THE IMPACT OF MIGRATION ON EARNINGS OF MARRIED MEN AND WOMEN

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ABSTRACT. This paper investigates the impact of migration on incomes of married men and women. Also the potential self-selection is taken into account. The data used covers the period 1987-1994. The results show that moving in general is an beneficial action, and the returns to moving do not to a greater extent depend on destination. Even though both genders obtain a fairly similar post-migratory income growth, the incomes of females remain considerably lower. Evidence in favour of tied mover-hypothesis is found. Women more likely are the tied partners. On the other hand, in some cases it is the husband who follows.

Keywords: Family migration, gender, income

JEL classification: J61, J16, J31, R23

I Introduction

Based on individual labour market behaviour, one way to address the efficiency of migration is to investigate the economic consequences of moving. While a remarkable research effort has been targeted at the individual returns to migration, measured typically in terms of earnings gains (e.g. Hunt and Kau 1985, Robinson and Tomes 1982, Nakosteen and Zimmer 1982, Pekkala, 2000), the monetary returns from migration accruing to families have been given only a scant attention in empirical migration research. Yet, many migrants have family relations, which affect both the causes and consequences of moving (see e.g. Long 1974, Sandell 1977, Mincer 1978, Nivalainen, 2000).

The traditional human capital approach (Sjaastad, 1962) treats migration as a means of maximising an individual's personal welfare. Family migration, however, is a joint utility maximising decision, where the objective is to maximise total family income. While an unattached individual bases his/her migration decision simply on the difference between the benefits and costs of moving, decision making in the family context is far more complicated. As there are several individuals present, benefits and costs are multiplied. And unless all family members have identical tastes and needs, family ties give birth to tied movers (or tied stayers), who bear a personal loss for the sake of family. On the other hand, family ties may to some degree restrict the choice set of both spouses. Families may often wish to move near to larger labour markets, as these often offer better chances for tied migrants too to improve their position. Therefore, regional and labour market issues are closely connected with family migration, especially in case of two-earner families. In addition, regional aspect is of general interest in Finland as in recent years the pace of migration has accelerated and migration steams have started to concentrate to only few areas leading to a worrying population loss in the larger part of the country.

While studies dealing with the monetary returns to individual migration have reported somewhat miscellaneous results, analyses concentrating on family migration have generally observed migration to increase family earnings (Polachek and Horvath 1977, Sandell 1977, Holmlund 1984). This improvement is usually due to rise in husbands' incomes. At the same time, migration is proved to have detrimental effect on women: not only on wives' incomes (Polachek and Horvath 1977, Sandell 1977, Mincer 1978, Grant and Vanderkamp, 1980, Holmlund 1984, Maxwell, 1988), but also on their employment and labour force participation (Duncan and Perrucci 1976, Lichter 1980, Shihadeh 1991). This all suggests that wives are the tied ones in family migration. However, the situation in Finland is not as obvious, as Finland is much on an equality of genders, at least when compared with many other countries.

In recent years, the potential correlation between the migrants' unobserved characteristics and their income has aroused considerable interest among regional scientists. Unattended, this so-called selectivity bias may distort the results. However, findings concerning selectivity are mixed, and tend to vary from country to another. Some studies have uncovered evidence of selectivity (for Finland, see Eriksson, 1993,

see also Robinson and Tomes, 1982, Islam and Choudhury, 1990, Détang-Dessendre, Drapier and Jayet, 1999), while others have failed to find any (e.g. DaVanzo and Hosek, 1981, Borjas, Bronars and Trejo, 1992). Family migration research has generally neglected potential selectivity problems. To my knowledge, only Axelsson and Westerlund (1998) have handled this question in their study of migration and household income in Sweden. They found, however, no indication of selection in their sample.

The purpose of this paper is to study the impact of *family migration* on income. Migration is here defined to occur between sub-regions (NUTS 4), which correspond to the actual labour market areas. The sample consists of working-aged persons, who are married with the same spouse throughout the inspection period, i.e. from 1987 to 1994. The study inspects the existence of the tied mover-phenomenon, and investigates both genders separately. Both the level and change of income, and their regional variation are examined. This is done to find out whether the returns to family migration depend on the characteristics of destination regions. For this reason the sub-regions are classified into eight categories on the basis of their function and characteristics, and not solely on the ground of administrative borders, as in many previous studies. The study uses multiple estimation techniques and, unlike most earlier family migration studies, encounters selection bias in the estimations.

The findings show than family migration, in general, is a favourable action for individuals. However, the benefits do not necessarily arise right after the move, but it takes some time the returns to occur. Further, even though the income level of females is considerably lower, both genders obtain a fairly similar post-migratory income growth, when other things are held constant. Regional inspection shows that among migrants the returns do not depend on the destination, a finding supporting the human capital view. Evidence in favour of the tied mover-phenomenon is found. Especially children, presence of employed or highly educated husband dampen the benefits of females. In addition, only women moving to the largest and most diversified labour markets are able to increase their incomes in relation to stayers. In turn, only the presence of an employed wife has a negative effect on men. Moreover, men's success is not tied to larger labour markets alone. Thus, in Finland, as in many other countries too, women more likely play the tied role. On the other hand, in some cases it seems to be the husband who follows. This is an important new finding, and signals that the society has changed during the last few decades. Finally, the results indicate a positive selectivity in family migration decisions.

The remainder of the study is structured in the following way. Section two introduces the theoretical background and the methods used. The data and variables are described in the third section. The results are presented in the fourth section and section five concludes the study.

II Analytical framework

Theoretical considerations

The human capital approach (Sjaastad, 1962) to migration suggests that individuals will choose the location that will maximise the present value of earnings net of moving costs. The costs consist of the direct

expenses of moving, plus the psychic costs of changing ones environment, as well as the costs derived from uncertainty. Sandell (1977) and Mincer (1978) first applied the human capital approach to family migration. They postulate that a family is a rational agent, whose objective is to maximise total family income. Here we assume that the present value of family's earnings stream is equal to the sum of the present value of the husband's earnings plus the present value of the wife's earnings, i.e.

$$FE_{it} = \sum_{k=w,h} \left[\int_{t=1}^{R_k} E_{kit} \right] e^{-rt} dt . \qquad (1a)$$

or $$FE_i = E_{wi} + E_{hi} \qquad (1b)$$

If a family decides to move, it must expect the present value of the returns to exceed the costs of migration. Thus, migration takes place if

$$FE_j - FE_i - M > 0 . \qquad (2)$$

M gives the present value of the family's moving costs ($M > 0$), FE_i and FE_j indicate the present value of family's lifetime earnings in the origin region *i* and destination region *j*, respectively. E_{kj} and E_{ki} are the earnings of family member *k* (*k* = *w*, *h*; *w* = wife, *h* = husband) in the destination and origin, respectively. R_k indicates his/her year of retirement, r is discount rate and t is time.

By looking at the above formulas (1a, b and 2), it is apparent that family migration involves much more complexity than the migration of unattached individuals. The probability that a family moves is equal to the individual's probability only if gains and losses of the spouses are perfectly correlated (or if one of the spouses is ignored in the mobility decision). Presumably, however, each spouse has a unique utility function, and the net benefits (earnings gains minus costs) differ between the spouses.

If the family moves, and if both spouses are in the labour market, formula (2) implies

$$E_{wi} + E_{hj} > E_{wi} + E_{hi} . \qquad (3)$$

Thus, maximisation of family earnings indicates that the sum of the spouses' income streams must increase as a result of migration. This happens if i) both spouses' streams

increase or ii) the increase in one partner's stream offsets the reduction in the other partner's stream. A concept associated with the latter case is *tied migration* – the migration of individuals who give up their personal gains to accompany the family. The tied one in the family has traditionally been the wife, a finding documented in various studies (Sandell, 1977, Maxwell, 1988, Shihadeh, 1991). However, the difficulty of migration decision still remains even if moving would improve both spouses' position, because their preferences may point to different regions. For this reason a family may move to destination, where neither of the spouses' personal gains is maximised but the family gain is greatest. Especially larger and more diversified labour markets often offer a greater selection of job possibilities also for the tied partner. Hence it can be argued that to some degree family relations restrict the choice set of both spouses.

Another analytical issue concerns selection bias. As noted earlier, selectivity should be taken into account always when inspecting the outcomes of moving. Morrison (1977) explains the issue:

> *"…as a prism separates light, the act is (merely) selective of certain persons who would have improved their status irrespective of the decision to migrate"*.

In other words, selection bias occurs when the unobserved determinants of migration are related to unmeasured characteristics that are also related to earnings, such as ambition and predisposition toward human capital investments. Those who select to migrate are not randomly drawn from the population as a whole. Under self-selection, migrants have comparative advantage with the migration and therefore will benefit more than would a randomly selected individual with the same characteristics (Maddala, 1983). Consequently, measuring gains of migration by simply comparing migrant earnings with non-migrant earnings will bias the estimated gains upwards. To yield consistent estimates, potential self-selection has to be controlled for.

Methods

To evaluate the returns to migration, the following model is utilised:

$$lnE = XB + \alpha I + u, \tag{4}$$

where *lnE* indicates logarithm of the earnings, *X* is a vector of observable variables that exert influence on earnings, *I* denotes a dummy variable for migration (*I*=1 if the individual migrates, *I*=0 otherwise), and *u* is the stochastic error term. The impact of migration on earnings is measured by the estimate of α.

In the above model, the migration dummy cannot be treated as exogenous if the decision to migrate (or not to migrate) is based on individual self-selection rather than on random selection. Several alternative procedures exist to control for self-selection. They are discussed in more detail in Heckman (1979), Lee (1982) and Maddala (1983), and in many others. The present paper applies three different kinds of methods. The first one is the commonly used Heckman-type model (see e.g. Heckman, 1979, Axelsson and Westerlund, 1998), where in the first stage a probit model for migration decision is estimated:

$$I^* = Z\gamma + v, \tag{5}$$

where Z denotes a vector of observable variables affecting net benefits from migration, v is the random error term. I^* is the propensity to migrate, and as such an unobservable, latent variable. Instead, what we observe is the migration event:

$$I=1, \text{ if } I^* > 0 \tag{6}$$
$$I=0, \text{ if } I^* \leq 0.$$

The second stage entails the estimation of earnings equation of type (4), appended with selectivity variable from the stage 1. For comparison, also a treatment effects model with instrumental variable techniques (2SLS) is estimated (see e.g. Barnow, Cain and Goldberger, 1981), using the predicted probabilities from the probit model as an instrument for I. As a third method, a switching regression model with an endogenous switching (mover/stayer model) is applied, where separate earnings equations are estimated for movers and stayers (see Nakosteen and Zimmer, 1980, Robinson and Tomes, 1982, Greene, 1998).

III Data and variables

My data set, covering the period 1987-1994, derives from two sources: the Finnish longitudinal census data file and longitudinal employment statistics. The longitudinal census, maintained and updated by Statistics Finland, contains data on population, economic activity, dwelling conditions and family relations. In turn, the longitudinal employment statistics mainly consists of data on economic activity, places of work and degrees and types of income.

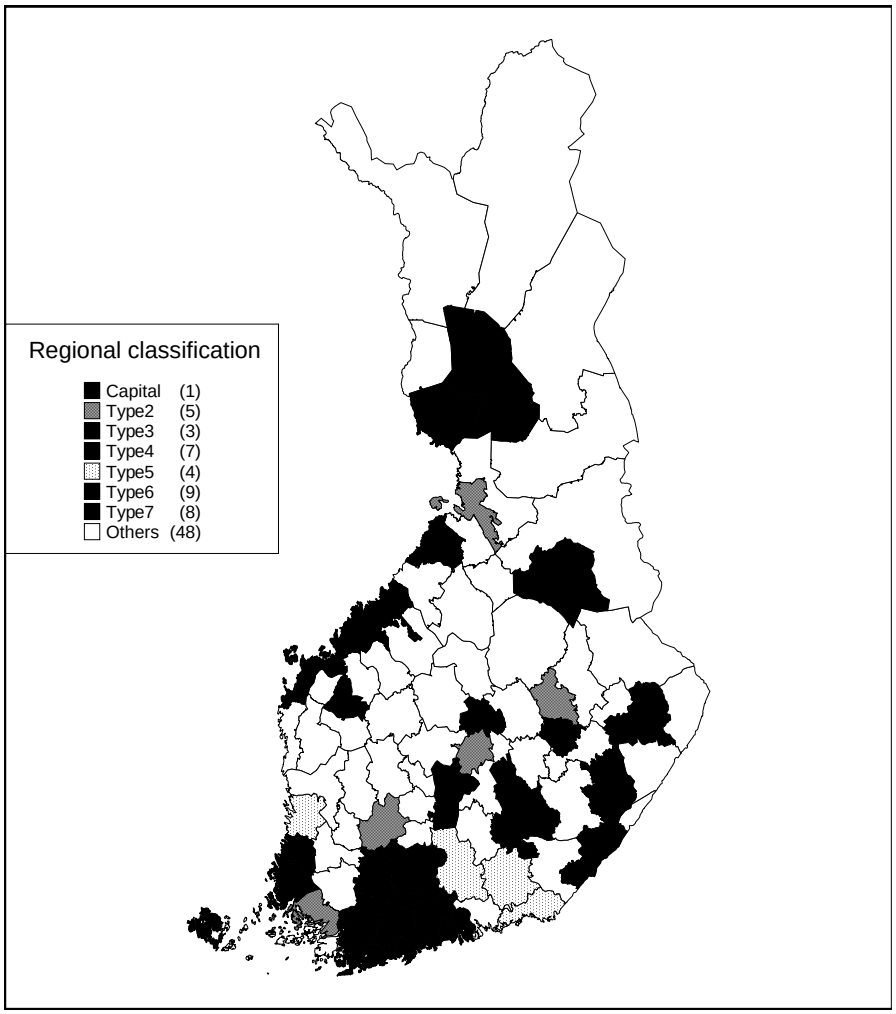
The sample used in the present study consists of persons who are married with the same spouse throughout the whole period of inspection, i.e. from 1987 to 1994. Stable couples were chosen to eliminate moves motivated by new marriage or divorce. Only working-aged individuals, i.e. those aged 18-64 in 1994 were selected. Further, to concentrate on the effects of migration on income, those individuals who had zero earnings in

any year during the inspection period were excluded. The final sample, an unbalanced panel, comprises altogether 60 554 observations (8 693 individuals). In total, these data include 2 291 moves across the Finnish sub-regions during the period under scrutiny.

Regional classification

This study investigates migration between the 85 sub-regions in Finland, which correspond to the actual travel-to-work areas. For this study the sub-regions were classified into eight categories. Unlike most previous studies, the regional grouping here is based neither on geographic location of regions, nor solely on administrative borders, but is related to the importance of regions' differential quality and characteristics. After all, characteristics of a regions, rather than their geographic location, define the job and income opportunities of employees.

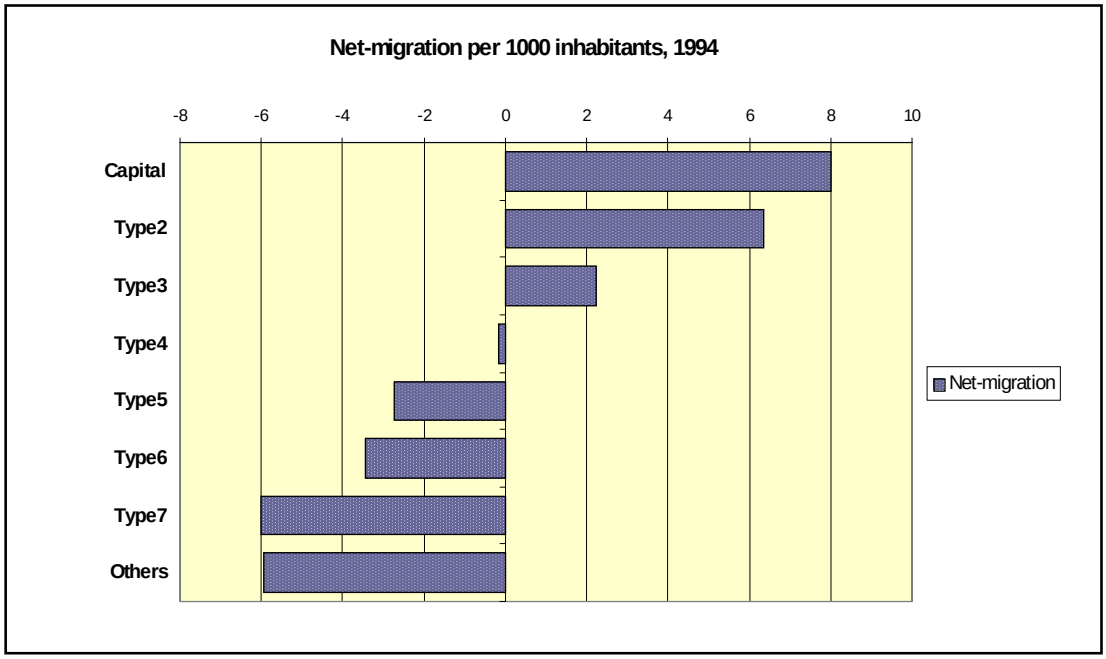
Map 1. *Regional classification used*



Regional division (see Map 1) is formed on the ground of the classification of Vartiainen (1995), who categorized Finnish sub-regions according to their attributes and functional role. The capital of Finland, Helsinki, is located in the Capital-region. Type2 comprises five large, versatile and internationalising sub-regions with an university. The sub-regions belonging to the first two classes are often called as 'growth centres', as they have shown rapid growth in recent years (both in GDP and population). Their growth has been driven by the hasty growth of information technology and telecommunications-sector (IT), which is heavily represented in these regions. Like regions in the preceding classes, the three regions belonging to Type3 are also educational centres with university, but they are somewhat smaller in population and are not so much IT-oriented. In turn, Type4 includes seven sub-regions, which can be described as provincial[i] centres. Type5 consists of four heavily industrialised regions, while eight smaller

industrial centres form the Type7. Nine small urban sub-regions with only local importance fall into Type6. The category Others includes all remaining sub-regions, many of which are sparsely populated and have one-sided economic structures. These are considered as peripheral regions.

Figure 1. *Net-migration in 1994 in each regional type*



Besides their differential economic structures, these regional types also differ in their capability to draw in migrants. For example, in 1994 only the Capital, Type2 and Type3 gained net-migration surplus, while all the others lost population through internal migration (see Figure 1). In the empirical part of the study, these three regions with positive net-migration are mirrored against the group of less successful regions to find out whether the potential explanation for their migratory success lies in their better income prospects.

Variables

The present study utilises two different dependent variables. The first one, the level of income, is the logarithm of person's[ii] annual taxable income ($ln[income_t]$). The second one, the change of income, is $ln[income_t]$-$ln[income_{t-2}]$, i.e. income change between a year before and after migration. This differs from variables used in most studies. Earlier

research usually employs only one lag (i.e. t-1), and allows migration to occur at some point during year t. In that case year t's annual income often comprises both pre- and post-migration incomes, which can lead to causality problems. In the present setting these problems are avoided.

Table 1. *Descriptive statistics for migrants and non-migrants*

VARIABLE	Migrants	Non-migrants
Ln[income t] (=log of taxable annual income)	4.08 (40.8)*	4.05 (40.5)*
Growth of income (=ln[income t]–ln[income t-2])	0.04 (43.7)**	0.02 (20.8)**
Gender (=1 if female)	0.51	0.44
Age	26.90	30.20
Intermediate education (=1 if upper level of upper secondary education)	0.51	0.49
High education (=1 if an university degree of equivalent)	0.21	0.10
Spouse has high education	0.04	0.02
Student	0.12	0.12
Self-employed	0.02	0.06
Unemployed (=1 if at least two weeks' unemployment period during a year)	0.14	0.12
Children (=1 if has children under 18 years of age)	0.24	0.28
Agriculture (=share of people working in agriculture, scale 0-10)	0.47	0.53
Unemployment rate	11.04	11.30
Before moving lived in		
Capital	0.15	0.26
Type2	0.16	0.18
Type3	0.05	0.05
Type4	0.09	0.08
Type5	0.10	0.09
Type6	0.11	0.09
Type7	0.07	0.05
Others	0.28	0.20
After moving lived in		
Capital	0.26	
Type2	0.22	
Type3	0.05	
Type4	0.07	
Type5	0.08	
Type6	0.10	
Type7	0.05	
Others	0.17	
N***	2 291	58 263

* For convenience, actual income level is multiplied by 10 for the estimations. ** Actual income growth is multiplied by 100 for the estimations. *** Except for the growth of income 1 849 and 40 936, respectively.

The set of explanatory variables consists of factors thought to influence individual's labour market position and earnings. They are chosen on theoretical grounds and on the basis of findings of earlier research. Individual characteristics control for observable differences in individuals' labour market experience, human capital accumulation, family background and labour force status. Regional variables, such as area unemployment rate, region's economic structure and the type of the region (see Map 1) control for varia-

tion in individuals' labour market conditions. The names of variables are mostly self-explanatory but definitions are given in some cases. These, as well as some important characteristics of the sample individuals, separated by migration status, are presented in Table 1.

Concerning the dependent variables, no significant differences are noticed in the income levels, but it looks as if the income growth would be faster among migrants. Means of independent variables indicate that migrants are younger than non-migrants. They are also more often highly educated, and so are their spouses, too. Personal unemployment experience seems to enhance migration, while those with children are less eager to move. Self-employed persons appear to be more tightly rooted in their home regions. Being a student does not seem to affect regional mobility much.

With regard to regional characteristics, tendency to move is inversely related with the share of agriculture. Area unemployment rate does not have strong influence on moving decisions, and migrants, in fact, seem to originate from regions of slightly lower unemployment rates. The majority of stayers live in the Capital-region, but also Type2, as well as Others are well represented. When inspecting the spatial distribution of moves, nearly one third of migrants originate from the Others. On the other hand, a high proportion also hails from the Capital[iii]. In addition, over 10 per cent of the movers are ex-inhabitants of Type2 or Type6. Not surprisingly, migrants most likely head to the Capital or to large versatile centres (Type2). It should be noted, however, that a fairly large share of them also settles down to peripheral regions.

IV Estimation results

This section explicitly examines whether the familial migrants benefit economically from moving, and inspects the returns to both genders. Various modelling techniques are used and the presence of self-selection is detected. In the first phase, the whole sample is under scrutiny. The estimation results for the level and change of income are listed in Tables 2 and 3, respectively. The first and third column contain the coefficients of the Heckman-type models, the only difference between these two being the inclusion of destination dummies in the latter. The estimates of the treatment effects-model are presented in the second column. It can be seen that all three models paint a fairly similar picture, none of the significant variables change signs. However, Heckman-type models display much better fit.

Table 2. *Estimation results for the level of income*

	Heckman 1		Treatment effects		Heckman 2	
Variable	Coeff .	(std.error)	Coeff.	(std.error)	Coeff.	(std.error)
Constant	21.38***	(0.338)	22.95***	(0.409)	21.39***	(0.339)
Age	1.09***	(0.019)	1.04***	(0.023)	1.09***	(0.019)
Age squared	-1.28***	(0.026)	-1.25***	(0.031)	-1.28***	(0.026)
Female	-0.91***	(0.054)	-0.72***	(0.066)	-0.91***	(0.054)
Intermediate educ.	1.85***	(0.061)	1.94***	(0.071)	1.86***	(0.061)
Higher educ.	4.50***	(0.104)	4.85***	(0.123)	4.50***	(0.104)
Spouse higher educ.	1.08***	(0.179)	1.53***	(0.218)	1.04***	(0.179)
Student	-8.92***	(0.090)	-9.10***	(0.109)	-8.92***	(0.090)
Self-employed	-3.97***	(0.121)	-4.01***	(0.141)	-3.96***	(0.121)
Unemployed	-5.35***	(0.082)	-5.11***	(0.099)	-5.35***	(0.082)
Children	-0.95***	(0.065)	-1.09***	(0.076)	-0.95***	(0.065)
Agriculture	-0.58***	(0.045)	-0.64***	(0.053)	-0.57***	(0.045)
Unemployment rate	0.08***	(0.004)	0.07***	(0.005)	0.08***	(0.004)
Capital	1.34***	(0.080)	1.37***	(0.095)	1.36***	(0.081)
Type2	0.04	(0.083)	0.18*	(0.100)	0.05	(0.084)
Type3	0.21*	(0.126)	0.25	(0.152)	0.20	(0.127)
Migrated(t)	-10.89***	(0.675)	-19.29***	(0.992)	-10.97***	(0.676)
Migrated(t-1)	0.72***	(0.136)	2.74***	(0.198)	-	-
Migrated(t-1) to						
Capital	-	-	-	-	0.38	(0.266)
Type2	-	-	-	-	0.65**	(0.296)
Type3	-	-	-	-	1.45**	(0.588)
Type4	-	-	-	-	1.74***	(0.502)
Type5	-	-	-	-	0.29	(0.484)
Type6	-	-	-	-	1.12***	(0.423)
Type7	-	-	-	-	1.06*	(0.547)
Others	-	-	-	-	0.61**	(0.309)
Lambda	4.71***	(0.290)	-	-	4.74***	(0.290)
N	51 434		51 434		51 434	
Adj. R2	0.42		0.17		0.42	
	* /** /*** significant at the 10%/ 5%/ 1% level					

As expected, lower level of income is related to females, students, unemployed persons, self-employment and to regions with a higher share of people working in agriculture. Also those with children tend to have lower incomes. In turn, incomes increase with age and education[iv]. Interestingly, the results signal selective mating: not only individual's own, but also his/her spouse's education exerts a positive impact on incomes.

As mentioned earlier, the regions with net-migration surplus (Capital, Type2, Type3) are mirrored against the group of weaker regions. In line with expectations, those living in the Capital have higher incomes. Also the other two regional types show a positive influence, but the difference to other regions is not significant (at 0.05 level). A bit surprisingly, area unemployment rate is positively connected with the level of income. An explanation for this can be found: the unemployment rate in Finland jumped to a considerably higher level in the beginning of the 90s when the deep recession started[v]. This together with the year-by-year increasing general income level leads to a positive relationship.

With regard to migration, the results show that migrants at the time of moving have lower than average incomes. However, after one year their income level has exceeded that of non-migrants. Migrants' in-

comes also remain higher, as migration two years earlier gets a significant positive coefficient, too (see Table 3). A more detailed regional inspection (Table 2, Heckman 2) reveals that significantly higher income holds for all migrants, except for those having headed to Capital or to heavily industrialised regions. In these two regions it apparently takes a longer time for migrants to exceed the prevailing income level. Finally, it is noteworthy that migrants are positively selected: the selectivity variable (Lambda) gains a significant and positive coefficient.

Table 3. *Estimation results for the level of income, with more lags*

Variable	Coefficient	(std. error)
Other variables as in Heckman 1, Table 2		
Migrated(t)	-11.21***	(0.696)
Migrated(t-1)	0.40***	(0.135)
Migrated(t-2)	0.39***	(0.150)
Lambda	4.77***	(0.298)
N	42 741	
Adj. R2	0.39	

The estimation results for the income change (Table 4) show that a faster income growth is associated with younger age, higher education, and with being a male. The positive coefficient of children most likely partly reflects the age effect; parents of children tend to be in their best working ages. As hypothesised, the higher the income is in previous year, the slower is its growth. Also studying, self-employment and unemployment experience tend to diminish income growth.

Those living in regions with higher unemployment rates realise a slower increase in their incomes. Somewhat surprisingly, the situation in regions dominated by agriculture is just the opposite. This, however, may be due to these regions originally lower income levels. The same argument, although reversed, applies to Capital, where the general income level is the highest in Finland. In turn, inhabitants of Type2 and Type3 do not reap a significantly higher income growth in relation to rest of the regions.

Table 4. *Estimation results for the change of income*

	Heckman 1		**Treatment effects**		**Heckman 2**	
Variable	Coeff.	(std.error)	Coeff.	(std.error)	Coeff.	(std.error)
Constant	247.25***	(4.122)	243.78***	(5.138)	246.30***	(4.118)
Ln[income(t-1)]	-1.08***	(0.051)	-1.10***	(0.053)	-1.07***	(0.051)
Age	-8.60***	(0.247)	-8.48***	(0.265)	-8.55***	(0.247)
Age squared	9.94***	(0.329)	9.89***	(0.334)	9.88***	(0.329)
Female	-2.17***	(0.678)	-2.59***	(0.761)	-2.07***	(0.677)
Intermediate educ.	2.31***	(0.735)	1.80**	(0.833)	2.20***	(0.734)
Higher educ.	24.67***	(1.134)	22.77***	(1.848)	24.57***	(1.133)
Student	-47.32***	(1.207)	-47.49***	(1.217)	-47.23***	(1.205)
Self-employed	-11.85***	(1.453)	-11.54***	(1.485)	-12.09***	(1.451)
Unemployed	-23.86***	(1.002)	-24.13***	(1.040)	-23.81***	(1.000)
Children	3.69***	(0.782)	4.20***	(0.882)	3.72***	(0.781)
Agriculture	2.10***	(0.556)	1.99***	(0.562)	2.20***	(0.559)
Unemployment rate	-1.05***	(0.048)	-1.03***	(0.052)	-1.04***	(0.048)
Capital	-3.14***	(0.986)	-2.88***	(1.005)	-4.61***	(0.997)
Type2	0.74	(1.030)	0.53	(1.060)	0.40	(1.044)
Type3	0.15	(1.575)	0.01	(1.592)	0.29	(1.599)
Migrated(t-1)	13.24***	(1.615)	54.96*	(31.831)	-	-

Migrated(t-1) to					-	-
Capital	-	-	-	-	41.69***	(3.074)
Type2	-	-	-	-	12.26***	(3.482)
Type3	-	-	-	-	-1.37	(7.006)
Type4	-	-	-	-	5.96	(6.050)
Type5	-	-	-	-	1.25	(5.765)
Type6	-	-	-	-	-0.76	(5.066)
Type7	-	-	-	-	4.81	(6.669)
Others	-	-	-	-	-6.15*	(3.714)
Lambda	3.58***	(0.700)	-	-	3.75***	(0.700)
N	42 741		42 741		42 741	
Adj. R2	0.14		0.12		0.14	
	* /** /*** significant at the 10%/ 5%/ 1% level					

The most interesting part of the results relates to migration, which shows a large positive and significant effect. In addition, positive selectivity of migrants is again present. Thus, also this measure signals migration to be a profitable investment. Regionally, moving to Capital seems to offer the best award, although also those heading to large, versatile regions (Type2) succeed considerably well in relation to non-migrants. This is not surprising as migrants to these two regions are usually young individuals or young couples starting their careers. Instead, migrants to Others experience a slower income growth. Based on the findings of Kauhanen and Tervo (1999)[vi], it can be assumed that this is due to these migrants' older age and higher pre-move incomes. Migrants to these areas do not necessarily measure the benefits of moving in pecuniary terms.

To look things from a different perspective, a mover/stayer model was estimated. The estimation results for the level and change of income are presented in Table 5. The comparison of migrants and non-migrants reveals many similarities but also some interesting differences. It can also be seen that the correlation between the errors of migration and income equations is significant for both groups in the level equation and only for migrants in the change equation. Income level shows somewhat higher correlation with staying (ρ_{v0}) than with migration (ρ_{v1}), while the income growth is more correlated with moving. Furthermore, residual's variance in the income equations is, quite naturally, greater among migrants (σ_{11}) than among stayers (σ_{00}). Especially the variation of unexplained growth is much larger for migrants.

As expected, both migrant and non-migrant females have lower levels of income. Interestingly, spouse's high education has a positive coefficient in both groups, but it has a significant impact only on stayers' incomes. This signals that the education levels and occupational statuses between spouses are more diversified in migrant families.

The most striking differences between migrants and non-migrants relate to regional variables. In relation to weaker regions (specification 1), incomes of non-migrants in the Capital are considerably higher, while those of incoming migrants tend to be lower (not significant). Income growth equation shows almost opposite results: significantly smaller income growth is attached to those staying in Capital. In turn, those

moving there experience a very large positive change in their incomes. Also migrants to Type2 encounter significant gains in relation to weaker regions.

Table 5. *Mover/stayer-model: Corrected regressions for migrants and non-migrants*

Variable	**Level of income**				**Change of income**			
	Migrants		Non-migrants		Migrants		Non-migrants	
	Coeff.	std.err.	Coeff.	std.err.	Coeff.	std.err.	Coeff.	std.err.
Specification 1								
Constant	13.18***	(2.090)	21.22***	(0.331)	181.58***	(33.11)	243.63***	(5.422)
Ln[income(t-1)]	-	-	-	-	-1.34***	(0.203)	-1.03***	(0.041)
Age	1.17***	(0.109)	1.10***	(0.020)	-13.66***	(2.029)	-8.47***	(0.278)
Age squared	-1.47***	(0.161)	-1.30***	(0.027)	12.54***	(3.103)	9.77***	(0.368)
Female	-0.61**	(0.245)	-0.99***	(0.056)	1.78	(3.600)	-2.14***	(0.703)
Intermediate education	1.82***	(0.326)	1.95***	(0.062)	16.28***	(4.670)	2.16***	(0.769)
High education	4.14***	(0.488)	4.68***	(0.099)	84.46***	(6.338)	23.64***	(1.784)
Spouse has high education	0.76	(0.696)	1.12***	(0.196)	-	-	-	-
Student	-6.84***	(0.329)	-8.16***	(0.075)	-48.96***	(5.154)	-46.82***	(0.954)
Self-employed	-6.41***	(0.624)	-3.62***	(0.092)	-38.19***	(10.038)	-11.73***	(1.176)
Unemployed	-5.16***	(0.322)	-4.87***	(0.078)	-38.52***	(4.670)	-22.81***	(0.992)
Children	-1.46***	(0.297)	-0.95***	(0.067)	-15.79***	(4.740)	4.12***	(0.821)
Agriculture	-0.16	(0.195)	-0.58***	(0.044)	4.30	(3.126)	2.17***	(0.562)
Unemployment rate	0.01	(0.018)	0.08***	(0.004)	-1.17***	(0.272)	-1.06***	(0.051)
Capital	-0.19	(0.369)	1.39***	(0.085)	12.37**	(5.434)	-3.62**	(1.126)
Type2	0.12	(0.361)	0.04	(0.084)	11.18**	(5.221)	0.53	(1.085)
Type3	0.52	(0.564)	0.14	(0.126)	13.41	(8.287)	-0.21	(1.583)
Specification 2: More regions added, other variables as above								
Capital	-	-	-	-	-	-	-	-
Type2	0.30	(0.364)	-1.36***	(0.088)	-1.15	(5.332)	4.19***	(1.146)
Type3	0.74	(0.635)	-1.49***	(0.144)	-0.36	(9.356)	3.32*	(1.829)
Type4	0.65	(0.576)	-1.66***	(0.125)	-13.45	(8.287)	1.42	(1.657)
Type5	-0.63	(0.486)	-1.42***	(0.107)	-6.72	(6.887)	5.73***	(1.409)
Type6	0.79	(0.522)	-1.24***	(0.111)	-18.38**	(7.789)	3.61**	(1.446)
Type7	0.06	(0.581)	-1.53***	(0.140)	-7.72	(8.521)	1.45	(1.796)
Others	0.24	(0.684)	-2.24***	(0.145)	-17.25*	(9.783)	3.71**	(1.889)
Variance Parameters	σ_{11}= 6.82***		σ_{00} = 6.28***		σ_{11}= 112.54***		σ_{00} = 66.79***	
	ρ_{v1} = 0.61***		ρ_{v0} = 0.89***		ρ_{v1} = 0.82***		ρ_{v0} = 0.01	
N total	51 434				42 741			
N of migrants	2 291				1 848			

* /** /*** significant at the 10%/ 5%/ 1% level

Note: Variance parameters relate to specification 1. However, they were almost similar in specification 2.

Specification 2 inspects regions in more detail and holds Capital as a base category. As expected, among stayers Capital is the highest income region in Finland: every other region attains significantly negative

coefficient. In this light it is natural that nearly all of the regions show a faster income growth than Capital. However, in the migrant-group this is no longer true: the income levels of migrants do not differ between regions. In fact, none of the regional variables gain significance among migrants. Income development equation shows that the Capital with its most diversified labour markets offers the best prospects for migrants: all other areas show a negative effect. Nevertheless, and somewhat surprisingly, in most cases the difference is not significant. This means that the success of a migrant do not depend on the destination, a result supporting the human capital view.

It is worth noticing that the presence of children dampens income growth among migrants, but has a positive effect among stayers. This could be connected to tied migration. At this point, an interesting detail is also that non-migrant females undergo much weaker income development than men. Among migrants, however, being a female is positively associated with income growth, but the difference is not significant. Thus, when other things are held constant, male and female migrants seem to confront fairly equal income growth.

Inspection by gender

This section investigates genders separately. As we are more interested in the development of income, the results relating to levels of income are not presented here (they can, however, be obtained from the author upon request). Three different specifications of Heckman-type model were used for both genders: the first is the basic one, the second includes interactive dummies and the third contains dummies for destination regions.

Estimation results for women and men are listed in Tables 6 and 7, respectively. As can be seen, migration results in returns for both genders and lambda is again significant. Most of the variables in the first specification point to the same direction. The only difference is that men's intermediate education does not gain significance, but women with intermediate qualifications experience higher income growth than those with lower ones.

Table 6. *Estimation results for the change of income: women*

	Specification 1		**Specification 2**		**Specification 3**	
Variable	Coeff.	(std.error)	Coeff.	(std.error)	Coeff.	(std.error)
Constant	260.16***	(5.865)	259.74***	(5.864)	258.82***	(5.855)

Ln[income(t-1)]	-1.40***	(0.079)	-1.40***	(0.079)	-1.39***	(0.078)
Age	-8.63***	(0.353)	-8.63***	(0.353)	-8.53***	(0.352)
Age squared	9.99***	(0.467)	9.99***	(0.467)	9.87***	(0.466)
Intermediate education	4.43***	(1.079)	4.43***	(1.078)	4.12***	(1.077)
Higher education	27.50***	(1.525)	27.56***	(1.525)	27.36***	(1.521)
Student	-51.31***	(1.588)	-51.27***	(1.587)	-51.23***	(1.584)
Self-employed	-16.69***	(2.970)	-16.75***	(2.968)	-16.82***	(2.963)
Unemployed	-20.57***	(1.639)	-20.60***	(1.639)	-20.58***	(1.635)
Children	2.35**	(1.057)	3.01***	(1.082)	2.37**	(1.055)
Agriculture	1.66**	(0.837)	1.67**	(0.837)	1.65**	(0.843)
Unemployment rate	-1.20***	(0.069)	-1.19***	(0.069)	-1.19***	(0.069)
Capital	-2.84**	(1.396)	-2.81**	(1.395)	-4.70***	(1.411)
Type2	1.13	(1.487)	1.10	(1.487)	0.85	(1.510)
Type3	0.06	(2.245)	0.05	(2.244)	-0.17	(2.281)
Migrated(t-1)	10.58***	(2.153)	15.65***	(2.628)		
x Spouse has high educ.	-	-	-7.19	(10.608)	-	-
x Spouse employed	-	-	-10.36*	(6.082)	-	-
x Children	-	-	-13.02***	(4.844)	-	-
Migrated(t-1) to						
Capital	-	-	-	-	41.58***	(4.014)
Type2	-	-	-	-	2.83	(4.578)
Type3	-	-	-	-	1.40	(9.224)
Type4	-	-	-	-	5.58	(7.833)
Type5	-	-	-	-	-7.08	(7.786)
Type6	-	-	-	-	-5.16	(6.888)
Type7	-	-	-	-	-11.58	(9.379)
Others	-	-	-	-	-3.52	(5.038)
Lambda	4.34***	(0.969)	4.42***	(0.969)	4.43***	(0.967)
Adj. R2	0.16		0.16		0.17	
N	18 681		18 681		18 681	
* /** /*** significant at the 10%/ 5%/ 1% level						

Specification 2 introduces three interactive dummy-variables. The variables used have been chosen because they are thought to represent situations where tied migration is most likely to occur. Having said that, specification 2 reveals interesting gender differences. If the female's spouse has been employed at the time of moving, or he has university degree or equivalent, or if there has been children present, her income growth is dampened. Identification of these 'sufferers' makes the coefficient of migration much larger. At the same time, men's respective coefficient abates. For men, only the presence of employed spouse has a negative effect. Children in turn have a very large positive effect. These remarkable differences are interpreted to reflect the effect of tied migration: even though in some cases it appears to be the husband that follows, the role of tied mover more often seems to fall on women.

Table 7. *Estimation results for the change of income: men*

	Specification 1		**Specification 2**		**Specification 3**	
Variable	Coeff.	(std.error)	Coeff.	(std.error)	Coeff.	(std.error)
Constant	236.31***	(5.698)	236.42***	(5.697)	235.66***	(5.694)
Ln[income(t-1)]	-0.88***	(0.067)	-0.87***	(0.067)	-0.87***	(0.067)
Age	-8.56***	(0.344)	-8.56***	(0.344)	-8.53***	(0.344)
Age squared	9.90***	(0.461)	9.90***	(0.461)	9.87***	(0.461)
Intermediate education	0.94	(1.004)	0.95	(1.004)	0.97	(1.002)
Higher education	22.74***	(1.693)	22.77***	(1.694)	22.60***	(1.692)
Student	-43.65***	(1.820)	-43.63***	(1.820)	-43.58***	(1.818)

Self-employed	-10.91***	(1.722)	-10.88***	(1.722)	-11.11***	(1.721)
Unemployed	-25.29***	(1.285)	-25.29***	(1.285)	-25.17***	(1.284)
Children	4.93***	(1.146)	4.34***	(1.166)	4.95***	(1.145)
Agriculture	2.55***	(0.744)	2.55***	(0.744)	3.03***	(0.747)
Unemployment rate	-0.92***	(0.066)	-0.92***	(0.066)	-0.92***	(0.066)
Capital	-2.93**	(1.389)	-2.93**	(1.388)	-4.06***	(1.403)
Type2	0.78	(1.419)	0.81	(1.419)	0.37	(1.437)
Type3	0.61	(2.190)	0.76	(2.190)	1.02	(2.219)
Migrated(t-1)	16.04***	(2.384)	14.29***	(2.778)		
x Spouse has high educ.	-	-	1.95	(10.548)	-	-
x Spouse employed	-	-	-13.11*	(7.321)	-	-
x Children	-	-	17.24***	(6.113)	-	-
Migrated(t-1) to						
Capital	-	-	-	-	41.20***	(4.635)
Type2	-	-	-	-	22.06***	(5.208)
Type3	-	-	-	-	-4.33	(10.457)
Type4	-	-	-	-	7.61	(9.200)
Type5	-	-	-	-	9.23	(8.387)
Type6	-	-	-	-	4.02	(7.324)
Type7	-	-	-	-	17.97**	(9.360)
Others	-	-	-	-	-8.25	(5.386)
Lambda	2.70***	(1.002)	2.65***	(1.002)	2.98***	(1.003)
Adj. R2	0.12		0.12		0.13	
N	24 060		24 060		24 060	

* /** /*** significant at the 10%/ 5%/ 1% level

Inspection of destination dummies shows further gender contrasts (specification 3). Only women moving to the Capital are able to significantly enlarge their incomes in relation to stayers. In turn, men's success is not restricted to the largest labour markets alone: those heading to Capital, Type2 or Type7 receive significant gains. Also this finding serves as an evidence in favour of tied wives.

V Concluding remarks

It is well known that many migrants have family relations, but despite that empirical migration research has not adequately addressed the family aspect. Therefore, the aim of the present paper was to examine whether moving in the presence of family ties is a profitable action. The returns to migration were measured by the level and change of income. Potential gender differences in the outcomes of moving were detected and the existence of tied mover-phenomenon in Finland was inspected. Regional aspect was considered in order to determine if the returns to family migration depend on the characteristics of destination regions. The study utilised a data set consisting of married persons and covering the period of 1987-94. Multiple estimation methods were used and self-selection was encountered in the estimations.

The results show that family migration, in general, is an advantageous investment in the individual's human capital. At the time of the moving migrants have lower incomes, but their income growth is faster in relation to non-migrants. However, and in line with earlier Finnish studies (see Laakso, 1998), the finding suggest that the returns do not necessarily arise immediately after the move, but there is a significant time dimension involved. Hence, using data too recent to migration may not give correct results. Further, it was found out that male and female migrants confront a fairly equal income growth, when other things are held constant. Notwithstanding, women still have significantly lower incomes. When compared with non-migrant women, it seems that moving, at least to some degree, helps women to catch up with men. Nevertheless, this is yet not enough to erase the existing gender differences in the income levels.

Regional inspection signals that virtually all migrants finally earn more than non-migrants. However, only those moving to large versatile labour markets see a faster increase in their incomes. In turn, those heading to one-sided, peripheral regions experience somewhat weaker development than stayers. This, most likely, is due to older age of peripheral migrants (See Kauhanen and Tervo, 1999). Separate examination of migrants and non-migrants evidence the income prospects of non-migrants to depend on the existing region. On the contrary, in the migrant-group the income levels do not show any regional variation. In addition, majority of regions seem to offer equal income growth for them. This corroborates the human capital view: the returns to migration do not depend on the destination.

Even though moving in general is a favourable investment, it is not as beneficial to *all* individuals. If the female has an employed or highly educated spouse or children, her income growth is dampened. In addition, only women moving to the largest and most diversified labour markets are able to increase their incomes. For men, only the presence of employed wife has a negative effect, and their better prospects are not restricted to the largest labour markets alone. In the family context these can be interpreted as indicators of tied migration. Thus, in line with earlier studies (among others, Mincer, 1978, Holmlund 1984, Shihadeh, 1991), women more likely play the tied role in Finland, too. On the other hand, in some cases it also seems to be the husband who follows. This is an important new finding, which has not arisen in earlier family migration studies. Most of them are decades old (Duncan and Perrucci, 1976, Polachek and Horvath, 1977, Sandell, 1977, Mincer, 1978, Lichter, 1980, etc.), and the society has undergone many changes since these studies were conducted. For example, education level and labour force participation of women has risen, and men and women have become more equal. The existence of tied migrant men is a concrete indicator of these changes. It would be interesting to know if tied husbands exist in other countries, too, or is this solely a Finnish phenomenon.

Last but not least it was found out that positive and significant selectivity is present in family migration decisions, too. This, at least to some degree, questions the findings of earlier family migration studies, practically all of which have neglected selectivity: without the selectivity correction the monetary returns to migration cannot be assessed assuredly.

Many unanswered questions still remain. The above findings revealed that most dissimilarities between migrants and non-migrants relate to regional variables. Where does this come from? Are certain regions absorbing certain kinds of families, and what are the differences between migrants to certain regions? More thorough regional inspection of in-migrants clearly has potential for future work. Moreover, if data on family income will become available, consequences of migration should be re-inspected with family income as dependent variable. Data on actual families would also make it possible to examine the tied-mover phenomenon more thoroughly: the returns to moving for both partners inside a family could be detected, and, as a result, the estimates of men and women would be directly comparable with each other.

[i] Province here means NUTS3-level regions.
[ii] Individual income, instead of family income, is used because the data set at hand does not contain information on the spouse's taxable income.
[iii] This is logical as Tervo (2001) observed that in Finland in- and out-migration are positively correlated.
[iv] There is so called 'ability bias' present in the schooling-coefficients, because schooling and unobservable ability are positively correlated (see e.g. Willis and Rosen, 1979, Willis, 1986). However, as we are not interested in the magnitude of these coefficients, but only in their sign and significance, this is not a serious problem.
[v] Year-dummies for the recession period were originally included in models, but they did not show any significance, so they were left out from the final models.
[vivi] Kauhanen and Tervo (1999) studied perverse migration, i.e. in-migration to depressed regions. Among other things, they observed that migrants to these areas are usually older persons.

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