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Modelling the propensity to live and stay in the Åland Islands – a case of eroding insider advantages of immobility?

Jouko Kinnunen

Statistics and Research Åland (ÅSUB)
P.O.Box 1187, AX-22111 Mariehamn, Åland, Finland
email: jouko.kinnunen@asub.aland.fi
phone: +358-18-25 494, fax: +358-18-19495

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Abstract

This article has a dual purpose. Firstly, it presents the nature and the recent development of migration to and from the Åland Islands by means of discrete choice models. Secondly, the model is estimated in such a fashion that its results are usable in a simulation model. The analysis is conducted by using individual data from longitudinal population censuses, which enables the use of individual-specific characteristics and a panel data specification in the analysis. The results lend support to Harris-Todaro –type expected wage hypothesis, as well to several suggestions of the human capital theory of migration. The results even support an insider advantage hypothesis by showing that staying in Åland is state and duration dependent, i.e. those who already live in Åland, have stayed longer, and are native Ålanders are more probable stayers. However, the results also reveal that there is an increasingly negative tendency in the probability of native Ålanders to live in Åland, whereas the probability of Finnish-born migrants to live in Åland has slightly risen during the 1990s. The author suggests that this development may be due to a growing internalisation, e.g. through the EU membership, as well as due to a failure to adjust the education policy to changing demand of language skills.

JEL Codes: J61, R23, C33, C35

1 Background

Literature on the connections between migration and regional economic conditions has been on a steady increase in during the last decade, no less so in Finland. This is understandable, given the fact that migration flows to the Finnish growth centres from peripheral regions have increased since the middle of the 1990s (Nivalainen 2000; Haapanen, 2002; Häkkinen, 2000). Out of 20 Finnish (NUTS 3) regions, seven experienced in average positive net migration during 1990-2002, one of these regions being the Åland Islands (Statistics Finland, 2003).

Åland Islands is a small autonomous province of Finland, inhabiting 26,000 persons on 65 of its 650 islands, located in the Baltic Sea in between Finland and Sweden. Migration has become an increasingly important determinant of labour supply in Åland. During 1990-2002, net migration averaged 0.36 per cent of population, a level corresponding that of the growth areas in the Southern Finland save the capital city region Uusimaa. In 2002, however, the net migration rate was highest in Åland, 0.84 per cent, of all the Finnish NUTS 3 regions.

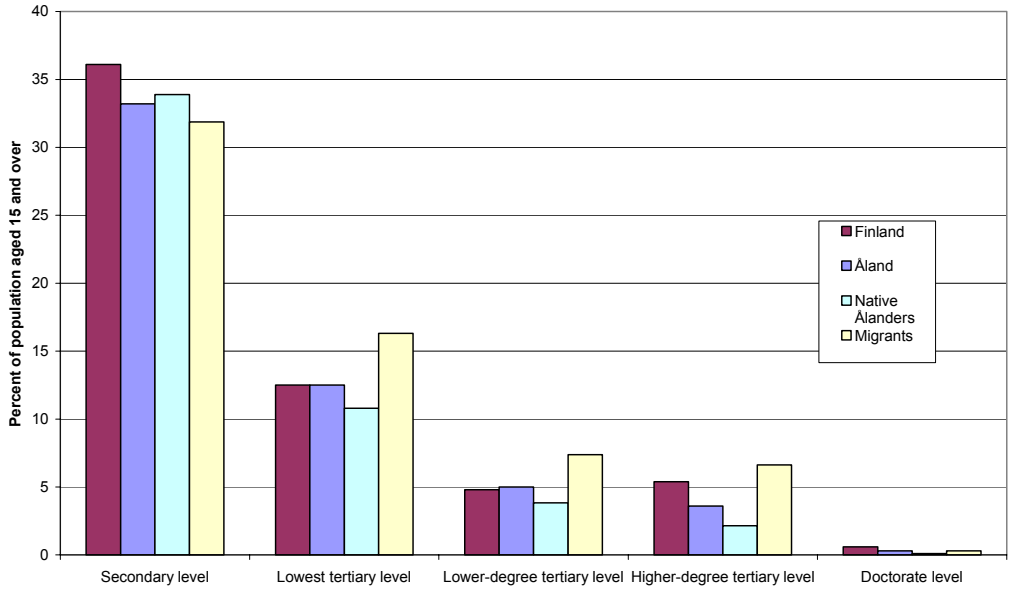
In general, the educational level of Ålanders is somewhat lower than in the mainland Finland. However, the educational level of non-native inhabitants of Åland is higher than that of the native population, and even higher than the general educational level in the mainland Finland

(see figure 1). Migration has thus been important for the build-up and maintenance of human capital stock in Åland.

Another way to look at the migrants' importance for the local labour market is to compare migrants' shares in different socio-economic groups. We see that migrants have shares surpassing their population share among the unemployed and white-collar workers and officials. In return, migrants' share is low among entrepreneurs and blue-collar workers (see figure 2). The educational and socio-economic groupings reflect basically the same situation: posts requiring a high human capital input are manned to a considerable degree with migrants.

A reason for the high unemployment among migrants could be that spouses have not found employment after moving to Åland. Åland's rather one-sided structure of economy may make it hard to find an employment for spouses with a specialised education or without a working knowledge in Swedish[1]. Nivalainen (2004) has studied the post-move employment of two-earner families in Finland. She found that migration has a negative impact on the employment of wives, whereas migration leaves the majority of husbands unaffected or improve their employment. Indeed, in our longitudinal sample data for the years 1990-2000, female migrants had a higher incidence of unemployment according to a cross-tabulation of unemployed by sex and place of birth ($p = 0{,}00003$ for P^2 with d.o.f. = 1).

Figure 1. Educational level in Finland and Åland

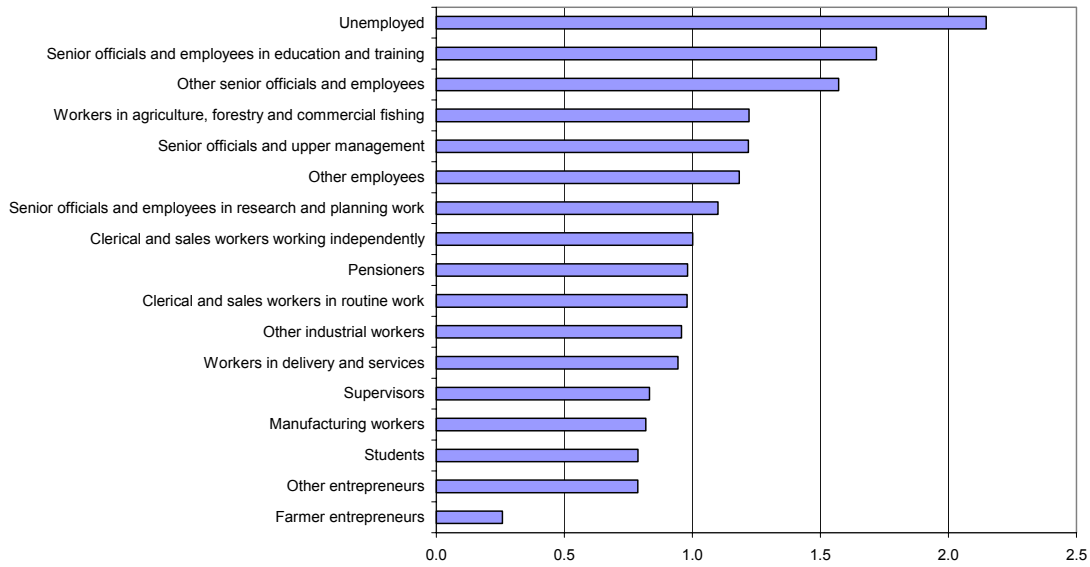


In addition to the geographic isolation from the mainland Finland, the linguistic characteristics of Åland distinguish it quite effectively from the rest of Finland – 93 per cent of Ålanders speak Swedish as their mother tongue, while in the continental Finland, 93 per cent speak Finnish (Statistics Finland, 2003a). Furthermore, the autonomous position of Åland with its own legislative powers in several issues reinforces this distinction. Åland is also in many ways more connected to Sweden than other regions in Finland, which in turn lends to the fact that the foreigners' share of the inhabitants is the highest in Åland of all the

[1] Almost 40 percent of the gross regional product is generated by sea transport, and the share of industrial production is less than 10 per cent.

Finnish regions (8.6 per cent in Åland in 2002, while 2.9 in the whole country; Statistics Finland, 2003a). Majority of the young Ålanders prefer attending the Swedish universities: 71 per cent of the university level students studying outside Åland were enrolled in the Swedish universities, whereas only 24 per cent studied in the mainland Finland (Statistics Åland, 2003). Therefore, a study concentrating only in the national migration would give only a partial picture of the migration to and from Åland.

Figure 2. Socio-economic group's share among migrants in relation to its share among natives



Ålanders have a strong identification to their home region. Ålanders more readily concern themselves as having a Nordic identity than Finno-Swedish or Finnish identity (Häggblom – Kinnunen - Lindström, 1999). There is in fact a small but active lobbying group that strive for an independent state of Åland. This group, Ålands Framtid (Åland's Future) got two seats in the regional parliament in the last elections. The strong ties to the home region may act as a constraint to out-migration, thus increasing the immobility of Ålanders (see Fischer et al., 2000).

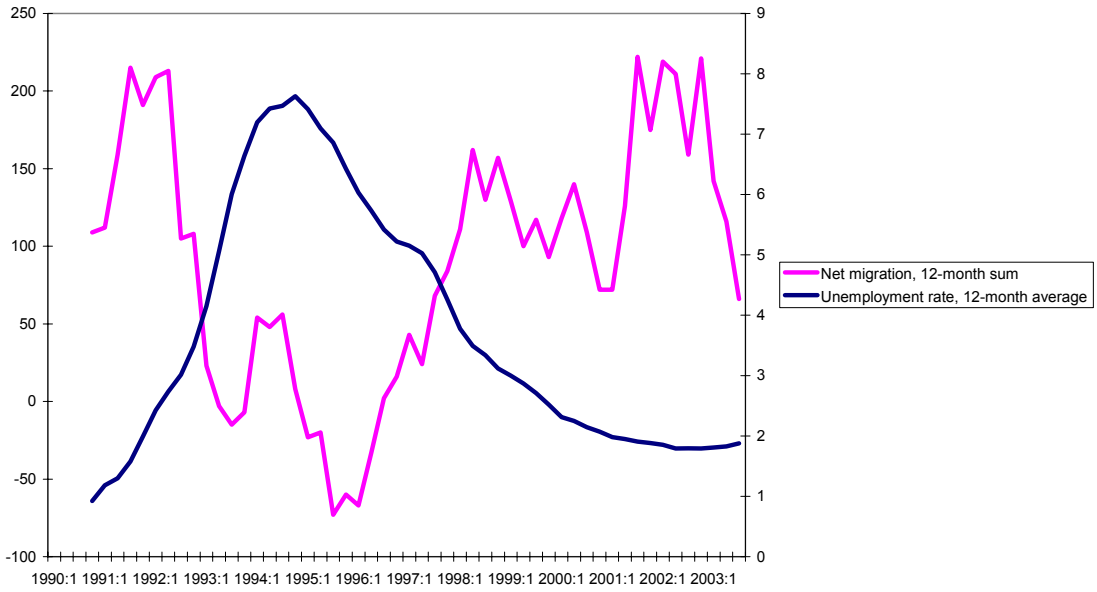
Åland has also special legislation regarding a regional "citizenship" called right of domicile. It is necessary to possess the right of domicile e.g. in order to own and hold real estate in Åland. Therefore, migrants moving to Åland cannot buy detached houses without an exceptional permit. In order to obtain the right of domicile upon application, one has to live in Åland for five years and have satisfactory knowledge of Swedish. Furthermore, everyone who lives outside Åland for five years looses her right of domicile, even the native Ålanders (Åland Government and the Legislative Assembly, 2002). These restrictions most probably act as obstacles to in-migration, and maybe they even deter some out-migration.

Due to these special characteristics, Åland is occasionally left out in the regional analysis of migration. Pekkala (2003) puts it as follows: "The special character of Åland could affect the analysis as it is likely that the personal migration determinants in Åland differ from those in the rest of the country." Her reasoning begs the question: what are those determinants? This study tries to shed light on this issue.

Although Åland is normally classified as a peripheral rather than as a growth-centre region (see e.g. Haapanen, 2002), regarding migration it behaves like one, although on a miniature scale. One of the reasons behind this could be Åland's language profile: for the Finnish Swedish-speaking minority representing only 5.1 per cent of the total population in the mainland Finland (Statistics Finland 2003a), Åland with its unilingual Swedish-speaking status – in contrast to the bilingual status of Finland - is an interesting migration target.

Apart from Åland, only regions around the Finnish capital area with considerable Swedish-speaking minorities have experienced positive net migration flows and increases in the number of Swedish-speakers during the last decade, while other regions with Swedish-speaking population have lost inhabitants (Statistics Finland, 2003a). Therefore, Åland seems to be an important migration target for the Swedish-speakers. Another factor enhancing the growth-centre-like migration behaviour of Åland may have been the expansion of the public sector in Åland. Between 1991 and 2000, the number of employed in the public sector in Åland rose by 24 per cent, whereas the employment in the private sector grew only by 1.3 per cent (Statistics Finland, 2003c).

Figure 3. Net migration and unemployment

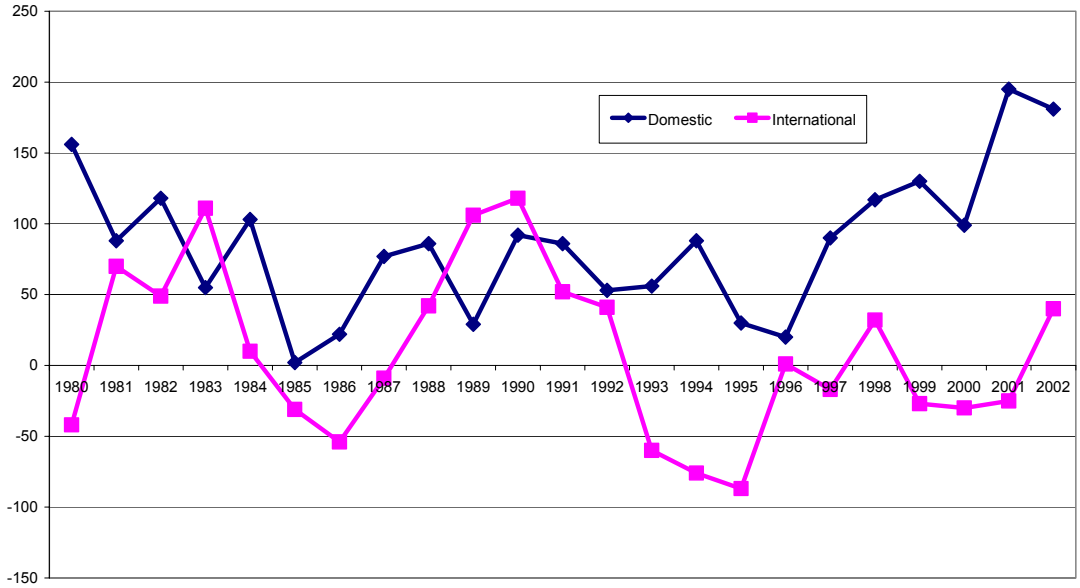


In the year 2000, 79 per cent of Åland's inhabitants born in the mainland Finland were Swedish-speakers and 21 per cent Finnish-speakers. Together they represent one fifth of Åland's inhabitants (Statistics Finland, 2003b). According to the sample data used below, 58 per cent of the migrants that lived before moving to Åland in the mainland Finland, lived in a municipality where Finnish was the language of the majority. It means that migrants have clearly been more exposed to, and probably are better at the Finnish language than the average Ålander. The unemployment rate of Åland has traditionally been clearly lower than in the rest of Finland, currently indicating practically full employment (2.9 per cent in 2002; the rate for the mainland Finland was 9.1 per cent; Statistics Finland, 2003a). The net migration flow of Åland is clearly negatively correlated with the unemployment rate, as can be seen from the figure 3. Another interesting fact concerning the net migration is that at least during last three decades, the net migration from the mainland Finland has always been positive, whereas migration flows with the rest of the world have varied from positive to negative

(Statistics Finland, 2003d; see figure 4). However, the available migration statistics does not divide the migration flows to any subgroups. As the regional government is prone to guard the "language balance" of the province, migration tendencies of non-Swedish-speakers is a contentious political issue.

In the regional economic analysis, computable general equilibrium models have proven to be a useful tool. Several of them have migration explicitly included in the model. For example, Hoffman et al (1996) analysed the role of defense cuts in California, using different assumptions on the interstate factor mobility. Zhai and Wang (2002) analysed changes in rural-urban migration due to China's WTO membership, by using a Harris-Todaro specification of rural-urban migration. Honkatukia et al. (2003) analysed quantitative effects from possible regional policy measures in the province of Middle Finland. The migration flows were determined outside the CGE model by a dynamic econometric model fitted for 11 continental provinces during 1975-2000.

Figure 4. Domestic and international net migration



These models have to address the migration issue in order to make the labour market behave in a more realistic manner. However, the crucial behavioural parameters of migration are not always based on relevant empirical estimates.

This study aims to bridge partially the gap between the econometric and simulation models by suggesting a way to use individual-level panel data constructed from longitudinal census data to estimate the crucial parameters in a one-region CGE model with a migration module.

2 The theoretical underpinnings and earlier empirical results

Migration can be derived from the optimising behaviour of individuals who consider migration as an investment to their human capital. Sjaastad (1962) was the first one to apply the human capital theory in the context of migration. An individual migrates when the

expected discounted utility streams (U^e_{jt}) in a new location exceed those of the current location (U^e_{it}), after subtracting the costs (I_{ij}) attached to migration (see e.g. Häkkinen, 2000, and Hämäläinen and Böckerman, 2002).

$$\int_{t_0}^{T} \left[U^e_{jt} - U^e_{it}\right] e^{-rt} dt - I_{ij} \qquad (1)$$

The applications of this theoretical framework have normally assumed that the utility of moving to a location depends on the expected wage level, discounted by the local costs of living. Local unemployment rate of the destination, or its mirror image employment rate (100-unemployment rate), is often used to indicate the probability of finding a job.

There are also non-pecuniary gains and costs in changing the place of residence. These differences in local amenities, such as climate, availability of cultural activities or pure nature, or supply of public services have been offered as an explanation for the empirical findings of low or no convergence of wage levels between regions (see discussion in Goetz, 1999). In bilingual countries like Canada and Finland, where population with different mother tongues are spatially separated, language may be a key variable in defining the individual's set of plausible migration targets (see Häkkinen, 2000).

The costs of migration are supposed to depend positively on the distance between the origin and target locations. Even psychological costs may depend on the distance, as the longer the distance between locations, the costlier it is to keep contact with the relatives and friends of the place of origin. In the context of Åland, it is natural to assume that psychological costs of moving to Åland are higher if the individual crosses the language barrier. In Åland, most of the public and many of the private services are available in Swedish only. Learning a new language, or brushing up existing capabilities, poses other costs as well, through the time spent learning it. To sum up, it seems much less likely that a person belonging to the Finnish-speaking majority migrates to Åland.

Human capital theory and empirical evidence also suggest that the younger and educated individuals would have higher probabilities of migrating, due to longer planning horizons and better employment prospects (Häkkinen, 2000; Nivalainen, 2003; Pekkala, 2003).

Harris and Todaro (1970) formulated a model of rural-urban migration where individuals choose their place of residence according to the differences in the rural and urban wage and unemployment levels. An individual chooses the place where the expected pay, i.e. employment rate times wage, is highest. Pekkala (2003) applied the Harris-Todaro model in a way that combines it with the human capital theory. By using a sample of the Finnish population census data from 1985-1996 in estimation of multinomial logit models, she showed that increases in urban wages and employment significantly increase mobility to urban regions, whereas the rural counterparts reduce it. However, higher expected rural wages do not raise migration to rural areas. She concludes that the employment situation is the most important determinant of migration. Several individual-specific characteristics were also shown to be significant determinants of migration. Education, for example, promotes migration, whereas family size and home ownership tend to keep people from moving.

Pekkala and Tervo (2002) showed that the unemployed are not necessarily better off if they migrate to other regions. In fact, in the short term, migrants might have been better off in their

original region. It is predominantly other, partly unobservable characteristics such as education, human capital and ability that determine whether a person becomes employed. Therefore, migration looks only partly base on a rational decision-making. However, the unemployed were more inclined to migrate than the employed persons.

Nivalainen (2003) showed that the unemployed are more prone to move both from urban municipalities to rural ones, and vice versa. Having an earlier migration history also increased the migration probability. Renters were shown to be more mobile than owner-occupiers. Swedish-speakers proved to be less prone to move into urban areas.

In Häkkinen's (2000) study of determinants of individuals' migration decisions in Finland it was shown that Swedish-speakers had lower propensity to migrate. She reasons that uni- or bilingually Swedish municipalities are few in number, so the lack of interesting migration targets may reduce Swedish-speakers' tendency to move. Even her results showed that having an earlier migration history increases the probability of moving again.

Nakosteen and Zimmer (1980) studied the earnings of migrants and non-migrants. The binomial moving decision was coded as one if the individual moved to another state, zero otherwise. Firstly, they estimated a mover/stayer model in which they used a probit equation to explain which persons moved into another state (in the U.S.A.), and then used OLS to estimated hourly wages for migrants and non-migrants, including a selection bias variable obtained from the probit equation.

Bellemere (2004) studied the out-migration propensities of immigrants using the German Socio-Economic Panel (GSOEP). He concluded that out-migration, which was measured by means of panel attrition, was more probable for those having lower labour market earnings and work propensities.

Fischer et al. (2000) used an opposite perspective and modelled immobility. This approach is well grounded, as the majority of people do not migrate, but choose to stay in their home region in spite of the differences in wages and employment prospects between regions. They provide thus an "amenities-approach" -like explanation for the low convergence of wages and unemployment rates, which has been recognised in many studies (Goetz, 1999;see also Pekkala and Kangasharju, 2002; Evans, 1990).

Fischer et al. (2000) coined their perspective as an *insider-advantage approach*, according to which insider advantages result from accumulation of location-specific "social capital". This social capital or "regional amenity value" accumulates both during working and leisure time. The insider advantages can also be divided into society-specific, firm-specific and place-specific advantages, which opens up the possibility of different kinds of accumulation of social capital among different societal groups. Migration to another area would turn these location-specific investments as sunk costs. As the insider advantages accumulate over time, they make people increasingly immobile over the course of time. Therefore, duration of stay (leisure time -based social capital accumulation) as well as years since last employer change (working time -based social capital accumulation), and number of previous moves (low accumulation of insider advantages) were central explanatory variables in their analysis, and empirical findings with Swedish micro data confirmed that they indeed were important for determining the probability of staying, and had expected signs. Also different variables describing the phases of life and societal groups (age, age^2, number of children, unemployed, foreign born, level of education, earlier migration history etc.) were statistically

significant determinants of the probability of staying. By having age included the authors controlled for the possibility that older people tend to be less mobile in general, thus cleaning this effect away from the "duration of stay" variables.

3 The model

The above examples of earlier studies have focused on modelling in- and out-migration as separate flows, or staying or moving as a binomial decision. Also in this study, a mover-stayer model is included in the analysis. However, the focus of the study is on *net migration* through modelling the propensity to *stay in or migrate to* Åland, which receive the same code in the data (they both equal 1). By using this specification, I suggest that it is possible to interpret the results of the estimations as net migration flows, once the propensity to live in Åland is multiplied with a relevant population figure. However, in the present case the data has a sample bias, covering only those who lived in Åland at least during one of the years covered. This poses problems for the estimations, which are discussed below. Another difference with the majority of the above referenced migration literature is that the panel structure of the dataset is explicitly utilised in the analysis.

A dynamic discrete choice model specification is motivated by a realistic assumption of state dependence of choosing a place to live in. Current inhabitants are assumed to have a higher propensity to live in Åland during the next period than those living somewhere else. The separation of state dependence from unobserved heterogeneity is possible only if one has access to panel data (Hsiao, 2003; see also Hämäläinen, 2003).

A dynamic binomial latent regression model can be expressed as follows (see e.g. Hsiao, 2003, for the general formulation of dynamic discrete panel data model, and Hämäläinen, 2003, in the context of persistency of unemployment):

$$y_{it}^{*} = a_0 + \gamma y_{i,t-1} + \phi \sum_{s=1}^{t-1} \prod_{l=1}^{s} y_{i,t-l} + \lambda' z_i + \beta' x_{it} + u_{it}, \quad i = 1,...,N, \quad t = 2,...,T \tag{2}$$

y_{it}^{*} denotes the unobserved, underlying propensity to stay in Åland, y_{it-1} stands for the indicator variable stating whether the person lived in Åland in the previous period, and z_i denotes individual's time-invariant, observable characteristics, x_{it} for time-varying variables, and let u_{it} be a two-component error term consisting of an individual-specific and of a random term.

$$u_{it} = \alpha_i + \varepsilon_{it} \tag{3}$$

y_{it} is the observed state of affairs, i.e. whether the individual stayed in Åland or not, which depends on the unobserved index function y_{it}^{*} as follows:

$$y_{it} = \begin{cases} 1 \; if \; y_{it}^{*} > 0 \\ 0 \; if \; y_{it}^{*} \le 0 \end{cases} \tag{4}$$

In order to account for the accumulation of insider advantages, the duration of the recent stay in Åland (within the study period), $\phi \sum_{s=1}^{t-1} \prod_{l=1}^{s} y_{i,t-1}$, is included as an explanatory variable.

By assuming that both the error terms follow a random unitary normal distribution or a logistic distribution, either random effects probit or logit model will be the workhorse of the analysis. However, the logit specification does not normally behave so well when the probability of some of the possible occurrences is low (Greene, 2003). A fixed effects panel data model is not an attractive alternative as our data is a random sample from a larger total population.

An additional issue to be tackled with the dynamic models is that of the initial conditions (see Hsiao, 2003). The model requires an assumption on the relationship between the initial observations y_{i1} and the unobserved heterogeneity component u_{it} (Hämäläinen, 2003). We can either assume that the initial conditions are independent of the unobserved heterogeneity, or we allow for correlation between them. A practical way of relaxing the independency assumption is to follow the proposition of Woolridge (2002), and model the distribution of the unobserved effect conditional on the initial value and explanatory variables. In other words, the first-year observation of place of residence is included as a time-invariant characteristic variable for periods t = 2…T. Then u_{it} can be expressed as follows:

$$u_{it} = a_i + y_{i1} + \varepsilon_{it} \tag{5}$$

4 The data

The central estimations in this study are conducted with a longitudinal population census data from 1990-2000. Individuals aged 15-65 were included in the frame population. However, the age condition had to be fulfilled only during one of the years included in the study. Therefore, given the dynamic modelling framework, individuals' minimum age is 6 and maximum age 75, during the estimation period of 1991-2000. A ten per cent sample was drawn from those who lived during the whole period in Åland. There were 16,272 such individuals in the population, of which 1,616 were included in the sample. A sample of 20 per cent was drawn from those who migrated to or from Åland during the same period. In total, there were 4,519 such persons (5,754 persons were excluded due to low/high age or death), and 909 individuals were drawn. In total, there are thus 2,525 individuals in the sample. Over-sampling of migrants was motivated by the reduced number of migrants: during 1990-2000, only 479 individuals moved to and 407 moved from Åland in average per year, resulting in an annual net migration of 72 persons. However, this sampling scheme did not readily result in an adequate annual representation of individuals who stayed, moved in, or moved out from Åland. Therefore, each individual was each year assigned to one of the three groups according to their migration decisions. The relative sizes of the groups were compared to register data, and corrective weights were employed in such a manner that annual streams of in-migration

and out-migration were in correct proportion to those who stayed in Åland. The statistical package then automatically takes into account the weights calculating the asymptotic covariance matrices (Greene, 2002). Thereby, both the over-sampling and the annual representativeness were simultaneously accounted for.

The data include variables on the individual characteristics and on the general economic conditions. However, variables x_{it} with both cross-sectional and annual variation are observed only for those that stayed inside the Finnish borders. Therefore, e.g. annual earnings cannot be used in regressions that include those who migrated to Åland from abroad. They are used in the mover-stayer regressions only (see table 1).

Given the international nature of migration patterns to and from Åland, the definition of a relevant population of those living outside Åland was problematic. The individual, time-variant data is available only for those staying inside the Finnish borders. Individual-level data is not possible to leave out to institutions abroad. Those never living inside Finland are thus naturally excluded from the material. What is more, a considerable share of migration from abroad is return migration. Therefore, it is reasonable to frame the population so that only such persons are included that have lived in Åland at least during one of the years included in the sample. In the later sections, the effects of this population specification will be discussed.

Table 1. Descriptive data for years 1991-2000

	Mean	Std.Dev.	Skewness	Kurtosis	Minimum	Maximum	N*T
Lived in Åland during t-1, y_{it-1}	0.788	0.409	-1.407	2.980	0.00	1.00	25,250
Lived in Åland year 1990	0.762	0.426	-1.230	2.513	0.00	1.00	25,250
Swedish-speaker	0.889	0.314	-2.482	7.162	0.00	1.00	25,250
Income class in FIM 10.000 (0-40)	10.38	7.654	1.241	5.199	0.00	40.00	20,250
Duration of recent stay in Åland	3.969	3.295	0.349	1.817	0.00	10.00	25,250
Log (unemployment rate)	1.364	0.464	-0.054	1.578	0.69	2.03	25,250
Personally unemployed	0.042	0.201	4.551	21.713	0.00	1.00	25,066
Family size 2 -	0.725	0.447	-1.007	2.014	0.00	1.00	25,250
Native male Ålander	0.298	0.457	0.883	1.779	0.00	1.00	25,250
Native Ålander * education level	0.147	0.511	4.059	20.429	0.00	4.00	25,250
Native Ålander	0.574	0.494	-0.301	1.090	0.00	1.00	25,250
Time trend* Native Ålander	3.729	3.878	0.504	1.781	0.00	11.00	25,250
(Age)^2/100	15.416	12.105	0.982	3.202	0.36	56.25	25,250
Born in mainland Finland	0.285	0.451	0.955	1.912	0.00	1.00	25,250
Time trend* born in mainland Finland	1.824	3.272	1.588	4.095	0.00	11.00	25,250
Native Ålander*Age	21.086	21.993	0.565	1.989	0.00	74.00	25,250
Native Ålander*(Age)^2/100	9.283	12.642	1.423	4.104	0.00	54.76	25,250

5 The results

Due to reasons to be explained below, the results of a time series regression explaining net migration with quarterly data covering years 1990-2003 are presented first. The dependent is

the yearly sum of net migration that explained by the unemployment rate (four-quarter average) and by the lagged dependent. We see that unemployment has dynamic effects, and due to the logarithmic form of the variable, its effect on net migration depends on the unemployment level. Longer lags of the dependent variable, as well as lags of the explanatory variable were not significant in this estimation.

Table 2. Results of the time series regression

Dependent:	Net migration (annual sum)		
Nr of observations: 52		Period: 1991:1-2003:4	
Variable	Coefficient	t-Statistic	Std. Error
Constant	81.061	3.208***	25.26708
Ln(Unemployment)	-42.927	-2.915***	14.72448
Net migration$_{t-1}$	0.656	6.666***	0.098374
R-squared	0.798	Mean dependent var	89.923
Adjusted R-squared	0.790	S.D. dependent var	81.769
S.E. of regression	37.480	Akaike info criterion	10.141
Sum squared resid	68833.070	Schwarz criterion	10.254
Log likelihood	-260.678	F-statistic	96.873
Breusch-Godfrey Serial Correlation LM Test: F-stat	1.999 (prob= 0.147)	Prob(F-statistic)	0.000
Long-term coefficients			
Constant	235.5		
Unemployment	-124.7		

In order to enable comparison with earlier studies and to facilitate a richer interpretation of the "net migration" estimations, I first estimate a traditional mover/stayer model where the mover accrues the code 1. I use quotation marks for the net migration, as the results are partly biased due to the sample bias. Furthermore, this dataset suffers from no sample bias regarding out-migration. In this analysis, first-year in-migrants are naturally excluded from the sample. The estimation results are shown in table 3. Two alternative specifications are presented. We see that persons living with partners and family are less prone to out-migrate, as well as those who are Swedish-speakers, high-earners, and who have stayed already for a longer time in the island. In contrast, well-educated, especially native-born well-educated, unemployed, and younger persons are more inclined to leave the island. These results are well in line with the above-referenced theory and empirics.

There is also a declining tendency to out-migrate, which is found to be similar among the natives and migrants. Time-trend and annual dummy specifications yield very similar results in this and in other respects.

Table 3. Results for a mover-stayer model

	RE probit, time trend			RE probit, time dummies		
	Coeff.	t-ratio	Marg.Eff.	Coeff.	t-ratio	Marg.Eff.
Constant	-1.329	-4.256***	-0.01767	-2.777	-7.975***	-0.03577
Family size 2 -	-0.379	-6.022***	-0.00503	-0.377	-5.67***	-0.00485
Income class	-0.015	-3.359***	-0.00020	-0.016	-3.466***	-0.00021
Lived in Åland year 1990	-0.878	-8.101***	-0.01167	-0.821	-6.273***	-0.01057
Duration of stay in Åland	0.160	6.84***	0.00213	0.149	5.304***	0.00192
Native Ålander	-0.126	-0.803	-0.01167	-0.089	-0.126	-0.00115
Duration of stay * Native Ålander	-0.107	-1.774	-0.00142	-0.098	-1.43	-0.00127
Educational level	0.117	3.271**	0.00155	0.118	3.191**	0.00153
Swedish-speaker	-0.181	-2.287*	-0.00240	-0.177	-2.112*	-0.00228
Personal unemployment	0.439	5.122***	0.00584	0.458	5.226***	0.00590
Age	0.055	3.19**	0.00073	0.057	3.253**	0.00074
(Age)^2/100	-0.093	-4.09***	-0.00124	-0.097	-4.126***	-0.00125
Educational level * Native Ålander	0.167	2.292*	0.00222	0.171	2.187*	0.00220
Time trend	-0.148	-9.416***	-0.00197	-	-	-
Time trend* Native Ålander	-0.00046	-0.007	-0.00001	-	-	-
Year 1991	-	-	-	1.027	3.935***	0.01323
Year 1992	-	-	-	1.103	5.889***	0.01421
Year 1993	-	-	-	0.871	4.394***	0.01122
Year 1994	-	-	-	0.508	2.77**	0.00655
Year 1995	-	-	-	0.433	2.464*	0.00558
Year 1996	-	-	-	0.258	1.5	0.00333
Year 1997	-	-	-	0.082	0.464	0.00105
Year 1998	-	-	-	0.153	0.871	0.00197
Year 1999	-	-	-	-0.064	-0.359	-0.00083
Year 1991*Native Ålander	-	-	-	-0.022	-0.033	-0.00028
Year 1992*Native Ålander	-	-	-	-0.071	-0.112	-0.00091
Year 1993*Native Ålander	-	-	-	-0.457	-0.786	-0.00588
Year 1994*Native Ålander	-	-	-	0.08	0.158	0.00103
Year 1995*Native Ålander	-	-	-	-0.082	-0.172	-0.00106
Year 1996*Native Ålander	-	-	-	0.069	0.161	0.00089
Year 1997*Native Ålander	-	-	-	0.01	0.021	0.00013
Year 1998*Native Ålander	-	-	-	-0.214	-0.535	-0.00275
Year 1999*Native Ålander	-	-	-	-0.229	-0.548	-0.00295
Random effect parameter D	0.112	2.055*	-	0.11	1.783	-
Log likelihood		-1246.217			-1235.773	
Nr of observations		20,258			20,258	

Note: *** (**,*) indicates a significance level of 0.1 (1, 5) per cent.

Table 4. Results for the "net migration" model

	RE probit time trend			RE probit time dummies		
	Coeff.	t-ratio	Marg.Eff.	Coeff.	t-ratio	Marg.Eff.
Constant	-1.539	-18.001***	-0.1901	-	-	-
Lived in Åland during t-1, y_{it-1}	2.009	49.1***	0.2481	2.039	47.925***	0.2485
Lived in Åland year 1990	0.397	6.988***	0.0490	0.403	6.883***	0.0491
Duration of stay in Åland	0.054	5.472***	0.0067	0.049	4.74***	0.0059
Ln (unemployment rate, %)	-0.128	-3.267**	-0.0158	-2.173	-18.188***	-0.2649
Family size 2 -	1.017	36.657***	0.1255	1.022	36.094***	0.1246
Swedish-speaker	0.083	1.781	0.0102	0.084	1.759	0.0102
Native male Ålander	0.156	2.67**	0.0193	0.153	2.626**	0.0186
Educational level * Native Ålander	-0.142	-3.809***	-0.0175	-0.14	-3.71***	-0.0171
(Age)^2/100	0.020	8.983***	0.0025	0.021	9.198***	0.0026
Age*Native Ålander	-0.027	-2.258*	-0.0033	-0.036	-6.084***	-0.0044
(Age)^2/100*Native Ålander	0.050	3.255**	0.0062	0.062	6.627***	0.0076
Born in mainland Finland	-0.420	-5.819***	-0.0518	-0.261	-5.23***	-0.0318
Native Ålander	0.924	4.326***	0.1141	-	-	-
Time trend* Native Ålander	-0.089	-7.836***	-0.0110	-	-	-
Time trend* Born in mainland Finland	0.02400	3.226**	0.0030	-	-	-
Year 1991	-	-	-	-0.078	-1	-0.0094
Year 1992	-	-	-	0.694	5.827***	0.0846
Year 1993	-	-	-	2.355	12.107***	0.2871
Year 1994				2.544	12.086***	0.3100
Year 1995	-	-	-	2.183	11.249***	0.2660
Year 1996	-	-	-	1.775	10.596***	0.2164
Year 1997	-	-	-	1.495	10.38***	0.1822
Year 1998	-	-	-	0.891	8.065***	0.1086
Year 1999	-	-	-	0.335	3.252**	0.0408
Year 1991*Native Ålander	-	-	-	0.771	5.465***	0.0940
Year 1992*Native Ålander	-	-	-	1.098	7.648***	0.1338
Year 1993*Native Ålander	-	-	-	0.776	5.374***	0.0946
Year 1994*Native Ålander	-	-	-	0.597	4.274***	0.0728
Year 1995*Native Ålander	-	-	-	0.627	4.284***	0.0764
Year 1996*Native Ålander	-	-	-	0.573	3.92***	0.0699
Year 1997*Native Ålander	-	-	-	0.293	2.097*	0.0357
Year 1998*Native Ålander	-	-	-	0.31	2.163*	0.0378
Year 1999*Native Ålander	-	-	-	0.22	1.55	0.0268
Random effect parameter D	0.070	3.336***	-	0.076	3.548***	-
Log likelihood		-4351.642			-4331.195	
Nr of observations		25,250			25,250	

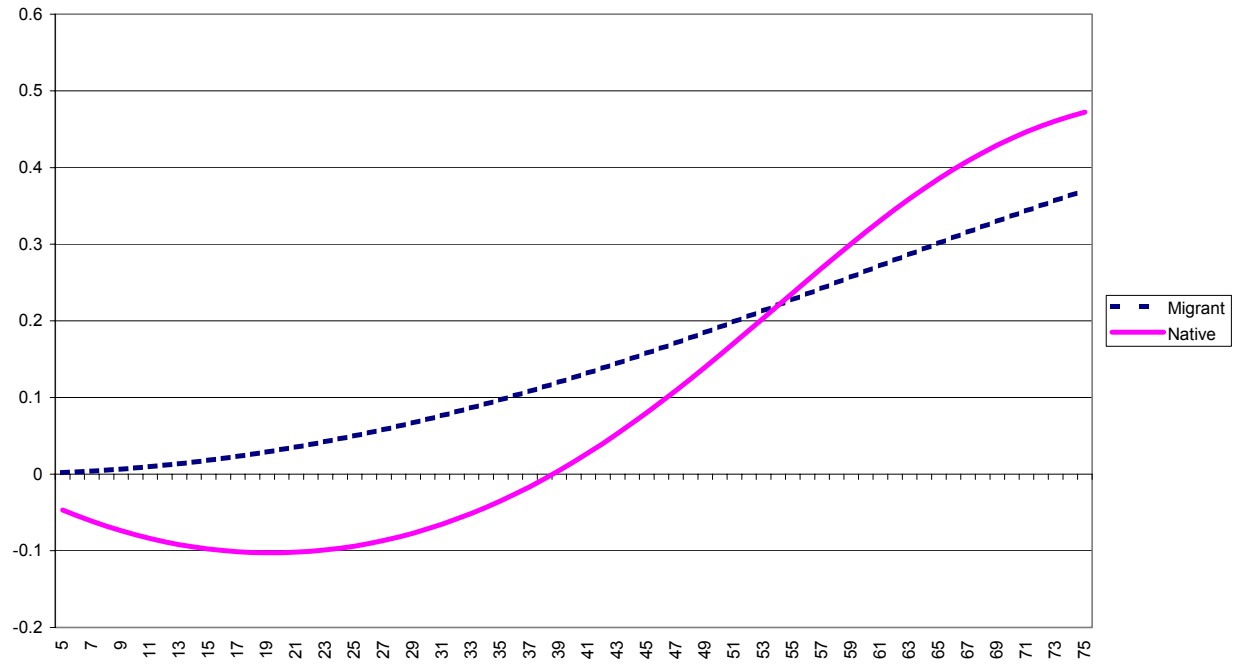
Note: *** (**,*) indicates a significance level of 0.1 (1, 5) per cent.

Table 4 presents the "net migration" estimation results. Results are presented for two random effects probit models.[2] The specification was tested with the likelihood ratio test for nested models, and Davidson – Mackinnon (1993) artificial regression test for non-nested models.

The personal unemployment variable is left our here as we have no information on the employment status of persons living outside the Finnish borders. Instead, general unemployment level is used here. However, this poses an identification problem for the model with year dummies: the constant has to be left out. The coefficient of the unemployment rate turns then out to be unrealistically high, as the constant is merged with the unemployment rate that is invariant over the cross-sectional observations. However, we see that apart from the time dummies and the unemployment variable, other variables of the time dummy model get similar results with the time trend specification. The coefficient of the unemployment rate does not suffer from the same problem in the time trend specification, and it can be used in the further analysis. In effect, the role of the time dummy specification here is to render credibility for the time trend specification, which is more unusual in the migration context, but it is central for the discussion below.

The probability of living in (or moving to) Åland increases with age for both the groups. However, for natives, there is greater tendency to leave the home region in the young age and return later on. Brunström (2003) showed in a study based on a mail survey to in- and out-migrants that among the native Ålanders the young are over-represented among the out-migrants in Åland, whereas the retired are a considerable group of in-migrants, which concurs with our results. Figure 5 depicts the contribution of age to the value of probability function.

Figure 5. Contribution of age to the probability of living in Åland



[2] Even logit and pooled probit models were tried but they either did not perform well (random effects) or provided similar results as the probit model (pooled version). The pooled probit results were not especially informative vis-à-vis random effects models, but they can be acquired from the author.

The results support the insider advantage hypothesis, as all our variables describing the insider advantage, namely the indicator variable for the initial place of stay, previous year's place of stay, and duration of recent stay, as well as being a native Ålander, all get positive and very significant values. Male Ålanders are also even more inclined to live in their home province than female Ålanders. The duration variable had no significant difference between the native-born and migrants.

However, there is also a significantly negative time trend present for native Ålanders, which at the end of the study period (year 2000) abolishes the positive contribution of "Native Ålander" – dummy. Therefore, one could argue that the insider advantage of natives Ålanders is eroding. Conversely, the probability of mainland Finland-born inhabitants to stay in Åland rises over time, which by following the same line of reasoning should be interpreted as increasing insider-advantages for this group. However, the same picture is not conveyed by the time-dummy specification. In that model, the effect of general economic conditions is mixed with the time dummies.

We also see that educated Ålanders are less prone to live in their home region. Given the small size and one-sidedness of the local labour market, this result seems plausible.

Having a partner and/or family increases the probability of living in Åland by nearly 13 per cent, which ought to reflect the virtues of a small society: small distances, safety, effective social control etc. Dummy variables for different size of families were tried, but those describing other than one-person households got very similar coefficients.

The results thus lend support to Harris-Todaro –type expected wage hypothesis if we consider Åland as a central area, and they concur with the earlier empirical results (see e.g. Pekkala, 2003).

The data includes other characteristic variables like employer's sector and industry, but they did not possess any significant explanatory power. Interestingly, the mother tongue variable was not a strong explanatory variable in this setting. Its coefficient was positive, but significant only at 10 % level.

The random effect parameter D describes the share of individual heterogeneity in the error variance, i.e. $\rho = \frac{\sigma_a^2}{\sigma_a^2 + \sigma_\varepsilon^2}$. The size of the coefficient is relatively modest.

In conclusion, the determinants of migration flows in Åland seem to be in line with those of other regions. However, there is a clear language-determined selection mechanism that quite effectively filters out the Finnish-speakers from the in-migrants. Nevertheless, our dataset was readily pre-selected, as persons who never lived in Åland were excluded from it. Therefore, indicator variables for mother tongue were left with no role in this estimation.

Comparison of the mover-stayer model and the "net migration" model shows that the time trends work in different directions in them. If there is a general negative tendency to out-migrate, and simultaneously there is a negative trend for the net migration of natives, it suggests that the return migration of natives is declining. Being a Swedish-speaker increased the probability of staying, but at the same time it did not contribute significantly to the net migration. However, the presence of the sample bias affects the results of the migrants, less so those for the natives. I believe the dataset captures the essence of the net migration for the

natives, as the vast majority of Ålanders live in Åland, and the only in-migration is return migration. In the next section, I discuss the possibilities of combining the "net migration" results with the time series estimation of the net migration, and the use of such equations for simulation purposes.

6 Use of the results for simulation purposes

The above results can be used to simulate changes in population levels as the unemployment rate varies. This is achieved by multiplying the probability of living in Åland with a relevant population figure, which is interpreted to be the registered size of the population group, divided by the estimated probability of staying for that group. Hence, the actual population figure and the probability of staying are made compatible.

The absolute values for the x-variables used below are either from the year 2000 as per the population census or, if no recent register-based figure was available, mean values for 1991-2000 according to the sample data. Hence, the equations have been updated to reflect the situation of the year 2000. The changes in the population levels can be interpreted as changes in net migration. New linear regressions are conducted with unemployment rate as the only explanatory variable. Thus we apply "ceteris paribus" for the other, non-economic variables.

The coefficient values for the log of unemployment rate can be combined with the available register and sample data on the mean values for net migration and unemployment. Thereby, simple simulation equations can be calculated, as shown in the table 5 below. The net migration levels calculated from the probit "net migration" model seem unrealistic in comparison with the time series analysis. Therefore, the net migration equation of the non-natives is calculated here as a residual between the time series equation and the probit "net migration" equation for natives. The constant term is adjusted in order to ensure the calibration of the equation to the registry figures of unemployment and net migration.

Table 5. Simplified net migration equations

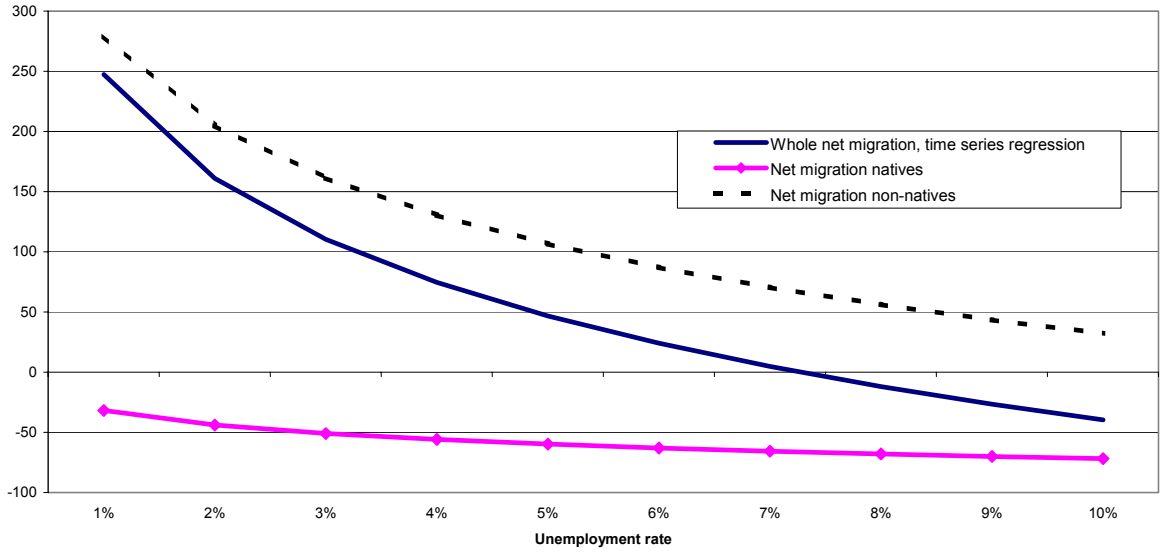
		Whole population	Natives	Migrants
Mean net migration 1991-2000	Y	72.36	-56.28	128.64
Log of mean unemployment 1991-2000	Ln(X)	1.404	1.404	1.404
Coefficient from the linear regression	B	-124.7	-17.3	-107.35
Constant	Y-Ln(X)*B	247.4	-31.9	279.3

The resulting net migration equations are depicted in figure 6. Note that the migration flow of native Ålanders is quite irresponsive to changes in the unemployment rate, whereas non-native inhabitants stand for the most part of the adjustment of labour supply.

These equations could be readily applied in a CGE model with downward inflexible wages. One possibility could be to interpret the changes in the unemployment rates as proxies for different expected income levels in the Harris-Todaro fashion. Then proportionate changes in disposable income would then give rise to changes in the net migration. A modelling solution of this kind was used, though separately on in- and out-migration by Berck, Golan and Smith (1996) in their dynamic CGE model for California. However, it is an unresolved issue whether the present estimation would really be a reliable estimator for the expected income level, although Berck, Golan and Smith (1996) argue that the effects of changes in employment and wages are difficult, if not impossible to separate in empirical analysis. The

results of Pekkala (2003) suggest that employment situation is the driving force of the migration, rather than wage differences. One aspect that supports this conclusion is the progressivity of the Finnish income taxation, which effectively reduces the differences in the disposable income (Moisala – Uusitalo, 2004).

Figure 6. Net migration of natives and non-natives



7 Discussion

In this paper, a way to estimate a net migration equation from a binomial probability model was presented. It was shown that the decision where to reside is clearly an issue of state dependence and of duration. The signs of the statistically significant variables followed the suggestions of the migration theory and they concurred with the earlier empirical results.

In order to derive a migration equation for a simulation model, probability-based equations were replaced - without almost any loss of accuracy - by simpler linear regressions. The numerous non-economic variables were thus "frozen" to their average levels and included in the constant term. In fact, were there statistical series available for the two population subgroups of interest, a major part of this exercise could have been omitted.

The estimated net migration rate of native Ålanders resulted in being quite irresponsive to different unemployment levels, which illustrate native inhabitants' strong preferences for their home region.

However, there seems to be a decreasing tendency for native Ålanders to return to their home province once they out-migrate. However, these changes are too small to cause any discernible restructuring of the population structure in the foreseeable future, and the dramatic title of this article may seem unwarranted. Anyhow, it is interesting to try to seek for reasons behind this development.

It could well be the case that the increasing contacts of Ålanders with the private businesses and authorities in the mainland Finland, e.g. due to search of new markets of private businesses, as well due to EU membership[3], have increased the demand for persons with proficiency in both Finnish and Swedish. However, Ålanders are known to have very rudimentary faculties in the Finnish language. In a recent survey among the authorities and the private sector, a clear picture of the current need of the Finnish language was drawn: in practically every sector and post, especially in the public sector, knowledge of Finnish was desirable, if not a necessary skill (Sanders, 2003). Having a need to know Finnish is a problematic, taboo-laden issue for the public sector due to Åland's unilingual status. The interviewed had the impression that the amount of contacts with the mainland Finland had increased considerably during the last years (Sanders, 2003). Therefore, the insider advantages of those not fluent in Finnish may well be eroding.

The mainland Finland has obviously been able to provide Åland with suitable labour force, whereas native Ålanders have mainly migrated to Sweden. If the shape of migration flows is causally related to growing demands of proficiency in Finnish, and in particular if the trend continues, it would indicate that Åland's language policy may cause a problematic paradox: by not advocating a better command of the Finnish language in Åland in order to protect the status of the Swedish language in Åland as the sole lingua franca, the regional government may deteriorate the chances of "out-flown" native Ålanders to find employment in Åland, making the return to Åland more difficult for them. This reason may also lie behind the inflow of bilingual labour force from the mainland Finland. In that case the cover title would certainly be justified.

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[3] Åland is represented by Finland in the EU. A considerable amount of information flow between Åland and the EU is channelled through the national authorities of Finland. Majority of the preparatory material is written in Finnish.

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