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DETERMINANTS OF NORDIC MIGRATION TO SWEDEN

by

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1 Introduction

During most of the Post–war period the integrated Nordic labor market has been characterized by positive net immigration to Sweden from Finland, Norway and Denmark. A substantial net migration to Sweden is not surprising since Sweden has had the highest real wage of the Nordic countries and a favorable labor market. Maybe more surprising is that the migration flows have been dominated by Finnish migration to Sweden, to an extent which is not in proportion to the size of the Finnish population. Comparatively low real wages and a less favorable labor market in Finland are certainly important factors to explain the differences in the migration flows in the Nordic labor market. On the other hand, there are conditions which are such that one should expect less Finnish migration, like a language disadvantage for a majority of the Finns and the distance factor.

The strong dominance of Finnish migration to Sweden suggests that there are inherent differences in migration behavior between the populations of Norway, Finland and Denmark. If such differences exist, then e.g. a real wage increase in Sweden gives rise to a larger inflow of Finns than of Danes and Norwegians, i.e. the migration elasticity with respect to Swedish real wages is higher for the Finns. The purpose of the paper is to identify the causes of the differences in the flows of Nordic migrants into Sweden. To this end I shall estimate a human capital migration model and I compare the elasticities obtained for the different Nordic nationalities separated by gender.

I shall also study the much overlooked issue of the role of unemployment benefits in the determination of Nordic migration. One reason for studying benefits is that, with the exception of an initial increase, Danish emigration to Sweden remained at

normal levels despite high and increasing unemployment rates after the mid seventies. As the increased unemployment was accompanied by substantial increases in real unemployment benefits, this suggests that benefits gave rise to "adverse incentives" and hampered migration.

Since the paper deals with differences in migration behavior I focus on immigration to Sweden since this country is a net receiver of migrants from the other three countries. The aggregated pooled data which are used cover the flows of Nordic immigrants to Sweden's 24 provinces (län) during the period 1968 to 1985 classified by citizenship and gender. Using a traditional human capital approach, I specify a logistic model to estimate the probability that Finns, Danes and Norwegians of both gender will migrate to Sweden.[1/]

2. Stylized Facts on Nordic Migration

An aggregate measure of the long run effects of migration on the population sizes is the number of Nordic citizens living in some other Nordic country. The stocks of Nordic immigrants are shown in Table 1 for the years 1975 and 1985.

The Finnish domination is obvious. Of all Nordic citizens living in some other Nordic country the Finns constituted 64 % in 1975 and 57 % in 1985. Even more striking is the very strong concentration of Finns to Sweden. Of the large number of Finns living in other Nordic countries, 98 % resided in Sweden in 1975 and 97 % in 1985. The absolute number fell towards the end of the period under study as it did for the number of Finns living in Denmark, while the number living in Norway increased from 1.8 to 3.2 thousands. Compared to the number of Finns in Sweden

the figure remains low. Sweden has attracted the majority of Finnish, Danish and Norwegian migrants and Sweden has also become the Nordic country hosting the largest number of Icelanders.

Table 1. Nordic citizens residing in some other Nordic country. 1975 and 1985. In Thousands. In brackets are shown the percentage distribution.
Source: Yearbook of Nordic Statistics.

			1975		
	Sweden	Finland	Norway	Denmark	Total
Swedes	——	2.7 (15)	7.3 (42)	7.5 (43)	17.5
Finns	183.2(98)	——	1.8 (1)	2.4 (1)	187.4
Norweg.	26.8(71)	.3 (1)	——	10.4(28)	37.5
Danes	32.2(70)	.4 (1)	13.7(29)	——	46.3
Iceland.	1.4(34)	.0 (0)	0.8(19)	1.9(46)	4.1
				Total	292.8

			1985		
	Sweden	Finland	Norway	Denmark	Total
Swedes	——	4.9(21)	9.8 (43)	8.1(36)	22.8
Finns	138.6(97)	——	3.2(2)	1.8(1)	143.6
Norweg.	26.4(72)	.4(1)	——	9.8 (27)	36.6
Danes	25.1(61)	.4(1)	15.4(38)	——	40.9
Iceland.	3.4(39)	.0(0)	1.9(22)	3.3(38)	8.8
				Total	252.7

Finland receives few migrants from other Nordic countries. As can be seen, there are extremely low numbers of Danes and Norwegians residing in Finland. Neither does Finland attract many Swedes who instead prefer to go to Denmark and Norway. It should also be recognized that the community of Swedes living in Finland might contain persons who moved back to Finland after having been naturalized in Sweden.

The flow of migrants to Sweden has changed considerably during the post war

period. Finnish migration to Sweden reached a peak of close to 40 000 in 1969 but has since then declined considerably and has not exceeded 6 000 since 1981. Danish migration reached a peak of around 10 000 in 1975, while normal Danish migration to Sweden is around 1 200 to 2 000 as is the Norwegian.

3 Model Specification.

In general the share of the population at origin that migrates from country i into the receiving country's region j and of gender g can be written as:

$$(1) \qquad m_{ijg} = f(X_{qig}, X_{rjg}, D_{ij}). \qquad \begin{matrix} q=1...h...H \\ r=h...H...L \end{matrix}$$

where, as in subsequent equations, the index for time period has been suppressed. m_{ijg} is the rate of migration from country i to j for gender g. X_{qig} is a vector of origin related variables (index q), X_{rjg} a vector of destination related variables (index r), and D_{ij} the distance between i and j. Note that the variables h...H may be relevant for the origin as well as for the destination, like for instance real wages and unemployment. The variables represented by 1...h–1 are specific for the origin and H+1...L specific for the destination. As written, the explanatory variables are specific for each gender.

Following the seminal work by Sjaastad (1962) and the mainstream of migration research thereafter, the standard analytical approach is to regard migration as a human investment. The decision rule of the individual implies that migration is the

optimal activity whenever the discounted utility at the destination exceeds the discounted utility at the origin, net of psychic and pecuniary costs of moving. Fields (1979) and Schultz (1982) show how the human capital model can be estimated on a double–logarithmic form and be made consistent with the logistic model where the individual faces a polytomous choice of migrating to a number of discrete alternatives. According to the logistic model, an individual's decision to move to j, given that he now lives in i, depends on a linear combination of origin and destination variables, like $P_{ijg}=e^{z_{ijg}}/\Sigma_j e^{z_{ijg}}$, where $\Sigma_j P_{ijg}=1$ for all i and g. P_{ijg} represents the probability of moving and Z_{ijg} is a log–linear function of the independent variables in (1), i.e. $Z_{ijg}=\gamma_{ijg} + \Sigma_q \beta_{qig} \ln X_{qig}+\Sigma_r \varphi_{rig} \ln X_{rjg} + \partial_{ijg} \ln D_{ij}$. If the probability of staying at the origin is roughly constant over labor markets, Fields (1979) and Schultz (1982) show that one can estimate

$$(1') \qquad \ln m_{ijg} = \gamma_{ijg} + \Sigma_q \beta_{qig} \ln X_{qig}+\Sigma_r \varphi_{rig} \ln X_{rjg} + \partial_{ijg} \ln D_{ij}.$$

The double–logarithmic specification has several advantages. The most important is that it takes care of multiplicative interactions between the explanatory variables. As such it is consistent with the expected wage hypothesis which implies a multiplicative interaction between wages rates and unemployment rates. For the model to be estimated here, another interaction is also of particular importance, namely between unemployment benefits and unemployment levels. Benefits and unemployment may well interact as the effects of benefits on migration might be stronger the higher is the level of unemployment. Norway could here be chosen as an

extreme case: In an economy of virtually full employment, like the Norwegian for the period under study, the unemployment risk is so low that unemployment benefits are of no concern for the migration decision. The argument could also be reversed, i.e. the effects of unemployment on migration depend on the level of benefits. At a high benefit level, a given unemployment increase has a low effect on migration. The argument applies to the origin as well as to the destination conditions. The interactions proved to be empirically important and the logarithmic form explained a larger share of the variance than did other forms. Another advantage with the specification in (1') is that the logistic model can be compared to other double–logarithmic but non–logistic models.[2/]

The dependent variable, the rate of migration, is determined as $m_{ijg} \equiv M_{ijg}/RP_{ig}$, where M_{ijg} is the gross flow of migrants from i to j of gender g and RP_{ig} is the population of gender g "at risk" to migrate. RP_{ig} is defined as the end of period population less in–migrants plus out–migrants.

Concerning the explanatory variables, it should first be noted that earlier studies suggest that the variables related to the place of destination yield higher absolute parameter estimates than the corresponding ones at the place of origin. For income variables, Vanderkamp (1971) stresses that such asymmetries occur since income at origin play a role in financing the move while income at destination, unless capital markets are well developed, does not. The use of differences (like $w_i - w_j$ for wages at origin and at destination) is therefore an empirically incorrect way to specify the variables.

The explanatory variables are related to incomes (wages, unemployment benefits etc.), the labor market (unemployment etc.), earlier migration (capturing degree of

uncertainty at destination etc.) and distance (capturing costs of transportation, psychic costs of moving etc.).

I distinguish income if employed from income if unemployed. In determining the income variables, I follow Vanderkamp (1971), and consider the higher degree of income uncertainty that follows from increased distance by dividing the income related variables at destination by distance. The greater the distance from origin to destination the more income prospects are discounted. Migration is then affected in a nonlinear way by distance, implying that the deterring effect becomes smaller and smaller with longer distance.

Distance corrected real disposable wages are determined for each of the 24 Swedish provinces and separated by gender. Alternative formulations based on expected real wages proved inferior to the chosen one. The variable is defined as:

$$(2) \qquad w_{jg}/D_{ij} = (W_{jg}(1-T_s)/CPI_s)/D_{ij} = W_{jg}(1-T_s)/(CPI_s\, D_{ij}),$$

where indices j and g represent Swedish destination province and gender and where

w_{jg} = real wage,

W_{jg} = nominal average wages,

CPI_s = Swedish consumer price index,

T_s = Average income tax rate in Sweden for a married worker with two children, and

D_{ij} = distance between country i and province j.

Nominal average wages are distinguished by gender and by province. Consumer

prices are those of the national level.[3/]

Real wages at origin which also enter as an independent variable, are determined as the average real wage separated by gender, i.e. nominal wages divided by each origin country's consumer price index:

$$w_{ig}=W_{ig}/CPI_i, \tag{3}$$

where index i represents country of origin.

Concerning incomes if unemployed, i.e. benefits or social welfare, the treaty on the integrated Nordic labor market states that any Nordic citizen is eligible to local support at the destination. Even though a migrant is not eligible for unemployment benefits unless a job has been obtained at the destination, benefits might attract migrants since a positive unemployment risk is likely to be present, particularly so for migrants. Benefits in Sweden are determined as:

$$b_S/D_{ij} =(B_S(1-T_S)/CPI_S)/D_{ij}= B_S(1-T_S)/(CPI_S\ D_{ij}), \tag{4}$$

where b_S = Net–of–tax real unemployment benefits for migrants from i to j, and

B_S = nominal unemployment benefits.

Benefits are measured as the maximum amount of benefits per day. For Norway, welfare payments replace unemployment benefits due to the lack of data. A corresponding definition as in (4), without the distance factor, applies to benefits in the countries of origin. In certain instances, taxes are zero for benefits. The appendix

provides exact definitions of the benefit variables. Higher destination benefits are assumed to stimulate migration and higher origin benefits to hamper migration.[4/]

Earlier migration, represented by the number of citizens of the origin country residing at the destination province, has in previous studies been shown to stimulate migration. Such a community lowers different costs connected with the move, in particular those related the uncertainty about local conditions. Earlier migration may be of particular importance for migrants who do not know the language at the destination, in this case a large part of Finnish migrants. Let POP_{ij} be the population of citizens from origin country i residing in province j. The size of the local community is likely to enter in a nonlinear fashion and the stimulating effect is assumed to become weaker as the magnitude of the variable increases. Hence, the inverse of the variable, i.e. $1/POP_{ij}$, is included. Since I focus on the information aspect I include only people in ages 16 to 64 so as to limit the variable to those with potential and recent labor market experience.

Unemployment is measured as the official unemployment rates of each country. For the destination, the variable is separated by province but not by gender as the overall (male plus female) unemployment rate turned out to be empirically preferable. For the origin countries, however, the unemployment rate was separated by gender.[5/]

4. The Estimations.

4.1 A Basic Model Formulation: Model 1.

The first model is then specified, for nationality i and gender g, as:

$$(5) \quad \ln m_{ijg} = \underset{+}{\alpha_1} \ln (w_{jg}/D_{ij}) + \underset{-}{\alpha_2} \ln w_{ig} + \underset{+}{\alpha_3} \ln (b_s/D_{ij}) + \underset{-}{\alpha_4} \ln b_i + \underset{-}{\alpha_5} \ln (1/POP_{ij}) + \underset{+}{\alpha_6} \ln u_i + \underset{-}{\alpha_7} \ln u_j + \sum_{j=1}^{24} \alpha_{ijg} \ln RD_j + \epsilon_{ijg}$$

Both variables m_{ijg} and POP_{ij} include migrants in ages 16 to 64. I assume the signs indicated below each variable.

There are several ways to raise the efficiency of the estimates. Since data are pooled the application of the least squares dummy variables (LSDV–) model may, and does, contribute to raising the efficiency of the estimates. Regional dummy variables, RD_j, for the 24 Swedish provinces are therefore included.[6/]

Equation (5) is specified for six groups, i.e. Finnish men and women, Danish men and women and Norwegian men and women. Since errors very well way be correlated over the nationalities and particularly over gender of the same nationality, this suggests that the correct approach is to estimate Seemingly Unrelated Regression Equations as this might also raise the efficiency.[7/]

I refer to the model above as Model 1. In Table 2, are shown the elasticities obtained from Seemingly Unrelated Regressions Estimation.

Table 2. Model 1. Estimated elasticities. Seemingly unrelated regressions of logit model in Equatio (5). t–ratios in parenthesis. Dependent variable: ln m_{ijg}.

Indep. Variable:	Finnish Males	Females	Danish Males	Females	Norwegian Males	Females
w_{jg}/D_{ij}	3.5274	2.5251	–3.4077	–2.6423	–.9720	.1541
	(5.752)	(4.542)	(–2.785)	(–2.415)	(–.981)	(.215)
w_{ig}	–3.5841	–4.6836	9.3602	5.3008	–.8129	–.9168
	(–4.227)	(–8.389)	(6.865)	(6.610)	(–.879)	(–1.235)
$1/POP_{ij}$	–2.2524	–1.9331	–2.0983	–1.7077	–1.8368	–1.1836
	(–18.182)	(–18.178)	(–10.419)	(–8.925)	(–8.532)	(–7.314)
u_j	–.5760	–.5796	–.8926	–.6891	–.3534	–.2992
	(–6.851)	(–8.145)	(–7.892)	(–6.693)	(–3.595)	(–3.826)
u_i	.1017	.0520	.2556	.1808	.2614	–.0339
	(1.007)	(.511)	(2.712)	(2.206)	(2.335)	(–.502)
b_s/D_{ij}	1.3273	1.1173	–1.4658	–1.1588	.1991	–.0009
	(3.635)	(3.929)	(–8.942)	(–7.148)	(.558)	(–.003)

Table 2 cont.

Table 2 cont.

b_i	–1.7430	–.9406	–5.6918	–3.9919	–.4747	.0634
	(–3.184)	(–2.286)	(–8.849)	(–7.298)	(–1.225)	(.213)
	$\overline{R}^2$=.9997	$\overline{R}^2$=.9999	$\overline{R}^2$=.9991	$\overline{R}^2$=.9994	$\overline{R}^2$=.9995	$\overline{R}^2$=.9999

System weighted R^2: 0.9976 Degrees of Freedom: 2406

Note: The results of the the regional dummies are not shown due to lack of space.
The system weighted R^2 is measured as if all the models were combined and run as a single equation.

The estimates of the distance corrected real wage and of real wages at origin come out significant and with the expected sign only for Finnish males and females. Wages at origin yield estimates of the expected sign, though not significant, for

Norwegians. For Danes of both gender the estimates have taken on the unexpected signs for both wage variables.

The population variable has yielded highly significant estimates of the expected negative signs for all groups of migrants. For all three nationalities the absolute estimates are higher for men than for women.

Unemployment at destination, u_j, has yielded significant estimates of the expected negative sign for all groups. Unemployment in the Swedish provinces appears to be of greatest importance for Danish migrants and of the least importance for Norwegian ones. The estimated elasticities differ more between the nationalities than between gender.

Turning to unemployment at origin, u_i, this variable has yielded estimates of the expected positive sign in all cases but Norwegian females. The estimates for Finnish migrants, though, are not significant. It should also be noted here that Danish migration to Sweden is affected with the expected sign by unemployment in Denmark. Hence, the noted low migration to Sweden during the years of rising unemployment in Denmark should not lead to the conclusion that unemployment does not affect migration.

Benefits at destination, corrected for distance, yield a significant estimate of the expected positive sign for Finnish migrants of both gender. Hence, both Swedish unemployment and Swedish unemployment benefits stand out as important explanatory variables for the Finnish migration to Sweden. For Norwegian male migrants the estimates of Swedish benefits are of the expected sign but not significant and for other groups the estimates are of the unexpected sign.

The estimates of the parameter for benefits at origin are of the expected negative

sign and highly significant for four groups: Finnish males and females and Danish males and females. The elasticities for the Danes are considerably higher than for Finns and for both nationalities the estimates are higher for males than for females. The hypothesis stated in the introduction that Danish benefits have caused "adverse incentives" is therefore supported in this regression.

Before drawing more conclusions, an alternative formulation should be tested.

4.2 Relative Unemployment and Relative Benefits: Model 2.

One reason for the failure of the wage variables to explain Danish and Norwegian migration, might be multicollinearity between wages and benefits. If this is the case, an alternative is to specify benefits in relative terms. In Model 2, I replace benefits at the destination and benefits at the origin with the ratio of the two. The results from including relative unemployment benefits, along with relative unemployment levels, are presented in Table 3.

Table 3. Model 2. Estimated elasticities. Seemingly unrelated regressions. Relative unemployment and relative benefits included. t–ratios in parenthesis. Dependent variable: ln m_{ijg}.

Indep. Variable:	Finnish Males	Females	Danish Males	Females	Norwegian Males	Females
w_{jg}/D_{ij}	5.0163	2.9711	–.1415	–1.8087	.2122	.3949
	(9.364)	(5.695)	(–.121)	(–1.583)	(.329)	(.777)
w_{ig}	–5.6524	–5.1947	–1.8136	.1285	–2.1623	–1.2558
	(–22.235)	(–19.069)	(–2.190)	(.181)	(–6.077)	(–4.104)

Table 3 cont.

Table 3 cont.

$1/POP_{ij}$	–2.6018	–2.1012	–2.1715	–1.8153	–1.8349	–1.2594
	(–22.918)	(–22.067)	(–9.764)	(–8.745)	(–8.708)	(–7.755)
u_i/u_j	.1109	.2954	.4475	0.2765	0.1747	.0575
	(2.550)	(5.972)	(5.298)	(4.270)	(2.459)	(1.004)
$b_i/(b_s/D_{ij})$	–1.1997	–1.2042	.8381	.7026	–.0676	.1478
	(–3.879)	(–4.372)	(6.866)	(6.770)	(–.200)	(.519)
	$\bar{R}^2$=.9997	$\bar{R}^2$=.9998	$\bar{R}^2$=.9984	$\bar{R}^2$=.9990	$\bar{R}^2$=.9995	$\bar{R}^2$=.9998

System weighted R^2: .9970 Degrees of Freedom: 2418

Note: The results of the the regional dummies are not shown due to lack of space.

Distance corrected wages at destination continue to be a variable of mixed success. For Norwegian migrants the variable now yields estimates of the expected sign, though still not significant. However, wages at origin appear with the expected negative sign for all groups except Danish females. The values of the estimates are considerably higher for Finnish migrants than for Danish and Norwegian. The estimated elasticities of the population variable are not much affected as compared to those in Model 1.

Relative unemployment gives significant estimates of the expected sign for all groups except Norwegian females. The estimates are the highest for Danish male migrants.

Relative benefits are of the expected negative sign only for Finnish males and females and for Norwegian males. Only for Finnish migrants are the estimates significant.

5 Conclusions.

I have estimated a model to illuminate the differences in migration behavior between Finnish, Danish and Norwegian migrants of both gender and focused particularly on the role of unemployment benefits for migration to Sweden.

The regressions indicate that there are differences in migration behavior in the liberalized Nordic labor market. The obtained elasticities are only in a few cases higher for Finns than for Danes and Norwegians. This is so for the elasticity of migration with respect to wages at origin in Model 2. Also Swedish benefits seem to be of importance for Finnish migration to Sweden, while migration from Denmark and Norway is not affected by this variable.

Other variables did not yield higher estimated elasticities for the Finnish population than for the other nationalities. Unemployment at destination stands out as an important determinant for all groups of migrants but the elasticities are higher for Danish migrants than for Finnish and Norwegian ones. Furthermore, unemployment at origin does not yield significant estimates for Finnish migrants while it does for Danish males and females and for Norwegian males. Finally, unemployment benefits at the origin yield significant estimates of the expected sign for Finnish and Danish migrants but the estimates are considerably higher for Danish migrants than for Finnish. It is therefore concluded that the results do not support the hypothesis that the Finnish domination of the migration flows is connected with generally higher elasticities of migration for the Finnish population. The differences in the levels of unemployment, wages etc. between the destination and the origin appear to be the factor that caused the large flows of migrants from

Finland to Sweden.

A second conclusion is that the reason why increasing unemployment rates in Denmark did not cause major migration flows to Sweden is not that the migration elasticities with respect to unemployment at origin are low. An unemployment increase in Denmark does, ceteris paribus, give rise increased migration to Sweden. However, the Danish migration elasticities with respect to unemployment benefits at origin are, according to the estimations, high compared to those of other nationalities. The drastic increase in Danish benefits and the considerable effects on the migration probability of Danish benefits stand out as important determinants of the apparently low migration to Sweden during the high unemployment years. Hence, the results indicate that rising Danish benefits had an inhibiting impact on Danish migration to Sweden.

In the cases when significant elasticities of the expected signs were obtained for both gender, the absolute values of the estimates are, with only a few exceptions, higher for men than for women. This conclusion is in line with previous migration studies for other labor markets.

NOTES

1. Earlier studies on Finnish–Swedish migration include Nyberg (1980) who, based on annual data for the period 1962–1977, points to the conclusion that the gross emigration ratio from Finland to Sweden may satisfactorily be determined by relative wages and Finnish labor market conditions. Swedish unemployment does not perform well as an explanatory variable. Wadensjö (1973) finds that Swedish unemployment rate is an important determinant of immigration to Sweden from Finland and from Norway, but not from Denmark. Annual data for the period 1956 to 1967 are used for OLS–estimations.

2. For other arguments in favor of the double–logarithmic logistic form, See Fields (1979) and Schultz (1982).

3. Whether taxes are included or not in the formulation of (2) and (3) turned out to be empirically of no major concern. The preferable formulation is to include taxes in (2) but exclude taxes in (3).

4. Kaun (1970) and Cebula and Shaffer (1975) both studying US migration, find that higher welfare payments stimulate migration but that the significant estimates are numerically small. Potentially fruitful would be to include the duration of benefits.

5. As the dependent variable is a flow variable, one might consider to specify explanatory variables in a rate of change form. As this was done for the unemployment variables no improvement in the performance of the model was

obtained, though. It should also be remembered that unemployment variables are notoriously difficult to include successfully. For this reason, job vacancies or some labor market turnover variable are often included instead. However, job vacancies do not appear superior to unemployment in the present model.

6. Applying the LSDV–model precludes the use of distance as a separate explanatory variable as this variable is constant over time and hence causes the model to be linearly dependent. In the choice of including the well founded distance variable or regional dummy variables, I choose the latter due to the superior statistical fit. Undoubtedly, this has the disadvantage that no information on the effects of distance on migration are obtained. However, as distance enters the income variables, distance still has an impact on migration in the model and its effects are also captured by the regional dummies.

7. Seemingly unrelated regressions are normally more sensitive to specification errors than single equations like OLS. Since the model is specified in a rather traditional way, the misspecification argument is not likely to be serious enough to warrant avoidance of system methods.

REFERENCES

Cebula, R.J. and B.K. Schaffer (1975): "Analysis of Net Interstate Migration: Comment". Southern Economic Journal 41. April. 690–693.

Fields, G. S. (1979): Place–to–Place Migration: Some New Evidence. The Review of Economics and Statistics, Vol LXI, No 1, 21–32

Kaun, D.E. (1970) "Negro Migration and Unemployment," The Journal of Human Resources. 5 Spring, 191–207

Nyberg, P. (1980): Emigration, ekonomisk tillväxt och stabilitet. En teoretisk undersökning kring emigrationens orsaker och effekter på medellång sikt. Åbo akademi, Åbo.

Schultz, T.P. (1982):"Lifetime Migration within Educational Strata in Venezuela: Estimates of a Logistic Model". Economic Development and Cultural Change, Vol 30, April, 559–593.

Sjaastad, L. (1962):"The Costs and Returns of Human Migration", Journal of Political Economy, 70, 80–93.

Vanderkamp,J. (1971):"Migration Flows, Their Determinants and the Effects of Return Migration". Journal of Political Economy, No 5 Sep/oct. 1012–31.

Wadensjö, E.(1973): Immigration och Samhällsekonomi. Studentlitteratur. Lund.

Appendix.

Variable definitions and data sources. The following indices apply: i=Norway, Finland and Denmark, j= Swedish province j, s=Sweden, g=gender.

B_i Benefits. For Denmark and Sweden this is measured as the maximum amount of benefits per day. Source: Direktoratet for Arbejdslöshedsforsikringen and AMS, försäkringsenheten, respectively. For Finland the variable is the added value of maximum payments from the UI funds and the cash payment. Source: Social– och Häslovårdsministeriet. For Norway the variable is replaced by welfare payments are determined by the average annual payments of the "folketrygdens grunnbelöp". Source: Arbeidsdirektoratet.

D_{ij} Distance from i to j, measured in kilometers from the closest land border of country i to the central city of province j. For sea transportation, I measured the route over the closest port for passenger transportation in Sweden.

E_j Number of persons in labor force. Source: Statistics Sweden.

M_{ijg} The number of migrants from country i and gender g who also are citizens of i and who move to Swedish province j. Ages 16–64. Source: Statistics Sweden.

POP_{ij} Citizens of country i residing in Swedish province j in age groups 16 to 64. Source: Statistics Sweden.

RP_{ig}= Population at risk. Number of citizens of country i and gender g in age groups 16 to 64 at end of period minus in–migrants plus out–migrants.

T_s Tax rate for workers in manufacturing, married with two children. Source: Tax tables of Riksskatteverket (National Tax Bureau) and Kommunal Statistisk Årsbok (Statistical Yearbook of Local Governments.)

u_{ig} Unemployment rate in country i. Source: Yearbook of Labor Statistics, ILO.

u_j Unemployment rate for both gender i Swedish province j. Source: Statistics Sweden.

w_{jg} The real wage rate in province j and gender g. The gender specific real wage covers time rate, piece–work, overtime supplement, extra shift pay, public holiday pay, annual holiday pay and other benefits, corresponding to the so called "C–lön". This wage is divided by the overall Swedish consumer price index. Source: Statistics Sweden and Yearbook of Labor Statistics, ILO.

w_{ig} Real wage at origin country i and gender g, measured as average wage in manufacturing (all industries) divided by consumer price index. Source: Yearbook of Nordic Statistics.