families are defined as married/ cohabitant husband-wife families, who are non-divorced/non-separated during the period 1995 to 2000. Migrants are defined as families who during the period 1996-1999 migrated from one LA-region to another. The analysis is based on the LOUISE-database, complemented with data on internal migration.

The empirical findings indicate that refugee-immigrant families who migrate internally a relatively short time after their arrival achieve a higher family income in comparison with both otherwise similar families who do not migrate and families who move after having lived in the host country for a longer time. Thus, we may conclude that internal migration generates positive effects on the income of recently arrived refugee-immigrant families. We could not find, on the other hand, similar results for immigrant families from other (world) regions. Note that our results seem robust with respect to the estimation method and the way in which we measure the price level.

One possible explanation is that immigrants from the Nordic countries, Europe and even Asia have the opportunity to gather pre-immigration information about the country of destination e.g. by visiting the country before they decide to immigrate, and this, in turn, may increase their chances of finding a reasonably good match for their skills upon arrival. In contrast, refugee-immigrants, for political reasons, may lack such an opportunity and, thus, end up in places where their skills do not match the demand for skills. Another explanation may be related to the limited opportunities that refugee-immigrants have when they choose the initial place of residence. Even though the "whole of Sweden strategy" officially ended in 1989 (see section 2), the supply of housing still plays a major roll in refugee-immigrants' choice of initial place to live.[22] For example, the metropolitan areas, where the opportunity to find a good skills match is likely to be greater than in other areas, are often not an option for newly arrived refugees when there is a housing scarcity. As a result, from the perspective of skill matching, recently arrived refugee-immigrants are likely to live in the "wrong" regions, and, thus, internal migration remains as a possible means to finding a better one.

[22] See The Integration Board (2003).

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APPENDIX

Table A1 Logit estimates of the (binary choice) migration decision equation (s.e. within parentheses).

Variable	Nordic	Europe	Asia	Refugee
Constant	0,55 (0,85)	4,9* (0,93)	7,9* (1,0)	5,56* (0,26)
YSI	-0,03* (0,008)	-0,04* (0,009)	-0,046* (0,02)	-0,052* (0,005)
$(YSI - \overline{YSI})^2$ /100	0,13* (0,05)	0,12* (0,06)	-0,6* (0,3)	-0,16* (0,05)
AGE	-0,01 (0,01)	-0,026* (0,011)	-0,045* (0,013)	0,028* (0,003)
$(AGE - \overline{AGE})^2$ /100	0,02 (0,08)	0,07 (0,08)	-0,02 (0,10)	0,07* (0,03)
EMP^H	-0,71* (0,12)	-0,42* (0,15)	-0,55* (0,17)	-0,57* (0,056)
EMP^W	0,59* (0,11)	-0,59* (0,14)	0,48* (0,17)	-0,54* (0,07)
EDU^H (secondary)	0,23 (0,18)	0,06 (0,19)	0,08 (0,32)	0,10* (0,05)
(post-secondary < 2 years)	0,68* (0,20)	0,27 (0,24)	-0,23 (0,36)	0,03 (0,07)
(post-secondary ≥ 2 years or more)	0,92* (0,21)	0,13 (0,22)	0,71* (0,27)	0,32* (0,07)
EDU^W (secondary)	-0,54* (0,25)	0,09 (0,19)	-0,12 (0,29)	0,0002 (0,054)
(post-secondary < 2 years)	0,19 (0,19)	0,04 (0,23)	-0,31 (0,35)	0,08 (0,08)
(post-secondary ≥ 2 years or more)	-0,017 (0,23)	0,49* (0,21)	0,57* (0,29)	0,19* (0,09)
CHILD	-0,11** (0,06)	-0,17* (0,08)	-0,16* (0,07)	0,06* (0,016)
U/V	0,18 (0,16)	-0,17 (0,20)	0,15 (0,21)	0,49* (0,06)
MOVDEN	1,5 (5,1)	-1,6 (6,1)	1,6 (9,0)	3,8* (1,9)
POP	-0,21* (0,06)	-0,50* (0,07)	-0,55* (0,11)	-0,50* (0,02)
IMDEN	-0,58 (2,4)	8,2* (3,5)	-5,9 (3,77)	-3,7* (1,09)
ETHDEN	-2,3 (2,7)	-63,0* (15,0)	-45,9 (38,3)	-18,0* (3,1)
Pseudo R^2	0,08	0,12	0,20	0,23
N-OBS.	16 229	8 685	3 277	32 132

Note: * significant at 5% and ** significant at 10%. *AGE* and *YSI* refer to the husband.

Table A2 Parameter estimates of the income change equation (s.e. within parentheses).

Variable	Nordic	Europe	Asia	Refugee
Constant	0,55*	0,60*	0,42*	0,64*
	(0,02)	(0,03)	(0,08)	(0,014)
M (α)	-0,05	0,006	0,12	0,16*
	(0,28)	(0,33)	(0,20)	(0,023)
YSI (μ_1)	0,35	-11,5	0,12	-0,36*
	(2,3)	(9,3)	(0,39)	(0,056)
$(YSI - \overline{YSI})^2$ (μ_2)	-0,02	0,86	0,09	0,023*
	(0,11)	(0,92)	(0,17)	(0,003)
YSI (θ_1)	0,0008*	0,0005	0,004*	0,002*
	(0,0005)	(0,0008)	(0,002)	(0,0005)
$(YSI - \overline{YSI})^2$ (θ_2)/100	0,006**	0,003	-0,01	-0,01*
	(0,003)	(0,006)	(0,02)	(0,004)
AGE	-0,008*	-0,005*	0,001	-0,004*
	(0,0004)	(0,0007)	(0,002)	(0,0003)
$(AGE - \overline{AGE})^2$ /100	-0,05*	-0,03*	-0,006	-0,04*
	(0,004)	(0,006)	(0,01)	(0,003)
ΔEDU^H	0,0009	-0,0003	-0,08**	-0,001
	(0,002)	(0,003)	(0,004)	(0,001)
ΔEDU^W	0,02*	0,008*	0,006	0,001
	(0,002)	(0,003)	(0,004)	(0,001)
$\Delta CHILD$	0,13*	0,11*	0,07*	0,07*
	(0,003)	(0,008)	(0,01)	(0,003)
y_{t-1} (1995)	-0,02*	-0,03*	-0,06*	-0,06*
	(0,0009)	(0,002)	(0,004)	(0,001)
Adj. R^2	0,15	0,11	0,12	0,18
N.Obs.	16 229	8 685	3 277	32 132

Note: * significant at 5 percent and ** significant at 10 percent. The estimations are corrected for heteroscedasticity. *AGE* and *YSI* refers to the husband. The dependent variable is measured as the change in the logarithm of the family disposable income between 1995 and 2000.