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## EC Integration, the Quality of Information and Labor Mobility in Sweden

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A list of Working Papers on the last pages

No. 273, 1990

**EC INTEGRATION, THE QUALITY OF  
INFORMATION AND LABOR MOBILITY  
IN SWEDEN**

by  
Per Lundborg

Paper presented at the IUI/NEF Workshop on **The EC Internal Market and the Nordic Countries**, June 11–13, 1990, at Lidingö, Sweden

November, 1990

The Industrial  
Institute for Economic  
and Social Research

Revised

EC Integration, the Quality of Information and Labor Mobility in Sweden.

by

Per Lundborg

Paper presented at the IUI-NEF workshop on the EC Internal Market and the Nordic Countries. I am grateful to Henryk Kierzkowski and to colleagues at IUI for helpful comments. The study has been financially supported by the Ministry of Labor.

October 12 1990

## 1. Introduction.

Free mobility of labor is one of the central objectives of the creation of the Internal Market in 1992. For Sweden and other Nordic countries outside the EC, membership would imply that the area of free labor mobility extends beyond the Nordic countries which today constitute such an area. An extension can be expected to have consequences not only for wage formation, employment, incomes etc., but also for the mobility of labor within a country that joins the Community.

If workers in the EC are allowed free entry to the Swedish labor market, an immediate effect is that Swedish firms are given the possibility to recruit workers in a considerably larger area than now is the case. This external migration that would follow from recruitment abroad and from foreign workers' job search in Sweden facilitates the filling of vacancies for any firm in the extended area. However, one could also argue that a larger stock of immigrants in a country raises labor mobility within the country because immigrants are more likely to be geographically mobile than the native population. I shall present arguments for why a larger stock of immigrants may increase mobility in the labor market, introduce the arguments into a human capital model and carry out an empirical test on the relationship between mobility and the stock of immigrants.

The theory of subsequent migration, on which the paper is based, has implications for the expected consequences for labor mobility of an integration of labor markets that follows from EC membership. Assume that Sweden joins the EC so that free mobility of labor between the two areas is established. If labor is heterogeneous, it might well be the case that some workers in Sweden migrate to the EC and some workers in the EC migrate to Sweden so that gross immigration to both areas increases. It can be shown that the increased stock of immigrants in the two areas, even if net migration is zero, increases labor mobility in both Sweden and the EC. Hence, a result of integration could be that mobility inside the borders of both areas is stimulated.

This result rests on the reasonable assumption of less than perfect information about

labor market conditions at the destination. With less than perfect information, newly arrived migrants are likely to face a long period of search for an acceptable job so that mobility increases. The worse the quality of information the more the immigrant has to remigrate in the destination country.<sup>1/</sup>

The mentioned relationships between information quality and mobility implies that high mobility of labor might be connected with lower rather than higher welfare. Assume an influx of labor to Sweden following an EC integration.<sup>2/</sup> If the immigrants have perfect information they immediately find their most wanted vacancies in Sweden and no remigrations take place. Mobility in the Swedish labor market does not increase but the inflow of labor implies a higher added level of welfare for the two areas and for Sweden. If, on the other hand, the immigrants have poor information about labor market conditions in Sweden they will move around during search for an acceptable job and a lower welfare may be implied. With poor information unemployment spells might be long, workers may not find an acceptable job and, eventually, might decide to move back to the country of origin after an unsuccessful search period. Clearly, the two areas' added welfare had been higher had the migrant stayed at the lower paid job at the origin.

Swedish welfare increases with an influx of well informed immigrants who immediately fill vacancies but does not increase if immigrants are poorly informed and unable to find a job. Consequently, low mobility should be connected with high welfare and high mobility, if caused by search, with low welfare. A priori, one cannot determine whether an observed mobility increase has raised welfare or not.

It will be shown that mobility among immigrants is considerably higher than among Swedes. Considering that the welfare effects of higher mobility depend on the quality of information, it becomes important to understand the reasons behind immigrants' higher mobility. To evaluate the expected consequences on labor mobility of Swedish EC membership I shall clarify to what extent immigrants' higher mobility depends on poor quality of information. The quality of information is assumed to depend on the distance

from the home country to the place of residence in Sweden. Hence, not only are immigrants assumed to have worse information than Swedes, but Nordic immigrants are also expected to have better information than non-Nordic immigrants.

The theory of remigration is expanded by assuming that immigrants' information about wages in Sweden improves over time and that, in the long run, immigrants' information equals that of the Swedes. This is of importance as it means that immigrants' higher remigration propensity falls over time and, *ceteris paribus*, in the long run equals that of the Swedes. The temporal aspect of the quality of information will therefore be illuminated. The longitudinal character of the data that are used allows a test of the effects of improved information quality on the remigration probability.

In the next section I present the stylized facts on the geographical mobility among Swedes and among immigrants in the Swedish labor market. In section 3, I give theoretical explanations for the higher mobility among immigrants and place these in a human capital model. In section 4 the model is applied and the results are presented in section 5 while the final section contains the conclusion of the paper.

## 2. Evidence on Mobility among Swedes and Immigrants.

Before turning to the theory and estimation, I shall present some stylized facts on mobility in Sweden. Figure 2.1 shows the changes of the geographical mobility of labor during the period 1964 to 1988.

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Figure 2.1. Migrations across province (län) borders in Sweden. In per cent of total population. 1964–1988.



Source: AMS

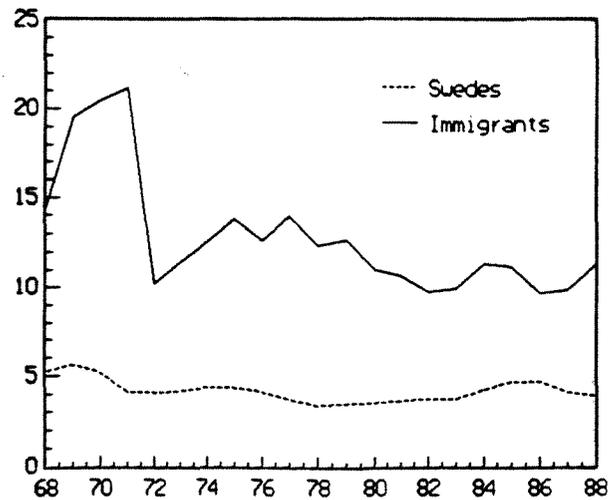
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The figure shows the number of moves over province (i.e. "län") borders in per cent of the total population. Until 1974 the share of the population that moved across the province borders was on average approximately 2.5 % per year. No trend can be identified. However, between the early seventies and 1982 a downward trend occurs. Since then mobility has again increased though it has not reached the levels of the period 1964–1974.

Figure 2.1 covers both Swedes and immigrants. To illuminate the importance of immigrants to mobility one would like to separate the two groups. To obtain the relevant data is however very costly. Alternatively, one can study mobility among the two groups over a few selected province borders. This has been done in Figure 2.2 for the province of Stockholm.

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Figure 2.2. Migrations to the Province of Stockholm from other Swedish Provinces.  
1968–88.



Source: Statistics Sweden

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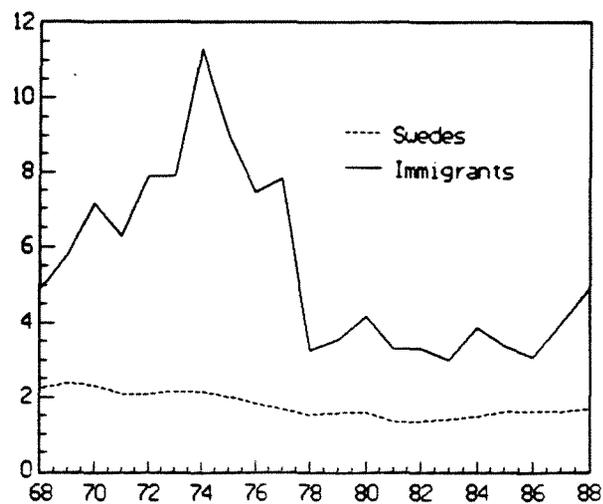
The figure only shows domestic mobility, i.e. migration to the province of Stockholm from all other provinces but not from abroad. For the two groups, the curves show the number of persons that moved to the province of Stockholm from 1968 to 1988 in per cent of the population of Swedes and immigrants, respectively, in other provinces than Stockholm. The curves show that immigrants are considerably more mobile than Swedes. Mobility to the province of Stockholm is approximately three times as high among immigrants as among Swedes. The difference was considerably higher during the years 1968 to 1971 when mobility among immigrants was very high.

However, it could be argued that the province of Stockholm is not perfectly representative as immigrants are over-represented in this province. A province which has

an approximately representative share of the population of immigrants is Malmöhus province.<sup>3/</sup> The internal mobility of Swedes and Immigrants into the province of Malmöhus is shown in Figure 2.3.

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Figure 2.3. Migrations to the province of Malmöhus from other Swedish Provinces. 1968–88.



Source: Statistics Sweden.

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Again immigrants show a higher degree of mobility than the Swedish population. Mobility is between three and four times as high among immigrants as among Swedes. Particularly during the years 1970 through 1977 migration to Malmöhus province was much higher among immigrants than among Swedes.

It is also of interest to show some characteristics of individuals in the data that are to be used. Table 2.1 shows the migration frequencies, age, sex, etc. among Swedes, short distance (Nordic) immigrants, and long distance (non-Nordic) immigrants.

Table 2.1 Characteristics among Swedes, short distance immigrants and long distance immigrants. From the Level of living survey years 1974 and 1981.

	Swedes		Short distance Immigrants		Long Distance Immigrants	
	1974	1981	1974	1981	1974	1981
Migration						
Experience*	.43	.58	.97	1.12	1.42	.96
Age	37	44	35	42	33	40
% women	50		50		50	
Years of						
Education	7.64	7.21	8.49	9.46	8.45	9.51
% married	70	62	76	52	92	69

\* Migration experience is measured as the number of municipalities in Sweden in which the individual resided during the last six years, i.e. 1968–1973 and 1975–1980 for the years 1974 and 1981, respectively.

The first thing to note is that migration experience is considerably higher among immigrants than among Swedes. While in 1974, the Swedes had moved, on average, .42 times since 1968, Nordic immigrants in Sweden had moved .97 times and non-Nordic immigrants 1.42 times. Between 1975 and 1980 the corresponding figures were .58, 1.12 and .96. In line with previous characteristics shown on the mobility of natives and immigrants, immigrants tend to remigrate considerably more than Swedes. However, it is

also clear from the table that other characteristics differ between Swedes and immigrants.

The questions to be addressed in the subsequent section are, first, how differences in internal mobility can be explained and, secondly, if one can expect free mobility of labor between Sweden and the EC to result in higher labor mobility in the Swedish labor market.

### 3. A Model of Internal Labor Mobility: The Role of the Quality of Information.

Since the seminal work of Sjaastad (Sjaastad (1962)) a leading view on migration is that people's moves are an investment in human capital. People migrate because the expected benefits of moving exceed the expected costs. It is, however, not necessarily the case that the migrant expects to remain at the place of destination, but actually expects to make some subsequent moves. This becomes particularly clear when one realizes that the initial move is undertaken in a situation of poor information about the conditions at the place of destination. Only under perfect information will the calculus of the costs and benefits of moving be a perfect one such that secondary migration should not necessarily be expected. With imperfect information the migrants will generally under- or overestimate the net benefits of migration.

For a long time, the assumption of perfect information was predominant in the migration literature. The first authors to allow for less than perfect information to explain the remigration propensity among movers were Yezer and Thurston (1976). Their study was later extended by Allen (1979). Notable empirical studies in the same spirit include Herzog and Schlottman (1983), Grant and Vanderkamp (1985) and Da Vanzo (1983).

Assume that Swedes and foreigners contemplate to migrate to a common destination place,  $j$ , in Sweden from their respective place of origin. These potential migrants are not contracted for a job at the destination but expect to search after arrival. Each individual

in each group have expectations about the wage distribution, the time necessary for job search at the destination and the rate of discount from which an acceptance wage  $w_j^a$  at place  $j$  can be determined.<sup>4/</sup> The unique acceptance wage maximizes the discounted expected value of earnings.<sup>5/</sup> Associated with the acceptance wage is also a unique expected duration of search.

Wage expectations are determined by the quality of information which varies from individual to individual. Hence the value of the acceptance wage also varies across individuals. Information, in turn, depends on the distance between place of origin and place of destination. Hence, since Swedes can be expected to have better information than potential foreign immigrants to Sweden, the probability of subsequent migration after arrival at  $j$  is higher for immigrants. Consider Figure 3.1 below<sup>6/</sup>:

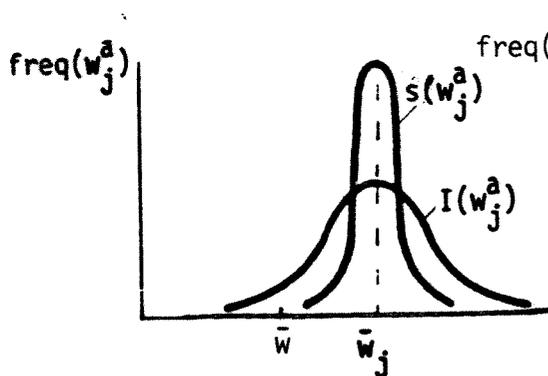


Fig 3.1.a

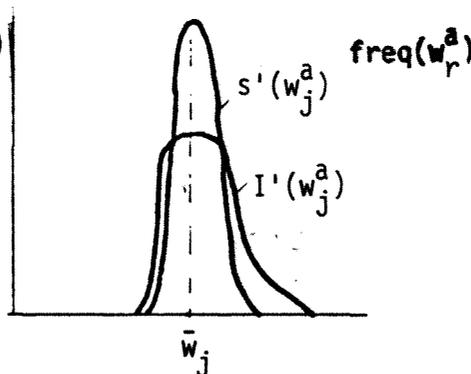


Fig 3.1.b

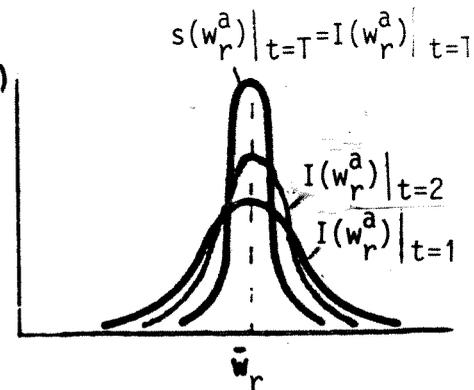


Fig 3.1.c

The panel 3.1.a. represents two groups of migrants with access to information of different quality.  $S(w_j^a)$  and  $I(w_j^a)$  are the distributions of the acceptance wage at the time

of the move to province  $j$  among Swedes and immigrants and the curves show that the Swedes have better information about the wage distribution at  $j$  than foreign immigrants do.  $\bar{w}_j$  is the wage at destination and  $\bar{w}$  the wage at origin. Without loss of generality,  $\bar{w}$  is assumed identical for both groups. Anyone expecting a wage above  $\bar{w}$  will move to  $j$ . An individual expecting a wage above  $\bar{w}_j$  overestimates the wage and is an optimist and an individual expecting a wage below  $\bar{w}_j$  is a pessimist. Consequently, both  $S$  and  $I$  contain more optimists than pessimists since all optimists, but not all pessimists, move. Thus, a larger proportion of those who overestimate the benefits of migration appears among the migrants and those who underestimate the benefits are proportionately fewer. Since migration rates to some location increase in the expected wages at destination, people who overestimate the wage are more likely to move.

The selectivity bias against the pessimists who underestimate the wage at destination depends on the accuracy of information. The worse information about the destination labor market, the larger is the number of people who overestimate the net benefits of moving. The more optimists dominate the set of immigrants, the larger is the probability of disappointment after arrival and the larger the probability of disappointment, the larger is the probability of subsequent migration (remigration or return migration). Since optimists are more over-represented among immigrants than among Swedes, immigrants are more prone to remigrate than natives are. Furthermore, since the quality of information falls in distance, the further away the migrants' place of origin the more likely are they to move again after arrival. Hence, immigrants from the Nordic countries should be less prone to relocate after arrival in Sweden than immigrants from, say, southern Europe.

Figure 3.1.a can be perceived of as representing the situation among potential migrants, or people "at risk" to migrate, before the move. Since migration selects against pessimists the distributions among actual migrants differ from the ones portrayed in 3.1.a.

Panel 3.1.b represents the distribution, at the time of the move, among actual migrants which is skewed due to the selection against the pessimists.

It is clear from 3.1.b that optimists dominate both groups but that they are more over represented among immigrants with poor initial information. The selection of optimists further adds to the higher migration rates among immigrants: an individual in I' is more likely to remigrate than one in I in 3.1.a.

The group of immigrants, I, then has a higher probability of moving since the poor information among this group made most individuals set the acceptance wage too high. Furthermore, long-distance (non-Nordic) movers are likely to have worse information than short-distance (Nordic) immigrants. That would imply that if Sweden extends the area of free labor mobility to include the European Community, immigrants' mobility within Sweden is likely to rise since the proportion of long-distance movers among the stock of immigrants increases.

Bowman and Myers (1967) argue that a recent migrant who considers a subsequent move has better information than before the move which implies that the information cost of another move has decreased. This "learning-by-doing" would further add to the probability that a recent migrant makes a subsequent move.

The above arguments can be expanded by assuming that information improves over time. Consider a group of immigrants in Sweden who do not return but stay for a long time. Whether they continue to move within Sweden or stay at a certain place the case will be that over time the frequency distribution of the acceptance wage at some other place,  $r$ , will change as depicted in panel 3.1.c. The panel represents the situation for people "at risk" to migrate.

In year  $t=1$ , the Swedes at  $j$  have considerably better information about wages at  $r$  than recently arrived immigrants at  $j$ . As time passes, however, the immigrants improve the quality of information so that at time  $t=2$  the distribution has approached the one for

Swedes and at time  $t=T$ , there is no difference in the quality of information between the groups. In the long run their distribution of the frequency of  $w_r^a$  will coincide with the one for the Swedes. This, in turn, means that the probability of remigration falls and, after some time, should be identical, *ceteris paribus*, to the one for the Swedes. The longitudinal data set can amply be used to test the hypothesis that the remigration propensity falls over time for staying immigrants as the quality of information about wages at  $r$  rises.

An indication that poor information plays a role in determining the remigration propensity is provided in Table 2.1. The long distance (Non-Nordic) immigrants' remigration rates during the previous six years is considerably higher for the year 1974 than for 1981, 1.42 compared to .96. This could be the result of improved quality of information after arrival in Sweden. For Swedes, and for short distance (Nordic) immigrants, the quality of labor market information does not improve to the same extent and no fall in the remigration rates is recorded. In the next section I shall test the effects of information quality on the remigration probability.

#### 4. Hypotheses, Data and Estimation.

According to the human capital model an individual in region  $i$  moves to region  $j$  if the discounted valued of moving to  $j$  exceeds the present value of earnings by at least an amount high enough to cover the costs of moving from  $i$  to  $j$  and the costs of searching for a new job in region  $j$ . The present value of the move from  $i$  to  $j$ ,  $PV_{ij}$ , equals:

$$(4.1) \quad PV_{ij} = \int_{t_s}^T w_j e^{-rt} dt - P_{ij} - C_{ij} - S_j(t_s) - K_i - \int_0^T w_i e^{-rt} dt$$

where

- $w_i, w_j$  = the wage rate per time period, regions  $i$  and  $j$ ,  
 $P_{ij}$  = the present value of the income compensated psychic costs  
of moving,  
 $C_{ij}$  = non-psychic costs of moving  
 $S_j(t_s)$  = search costs over  $t_s$  time periods,  
 $T$  = length of working life,  
 $r$  = the rate of discount.  
 $K_i$  = other costs caused by moving.

As I am interested in mobility within Sweden, both  $i$  and  $j$  represent two different regions in Sweden. Hence, I suppress the incidence of immigrants' return migration to the origin country. After arrival to the destination, the migrant expects to search for an acceptable job during  $t_s$  time periods at the cost of  $S_j(t_s)$ . To determine a minimum wage in  $j$ ,  $w_{ij}^m$  that causes the individual to make the initial move, one can set  $PV_{ij}=0$  and solve for  $w_{ij}^m=w_j$ . One then obtains

$$(4.2) \quad w_{ij}^m = \{P_{ij} + C_{ij} + S_j(t_s) + K + (1 - e^{-rT})w_i/r\} [r / (e^{-rt_s} - e^{-rT})],$$

which can be differentiated with respect to the variables involved to show that  $w_{ij}^m$  is an increasing function of  $w_i$ ,  $P_{ij}$ ,  $C_{ij}$  and  $t_s$ . For migration to come about the minimum destination wage must be higher the more attractive the place of origin is, the higher the psychic and moving costs are and the longer the time of searching for a new job is.

Furthermore,

$$(4.3) \quad p(M_{ij}) = f(PV_{ij})$$

where  $p(M_{ij})$  is the probability of remigration from region  $i$  to  $j$  and  $f' > 0$ .

The psychic costs of moving from  $i$  to  $j$ , represented by  $P_{ij}$  in equation (4.1), can be assumed to depend on the distance between  $i$  and  $j$ . Furthermore, the more friends at the origin the higher are the costs and the more friends at the destination the lower are the psychic costs of moving.

Psychic costs are normally assumed to depend on the level of education; more educated people can be expected to have a labor market which is geographically larger in scope than the poorly educated, to have a common language with well educated natives etc., and therefore to be able to adjust more easily to new environments than less educated people. (See Schwartz (1973)). Education is therefore expected to stimulate migration. Earlier migration experience may also play a role for migration. If a person is used to breaking up, the psychic costs of moving might be lower since the person is used to new environments.

I also include in psychic costs the capital that is given up by moving. The longer time a person spends at one and the same place, the more he invests in local specific capital. This capital can take many forms, like seniority at work, contacts with friends, relatives and neighbours, etc., and the value of the capital falls with the move. The one who moves has almost perfect information about conditions in the place he leaves and the capital can partly be regained by a return to the origin.

At the arrival in Sweden and the entry into the labor market, an immigrant has no capital invested in the new place. Thus, no capital is given up by an early remigration. Over time, however, immigrants also invest in local specific capital, whereby migration rates fall. In times of a continuous inflow of immigrants one should expect that the relatively recent arrivals contribute to a higher mobility of labor in the labor market.<sup>7/</sup>

Hence  $P_{ij}$  can be written as:

$$(4.4) \quad P_{ij} = P(D_{ij}, FR_i, FR_j, E, ME, LC_i)$$

where  $D_{ij}$  = Distance between i and j,  
 $FR_i, FR_j$  = Friends and relatives at origin i and destination j,  
 $E$  = Education,  
 $ME$  = Previous migration experience,  
 $LC_i$  = Local capital invested at i.

and where  $P'_d > 0$ ,  $P_{fr_i} > 0$ ,  $P_{fr_j} < 0$ ,  $P_e < 0$ ,  $P_{me} < 0$  and  $P_{lc} > 0$ .

The costs of moving from i to j,  $C_{ij}$ , is assumed to depend on distance between i and j and the number of dependents, DEP:

$$(4.5) \quad C_{ij} = C(D_{ij}, DEP)$$

where  $C_d > 0$ ,  $C_{dep} > 0$ .

It was noted that the probability of remigration depends on the quality of information possessed by the time of the initial move. Information quality, in turn, can be assumed to depend on distance from the original country to the Swedish region i, education, age and friends at i. Following Herzog and Schlottman (1983) I define an information function as:

$$(4.6) \quad I_{ki} = I_{ki}(E, AGE, FR_i, D_{ki}, t)$$

where k is the initial place of residence. Education is expected to influence information quality since well educated people might process information more efficiently than less educated people (Schultz (1975)). Furthermore, their labor markets are national and information about vacancies are given in journals, newspapers, at meetings, etc. (Schwartz (1973).) From this point of view we should expect education to lower remigration as the well educated have a higher success rate than the less educated. Corrective remigration

should therefore be more common among the poorly educated. This argument counteracts the previous one, i.e. the effects on migration via the psychic costs of moving, and leaves the expected net effect of education on migration ambiguous.

Age might also play a role since less experience might imply a less efficient processing of information and less information about opportunities in alternative locations. This adds to the traditional human capital argument for why the young move more, which is that they have a longer remaining life time during which the fruits of migration should be reaped (Becker (1964).)

Of relevance for the effect of information on migration is also distance of the initial move of the migrants,  $D_{ki}$ . Therefore the distance of the initial move is included as a proxy for the cost of information, since, in general, it is more costly to acquire information the further away the place of destination is. So the further away, the greater the risk of failure and the higher the probability of a later corrective move.

Time,  $t$ , is also expected to affect information. Over time the information argument above becomes weaker since for all groups information about wages at other locations improve. Therefore, in the short run after arrival, education has an ambiguous effect while in the long run, when information improves, the effect of education on migration is negative.

Accounting for equations (4.1), (4.4), (4.5), and (4.6) I shall for recent immigrants estimate the reduced form of equation (4.3). Time enters by separating the regressions for the short and for the long run. for the short run, (recent migrants to  $i$ ), I obtain:

$$(4.7) \quad P(M_{ij}) = f_s(w_j, D_{ki}, E, AGE, SEX, M, ME, FR_j, LC, FAM, NIM, NNIM)$$

where

- $w_j$  = Wage at destination,
- $D_{ki}$  = Length of distance of the initial move, i.e. between place of origin  $k$  to destination  $i$ ,
- $E$  = Years of education.
- $M$  = Marital status, (0 for unmarried, 1 for married),
- $SEX$  = Gender, (0 if male, 1 if female),
- $ME$  = Migration experience during 1968–73, number of moves between municipalities,
- $FR_1$  = Friends at origin,
- $LC_i$  = Local capital, measured as years with the same employer,
- $FAM$  = Family size,
- $NIM$  = Nordic immigrant (dummy variable),
- $NNIM$  = Non–nordic immigrant (dummy variable).

The function  $f_s$  is supposed to hold for the short run here defined for those who moved to province  $i$  during the last six years. Those who arrived earlier than six years back are excluded from the data set.

Note that  $D_{ki}$  captures the informational aspect while the inclusion of  $NIM$  and  $NNIM$  is supposed to capture effects which are specific to short–distance and long–distance immigrants, respectively. This may represent cultural and language similarities. Therefore, after correcting for distance, I expect that  $NIM$  has a positive impact on the remigration probability and  $NNIM$  a negative one, implying that short–distance migrants easily adjust to other destinations in Sweden while long–distance immigrants do not.

Equation (4.7) is applied to migrants who arrived recently and therefore the informational aspects are likely to have an influence. However, I shall apply a similar model to the same individuals but for a later time period when the informational

differences between Swedes and immigrants can be expected to have disappeared. For the year 1978, a more limited number of explanatory variables are included since only register data are available:

$$(4.8) \quad P(M_{ij}) = f_1(w_i, w_j, D_{ki}, E, AGE, SEX, M, ME, NIM, NNIM)$$

where  $w_i =$  Wage at origin.

Migration during a year appears during November 1 and October 31.

A number of hypotheses are implicit in the derivation of the regression model above. However, it is appropriate to single out a few hypotheses as being more important than others. Since the quality of information plays a crucial role in the analysis and since this role changes over time as explained in section 3, it is important to distinguish the short term effects from the long term effects. Hence, the following hypotheses are specified.

Hypothesis 1. In the short run, the further away the migrant's initial residence prior to  $i$  the worse is information about  $i$  and the higher is the probability of remigration.

The primary test of this hypothesis is that the variable  $D_{ki}$ , i.e. distance of the initial move, soon after arrival positively determines the remigration probability. Hence, I expect  $D_{ki}$  to yield a positive estimate. However, also education is of relevance and since well educated people process information better their need for a corrective remigration is lower than for the poorly educated. Hence, education lowers the remigration probability. But it was also mentioned that well educated more easily adjust to new environments which stimulated remigration so that the expected effect is indeterminate. Also increasing age implies a better processing of information so that corrective remigrations are less needed for the older; the hypothesis implies a lower remigration probability among the old than

among the young.

Hypothesis 2. In the long run, immigrants and Swedes will have the same quality of information so that information quality loses its role as a determinant of the differences in the remigration propensity between Swedes and immigrants.

This implies that the remigration probability for the same individuals as for which hypothesis 1 was tested at a later time period is not affected by distance. Furthermore, the only argument of relevance for education is that the psychic costs for the well educated of moving is lower so that education for the long run case should have a positive effect on remigration probability. Age should continue to yield a negative effect on the remigration probability but less negative than for the short run case since now the informational argument is not present.

The expected estimates following from the two hypotheses are then:

$$\hat{\beta}_{D_{ki}}^{74} > 0 \quad \hat{\beta}_{D_{ki}}^{78} = 0 \quad \hat{\beta}_E^{74} \geq 0 \quad \hat{\beta}_E^{78} > 0 \quad 0 > \hat{\beta}_{AGE}^{78} > \hat{\beta}_{AGE}^{74},$$

where a circumflex indicates that the value is estimated.

The arguments mentioned above point to the conclusion that one should also estimate the model for Swedes and immigrants separately. Since the quality of information is expected to be lower among immigrants than among Swedes one should expect education and age to play a more important role for immigrants' propensity to migrate in Sweden than for Swedes. The effects of age and education are determined for a given level of information quality and the poorer the information, the more important the effects of age and education become. Hence, age and education are expected to yield higher estimates for immigrants than for Swedes.

It was noted that age and education both affect the information quality and hence the migration propensity. To the extent that lower information quality is a reason for higher migration rates among immigrants, we should expect lower elasticities of migration with respect to education for immigrants than for Swedes. Finally, since age is of importance for the processing of information, I expect a higher elasticity of migration with respect to age among immigrants than among Swedes.

I shall use the Swedish Level of Living Survey (levnadsnivåundersökningen, LNU) which is a micro data base for the years 1968, 1974 and 1981. The number of respondents for these three years were 5 922, 5 616 and 5 613, respectively. To the data for these three years have been added register data for the years 1974 through 1984. I focus on annual locational changes during 1974 and 1978.

The models are estimated by maximum likelihood dichotomous logit. On the general form this reads:

$$(4.10) \quad P(M_{ij}) = \frac{1}{1 + e^{-(\alpha + \beta X_i)}}$$

where  $X_i$  is a vector of independent variables and  $\alpha$  and  $\beta$  the parameters to be estimated. Each coefficient shows how a change in a variable affects the probability of remigration.

## 5. Results.

Table 5.1 shows Maximum Likelihood estimates for the year 1974. Appendix 1 provides the exact definitions of the variables. Data for 1974 do not contain any information about wages at origin for the year 1974. The regression concern migrants who arrived at  $i$  during 1968 through 1973 and immigrants are assumed to have worse information than Swedes.

Since I analyze remigrations, the regressions for Swedes excludes all primary movers.

Immigrants have, by definition, previous migration experience. The destinations of all remigrations are other Swedish provinces.

Table 5.1. Maximum Likelihood Estimations of Logit Equation. Probabilities of remigration following a 1 percent increase in the independent variables. T-ratios in parenthesis. Year 1974

Population Independent variables:	All	Swedes	Immigr.
Constant	-.1597 (-1.694)	-.1662 (-1.610)	-.728 (-3.483)
Wage at destination( $w_j$ )	5.1E-7 (.760)	7.9E-7 (1.042)	-.73E-7 (.069)
Married(M)	-.0213 (1.516)	.0004 (.027)	-.2639 (-4.843)
Gender(SEX)	-.0044 (.352)	-.0004 (-.334)	-.0108 (-.334)
Friends at origin( $FR_i$ )	.0042 (.694)	-.0005 (-.072)	.0043 (.316)
Mig. Experience 1968-74(ME)	.0569 (4.714)	.0640 (4.553)	.0438 (1.734)
Education(E)	-.0146 (-4.116)	-.0116 (-2.916)	-.0221 (-2.645)
Local capital(LC)	.0010 (2.348)	.0004 (.977)	.0035 (2.692)
Family size(DEP)	-.0219 (-2.330)	-.0184 (-1.808)	-.0468 (-2.106)
Age(AGE)	-.0055 (-4.545)	-.0038 (-2.956)	-.0148 (-4.313)
Distance of initial move( $D_{ki}$ )	.0223 (3.500)	.0172 (2.687)	.0609 (3.016)
Nordic immigrant(NIM)	.0888 (3.038)		
Non-nordic immigrant(NNIM)	-.0815 (-4.413)		
Likelihood ratio	1305.36	999.85	307.85
Observations	1502	1157	345

The primary hypothesis that was derived from the model was that poor information prior to the move stimulated subsequent migration after the move. An indicator of the quality of information is distance and, as can be seen, the variable "distance of initial

move",  $D_{ki}$ , is clearly of importance to the results. As expected  $\hat{\beta}_{D_{ki}}^{74} > 0$  for Swedes as well as for immigrants and the estimate is significant. Poor information also appears to be of considerably greater importance to immigrants than to Swedes as a determinant of the remigration propensity.

The theoretical model of information and remigration propensity also predicted that education and age are of importance for the remigration decision. It was argued that well educated people process information better such that the less educated are more prone to remigrate after arrival. As can be seen, education has a negative impact on remigration in Sweden which vindicates the hypothesis concerning the impact of poor information. Education appears both in (4.4) and (4.6) and the estimate could therefore take on either value ( $\hat{\beta}_E^{74} \geq 0$ ). Obviously, the latter (information) effect dominates in this "short run" regression since the estimates are negative. Again, the absolute estimates are considerably higher for immigrants than for Swedes.

Concerning the age variable, it was argued that older and more experienced people process information better and hence tend to remigrate less. The expected positive sign is obtained ( $0 > \hat{\beta}_{AGE}^{74}$ ). However, whether the negative estimates are the result of a better processing of information or of other reasons for why older people migrate less, cannot be determined from the results. The absolute estimate is also here higher for immigrants than for Swedes.

Whether the migrant is married or not appears to be of importance for immigrants only, while the results indicates that for Swedes the existence of a spouse does not lower the probability of remigration. For both groups, however, family size tends to inhibit remigration. Local capital, here measured by the number of years with the present employer, yields a not significant estimate for Swedes and an estimate of the unexpected positive sign for immigrants.

Previous migration experience seems to be of greater importance to Swedes than to

immigrants, and for both groups this variable yields significant estimates of the expected sign.

Gender, friends at origin and destination wages have not yielded the expected and significant results.

The second year for which the regressions were run is 1978 and the results are presented in Table 5.2 below. This covers the same individuals as for the 1974 regression. By 1978 immigrants are assumed to have improved the quality of information.

Table 5.2. Maximum Likelihood Estimations of Logit Equation. Probabilities of remigration following a 1 percent increase in the independent variable. T-ratios in parenthesis. Year 1978

Population	All	Swedes	Immigr.
Independent variables:			
Constant	-.3773 (-8.640)	-.3591 (-8.346)	-.2912 (-4.174)
Wage at origin( $w_i$ )	-5.1E-7 (-1.440)	-5.0E-7 (-1.250)	-3.7E-7 (-0.440)
Wage at destination( $w_j$ )	1.3E-6 (.044)	6.5E-6 (.195)	-3.8E-5 (-.522)
Married(M)	.0146 (2.267)	.0155 (2.027)	.0131 (1.086)
Gender(SEX)	.0109 (1.840)	.0109 (1.572)	.0076 (.647)
Mig. Experience 1968-74(ME)	.0207 (3.650)	.0196 (2.591)	.0177 (2.378)
Education(E)	.0044 (2.556)	.0025 (1.155)	.0066 (2.243)
Age(AGE)	-.0008 (-1.260)	-.0015 (-1.887)	.0007 (.673)
Distance of initial move( $D_{ki}$ )	.0041 (1.444)	.0079 (2.169)	.0006 (.088)
Nordic immigrant(NIM)	.0093 (.529)		
Non-nordic immigrant(NNIM)	.0033 (.216)		
Likelihood ratio	532.22	445.01	81.17
Observations	1501	1157	344

The estimates of distance of the original move are now not significant immigrants

which is in line with the basic hypothesis that information has improved among immigrants with the extra years spent in Sweden. Still, though, information seems to matter for Swedes in determining the remigration probability, but the estimate is, as expected, considerably lower in 1978 than in 1974. Hence, the importance of poor information has fallen also for the Swedes.

Unlike for the year 1974, education now yields positive and significant estimates (except for Swedes) indicating that the informational aspect, unlike for 1974, does not dominate. ( $\hat{\beta}_E^{78} > 0$ ) This is also what one might expect: After some time has elapsed the information aspect is no longer present and only the positive effect remains. For Swedish migrants age again yields a negative and significant estimate while it does not for immigrants. Furthermore, it was expected that  $0 > \hat{\beta}_{AGE}^{78} > \hat{\beta}_{AGE}^{74}$  which holds for Swedes. For immigrants, the estimate of age for 1978 is not significantly different from zero.

Previous migration experience continues to yield significant and positive estimates.

## 6. Conclusions.

The theory of remigration suggests that mobility of immigrants, i.e. the remigration propensity, should be higher than the corresponding remigration rate among natives. This has consequences for the expected consequences of integration: to the extent that labor market integration leads to larger stocks of immigrants in the integrating countries, integration might lead to higher internal labor mobility. However, it was noted that increased mobility not necessarily is connected with higher welfare since it could be the result of low information quality among immigrants. If increased mobility is due to, say, selection of younger, better educated and more migration prone people with good information, a mobility increase is connected with positive welfare effects.

The results suggest that the remigration probability is strongly affected by the quality

of information as well as the more traditional variables like previous migration, age, family size etc. The regressions for the year 1974 indicated that poor information quality among immigrants is a factor explaining immigrants' higher mobility rate. The explanatory variables "distance to place of origin" as well as "education" and "age" produced effects on migration rates which are predicted from the theory. Hence, Hypothesis 1 is given a strong support in the regression for 1974.

Since data allowed the regressions to be carried out for the same individuals at two different time periods, 1974 and 1978, it was possible to test the time dependence of the quality of information and its effects on the remigration probability. For the year 1978 the results point more to the importance of traditional explanatory factors like previous migration experience, education (which stimulates migration), marriage status, family size etc. Hence, as suggested in Hypothesis 2, information differences between Swedes and immigrants diminishes over time and the variable "distance of initial move" no longer has a significant effect on the remigration probability among immigrants. This provides further empirical support to the repeat migration model. Should these results carry over to hold also for an increased stock of immigrants following a Swedish integration with the EC, we should expect mobility to rise. However, labor mobility should eventually fall as information quality among immigrants improve.

An important question is if a higher mobility remains among immigrants after the informational aspects have been accounted for. Unfortunately, this question cannot be given a satisfactory answer in the present study. Too many traditional migration arguments have been left out as data are restricted.

## NOTES

1. If, however, the migration process selects towards the more migration prone in both areas, this will not raise mobility in both areas.
2. According to the EC rules for the free mobility of labor, an immigrant who arrives to search for a job in another EC country has to finance his stay during search by means from his origin country. He is then not eligible to unemployment benefits in the host country.
3. This means that the share of immigrants residing in Malmöhus län is approximately the same as the share of Swedes living in Malmöhus.
4. It is a matter of some controversy whether an acceptance wage can be determined from the expected wage distribution or not.
5. This statement is based on the result from the job search model that the value of earnings is maximized by continuing to search until the expected value of the marginal increase in income that follows from sustained search equals the sum of the extra search costs and forgone earnings based on the expected value of the highest wage obtained during previous search.
6. The figure is based on Allen (1979) though the basic argument was presented by Yezer and Thurston (1976). Readers interested in more details on the theory should consult these two references.
7. Da Vanzo (1983) measures location specific capital by the ownership of the house the person occupies. As noted by her, a problem with using this is that the causation might run the other way: those who intend to stay initially are more likely to buy a home than those who do not plan to stay.

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## Appendix 1

### Variable definitions.

The dependent variable is determined from register data. Information is available about the municipality of residence on November 1 each year. If the municipalities differ from year  $t-1$  and  $t$  then the migration variable for time  $t$  is given the value 1 and else the value 0.

Since the migrant moves some time during year  $t$  it is difficult to establish the income at origin from the register data. Income during the year of the move is a weighted average of the income at origin and income at destination. I therefore let the income at  $t-1$  represent income at origin and income during  $t+1$  represent income at destination. For 1974 no data on wages at origin (i.e. for 1973) are available.

Children under 18 are excluded from the data set.

The number of friends at  $i$  are determined as the added sum of answers given to the question if the respondent visits or gets visits by friends and relatives. See variable V939 and U647 in (Vuksanovic (1979) and SOFI (1984).)

Migration experience measures the number of moves to other places during the last seven years and where the respondent has resided for at least a year.

Education is measured as the total number of years.

Local capital is represented by the number of years at the present employer.

Distance of initial move is measured as the number of mil (i.e. 10 K:s) from the place where the respondent was brought up, i.e. until he or she turned 16.