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MIGRATION AND INDIVIDUAL EARNINGS IN FINLAND: A REGIONAL PERSPECTIVE[1]

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Abstract

Attention has recently focused on the rapidly increasing pace and regional concentration of migration in Finland. Worries have been expressed about its possible repercussions on regional differences in income- and population structures. This study investigates the effects of moving on individuals, and compares these effects across the Finnish regions. Significant regional differences in types of in-migrants and their income development are observed. The results indicate that, in general, migrants tend to benefit from moving in form of higher post-move incomes. In particular, individuals who move to relatively rich regions obtain a higher level of incomes succeeding the move and also experience faster income growth. Those moving to poorer regions generally have lower incomes, yet moderate income growth. These findings indicate that migration contributes to changing regional balance in Finland, acting primarily as a dis-equilibrating mechanism.

KEYWORDS: Migration, regional economy, taxable incomes, income growth

JEL-classification: O15, R23

1. Introduction

Migration flows in Finland have experienced a sudden growth after the mid-1990s, compared to the last 20 years or so. For example, in 1998 as many as a quarter a million Finns changed their location of residence, that is 5 per cent of the whole population. The direction of migration has remained unchanged throughout past decades: People are moving away from the countryside into large cities, and, on the other hand, from north to south. This concentration of migrants to few urban regions has been experienced as a worrying trend both by politicians as well as the regions themselves. Indeed, in the 1990s migration flows have become even more concentrated both regionally and demographically. This means that regional population structure is changing rapidly as a result of migration. Therefore, to complement the recent discussion, it is reasonable to ask to what extent the mobility of labour will alleviate regional income- and unemployment disparities as theoretically predicted.

On the other hand, the observed narrowing of regional income disparities shows that Finnish regions are indeed becoming more equal in that sense, and that regional policy and other forces serve as equalising regional income structures (Kangasharju, 1998, Pekkala, 1998a and 1998b). In fact, neo-classical theory argues that migration is one important equilibrating mechanism in regional labour markets since workers move from low to high wage areas as a result of attempting to maximise their lifetime earning potential. Consequently, migration should equilibrate regional income structures and lead to convergence. To further analyse these important questions we need to look at migration as an individual decision and consider its consequences to *individuals*, comparing the rates and effects of migration across regions. Only then can we confirm the assumptions on *regional* effects of migration.

A great deal of migration studies use the human capital model originally introduced by Sjaastad (1962) as a starting point. Migration is seen as a result of people attempting to maximise the discounted present value of lifetime utility. Hence potential migrants weigh their expected benefits against the financial and psychic costs of moving to a certain country or region. Migration occurs providing that the perceived benefits exceed the costs. As these benefits and costs vary across migrants and regions all people will not move to the same area but most regions tend to experience both in- and out-migration. Conversely, the central place theory predicts that eventually all economic activity and people will be concentrated in only one (or a few) growth centres as this

is economically efficient (Krugman, 1991, Krugman and Venables, 1995). This view is supported by the current trend of migration in most countries and it suggests that people may be surprisingly equal in terms of their perceived net benefits from migration.

In Finland the rapid pace of inter-regional migration and its direction towards growing regional centres in the southern Finland has aroused considerable interest recently. Laakso (1998) observes that the age-structure of in- and out-migrants differs considerably across the Finnish sub-regions. This is likely to cause regional differences in the way in which incomes respond to migration. Interestingly, it is noticed that incomes do not grow immediately following the moving but only after a few years. After the initial transition period migrants' incomes quickly catch-up with those of the original population and eventually exceed them. Conversely, Eriksson (1993) finds that the positive effects on incomes tend to disappear in approximately ten years. This stresses the importance of taking into account the longer terms effects of migration by using a long enough data set. A major problem with much of the previous research is that it has failed to acknowledge any long-term influences as cross-section data for only one year are used. That may explain why the results are often so controversial.[2]

The present study concentrates on analysing the consequences of *regional* migration on individuals and regional economy. Earlier results concerning the change in incomes following migration are not unanimous and many studies examine the mobility of labour between industries or sectors, not regional mobility. Moreover, a large number of previous studies have not analysed the extent to which the actual destination region affects the change in migrants' incomes. The usual reason stated for this is that the proportion of migrants in the samples is too small to allow for any proper regional analysis to be made. Therefore, the purpose of this investigation is to search microeconomic evidence for the assumption that migration should equalise regional incomes by assessing whether the income effects of migration differ across regions.

Two different data sets for the period of 1987-95 are used. Firstly, a random sample is taken from the Finnish longitudinal population census, which is combined with longitudinal employment data. These data allow the consideration of the effects of migration after one or several years. The number of migrants in the sample is rather small, however, and therefore another data set is constructed to perform a more complete regional analysis. That set consists of *all* people who have migrated between the 19 NUTS3 regions at any point during 1987-95. Therefore the present

study looks at the consequences of migration from a wholly new perspective compared to previous Finnish studies.

The primary concern of the empirical examination is to answer two particular questions. Firstly, the panel data analysis seeks to find out whether migrating affects the person's income development following the move. It is found that, after controlling for several other factors influencing personal incomes and their growth, moving has a positive impact on incomes after a few years. Secondly, it is investigated whether the choice of destination region plays a part in the way in which moving affects the person's incomes. The results indicate that significant differences exist between the Finnish regions in terms of the types and incomes of the migrants they attract. The greatest positive impact on income is observed in the richest regions (Uusimaa and Ahvenanmaa) and lowest in eastern Finland. The growth of incomes, however, displays a different pattern: moving to the poorer regions has a positive impact on income growth. This explains why certain individuals move to lagging regions where growth prospects in general are less promising. Hence, the regression results confirm that the choice of destination region plays an important role in determining the gains from migration.

The remainder of this paper is organised as follows: Section 2 briefly introduces the theoretical background for studying migration and details the model used in empirical analyses. Data is described in the third section, while sections 4 and 5 present the results of estimation. Section 6 provides a summary and conclusion.

2. Theoretical background

Much of the current migration literature conforms to the human capital framework first launched by Sjaastad (1962). The central idea is that migration can be seen as a form of investment in human capital, aside of education, on-the-job training etc. It is assumed that people migrate as a response of maximising the net present value of their expected lifetime earnings or utility. Hence the migrant will select the region where he expects those earnings to be maximised. We can write the net present value (PV_{mn}) of moving from region m to region n as

$$(1) \qquad PV_{mn} = PVB_{mn} - PVC_{mn} = \Sigma\,[(E_{nt} - E_{mt}) / (1 + r)^t] - \Sigma\,[(C_{nt} - C_{mt}) / (1 + r)^t],$$

where PVB_{mn} is the present value of net benefits accruing from the move from region m to region n, and PVC_{mn} are the costs, correspondingly. The person will move from region m to region n

assuming that $PV_{mn} > 0$. Presumably he will also compare all possible pairs of regions (m, n) in order to find the destination region n where PV_{mn} is maximised. Hence we observe the migration decision:

(2) $M = 1$ if $PV_{mn} > 0$

$M = 0$ if $PV_{mn} < 0$

In reality we do not observe a lifetime stream of benefits and costs and are unable to analyse the potential psychic costs of moving. Therefore we need to obtain an alternative determinant to the decision to migrate, which should be readily observable. As the objective function presumes that future benefits be discounted it is reasonable to assume that the benefits most closely following the move are valued more highly. Moreover, as wages are not very flexible in the short-run, the income in the following period is a reasonably good proxy for the future income stream. Thereby the use of a relatively short time-span can be rationalised, and migration is likely to be determined by the earnings of the following few periods. If this is the case, we should observe faster earnings growth by migrants than by non-migrants.

The present study, as much of the previous research, uses a version of the Mincer (1978) earnings equation that incorporates several human capital variables. The general form of the semi-logarithmic earnings equation is

(3) $\log E_{it} = \beta' X_{it} + \mu_i + \varepsilon_{it}$,

where the dependent variable ($\log E_{it}$) is the logarithm of the earnings of individual i during period t, X_{it} is a column vector of the observable independent variables and β is a vector of fixed parameters. μ_i are the unobservable, individual-specific factors and ε_{it} is an identically independently distributed (iid) error term.

E_{it} is often determined as the level of annual or monthly earnings (Nakosteen and Zimmer, 1982, Eriksson, 1993, Vijverberg, 1995 and many others). However, as the level of earnings between even very similar individuals tends to vary drastically it is understandable why the results are often so contradictory. And, as argued above, migration decisions tend to be based on relatively short-term considerations, and therefore the *level* of earnings may not be as important a factor as its *growth*. Hence, both the level of annual earnings and the annual growth of earnings are chosen here as dependent variables. Specifically, the following versions of Mincer's semi-logarithmic functional form are adopted:

(4) $\log(E_{i,t}) = \beta' X_{i,t} + \alpha M_{i,\,t-1} + \varepsilon_{i,t}$, and

(5) $\log(E_{i,t}) - \log(E_{i,t-1}) = \beta' X_{i,t} + \alpha M_{i,\,t-1} + \varepsilon_{i,t}$.

In (4) the level of earnings and in (5) the growth of earnings between period t-1 and t are explained by a set of observable variables $X_{i,t}$, part of which may be region-specific and most of them individual-specific. The description of explanatory variables can be found in table 1. A binary variable $M_{i,\,t-1}$ equals one if individual i has migrated during period t-1, and zero if he has remained in his original location of residence. Lagged migration dummies are used in most specifications. When analysing the change in taxable incomes dummies are used either for lagged migration or migration that has occurred during the economic slump (1990-92).

Table 1: A description of the variables

Variable name	Meaning	Form	Expected effect on: Loginc / Change
Loginc	Level of taxable income	Logarithmic (times 100)	None
Change	Change of taxable income	$Loginc_t$ - $loginc_{t-1}$	None
Female	Sex of individual	Binary variable: 0 = male 1 = female	- / -
Age Age2	Age of individual, Age squared	Age in years (16 – 65) $(\text{Age in years})^2$	+ / -
Student	Student status	Binary variable 0 = not student 1 = student	- / -
Nonlab	Not in labour force	Binary variable 0 = in labour force 1 = non-labour force	- / -
Unemm	Months of unemployment	0 – 12	- / -
Selfem	Entrepreneur	Binary variable 0 = non-entrepreneur 1 = entrepreneur	- / -
Educ	Level of education	Scale: 0 - 8	+ / +
Mig_t	Migration	Binary variable 0 = non-migrant 1 = migrated in period t	**?** / **?**
$MigU_t$	Migration to Uusimaa	Binary variable 0 = non-migrant 1 = migrated to province of Uusimaa in period t	**?** / **?**
Unemr	Unemployment rate	% of labour force	- / -
Unemd	Unemployment rate difference to the mean	Mean unemployment rate – regional unemployment rate	+ / +
Urban	Rate of urbanisation	% of population living densely built-up areas	- / -
Uusimaa	Province of Uusimaa	Binary variable 0 = does not live in Uusimaa 1 = lives in Uusimaa	+ / **?**
Pri	Primary production	% of labour force	- / -

The approach described above has received a good deal of criticism since it does not correct for the so-called selectivity bias. Usually, individual differences in education, sex, employment and

other observable characteristics are taken into account when examining the earnings of migrants and non-migrants. This does not, however, remove the fact that migrants differ from non-migrants in some important respect as Greenwood (1975) explains:

> "…the fact that individual A migrates, while otherwise comparable B does not, suggests that an important difference does exist between the individuals. These differences may be in the way they view costs. The differences may also be in the way they view benefits."

In other words, the problem with censored data including both migrants and non-migrants is that the individuals do not represent a random sample, but are selected into groups by themselves according to some unobservable criterion. Hence the literature often refers to "self-selection" (see, for example, Maddala, 1983).

There have been many attempts to analyse the significance of the selectivity bias described above. However, no consensus has been reached on whether self-selection plays an important role in the context of regional mobility, but the results tend to differ widely (Nakosteen and Zimmer, 1980, and 1992, Hunt and Kau, 1985, Tunali, 1986, Holmlund, 1984, and many others). It seems that while many studies find evidence of self-selection, there are an equal number of those that fail to find any. Moreover, correcting for the selectivity according to one criterion may not improve the results at all, but there may be multiple selectivity (Vijverberg, 1995). The present study therefore explicitly tests for self-selection using methods proposed by Maddala (1983), and Nakosteen and Zimmer (1980). If selectivity problems are observed, they are corrected by using a sample selection model which is estimated in two stages (Barnow et al, 1981, Maddala, 1983, Ghatak et al, 1996). Individual-specific effects are also partly taken into account by the use of panel data, which should alleviate possible problems.

3. Description of the samples and data

The empirical analysis presented in this paper is based on two different data sets taken from the longitudinal population census file combined with longitudinal employment data. The data comprise the years 1987-95 and provide a vast amount of information on a large sample of individuals. The first sample was constructed by selecting a 0.2 percent random sample of individuals aged between 18 and 65 (at the end of the period). This sample comprised altogether 5636 individuals per year and includes information about their individual characteristics,

educational background, earnings, work history, housing, family etc., in addition to information on regional characteristics. These data include around 2500 individuals who have migrated across Finnish municipalities during 1987-95, compared to 48 000 non-migrants. The second sample was formed by choosing *all individuals,* who have migrated at some point between 1987 and 1995. However, only those individuals aged 18-65 were selected in the final sample. In total, there were 53 941 inter-regional migrants during the period under scrutiny. The use of the latter data makes it possible to get a much fuller picture of what has happened to migrants' incomes and it enables to properly consider regional aspects, since the number of migrants in each region is large enough.

It is easily seen that migrants are endowed with somewhat different characteristics than non-migrants. A comparison of migrants versus non-migrants is reported in table 2, which portrays these two groups in some important respects using 1987 and 1995 data. First, personal characteristics are compared and then regional ones. Note that for migrants the regional figures reported (last 4 rows) refer to destination region, not the region of origin. The results indicate that students and those with longer spells of unemployment (and more jobs quitted) tend to move more frequently. Conversely, entrepreneurs and people who are not in labour force move less frequently. Tendency to migrate decreases with age and increases with the level of education, as found in virtually all migration studies.

Table 2: A comparison of migrants versus non-migrants

	1987		***1995***	
Variable	Migrants	Non-migrants	Migrants	Non-migrants
Age (yr.)	30	35	35	43
Female (%)	55.9	49.2	46.5	59.7
Rate of schooling*	2.92	2.05	2.91	2.52
Months of unemployment	0.8	0.5	2.3	1.5
Entrepreneur (%)	5.1	10.7	4.7	10.2
Student (%)	6.6	8.6	7.9	3.2
Non-labour force (%)	7.7	11.2	11.6	19.4
Number of jobs quitted	1.4	1.1	1.0	0.8
Level of income*	289.0	287.7	295.4	302.2
Change of income*	18.16	14.35	5.51	4.42
Unemployment rate (%)	5.9	6.6	19.3	19.8
Primary production (%)	4.6	6.3	4.5	5.0
Services (%)	56.7	54.2	59.7	58.2
Industry (%)	23.2	23.7	21.2	21.3

*Notes: Level of income is the log of annual taxable income and the changes of income are the differences between 1987 and 1988 income, and between 1994 and 1995 income. See table 1 for further explanations.

The primary variables of interest here are the level of income in one hand and, on the other hand, its growth. Table 2 indicates that the growth of incomes is higher for migrants than for non-migrants. Migrants' level of incomes exceeds that of non-migrants in 1987, but not in 1995. This

indicates that migrants do not generally come from high-income groups, but are young, highly educated people with a greater potential for higher future income growth. The following section will examine whether the observed faster income growth of migrants is due to moving or whether some of their other features may explain it.

4. Empirical analysis of incomes and self-selection

The following empirical sections attempt to answer two particular questions. Firstly, the panel data model presented in this section analyses whether moving increases the migrants' incomes. And secondly, next section, with the analysis of cross-sectional data on all inter-regional migrants, considers how the choice of destination region has affected the migrants' post-move incomes. Both the level of income (**loginc**) and the growth of income (**change**) are considered, and several variables are included to control for observable influences on personal incomes. Panel data are exploited in the first stage as they partially control for other (unobserved) individual heterogeneity between migrants and non-migrants. The possible selectivity bias has not been accounted for in the first stage, as the principal concern is to check how certain personal and regional characteristics affect incomes. In the second stage, tests for selectivity are performed and corrected estimates are presented. And, as already noted, the adoption of panel data should partly correct for any individual specific factors not revealed by the observable characteristics. First a simple linear equation for the logarithmic level of income (**loginc**) is estimated exploiting both current and lagged migration behaviour (**mig**$_t$, **mig**$_{t-1}$, **mig**$_{t-2}$, **mig**$_{t-3}$ and **mig**$_{t-4}$) as explanatory variables. Secondly, a similar analysis is conducted on the change of incomes (**change**).

Table 3 presents the results for models where **loginc** is regressed on various individual and regional variables. A description of the dependent and independent variables can be found in table 1. When no lags for migration were used (specification 1) it was found that a lower level of taxable income is related, as expected, to females, students, people who are not in labour force, longer periods of unemployment, self-employment, heavily urbanised regions (not significant) and regions with a large share of agricultural workers. Higher incomes are associated with age and education. Also, living in the province of Uusimaa, or other regions where unemployment is smaller than average has a positive impact on incomes. Note that the migration-variable obtains a positively significant coefficient, which signals that migrating tends to lead to incomes higher than those of the average population. On the other hand, migrating to Uusimaa generally affects incomes negatively. A likely reason for this is that the migrant flow to Uusimaa consists largely of

students and young people who are just beginning their professional careers, whereas the average income in Uusimaa is very high.

Table 3: Results for the level of income: Panel data model (1987-95)

Variable	*Specification 1*	*Specification 2*	*Specification 3*	*Specification 4 (selectivity corrected)*
Constant	178.86 (4.11)**	203.48 (4.4)**	236.35 (5.98)**	187.83 (4.47)**
Female	-12.22 (0.76)**	-11.69 (0.79)**	-10.28 (0.89)**	-12.10 (0.56)**
Age	4.26 (0.17)**	3.26 (0.18)**	1.97 (0.25)**	3.81 (0.17)**
Age2	-0.35 (0.00)**	-0.03 (0.00)**	-0.13 (0.01)**	-0.03 (0.00)**
Student	-37.53 (0.86)**	-35.04 (0.90)**	-30.47 (1.12)**	-51.52 (1.22)**
Nonlab	-40.07 (0.67)**	-38.54 (0.69)**	-34.72 (0.82)**	-54.55 (0.81)**
Unemm	-1.23 (0.07)**	-1.29 (0.07)**	-1.44 (0.08)**	-3.38 (0.10)**
Selfem	-18.94 (0.86)**	-17.75 (0.89)**	-17.69 (1.07)**	-23.66 (0.86)**
Educ	5.54 (0.17)**	4.77 (0.17)**	3.88 (0.20)**	2.93 (0.13)**
Urban	-0.34 (0.29)	-0.29 (0.31)	-0.16 (0.35)	-0.12 (0.27)
Primary	-1.19 (0.60)**	-1.68 (0.62)**	-1.17 (0.71)	-0.50 (0.56)
Unemd	0.37 (0.10)**	0.36 (0.10)**	0.31 (0.11)**	0.07 (0.10)
Uusimaa	3.43 (0.94)**	3.09 (0.99)**	2.85 (1.14)*	12.50 (0.94)**
Migt	4.44 (0.95)**	4.13 (0.98)**	4.64 (0.17)**	219.26 (11.53)**
Migt-1	-	3.73 (0.97)**	4.16 (0.95)**	-
Migt-2	-	-	1.35 (0.94)	-
Migt-3	-	-	1.14 (0.92)	-
Migt-4	-	-	2.07 (0.89)*	-
MigUt	-3.85 (1.61)*	-4.25 (1.67)*	-5.56 (1.97)**	-212.93 (11.52)**
MigUt-1	-	-0.50 (1.64)	-	-
	R^2 = 27.6	R^2 = 25.6	R^2 =22.9	R^2 = 20.0
	N = 50724	N = 45088	N = 28180	N = 50724

*Notes: The empirical equation for the level of incomes was specified as

$$loginc_{t,\,t-1} = a + \beta_1 \times female + \beta_2 \times age + \beta_3 \times age2 + \beta_4 \times student + \beta_5 \times nonlab + \beta_6 \times unemm + \beta_7 \times selfem + \beta_8 \times educ + \beta_9 \times unemr + \beta_{10} \times urban + \beta_{11} \times pri + \beta_{12} \times region + \beta_{13} \times migtime + \alpha_1 \times M_{i,\,t} + \alpha_2 \times M_{i,\,t-1} + \ldots + \alpha_{T+1} \times M_{i,\,t-T} + \varepsilon_{i,t}.$$

When one or more lags were added the general results remained almost unchanged. In specification 2 the first lag for migration is positively significant, meaning that the migrants' incomes remain higher than average also the year following the move. The dummy for lagged move to Uusimaa is negative, yet not significant. Adding more lags (specification 3), it can be seen that all lags remain positive, but only the last (4-year) lag is significant.

Rather surprisingly, the analysis of income growth (**change** as the dependent variable) when panel data were used did not succeed in explaining why different individuals experience diverse growth in their incomes. The estimation results can be found in table 4, but note that the model was a very poor one in terms of its coefficient of determination. The interesting outcome was that migrants do not experience faster income growth right after the move, but only after a few years (specification 2). Moreover, the positive effect on income growth vanishes after about 5 years (specification 3). For Uusimaa the growth of incomes is generally lower than average, but migrants to Uusimaa seem to reap higher income growth.

Table 4: Results for the growth of income

Variable	*Specification 1*	*Specification 2*	*Specification 3*	*Specification 4 (selectivity corrected)*
Constant	60.73 (3.81)**	30.78 (3.89)**	26.62 (4.50)**	73.06 (4.15)**
Female	0.57 (0.49)	-	-	0.94 (0.46)*
Age	-2.04 (0.16)**	-1.17 (0.19)**	-1.14 (0.22)**	-2.49 (0.16)**
Age2	0.02 (0.00)**	0.01 (0.00)**	0.01 (0.00)**	0.03 (0.00)**
Student	8.78 (1.18)**	1.84 (1.45)	4.89 (1.65)**	8.46 (1.13)**
Nonlab	0.08 (0.84)	-	-	2.65 (0.75)**
Unemm	-2.04 (0.71)**	-2.67 (0.79)**	-3.11 (0.82)**	0.13 (0.09)
Selfem	-0.65 (0.84)	-3.35 (0.96)**	-0.45 (1.06)	-1.06 (0.80)
Educ	0.35 (0.12)**	0.56 (0.15)**	0.56 (0.16)**	0.68 (0.12)**
Urban	-0.19 (0.26)	-	-	-0.39 (0.25)
Primary	0.15 (0.54)	-	-	-0.86 (0.52)
Unemr	-0.44 (0.04)**	0.09 (0.04)*	0.24 (0.07)**	-0.46 (0.03)**
Uusimaa	-3.32 (0.62)**	-1.31 (0.72)	0.20 (0.83)	-7.84 (0.76)**
Migt	-4.69 (1.43)**	-5.57 (1.77)**	-3.14 (1.96)	-106.95 (10.67)**
Migt-1	-	-2.91 (1.43)*	-1.78 (1.57)	-
Migt-2	-	0.77 (1.39)	-0.83 (1.56)	-
Migt-3	-	0.58 (1.37)	0.42 (1.49)	-
Migt-4	-	-	-1.77 (1.47)	-
MigUt	9.31	9.80 (2.98)**	9.19 (3.33)*	108.92 (10.66)**
	R^2 = 0.02	R^2 = 0.01	R^2 = 0.01	R^2 = 0.01
	N = 45088	N = 28180	N = 22544	N = 45088

*Notes: The empirical equation for income growth is identical to that in table 3, but that the dependent variable is now (**$loginc_t$ -$loginc_{t-1}$**).

The first part of the panel data analysis proceeded as if no selectivity bias existed. There are, however, explicit tests for the existence of self-selection. The simplest test is to draw random samples of the data and compare the outcome (level of income) in the migrant group to that of the random sample (Lee, 1982, Maddala, 1983). The results for selectivity tests are presented in table 5, where the first column shows that no significant differences existed between migrants and individuals in a random sample. The T-test produced a value of 2,144, which is not significant at the 0,01 level. The magnitude of these differences appears to be such that it could easily be explained by the observable variables.

Table 5: Tests for self-selection

TEST 1	**TEST 2**		**TEST 3**
Migrants (N = 2338)	**Binomial Logit for**		$\sigma_{1U} = -1.52$
Mean (loginc) = 282.62	**Migration:**		
			$\sigma_{2U} = 27.62$
Random Sample (N = 2382)	**Constant**	**-301.28 (-40.69)****	
Mean (loginc) = 284.84	**Married**	**-0.05 (0.07)**	$\Rightarrow \sigma_{1U}, \sigma_{2U} \neq 0$
	Student	**31.41 (1.54)****	
	Non-labour	**23.77 (1.63)****	$\sigma_{2U} - \sigma_{1U} > 0$
T-test value = 2.144	**Female**	**5.14 (0.50)****	
Sig. = 0.032	**Own house**	**-0.03 (0.06)**	
	Commuter	**0.04 (0.07)**	
	Self-employed	**2.79 (0.79)****	
	Jobs quitted	**0.03 (0.11)**	
	Age	**-32.20 (17.63)***	
	Age2	**1.40 (12.6)**	
	Family size	**-0.05 (0.19)**	
	Unem. Rate	**0.10 (0.42)**	
	Education	**-1.01 (2.23)**	
	Urban	**0.03 (0.32)**	
	Primary prod.	**2.16 (12.97)**	
	Unem. Months	**0.82 (5.07)**	
	EXPINC	**52.12 (40.44)**	

A second test proposed by Nakosteen and Zimmer (1980) is to calculate the expected (predicted) level of incomes using the coefficients from income equations and use these in a hypothetical Logit-model for the probability to migrate. In other words, assuming that expectations are rational, we let individuals predict their future incomes in case of migration, and check if this exerts a significant impact on the probability of moving. The impact of variable **expinc** appears to be positive, but not significant. Therefore, the second test argues for proceeding as if no self-selection existed. Yet another, more complicated, test is suggested by Maddala (1983). This test is based on the covariance of the normal distribution of incomes in migrant and non-migrant groups. Assuming that individual i gets income Y_{1i} if he migrates and Y_{2i} if he does not, we have vectors (Y_1 and Y_2), which are normally distributed with means (μ_1, μ_2) and covariance matrix:

$$\begin{matrix} \sigma_1^2 & \sigma_{12} \\ \sigma_{12} & \sigma_2^2 \end{matrix}$$

Defining $u_1 = Y_1 - \mu_1$, $u_2 = Y_2 - \mu_2$ and $\sigma_2 = \mathrm{Var}(u_1 - u_2)$, it is then possible to test the hypotheses $\sigma_{1u} = 0$ and $\sigma_{2u} = 0$, where $\sigma_{1u} = (\sigma_{12} - \sigma_1^2) / \sigma$ and $\sigma_{2u} = (\sigma_2^2 - \sigma_{12}) / \sigma$. Moreover, it is required that $(\sigma_{2u} - \sigma_{1u})$ should be greater than zero.

The above test suggests that some self-selection is present in the data as the hypotheses that $\sigma_{1u} = 0$ and $\sigma_{2u} = 0$ are rejected. The fact that $\sigma_{1u} < 0$ and $\sigma_{2u} > 0$ indicates that the mean income of migrants is greater than μ_1; that is, the migrants have a higher than average earnings potential.

However, because of the opposite signs of σ_{1u} and σ_{2u}, the direction of selectivity bias is ambiguous. The magnitude of selectivity bias does not appear to be very large, though, like the first and second test suggests. Therefore, the earlier estimates can be assumed to be relatively robust, even though we need to correct for selectivity, in order to confirm the argument that migration itself should be an income-enhancing factor.

As some self-selection was observed, the panel data model for the level of income was re-estimated, now correcting for the selectivity. Note that the two-stage alternative was chosen over the switching regression model (Nakosteen and Zimmer, 1980, Maddala, 1983). The results remain qualitatively identical to the above ones (table 3). The coefficient for migration is significantly positive and much larger than above, signalling that moving indeed is an important income enhancing factor. All models were re-estimated using selectivity correction (not shown in table 3), but as the signs of independent variables remained the same as above, it can be argued that no significant selectivity exists and the results of the uncorrected models may be used. Similarly, the income growth model was re-estimated correcting for selectivity (table 4) and it was noticed that no qualitative change appeared in those results, either.

5. A regional analysis of migrants' incomes

Table 6 presents the differences in migrants' activities, education and income on the level of 19 Finnish regions (NUTS3). Inter-regional differences in means and variances were tested using ANOVA and it was found that significant differences in variances exist in all the variables. Differences in means were significant at the 0,01 level for all variables (incomes in 1995, income growth in 1992-95, education and the shares of students, self-employed and those who were not in labour force). Comparing the regions in terms of the share of migrants who were students in 1995, it is noted that the share varies greatly across regions (5-17%). Similarly, the share of those who were not in labour force in 1995 also differs widely across regions (9-17%). Interestingly, the share of migrants who were self-employed in 1995 (3 – 7%) is largest in those regions where self-employment is high in general. According to this regional comparison, migration is unlikely to alleviate regional income disparities as the highest incomes are recorded in the richest regions: Ahvenanmaa and Uusimaa, where also the growth of migrants' incomes is highest. Migrants

obtain lower incomes in many poor regions, but the growth of income is moderately high, nevertheless.

Table 6: Regional comparison of migrants (19 regions)

Region	*No. of migrants 1987-95*	*Students (%)*	*Non-labour (%)*	*Self-empl. (%)*	*Educ. level*	*Income 1995 (log)*	*Growth 1992-95*
Uusimaa	15250	14.7	8.7	3.0	3.41	281.61	20.77
Vakka-Suomi	3850	16.3	11.3	4.1	3.30	277.01	18.19
Satakunta	1846	12.7	13.5	4.9	3.08	278.76	19.75
Häme	2391	10.6	12.5	5.4	3.00	279.95	15.14
Pirkanmaa	4468	14.7	12.0	5.1	3.31	277.89	19.66
P-Häme	2172	11.3	15.0	5.1	2.90	276.90	18.11
Kymenlaakso	1739	11.5	13.5	4.6	3.16	279.45	15.22
E-Karjala	1323	13.5	14.4	5.7	3.15	276.20	16.07
E-Savo	2152	12.8	16.6	5.4	2.89	272.83	12.09
P-Savo	2974	12.8	14.7	5.6	3.14	274.11	11.71
P-Karjala	2132	15.9	13.6	5.9	2.98	271.52	13.12
K-Suomi	3168	16.2	13.5	5.3	3.23	275.42	15.53
E-Pohjanmaa	1526	11.6	15.4	6.6	3.09	277.34	15.76
Vaasan R.S.	1149	16.9	11.9	5.4	3.52	278.41	19.38
K-Pohjanmaa	783	11.6	13.7	7.0	3.34	277.73	15.94
P-Pohjanmaa	3877	14.1	12.4	4.6	3.35	278.07	17.04
Kainuu	952	12.3	13.9	4.7	3.13	276.28	17.79
Lappi	2063	13.4	12.9	6.0	3.15	276.09	15.06
Ahvenanmaa	126	4.8	11.9	4.0	3.76	293.84	26.10
TOTAL	**128302**	**14.0**	**12.0**	**4.6**	**3.24**	**278.11**	**17.58**

The estimates of the models of the level of income (**loginc**) are described in table 7. The first specification includes dummies for all regions except Uusimaa, which is taken to be the leading region to which other regions are compared. Here the individual characteristics gain the expected signs: Incomes were lower for females, students, self-employed, unemployed and those who were not in labour force. A positive coefficient was connected to age and education. Similarly, most regional characteristics display the expected sign: Incomes are lower if the share of agriculture or the unemployment rate is high. However, the coefficient for unemployment rate is not significant. Movers to heavily urbanised regions also obtain a lower level of incomes.

The results clearly indicate that, even after controlling for differences in personal characteristics of the migrants, the destination region plays a significant role in determining the gains from moving. Compared to Uusimaa, only moving to Satakunta, Vaasa or Ahvenanmaa had a positive impact on the migrants' 1995 incomes, yet not a significant one. Moving to any other region had a negative impact, and significant coefficients were connected to most regions located in eastern and northern

Finland. The negative coefficient of **migtime** indicates that the farther away the time of the most recent move the smaller the incomes in 1995.

Table 7: Results for the level and growth of income in the Finnish regions

	Level 1995		**Growth 1992-95**	
Variable	*Specification 1*	*Specification 2*	*Specification 1*	*Specification 2*
Constant	228.21 (3.19)**	230.26 (3.24)**	225.88 (5.74)**	227.61 (5.79)**
Female	-5.11 (0.34)**	-5.14 (0.34)**	-2.39 (0.60)**	-2.37 (0.60)**
Age	2.84 (0.10)**	2.74 (0.11)**	-10.02 (0.20)**	-10.03 (0.20)**
Age2	-0.03 (0.00)**	-0.03 (0.00)**	0.14 (0.01)**	0.14 (0.01)**
Student95	-39.15 (0.54)**	-38.97 (0.54)**	-10.58 (1.13)**	-10.57 (1.13)**
Nonlab95	-49.27 (0.58)**	-49.43 (0.58)**	-35.95 (0.97)**	-35.91 (0.97)**
Unemm95	-2.74 (0.05)**	-2.74 (0.05)**	-0.53 (0.08)**	-0.52 (0.08)**
Selfem95	-27.96 (0.83)**	-27.98 (0.83)**	-5.80 (1.33)**	-5.80 (1.33)**
Educ95	3.62 (0.09)**	3.63 (0.09)**	0.30 (0.15)*	0.30 (0.15)*
Urban	-0.89 (0.20)**	0.01 (0.09)**	0.21 (0.34)	0.24 (0.34)
Primary	-1.86 (0.46)**	-1.81 (0.46)**	0.98 (0.76)	1.04 (0.76)
Unemr	-0.01 (0.09)	-0.01 (0.09)	0.03 (0.14)	0.04 (0.15)
Uusimaa	-	-	-	-
Vakka-S	-2.64 (0.71)**	-2.52 (0.72)**	4.88 (1.28)**	5.02 (1.29)**
Satakunta	0.83 (1.06)	0.88 (1.06)	6.66 (1.85)**	6.75 (1.85)**
Häme	-1.91 (0.90)*	-1.80 (0.90)*	6.85 (1.53)**	6.98 (1.54)**
Pirkanmaa	-1.96 (0.74)**	-1.87 (0.74)*	6.60 (1.32)**	6.75 (1.33)**
P-Häme	-1.92 (1.06)	-1.86 (1.07)	8.12 (1.87)**	8.25 (1.87)**
Kymenlaakso	-0.51 (1.06)	-0.44 (1.06)	9.00 (1.83)**	9.07 (1.83)**
E-Karjala	-3.35 (1.24)**	-3.29 (1.24)**	5.35 (2.16)*	5.47 (2.16)*
E-Savo	-4.62 (1.10)**	-4.54 (1.10)**	5.11 (1.92)**	5.29 (1.91)**
P-Savo	-4.50 (0.95)**	-4.55 (0.95)**	4.64 (1.65)**	4.76 (1.65)**
P-Karjala	-5.14 (1.18)**	-5.15 (1.18)**	4.48 (2.04)*	4.62 (2.04)*
K-Suomi	-2.59 (0.94)**	-2.56 (0.94)**	4.69 (1.62)**	4.74 (1.62)**
E-Pohjanmaa	-0.88 (1.13)	-0.81 (1.13)	8.60 (1.93)**	8.69 (1.93)**
Vaasan. R.S.	0.04 (1.21)	0.13 (1.21)	3.32 (2.19)	3.45 (2.19)
K-Pohjanmaa	-0.48 (1.49)	-0.53 (1.49)	5.05 (2.61)	5.21 (2.61)*
P-Pohjanmaa	-0.54 (0.86)	-0.56 (0.86)	3.44 (1.49)*	3.52 (1.48)*
Kainuu	-1.62 (1.59)	-1.58 (1.59)	7.91 (2.72)**	8.10 (2.72)**
Lappi	-2.69 (1.36)*	-2.74 (1.36)*	6.58 (2.34)**	6.69 (2.34)**
Ahvenanmaa	3.49 (3.62)	3.82 (3.62)	-1.27 (6.79)	-1.20 (6.79)
Migtime	-0.07 (0.07)	-0.40 (0.12)**	0.02 (0.15)	-0.15 (0.18)
Mig95	-	-2.79 (0.63)**	-	-
Mig94	-	0.63 (0.57)	-	-
Migt93	-	0.13 (0.54)	-	-
Migt92	-	-0.15 (0.53)	-	-0.96 (0.89)
Migt91	-	1.11 (0.50)*	-	-0.76 (0.78)
Migt90	-	1.01 (0.47)*	-	-2.97 (0.70)**
Mig89	-	1.52 (0.47)**	-	-
Mig88	-	0.73 (0.49)	-	-
	R^2 = 32.7 N = 53941	R^2 = 32.8 N = 53941	R^2 = 12.3 N = 30 085	R^2 = 12.4 N = 30085

Finally, table 7 also presents the results for the income growth analysis, where the growth is measured as the difference between 1995 and 1992 incomes. The model again includes dummies for all regions except Uusimaa, together with dummies for migration during the years of economic slump (1990-92). Here high education seems to lead to faster income growth, whereas low growth is associated with women, unemployment, students, self-employment and non-labour force. Regional characteristics, on the other hand, tend to be insignificant in determining income growth.

Regional dummies reveal that, compared to Uusimaa, growth impact is significantly higher for those moving to all poorer regions. And most interestingly, high growth is also displayed by migrants to the poorest regions located in eastern Finland and on the western coast!

Now the impact of moving on income growth is somewhat, but not significantly, smaller the longer the time elapsed since the most recent move (specification 4). Moreover, if the most recent move has occurred during recession years, the subsequent income growth is downplayed. This indicates that those who moved in the years of the deepest recession experienced more difficulties in realising the potential gains of migration. Just like above, this analysis clearly indicates a significant role for the choice of destination region in determining the impact on migrants' incomes and their growth. Moreover, the analysis gives some reasoning on why certain individuals move to lagging regions where the growth prospects in general are poor (see Kauhanen and Tervo, 1999). The present study found large differences across the 19 NUTS3 regions in the types of in-migrants and the gains from moving. This finding signals that inter-regional migration affects regional population structure and income distribution. Finally, even though the effect of migration is not likely to be radically divergent in terms of regional income disparities in the short run, the long-term cumulative growth effects could still be large.

6. Discussion and conclusions

The present study analysed inter-regional migration in Finland during the period of 1987-95, seeking regional differences in the way in which the gains from moving are realised. The aim was first to find out whether migrants experienced higher personal incomes than non-migrants, and, secondly, to observe whether the income impact differed across the 12 Finnish provinces. It was found that migrants can be distinguished from non-migrants in many important respects, and they, for example, experienced faster income growth than non-migrants. On the other hand, significant regional differences in the characteristics and incomes of the migrants were discovered.

The panel data analysis confirmed that migrating produces gains in the form of higher incomes, even after the influences of personal and regional characteristics were controlled for. The results indicated that in those regions where the share of primary production and the unemployment rate were low, the impact of moving on incomes was higher. Higher incomes were also connected to

the province of Uusimaa, but migrants to Uusimaa obtained lower incomes compared to original residents. Moreover, selectivity did not appear to be a difficult problem in the regressions. However, the number of migrants in the panel was too small for any further regional analysis to be made, and therefore a sample of all inter-regional migrants was taken as the basis for regional analysis.

The cross-section analysis of migrants showed that the 19 NUTS3 regions differ significantly in terms of the development of in-migrants' incomes. Those who had moved to the relatively rich regions during 1987-95 obtained higher incomes in 1995 than those who had moved to poorer provinces. In particular, choosing Uusimaa as the destination region seemed to have a positive impact on the level incomes. Significantly negative impact was observed in almost all regions located in eastern or northern Finland. The growth of incomes, however, displayed a completely different pattern. Here, moving to any of the poorer regions seemed to influence the growth of incomes positively. Low growth was thus connected with migrants to Uusimaa, to which other regions were compared. These results support the earlier findings according to which migration causes changes in the regional distribution of incomes and population structure (Pekkala and Kangasharju, 1998, Ritsilä and Tervo, 1999). In other words, the short-term effect of migration may not be divergent in terms of regional incomes, whereas the long-term cumulative effect can cause widening regional disparities. The present study also gives an explanation to so-called perverse migration (Kauhanen and Tervo, 1999), as it was shown that there are gains to be made from choosing a more backward destination region. On the other hand, the effect of moving on income growth tends to be more negative the longer the time elapsed since the most recent move, which means that the gains from moving tend to be realised rather rapidly. This finding is also in line with previous Finnish studies (Laakso, 1998, Eriksson, 1993).

To conclude, the present study provided evidence of regional differences in the ways in which the migrants' incomes behave succeeding the move. This has important implications in terms of regional income structures and disparities, as well as the development of regional population structure. A more detailed regional comparison would be needed in order to confirm these conclusions at a more disaggregated regional level, as it must be acknowledged that the 19 NUTS3 regions used here are not entirely homogenous, but consist of very diversified sub-regions. However, due to data restrictions, performing such an analysis has not been possible so far. Future work will concentrate on this problem, as well as on incorporating more detailed

information on various regional characteristics that may be of importance when making the choice of destination region.

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[2] Compare, for example, Polacheck and Horvath (1977), Nakosteen and Zimmer (1980), Hunt and Kau (1985), Tunali (1986), Erikson (1993) and Axelsson and Westerlund (1993). Some of these studies find support for the argument that migration should increase personal or family incomes, while others find no such evidence.