ESSAYS ON FAMILY MIGRATION AND GEOGRAPHICAL MOBILITY IN FINLAND

Satu Nivalainen

Supervisor   Hannu Tervo
                   Professor
                   University of Jyväskylä

Reviewers   Jouke van Dijk
                   Professor
                   University of Groningen

                   Petri Böckerman
                   Dr., Docent
                   Labour Institute for Economic Research and
                   University of Tampere

Opponent   Jouke van Dijk
                   Professor
                   University of Groningen

Abstract: The thesis inspects family migration and geographical mobility in Finland during the 1990s and early 2000s. The thesis sheds more light on the nature of geographical mobility by identifying the characteristics of migrants and commuters, and by inspecting the consequences of mobility decisions to families and regions. The study consists of four separate articles. The first article deals with the determinants of family migration, separating long and short distance moves, and the second one with the employment consequences of family migration. Migration between urban and rural areas is studied in the third article, and the fourth one examines commuting as an alternative for migration.

Keywords: *family migration, distance, employment, urban, rural, commuting*

Tiivistelmä: Väitöskirja keskittyy perheiden muuttoon ja maantietelliseen liikkuvuuteen Suomessa 1990-luvulla ja 2000-luvun alussa. Tutkielma valottaa maantieteellisen liikkuvuuden luonnetta selvittämällä muuttajien ja pendelöijien ominaisuuksia ja tarkastelemalla liikkuvuuspäätösten seurauksia perheille ja alueille. Tutkielma koostuu neljästä erillisestä artikkelista. Ensimmäinen artikkeli tutkii perheiden muuton taustatekijöitä, erottaen pitkän ja lyhyen matkan muuton. Seuraava artikkeli käsittelee perheiden muuton työllisyysseurauksia. Kaupunki- ja maaseutualueiden välistä muuttoa tutkitaan kolmannessa artikkelissa ja neljäs artikkeli tarkastelee pendelöintiä muuttamisen vaihtoehtona.

Avainsanat: *perheiden muutto, etäisyys, työllisyys, kaupunki, maaseutu, pendelöinti*

ACKNOWLEDGEMENTS

This dissertation is the product of a number of years; it took me around a decade to get to the point I am now. The journey was long and eventful. During the process I got married and divorced. I also migrated multiple times: twice inside Finland (from Central to Northern Finland, and from Northern to Southern Finland), and once outside the borders of Finland (to California, US, and back). I also managed to get personal experience on commuting: in California I commuted a year on a daily basis, from San Diego County to Orange County. Family migration and geographical mobility are thus very close to my heart, not only through academic research but also through everyday life.

I wish to express my gratitude to many people who have supported me during this thesis work.

First of all, my warmest thanks to my excellent supervisor, Professor Hannu Tervo, who originally suggested family migration as the topic of my Master's thesis. I got instantly interested, and after completing my Master's, I wanted to learn more about the topic. Still, after 10 years, I find the subject extremely fascinating. Professor Tervo has been very supportive and empathic all these years, and has constantly encouraged me to continue my work with the thesis. He has also been very helpful in acquiring funding for my research. The thesis has been financially supported by the Yrjö Jahnsson Foundation, Alfred Kordelin Foundation, the Academy of Finland and University of Jyväskylä. Without Professor Tervo this dissertation would not exist.

I also wish to express my gratitude to the pre-examiners, Professor Jouke van Dijk (University of Groningen, the Netherlands) and Dr., Docent Petri Böckerman (Labour Institute for Economic Research and University of Tampere, Finland) for their motivating and insightful comments. I am very grateful to Professor van Dijk also for agreeing to act as my public examiner.

I also want to thank Professor Mikko Puhakka, who took great effort in arranging me a chance to visit the Department of Economics at University of California, Irvine, US. Thanks also to Professor Amihai Glazer at the University of California, Irvine, for acting as my host during the visit. The year I spent in the US changed my life in multiple ways, and was very important in the process of finalising this dissertation.

CONTENTS

ACKNOWLEDGEMENTS

SUMMARY
ESSAYS ON FAMILY MIGRATION AND GEOGRAPHICAL
MOBILITY IN FINLAND

YHTEENVETO
ESSEITÄ PERHEIDEN MUUTOSTA JA MAANTIETEELLISESTÄ
LIIKKUVUUDESTA SUOMESSA

SUMMARY

ESSAYS ON FAMILY MIGRATION AND GEOGRAPHICAL MOBILITY IN FINLAND

This thesis consists of four separate studies, each of which analyse different aspects of migration and geographical mobility in Finland. There are three main themes: family migration, migration between urban and rural areas, and commuting as an alternative for migration. The studies are preceded by an introductory chapter which provides theoretical background and outlines the content, as well as presents the main results of the thesis.

Chapter 2 examines factors underlying family migration. Based on a sample of stable Finnish families, both short- and long-distance migration is investigated. The results show a strong negative association between the family life-cycle and migration. The findings indicate that migration takes place mainly due to the demands of the husband's career, resulting in the wives being tied migrants. Two-earner families are less migratory, and in that sense the husbands are tied stayers. Distance matters; several differences are noticed between short- and long-distance migrants.

Chapter 3 investigates the post-move employment of men and women in Finnish two-earner families, taking account of selection bias and heteroskedasticity. The results demonstrate the importance of the selectivity correction: unobservable characteristics exist that both increase migrants' employment potential and make them more mobile. Migration itself generally exerts a negative effect, i.e. migrants have a lower tendency to be employed than stayers. However, more detailed analysis shows that migration in fact leaves the majority of husbands unaffected, and that some husbands actually benefit from moving. Instead, migration has a negative impact on wives in all cases, which again supports the view that wives are often the tied parties in family migration.

Chapter 4 examines migration between urban and rural areas, taking both origin and destination of migrants into account. The results show

that rural-to-urban migrants are highly educated while those moving from urban to rural areas are not. The results also indicate that locational preferences vary according to the life-cycle: young and single individuals head to urban areas, whereas couples and retired persons tend to relocate from urban to rural areas. The findings suggest that both rural-to-urban and urban-to-rural migration work to the benefit of the urban areas; hence regional disparities are likely to increase rather than decrease upon continuing migration.

Chapter 5 inspects commuting as an alternative for migration. Both short- and long-distance mobility is examined. It is shown that commuting increases employment and slows down population decrease in the weaker regions, and at the same time it secures labour supply and inhibits population growth in the growing regions. The results also show that to some degree migration and commuting are similarly selective processes. For example, mobility in general increases with higher education, and the effect is especially pronounced in interregional mobility. Hence, while migration generally tends to increase regional differences in educational levels, commuting may help to slow down the growth of these differences. There are also differences in the determinants of migration and commuting. For example, commuters tend to be older than migrants, and for the unemployed especially interregional commuting is an important way of finding a job. Family relations also have diverse impacts on migration and commuting. In particular two-earner families are more prone to commute than migrate.

YHTEENVETO

ESSEITÄ PERHEIDEN MUUTOSTA JA MAANTIETEELLISESTÄ LIIKKUVUUDESTA SUOMESSA

Tämä väitöskirja keskittyy perheiden muuttoon ja maantietelliseen liikkuvuuteen Suomessa 1990-luvulla ja 2000-luvun alussa. Tutkielma koostuu johdantokappaleesta sekä neljästä erillisestä artikkelista (kappaleet 2-5). Tutkielma on luonteeltaan empiirinen. Johdannossa kuvataan tutkimuksen teoreettinen kehikko, luodaan silmäys tutkimuksen taustatekijöihin ja alueelliseen liikkuvuuden pääpiirteisiin tutkimusajanjaksolla sekä esitetään artikkeleiden päätulosten tiivistelmä. Kappaleiden 2-5 keskeisten tulosten yhteenveto esitetään alla.

Ensimmäisessä artikkelissa (kappale 2) tutkitaan perheiden muuttoon vaikuttavia tekijöitä. Perhe koostuu kahdesta vastakkaista sukupuolta olevasta henkilöstä, jotka ovat naimisissa tai avoliitossa ja joilla voi olla lapsia. Tutkimuksessa erotellaan pitkän ja lyhyen matkan muutto, eli maakuntien välinen ja sisäinen muutto. Tutkimuksessa käytetään ainulaatuista tilastoaineistoa, jossa saman perheen jäsenet on yhdistetty ja joka sisältää runsaasti molempien puolisoiden sekä perheen ominaisuuksia. Empiiriset analyysit suoritetaan multinomial logit-malleilla.

Tulosten mukaan nuoret ja koulutetut perheet muuttavat aktiivisimmin. Perheen elämänvaiheen ja muuttamisen välillä on vahva negatiivinen yhteys. Jos perheessä on vain alle kouluikäisiä lapsia, se ei vaikuta muuttotodennäköisyyteen, kun taas kouluikäiset lapset ehkäisevät selvästi muuttamista. Tulokset myös viittaavat siihen, että miehen ura painaa muuttopäätöksessä enemmän, eli vaimot ovat ns. sidottuja muuttajia, jotka todennäköisemmin muuttavat seuratakseen miestään. Samaan aikaan vaimon työvoimaan osallistuminen hillitsee perheiden

muuttoa, ja tässä mielessä työssä olevien naisten puolisot ovat sidottuja nykyiseen asuinalueeseen.

Lyhyen ja pitkän matkan muuttoon vaikuttavissa tekijöissä on eroja. Tiiviimmät siteet nykyiseen asuinalueeseen ehkäisevät maakuntien välistä muuttamista, kun taas (miehen) yleinen inhimillinen pääoma (eli koulutus) kannustaa pitkän matkan muuttoja. Myös puolisoiden välinen suurempi tuloero lisää pitkän matkan muuton todennäköisyyttä. Työttömät muuttavat todennäköisemmin maakuntien välillä, eli tekevät pitkän matkan muuttoja. Lisäksi nykyisen asuinmaakunnan koko ja toimialarakenne vaikuttavat muuttomatkaan. Paikallinen taloustilanne on myös tärkeää: korkea työttömyysaste lisää pitkän matkan muuttojen todennäköisyyttä ja ehkäisee lyhyen matkan muuttoja.

Toinen artikkeli keskittyy maakuntien välisen eli pitkän matkan muuton työllisyysseurauksiin perheille. Analyysi kohdistuu kahden ansaitsijan perheisiin, eli tässä tutkimuksessa molemmat puolisot kuuluvat työvoimaan. Tutkimuksessa käytetään laajaa, perheistä koostuvaa tilastoaineistoa, joka sisältää runsaasti molempien puolisoiden ja perheen ominaisuuksia. Empiirisen analyysin ensisijaisena tavoitteena on tutkia molempien puolisoiden muuton jälkeistä työllisyystodennäköisyyttä ja tarkastella, onko muuton seurauksissa sukupuolten välisiä eroja. Tutkimuksessa huomioidaan mahdollinen ns. muuton valikoitumisharha käyttämällä rekursiivisia bivariate probit-malleja. Ns. valikoitumisharha tarkoittaa mahdollista korrelaatiota muuttamiseen ja työllisyyteen vaikuttavien tekijöiden välillä, joita tilastoaineistosta on mahdotonta havaita. Myös heteroskedastisuus otetaan mallituksessa huomioon.

Heteroskedastisuus ei näytä olevan suuri ongelma, mutta tulokset osoittavat valikoitumisharhan huomioon ottamisen tärkeyden. Ts. on olemassa havaitsemattomia tekijöitä, jotka lisäävät sekä muuttoalttiutta että muuttajien työllisyystodennäköisyyttä. On syytä huomata, että perheulottuvuudessa nämä havaitsemattomat tekijät eivät välttämättä liity vain yksilöihin itseensä, vaan voivat myös heijastaa heidän puolisoihinsa ja perheisiinsä liittyviä ominaisuuksia. Tästä huolimatta tulokset osoittavat, että muuttamisella sinänsä on negatiivinen vaikutus työllisyystodennäköisyyteen, eli muuttajat näyttävät muuton jälkeen olevan harvemmin työllisiä kuin paikallaan pysyjät. Vaimoilla tämä negatiivinen työllisyysvaikutus on paljon suurempi kuin heidän puolisoillaan.

Samaan aikaan tutkimuksessa kuitenkin havaitaan, että keskimääräiset tarkastelut voivat piilottaa suuren vaihtelun muuton työllisyysseurauksissa. Syvällisempi analyysi, jossa puolisoiden alkuperäinen muuttoa edeltävä työmarkkina-asema otetaan huomioon, osoittaa, että muutto on harvoin samaan aikaan optimaalinen molemmille puolisoille, ja tyypillisesti jomman kumman täytyy tehdä kompromisseja. Tämän analyysin perusteella havaitaan, että suurimmalla osalla miehiä muuttaminen ei itse asiassa vaikuta työllisyystodennäköisyyteen, ja osa miehistä jopa hyötyy muutosta työllisyysmielessä. Miesten työllisyystodennäköisyys on paikallaan pysyjiä heikompi vain silloin, kun molemmat puolisot ovat työttömiä ennen muuttoa. Vaimojen työllisyyteen muutolla sen sijaan on kaikissa tapauksissa negatiivinen vaikutus. Näin ollen tulokset viittaavat siihen, että miesten työllisyys painaa enemmän muuttopäätöksessä, ja vaimot ovat useammin ns. sidottuja osapuolia perheen muuttaessa.

Kolmas artikkeli käsittelee alueiden välisiä muuttovirtoja ja potentiaalista alueellista vaihtelua muuttamiseen vaikuttavissa tekijöissä kaupunki-maaseutu näkökulmasta. Muuttamista tapahtuu kaikkien alueiden välillä. Vaikka valtaosa muuttajista suuntaa kaupunkeihin, joka vuosi noin viidesosa muuttajista valitsee muuttokohteekseen maaseudun. Alueellisesta näkökulmasta kaikkiin suuntiin kulkevat muuttovirrat ovat yhtä tärkeitä. Tämän vuoksi kaikki mahdolliset lähtö- ja kohdealueiden kombinaatiot maaseutu-kaupunki-ulottuvuudella (maaseutu-kaupunki, kaupunki-maaseutu, kaupunki-kaupunki, maaseutu-maaseutu) otetaan huomioon analyyseissä. Erityistä huomiota kiinnitetään kuitenkin maaseudun näkökulmaan, eli kaupungeista maaseudulle ja maaseudulta kaupunkeihin suuntautuva muutto ja näiden muuttajien ominaisuudet ovat keskeisellä sijalla tarkasteluissa.

Empiriiset analyysit suoritetaan laajan yksilötason paneelimuotoisen tilastoaineiston avulla ja mallituksessa käytetään multinomial logit-malleja. Aineisto koostuu 20-69-vuotiaista yksilöistä, eli työikäisten alueellisen liikkuvuuden ohella aineisto mahdollistaa myös eläkeikäisten muuttokäyttäytymisen tarkastelun. Tulokset osoittavat, että sijaintimieltymykset vaihtelevat elämänvaiheen mukaan: nuoret ja perheettömät yksilöt muuttavat kaupunkeihin, kun taas pariskunnat ja eläkeläiset tyypillisesti suuntaavat kaupungeista maaseudulle. Lisäksi tutkimuksessa havaitaan, että työttömät eivät muuta vain kaupunkeihin, vaan he muuttavat myös kaupungeista maaseudulle. Tulosten mukaan kaupungeista maaseudulle muuttavien tulotaso on keskimääräistä

alhaisempi. Eläköitymiseen liittyvä muutto on keskeinen osa maaseudun tulomuuttoa ja maaseudulle suuntaavat eläkeläiset ovat pääosin lähtöisin kaupungeista.

Aluekehityksen näkökulmasta tulokset osoittavat, että muuttoliikkeellä on negatiivinen vaikutus maaseutualueille sekä määrällisesti että laadullisesti. Kaupunkialueet imevät nuoret ja koulutetut yksilöt maaseudulta. Näin ollen muuttoliike ei vain vääristä maaseudun ikärakennetta vanhempaan suuntaan, vaan se vähentää myös maaseudun inhimillisen pääoman varantoa, jonka on todistettu olevan keskeistä alueellisten kehitysmahdollisuuksien kannalta. Tällä inhimillisen pääoman menetyksellä on taipumus olla pysyvää, sillä päinvastaiseen suuntaan, kaupungeista maaseudulle, muuttavat ovat keskimääräistä heikommin koulutettuja. Tulosten mukaan sekä maaseudulta kaupunkeihin että kaupungeista maaseudulle suuntautuva muutto näyttää hyödyttävän kaupunkialueita, eli auttaa pitämään niiden ikärakenteen nuorena ja kehitysedellytykset suotuisina. Kaiken kaikkiaan tulokset osoittavat, että väestön ja inhimillisen pääoman kertyminen kaupunkialueille on nopeaa, ja että alueelliset erot tuppaavat supistumisen sijaan kasvamaan muuttoliikkeen seurauksena.

Neljäs artikkeli tarkastelee muuttamista ja pendelöintiä. Kuvaileva analyysi osoittaa, että pendelöinti on selvästi yleisempi työvoiman liikkuvuuden muoto kuin muuttaminen. Lisäksi, siinä missä muuttoliikkeellä on taipumus keskittää väestöä suurimpiin keskuksiin, pendelöinti auttaa tasaamaan väestön alueellista jakautumista. Pendelöinti lisää työllisyyttä ja hidastaa selvästi väestön vähenemistä heikommilla alueilla, ja samaan aikaan se turvaa työvoiman tarjontaa ja hillitsee väestön kasvua kasvavilla alueilla.

Empiirisessä analyysissä käytetään laajaa yksilötason tilastoaineistoa ja tarkastellaan pendelöintiä muuttamisen vaihtoehtona. Analyysi keskittyy työhön liittyvään alueelliseen liikkuvuuteen, eli kaikki yksilöt ovat työllisiä tarkastelujakson lopussa. Sekä lyhyen että pitkän matkan liikkuvuutta tarkastellaan. Tutkimuksessa hyödynnetään diskreetin valinnan malleja, erityisesti käytetään mixed multinomial logit mallitusta. Tulosten mukaan sekä muutto että pendelöinti ovat jossain määrin samalla tavoin valikoivia prosesseja. Esimerkiksi korkea koulutus lisää yleisesti alueellista liikkuvuutta. Korkean koulutuksen vaikutus korostuu erityisesti pitkän matkan alueellisessa liikkuvuudessa: korkeasti koulutetut yksilöt ja pariskunnat sekä muuttavat että pendelöivät enemmän kuin muut. Näin

ollen, siinä missä muuttoliike tyypillisesti pyrkii kasvattamaan alueellisia eroja työvoiman koulutustasossa, pendelöinti voi hidastaa näiden erojen kasvua.

Muuttamisen ja pendelöinnin taustalla olevissa tekijöissä on myös eroja. Esimerkiksi muuttamisen todennäköisyys on korkeimmillaan nuorena, mutta pendelöinnin ikäprofiili on tasaisempi. Ts. pendelöinti ei ole niin vahvasti painottunut nuorimpiin ikäluokkiin kuin muuttaminen. Tulosten mukaan eroja on myös työmarkkina-aseman mukaan, erityisesti pidemmän matkan alueellisessa liikkuvuudessa. Työttömänä olo lisää selvästi pendelöinnin todennäköisyyttä, eli työttömille pendelöinti näyttäisi olevan tärkeä työn löytämisen keino. Sen sijaan muuttamiseen työttömänä ololla ei keskimäärin ole vaikutusta. Tulosten mukaan työttömyyden ja muuton välisessä vaikutuksessa on kuitenkin suurta vaihtelua: osa muuttaa keskimääräistä herkemmin, osa pysyy tiukasti paikallaan. Toisin sanottuna tulokset osoittavat, että samanlaisilla havaituilla ominaisuuksilla varustetut ihmiset tekevät erilaisia valintoja. Eroja liikkuvuusmuotojen välillä havaitaan myös perheeseen liittyvien tekijöiden suhteen. Perhesiteet tyypillisesti ehkäisevät muuttamista, mutta pendelöinnin todennäköisyyttä ne eivät vähennä. Lyhyen matkan pendelöintiä perhesiteet jopa kannustavat. Erityisesti kahden ansaitsijan perheet todennäköisemmin pendelöivät kuin muuttavat.

CHAPTER 1

Introduction

1. Background

This thesis examines geographical mobility in Finland during the 1990s and early 2000s. Traditionally, migration has been considered as the most important form of geographical mobility. In spite of that, no single definition exists for migration, but it can be defined and measured in various ways. In essence, however, it is movement of population from one geographical region to another. In Finland, as in several other countries, regional classifications based on labour market areas or larger administrative units or areas have been used frequently.[1] Distance-based definitions have also been applied in some countries where the existing data provides such a possibility. A move is an event where an individual or family relocates from one region to another, whereas migration involves the movement of a population from one region to another.

In literature, a common premise is to consider interregional long-distance moves as actual migration. Typically, these moves are seen as work-related. Moves over shorter distances have been considered mostly living-related, addressing residential requirements. These two cases have usually been treated as fairly separate phenomena. During the last decade or so, however, researchers have begun to focus increasingly on the role of life stages as a determinant for moving, therefore migration and of choices where to live can be seen as closely interlinked, regardless of whether moving takes place within one region or between regions (e.g. Clark & Dieleman, 1996).

---

[1] Occasionally, moving has also been defined as the change of workplace locations, but the definition based on the change of region of residence is more commonly used.

1

Internationally, the development of interest in migration dates back several decades. Traditionally, research on the determinants and consequences of migration has addressed several questions, such as (Greenwood, 1997):

a) who migrates
b) why do these people migrate
c) where are the migrants coming from and where are they going
d) when do they migrate
e) what consequences result from migration at individual and regional level

Also in Finland, the significance and importance of migration for regions and regional development has been recognised for several years, and extensive research has been focused on its causes and consequences (e.g. Tervo, 2000a&b, Pekkala, 2000, Ritsilä, 2001, Haapanen, 2003, Hämäläinen& Böckerman, 2004). Nevertheless, the knowledge about migration is far from being complete, and many aspects of the above mentioned questions still remain unanswered.

Another form of geographical mobility is the back-and-forth travel between home and work: commuting. Commuting is usually defined as travelling to work across regional borders. Typically, regional classification is based on the lowest regional units, municipalities, in which case commuting involves travelling to work outside one's home municipality. Just like migration, commuting can also take place between labour market areas, or larger administrative units or areas.

Underlying geographical mobility are choices related to the locations of places of residence and work. Migration and commuting become closely interlinked through individual decision-making processes. At least two different types of interaction can be established. Often, commuting acts as an alternative to moving: commuting provides access to employment opportunities over wider areas without forcing people to move. On the other hand, commuting may also enable moving: for example, a family might move to live outside the urban centre while the workplaces of the family members still remain there. In such a case, commuting acts as a complement for moving.

Generally speaking, the geographical mobility of the Finns has been increasing constantly since the mid-1990s. For example, between 1995 and 2005, a total of 2.6 million moves across municipal boundaries were made. Based on this metric, it can be stated that in a decade, migration has

affected half the population of Finland.[2] For comparison, during that same period of time, only some half a million new Finns were born and some 170,000 new inhabitants arrived from abroad. Although internal migration does not change the total population of the country, it has a great regional impact; in many regions, migration is the single most significant factor determining its demographic development (e.g. Nivalainen & Volk 2004). The Eurobarometer (2006) shows that in comparison with the other EU countries, Finns have a higher than average rate of geographical mobility. More than every third Finn has moved between geographical regions at some stage of his or her life. Sweden and Denmark are also countries with similarly high rates of geographical mobility.

As a form of geographical mobility, commuting is far more common than migration. About five percent of the total population of Finland moves from one municipality to another annually, while about 15 percent of the Finns travel to work outside their home municipality (Figure 1). These percentage figures translate to large numbers of people: for example, in 2001, about 280,000 people changed their home municipalities, while over 700,000 people worked outside their home municipality. Thus it can be stated that in total, mobility between municipalities affects almost one million Finns annually.[3]

---

[2] The figure representing the number of moves does not tell the whole truth, as some people are likely to move several times. However, the figure can be considered indicative in relation to other demographic components.

[3] The figure does not include commuters' family members.
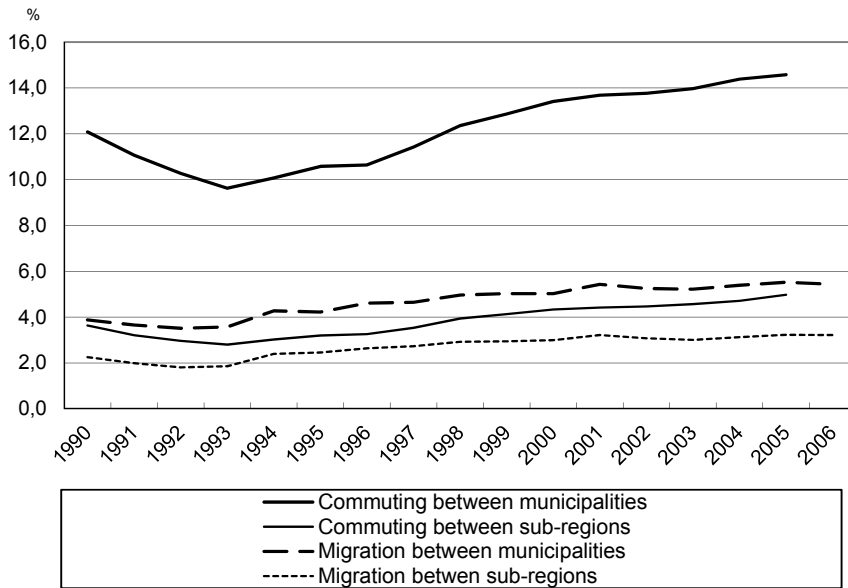
Figure 1. *Internal migration and commuting propensities in 1990-2006, % of population*

About 60 percent of those who migrate between municipalities at the same time also change sub-regions (NUTS4), which approximately correspond to labour market areas.[4] This proportion has remained reasonably steady for many years. In terms of numbers, this translates to some 170,000 interregional moves annually. Of the commuters, every third crosses sub-regional boundaries while commuting. For example, in 2001, some 240,000 persons or 12 percent of those employed worked outside their home sub-region. About 140,000 or 7 percent of those employed commuted between regions (NUTS3).[5] Nevertheless, commuting distances between sub-regions in general are shorter than migration distances (Figure 2).

---

[4] NUTS (Nomenclature des Unités Territoriales Statistiques) is the regional classification system of the EU, according to which all common regional statistics of the EU are compiled. During the inspection period there were around 80 NUTS4 regions (so called sub-regions) in Finland. Map of NUTS4 regions is presented in Figure 4 (see also Appendix 1 in Chapter 5).

[5] There are 20 NUTS3 regions in Finland. NUTS3 regions are shown in Appendix 1 (see also Figure 1 in Chapter 3).
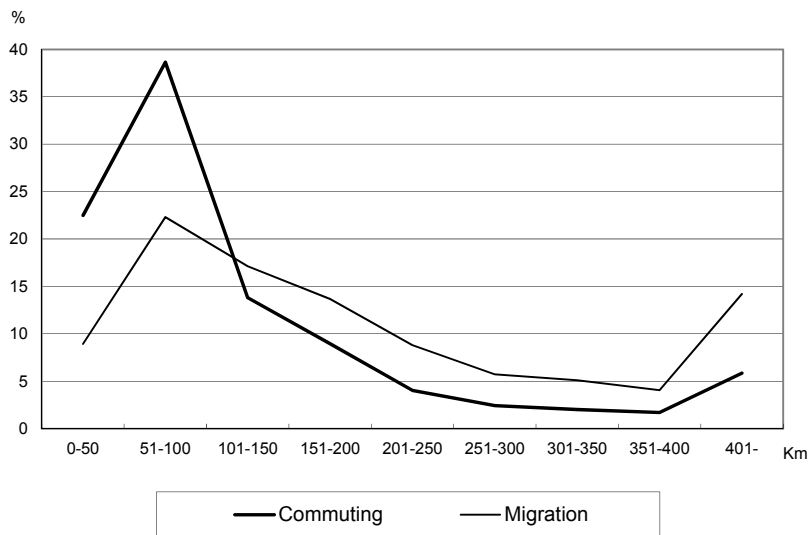
Figure 2. *Internal migration and commuting distances between sub-regions in 2001, % of respective group*

The purpose of this thesis is to deepen the existing knowledge about migration and geographical mobility in Finland. The thesis consists of four separate studies, each of which analyse different aspects of migration and geographical mobility. There are three main themes:

- Family migration
- Migration between urban and rural areas
- Alternative for migration: commuting

The thesis aims at shedding more light on the nature of geographical mobility firstly by identifying the characteristics of migrants and commuters and making inferences about the determinants of mobility from these, and secondly by evaluating the consequences of these decisions to families and regions. So far existing Finnish research has mainly been targeted at the individual-level determinants and consequences of migration (see Tervo, 2000a&b, Pekkala, 2000, Ritsilä 2001, Pekkala & Tervo, 2002, Haapanen, 2003), and no attention has been given to family migration. After the vigorous activity of the 1970s and 1980s, the migration of families has also been given only scant notice internationally in empirical research. Earlier Finnish studies have also mainly concentrated on long-distance migration, and have not been dealing especially with short-distance moves. In order to get a more

complete picture of geographical mobility, the thesis investigates mobility using several regional classifications, starting from the lowest regional unit (municipality) to the second largest regional unit (NUTS3 regions or "provinces"), i.e. both short and long distance mobility is inspected. Moreover, migration studies usually deal with general determinants of migration, or focus on in- or out-migration. Nevertheless, each end of population movement is equally important from the regional perspective; every migrant has both origin and destination, and not all migrants go in the same direction. In particular, it is not in- or out-migration alone but it is both that define the total impact of migration on different regions. This has not been given much notice in Finland, and according to my knowledge the issue has also remained largely unexplored in the international microlevel migration research. Likewise, even though commuting is much more common form of geographical mobility than migration, both internationally and in Finland, commuting has been studied considerably less than migration, and therefore knowledge of its determinants and consequences is substantially more incomplete.[6] In particular, practically no attention has been given to commuting as an alternative for migration.

The rest of the thesis is organised as follows. In the introduction, an overview of regional mobility from regional and individual perspectives is presented, after which the main theoretical frameworks used in the articles (human capital and job search theories) are shortly described. A description of the nature and development of internal migration and geographical mobility in Finland is also given. The second chapter deals with the determinants of family migration, separating long and short distance moves. Employment consequences of family migration are analysed in the third chapter. Fourth chapter inspects determinants of migration between urban and rural areas, taking both origin and destination of migrants into account. Commuting as an alternative for migration is studied in the fifth chapter.

---

[6] In Finland, exceptions to this include Montén & Tuomala 2003, Jolkkonen & Koistinen 2001, but both analyse only determinants of commuting, and mainly concentrate on certain regions.

2. Geographical mobility from regional and individual perspective: An overview

Internationally, the traditions of migration research date back for more than a century. Already in the late 19th century, Ravenstein (1889) presented observations that hold even today. He postulated that short-distance moves are more common than long-distance moves; that the volume of migration decreases with distance; that most long-distance migrants head to cities; and that each migration flow between regions generates a compensating counter-flow. He also stated that economic reasons were a major determinant in most migration decisions. Since then, migration has been studied by various fields of science and from various perspectives.

Migration is a highly complex phenomenon, behind which lies not only the psychology of the individual but also a host of spatial and social factors (Vartiainen, 1978). Therefore, migration and mobility in general can be observed from societal, regional or individual viewpoints. When migration is studied as a societal phenomenon, different patterns of migration can be observed in societies manifesting different levels of development and historical characteristics. For example, Zelinsky (1971) identified five different stages of societal development with diverging patterns of natural population growth and migration. In this view, migration is linked to the stages of society development. This perspective is highly simplified and as it was based on observations made by the late 1960s, it is at least partially outdated. Besides a society's current stage of development, its economic state also affects mobility; during an economic recession, migration usually decreases and, respectively, an economic upswing is accompanied by increasing migration activity (e.g. Hacker 2000; in Finland see Kangasharju et al., 1999, Pekkala & Tervo, 2002).

When migration is studied from the regional viewpoint, the main focus lies on interregional migration flows and factors underlying them. In this context, migration is usually explained by the locations of firms and jobs and mobility of the labour force related to it. Regional growth theories can be classified into equilibrium and cumulative growth theories. Different theories hold different notions about the role of migration.

Neoclassical growth theories place great importance on the mobility of factors of production. These theories maintain that factors of production move to seek their highest returns (Solow 1956, Swan 1956). Equilibrium

theories postulate that regional development progresses towards a state of equilibrium so that any change affecting the equilibrium causes a counter-reaction that returns the system to its original state. Migration is a crucial balancing factor; migrants move from low-income regions to high-income regions, and as a result, income differentials will be eliminated over time. This also applies to regional unemployment rates; migration is directed from areas with high unemployment to areas with low unemployment, therefore levelling out differences in regional unemployment rates (see Ritsilä & Tervo, 1999; for international evidence, see e.g. Van Dijk et al., 1989). [7]

Cumulative growth theories maintain that due to positive and negative backward linkages, regional development is cumulative in nature so that growth accumulates strongly in some regions while other regions develop in the opposite direction. As a consequence, the system drifts increasingly further away from its original state. According to this viewpoint, migration to specific regions speeds up their growth. Migration is a key factor for the prerequisites for regional development, and rather than equalising regional disparities, migration is more likely to increase them. The idea of cumulative causation affecting regional development dates back as far as the 1950s (e.g. Myrdal 1957). [8]

The so-called new economic geography (e.g. Krugman 1991; see also Ottaviano&Pinelli, 2004) also regards regional development as highly centralising in nature. Migration of labour is a key factor accelerating centralisation. In extreme circumstances, population and companies concentrate in central regions, while peripheral and more backward regions become deserted. The factors underlying centralising development are self-reinforcing. As a result, a development process triggered by historical reasons or even by accident progresses rapidly once it has started.[9] On the other hand, there are also factors pulling to the opposite direction, so-called counter forces to concentration. [10]

---

[7] For example Evans (1990) criticise this view: if migration were to level out regional disparities, migration should clearly slow down as regional differences decrease.
[8] However, Myrdal (1957) acknowledged the existence of factors that level out regional development. He also considered institutional factors as significant for development.
[9] The location of new business or industry in a region increases the demand for intermediate products and labour as well as the supply of end products. This elevates the local wage levels, which in turn attracts labour from other regions. As a consequence of migration, total demand of the region rises and labour markets become less competitive. These factors attract new companies to the region, which in turn accelerates the arrival of more labour. At the same time, demand for services grows in the region, which again

Depending on the nature of migration and theoretical viewpoint, migration can thus either even out regional development or accelerate centralisation and regional divergence. Migration can be both the cause and consequence of regional differences. Although equilibrium and cumulative growth theories may at first sight appear to paint vastly different pictures on the effect of migration on regional development, it should be noted that their viewpoints are different. Equilibrium growth theories are based on per capita differences in levels of income, which may well be declining at the same time as population and production become more concentrated (e.g. Pekkala, 2000).

Theories based on the individuals' viewpoint emphasise migration as an individual's choice. Individual needs and the human behaviour processes they instigate play a central role in these theoretical views. Migration is a consequence of forward-looking behaviour that strives to improve the welfare of an individual or a family within a given timeframe. A migration decision is based on the calculation and comparison of future gains and costs.

Although different theories and approaches view migration from different perspectives and seemingly independently of each other, in reality the various levels (societal, regional and individual) are in close interaction. In the end, observed migration flows are the reflection of individual decision making. It is, however, clear that both regional and societal circumstances affect individual choices. Since individual behaviour is underlying migration, theories focusing on the individual are discussed in more detail below. Due to the complexity of the phenome-

---

speeds up growth. A self-reinforcing cycle is born. Centralisation is boosted by increase in supply of labour and demand for end products generated by migration, as well as economies of scale emerging from various business connections. It is advantageous for businesses to locate in regions where the required labour is in good supply. It is advantageous for the labour to move to regions offering a rich choice of employment opportunities. Centralisation and concentration is further promoted by specialisation opportunities and the speed and ease of dissemination of information (see e.g. Kangasharju et al. 1999, Prime Minister's Office 2000).

[10] Some fields of industry are tied to specific locations. Market mechanisms may also limit the concentration of production and population, especially through cost of land and higher housing costs. Traffic congestion and pollution problems as well as various social problems may also undermine the status of a certain region as a desirable location. Furthermore, people have values that are related to non-economic factors, such as ties to their home communities or environmental values. Various political measures can also function as counter forces to centralisation. (e.g. Prime Minister's Office 2000).

non, migration research has involved the application of viewpoints and methods offered by a number of branches of science. Different sciences have traditionally adopted very different approaches to research migration. In economics, the most prevalent theories are human capital and job search theories, and they are also used in the articles composing this thesis. Therefore, the main characteristics of both are outlined in the following chapter.

The traditions of commuting research are much shorter than that of migration research, and therefore, in relation to migration, considerably less is known about it.[11] Nevertheless, theories of migration and commuting bear a great resemblance to each other (e.g. Evers 1990). In essence, both theories maintain mobility as an individual's choice, the purpose of which is to improve welfare.

3. Theoretical framework for mobility

In economic migration research, the two most commonly used theoretical frameworks are the human capital approach and the job search approach. Because mobility and migration decisions are made at the individuals' level, these theories are based on the behaviour of individuals or families. In both cases, individuals or families are assumed to strive towards increased welfare, and the crucial determinant in the decision-making process is the long-term utility or welfare of an individual or family. While an exhaustive review of these theories is unnecessary for the purposes of this study, a brief introduction is appropriate in this context.

3.1 Human capital approach

Economists have traditionally argued that people migrate in order to maximise their welfare. Sjaastad (1962) introduced the human capital approach, in which migration is viewed as an investment in human

---

[11] Typically, commuting has been studied in the context of urban area research, mostly as an intra-urban phenomenon. Such studies base their theoretical frameworks on location place models focused on urban areas (e.g. Alonso, 1964, Mills, 1967, Muth, 1969). Because this thesis investigates interregional mobility, these studies are excluded here.

capital. This approach maintains that individuals invest in their human capital through actions whose profits will be realised in the future. Investments in human capital include actions such as education, training or moving, which allow individuals to expand or enhance their knowledge, skills or physical and mental capabilities.

The purpose of migration is to improve welfare in the long term. As an investment, migration renders returns but has also costs, both of which can be broken down into monetary and non-monetary components. Monetary gains generated by moving can be measured for example in terms of changes in real income. Non-monetary gains may arise for example from better working conditions or various aspects such as social factors or living environment. Moving may also enable better use of one's training or education, if the new employment is better suited to one's skill set. In a similar fashion, new work experience gained from moving or changing jobs may advance one's future career development.

In addition to direct moving-related monetary costs (e.g. travel and transportation), costs caused by migration may also include increased living costs (e.g. housing, transportation). Non-monetary costs include for example moving-related losses of income (so-called opportunity costs) as well as costs arising from uncertainty and the 'psychic' costs of leaving behind of one's familiar living environment and friends. Typically, the longer the moving distance is, the higher are the costs of migration.

The human capital approach assumes that a potential migrant assesses the gains and costs in all possible locations and chooses to move only if moving accomplishes higher utility than staying at the present location. The chosen destination will be the location where the greatest possible net gain or welfare level can be expected to be realised in the long term. Although the potential migrant weighs up long-term gains, more weight is given to gains realising in the near future than those to be expected further in the future.

In the basic form of the human capital approach the migration decision is based on the optimisation of an individual's personal economic utility. However, in the presence of family relations the assumption of personal utility maximisation no longer holds. While single individuals in the labour market only have to worry about their own interests, families need to be concerned with the future prospects of both spouses. The presence of children further adds to the complexity of decision-making. Migration, which would be optimal for the individual, may not be optimal for the

family. Family relations are present in all stages of migration process. Motives for moving, selection of the destination[12] and consequences of migration are affected by family relations (see e.g. Long 1974, Sandell 1977, Mincer 1978).

Sandell (1977) and Mincer (1978) applied the human capital approach to family migration decisions. In the family context, migration is a joint welfare maximisation decision. It is the family gain, rather than personal gain, that motivates the migration of families. When deciding whether to move or not, the family assesses the present value of the expected future stream of benefits (returns) and costs that arise as a consequence of migration. Even though it can be assumed that non-monetary benefits and costs may be of great importance for some families, for simplicity, the basic framework often defines the benefits as differences in lifetime earnings at the destination and at the origin, and excludes the non-monetary costs.

Thus, when two or more members are present and the migration decision requires that all move, the migration decision variable can be written as:

$$NG_{fij} = \sum_{k=1}^{n} NG_{kij}$$

$$= \sum_{k=1}^{n} \left[\sum_{t=0}^{T_k} I_{kjt} (1+r)^{-t} - \sum_{t=0}^{T_k} I_{kit} (1+r)^{-t} \right] - \sum_{k=1}^{n} \sum_{t=0}^{T_k} C_{kt} (1+r)^{-t}$$

where NG_{fij} = family's net real gain from moving from i to j, j = 1...J

NG_{kij} = net real gain for family member k from moving from i to j

I_{kjt} = income in region j for family member k

I_{kit} = income in origin region i for family member k

C_{kt} = costs of migration for family member k

T_k = year of retirement for family member k

r = discount rate

n = number of family members, k =1...n

t = time.

---

[12] In terms of net migration, single individuals move away from semi-urban and rural municipalities, and head to urban municipalities. Married persons instead move away from urban municipalities and head to semi-urban and rural municipalities (see e.g. Statistics Finland, 2001).

In other words, the family weighs up the expected changes in future family income, net of the discounted migration costs. The total net gain of the family consists of the personal net gains of the family members. The family migrates only if the total returns exceed the costs, i.e. if the total net gain from migration is positive. From the set of possible locations the family chooses the one that maximises the gains of the family as a whole.

By looking at the above formula, it is apparent that family migration involves much more complexity than the migration of unattached individuals. In the absence of children, 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 differ between the spouses. The presence of children further complicates matters. 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. However, even if moving would improve the position of both spouses, the difficulty of the migration decision still remains: spouses' 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.

In this sense, both spouses are tied to some degree in the family migration. The dissimilarity in preferences that gives rise to ties might be reduced by a tendency for families to locate in more diversified labour markets, as these also offer a greater selection of job possibilities for the tied partner (e.g. Costa & Kahn, 2000). However, ties exist as long as the gain of at least one spouse in the family's optimal location is less than his/her potential optimal gain in the absence of family ties. Mincer (1978) argues that because of women's smaller earning power and their attenuated labour market participation with respect to that of their spouses, women are more likely to be the secondary earners in the family and thus the tied partners. International empirical evidence supports this view (see e.g. Sandell, 1977, Maxwell, 1988, Shihadeh, 1991).

The human capital approach does not treat commuting as a form of mobility, yet in principle it can be inspected using the same theoretical

framework. It can be assumed that commuting is chosen if its opportunity costs (e.g. commuting time and costs) are lower than those arising from moving.

Even if the human capital approach to migration seems plausible on common sense grounds, it is not without problems. The worst of its defects is perhaps the treatment of information. In the real world individuals do not have information of all available opportunities in order to calculate the relevant costs and returns. Moreover, the acquisition of information is not free. The human capital approach fails to focus on the process whereby individuals acquire information, which is fundamental to migration behaviour. (Molho, 1986).

Moreover, the human capital based family migration theory has been accused of gender blindness, as it is symmetric with respect to spouses. Thus, the approach does not assume that the husband's potential gains from moving are more important in migration decisions. Nor does it assume that the husband is able to impose his own private interests on the family, which may indeed be the case in reality. Instead, each spouse is assumed to place family well-being ahead of personal interests. The extent to which migration discriminates against married (or cohabiting) women with respect to their labour market position is also neglected. According to the theory, wage differentials between male and female jobs are not explained by migration but by the advantages of female jobs, such as lesser skill demands, more pleasant job requirements or working conditions, or higher starting wages (see Sandell 1977, England et al., 1988, Bielby and Bielby, 1992, Halfacree, 1995). Intuitively, these claims are not very appealing, and empirical support has not been conclusive (see, for example, England et al., 1988). Notwithstanding these weaknesses, the human capital theory provides an appropriate starting point for economic research on family migration, and migration in general.

3.2 Job search theory

Whereas, in principle, the human capital approach covers the broad spectrum of human behaviour and regards migration as an investment, the job search theory examines migration from the viewpoint of labour markets.

The search theory analyses individual behaviour under conditions of uncertainty and incomplete information. The theory recognises that information is imperfect and that the individual must undergo costly search process to obtain it. In its basic form, the search theory focuses on the job search carried out by the unemployed (see Herzog et al., 1993). However, it can be expanded to include the job search of those already employed. Job search methods vary in terms of duration and costs, and individuals vary in terms of their motives, qualifications and limitations. Employment opportunities are expected to vary by region. Simply put, job seekers search for employment in various regions and will move, if they receive the best pay offer equalling or exceeding the so-called optimal reservation wage[13] from outside their home region. The reservation wage depends on the job seeker's individual qualities and the characteristics of the local labour markets. Therefore, migration is a consequence of the job search process.

On the other hand, Molho (1986) argues that a distinction should be made between speculative migration undertaken in anticipation of finding suitable employment, and contracted migration, undertaken only after employment has been secured. In the former case, migration is a part of the search process, while in the latter case, migration is the outcome. Empirical evidence indicates the likelihood of contracted migration being more common than speculative migration (Molho, 2001).

Van Ommeren et al. (1997) complemented the job search model by adding commuting and changing of residence to it. This is rational, as residential and job-related moving are closely interconnected: moving to another region inevitably causes a change of residence. Commuting, in turn, is closely related to change of both employment and residence: change of either job or residence or both may result in commuting. [14] If commuting acts as an alternative for migration, the change of job location does not necessarily result in change in residential location, but manifests as change in commuting behaviour or distance.

As usual, individuals or households are assumed to maximise their utility. Utility depends on wages (characterising jobs), so-called "place

---

[13] The optimal reservation wage is determined to equate the marginal cost of obtaining one more offer with the expected marginal return from continued search (Herzog et al., 1993)

[14] Purely residential moving may also necessitate commuting. Yet the starting point for the theory is change of job location. If the change of both job and residence causes commuting, commuting acts as a complement to moving.

utilities" (characterising residences) and commuting distances. It is assumed that workers continuously search for better jobs and residences, and receive offers for both at a rate proportionate to the intensity of the search. Once received, an offer must be either rejected or accepted, taking into account commuting costs. Other costs arising from job and residence search and change must also be taken into consideration. These costs include for example losses of income, time and other resources required for the search process. In addition to monetary costs, further costs may arise that cannot be measured in terms of money, such as psychological costs related to the leaving behind of one's familiar living environment and friends. Distance also affects search costs: it is more costly to search in more distant locations. Furthermore, imperfect information and uncertainty must also be taken into account in the search process. (See van Ommeren et al., 1997).

In principle, an acceptable pay offer — one equalling or exceeding the reservation wage — leads to change of job, and increase in "place utility" leads to residence change. However, it must be noted that the combination of the chosen job and residence locations is not necessarily optimal in terms of travel-to-work distance, but due to uncertainty concerning future prospects, workers may be willing to accept a wide range of different workplace and residence combinations (van Ommeren et al. 1997). This may be particularly true for families: for example, two-earner households must consider locations of two jobs instead of one in their mobility decisions. [15] Earlier studies indicate that households tend to prefer residential locations with good connections, hence minimising future migration needs (Green 1997).

In summary, workers face two choices: where to live and where to work (see Romaní et al. 2003). These choices manifest as different behaviour. If the job location is given (for example, a worker finds work outside the home region), the choice set narrows down to that of location of residence: the worker can choose to live in the region where the workplace is located, or outside it. The choice of home location is reflected in mobility behaviour. As described above, choices are assumed to be driven by attempt to maximise utility; therefore individuals or households change their current state of affairs only if the change is expected to yield greater than zero net benefits.

---

[15] Commuting and migration behaviour in two-earner families have been theoretically addressed for example by van Ommeren et al., 1998.

3.3 Outcomes of the theories

In order to fully understand the complicated nature of migration, it is important to realise the vast amount of factors affecting migration. Regional variation exists in economic circumstances as well as other conditions and, at a general level, certain factors can be considered to either repel or attract migrants. Just like neoclassical growth theory, in its basic form the human capital theory maintains that individuals move to the regions with highest income levels. This increases the supply of labour in these areas and decreases it in low-income areas. As a result, pressures arise in high-income regions to lower wage levels, while the opposite occurs in low-income regions. As a consequence of migration, regional wage disparities level out. This also applies to disparities in regional unemployment rates. At the national economic level, the human capital approach places migration in a resource allocation framework by treating it as a means of promoting efficient resource allocation in the economy.

Individual qualities as well as family or household related factors also have a significant impact on mobility. The individual and regional factors considered by the human capital approach as important determinants for moving are presented in Table 1. The impact of regional factors is described from the viewpoint of the region of origin. In the destination region, they have the opposite impact.

The human capital approach argues that for example young people will be able to benefit from moving over a longer period of time, and they also typically have fewer e.g. family or job-related ties, and hence moving costs typically are lower at a young age. Unemployed persons have greater economic incentives for moving than employed persons, as well as lower

moving costs.[16] The search theory presents the same outcome, albeit for different reasons. Different groups have different job search intensity levels as well as different reservation wages, which gives rise to varying degrees of moving activity. For example, unemployed and young persons engage more actively in job search, and their reservation wages are lower. The duration of unemployment also has importance in the job search theory. The longer the duration of unemployment, the higher may the likelihood of moving become, because often the local employment opportunities are exhausted first. On the other hand, the job search theory also supports an opposite connection between the duration of unemployment and moving. The sooner the search area is broadened, the higher the likelihood of finding employment faster. However, continuing unemployment may also cause job search willingness to decline for various reasons. This decline in job search intensity is termed as the discouraged worker effect, and it may manifest as a lower propensity to move (see e.g. McQuaid et al., 2001).

---

[16] In addition to work, migration may occur for other motives as well. Tiebout (1956) postulated that people choose their residential locations by comparing levels of taxation and public services. If they are not in balance, people "vote with their feet", i.e. they move. The role of residential and natural conditions as determinants underlying migration has been recognised for a long time. For example, in the United States, so-called natural resource indicators are calculated for each member state and their areas. These scores record data such as annual average temperatures, landscape variation and location of lakes. Cromartie & Nord (1996) found that high-scoring regions have benefited from migration through increased income levels considerably more than mid-scoring areas. Low-scoring regions in turn have suffered from migration-generated income losses. In Finland, there is hardly any variance between regional natural conditions, therefore their significance is unlikely to be as high as for example in the United States. On the other hand, living environments can vary greatly within and between regions. In addition to their economic standing, people's individual preferences determine the type of area or environment they want to live in.

Table 1. *Determinants for moving and theoretical arguments explaining their impact (the human capital approach)*

	Decreases migration likelihood	Increases migration likelihood	Why?
Personal/family related characteristics			
Age	older age	young age	Young persons have more time to gain from moving, and they have less regional ties than older persons
Education	low education	high education	Migration is an investment to human capital, those with higher education have better abilities to obtain information and they also may have narrower career opportunities in a certain location
Labour market status	being employed	being unemployed, entry to the labour market	Unemployed or those entering labour market don't have ties to jobs and work-places and the costs of moving are lower since migration does not result in loss of work place.
Housing/Accomodation	owner-occupation	rental living	Owner-occupants have stronger ties to current region and hence costs of migration are higher. Transaction costs also may have an inhibiting effect on migration.
Family relations	being a couple, employed spouse	being single	Families have stronger ties to current locations and hence larger migration costs, in particular if both spouses are employed
Children	larger family size, school-aged children		Migration costs increase with family size, school-aged children cause stronger ties to current region

Table 1. *Continued*

Migration experience	living in region of birth, staying longer time in a region	earlier migration experience, recent move to a region	Those with migration experience have already broken their ties to region of birth, potential disappointment with the outcome of migration, experience makes migration decision easier, the shorter time spend in the region, the less ties to the region
Regional characteristics (region of origin)			
Unemployment rate	low unemployment rate	high unemployment rate	High unemployment rate reflects fewer job opportunities
Regional income level	high income level	low income level	In high income regions the expected personal income is higher
Living costs		higher living costs	High living costs (e.g. high housing prices) decrease attractiveness of a region
Production structure	Many sided production structure	One-sided production structure	Regions with many-sided production structure typically have higher number of (or more versatile) job opportunities

When compared with the human capital approach, the search theory improves the treatment of information and lays more emphasis on the process whereby the information is acquired. However, while the search theory explicitly predicts that certain variables should be relevant, the human capital approach merely provides a possible interpretation for such variables, if they happen to be empirically significant. This means that the search theory does not generate any additional predictions compared to human capital framework. (Molho, 1986).

In this sense, the human capital approach is broader than the search theory and it provides a platform for the interpretation of certain migration-related characteristics as well as different patterns of migration behaviour. Utility or welfare may depend on numerous factors: some

people value monetary aspects while others have a higher appreciation of their living environment or other non-monetary aspects. For example, it is clear that life stages are significant in migration decisions. Different individuals or families react differently to various factors. The factors that attract some people may repel others. This is caused for example by different sets of values. Hence, different personal values can explain a situation where migrants have the same starting points but they choose different destinations. The human capital approach is capable of explaining different patterns of individual behaviour. The theory offers a rational explanation for observations typically made in empirical studies. It also explains the selective nature of migration: the fact that the migrants usually are young, capable and well educated.

Nevertheless, the difference between the search and the human capital theories, at least in certain respects, is one of emphasis; both theories assume that rational individuals (or families) strive to maximise their utility or welfare (e.g. Molho, 1986). Therefore, the human capital approach and the job search theory can be seen as alternative ways to explore migration.

4. Selected facts about internal migration and geographical mobility in Finland

In order to put this thesis in the proper context, a short introduction of the nature on internal migration before and during the study period in Finland is essential. The main features of Finnish regional development have been urbanisation and regional concentration since the Second World War (see e.g. Palomaki, 1991). Nevertheless, Finland's urbanisation rate is still one of the lowest in the EU.[17] In Finland the number and direction of migration has varied considerably in the last decades. A period of strong concentration lasted from 1950s to the mid 1970s, after which the pace of migration slowed down. Harmonious regional development in Finland stopped with the deep recession of the early 1990s. During the recession, output fell by more than 10 per cent and unemployment quadrupled to almost 20 per cent (Figure 3). Between 1990

---

[17] Only Austria, Portugal, Greece and Ireland are less urbanised countries. At least partly a low rate of urbanisation is a result of active regional policy (see also Chapter 4).

and 1993 over 450 000 jobs were lost - as a reminder of the scale, we are talking about a total population of five million people.
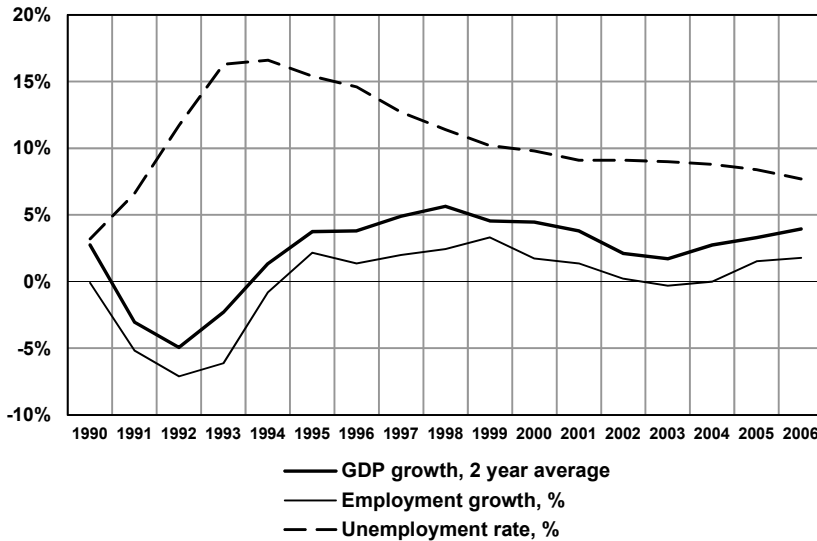
Source: Statistics Finland

Figure 3. *Unemployment rate, GDP and employment growth in Finland in 1990-2006,%*

During the recession internal migration activity was low (Figures 1 and 5). For example, the number of migrants reached its lowest ebb in three decades in 1992, when around 177 000 individuals (3.5% of population) changed home municipalities. The speed of internal migration started to rise hand in hand with the recovery, which began few years later. A migration boom has been prevailing since the mid 1990s. Highest ever migration figures (282 000 migrants, 5.4% of population) were recorded in 2001. After the mid 1990s, migration activity has constantly remained at high level.

After the recession, not only did the rate of migration speed up, but its concentration also became stronger. There were several factors contributing to this phenomenon. While the recession had hit the whole country fairly evenly, during the upswing the creation of new jobs started to concentrate heavily in a few fast growing urban regions. At the same time, the demand for labour was especially low in the eastern and

northern parts of the country.[18] In the late 90s and early 2000s, the average unemployment rate in Finland was around 10%, thus being well above the corresponding EU15 average. Regional variation was (and still is), however, substantial. For example, among the Nordic countries, Finland had the widest regional spread of unemployment rate, and it held both the highest and lowest positions (Hanell et al., 2002). In addition, the importance of knowledge and know-how as engines of growth has increased constantly after the recession. This structural change, together with the simultaneous hasty growth of information technology and related services, which are concentrated in just a few localities, has also been reflected in regional development. As a result of lagging employment opportunities in certain regions and rising opportunities in other regions, the number of regions receiving positive net in-migration dramatically decreased in the late 90s, and the area of highest net out-migration rate substantially expanded (see Figure 4).

---

[18] For example, between 1993 and 2001, employment in Finland increased on average about 2 per cent per year. Regionally, this varied from about 4 per cent to –0.3 per cent. That is, some regions had still not reached their pre-recession level of employment by the beginning of 2000s (PTT Economic Forecast 1/2002).
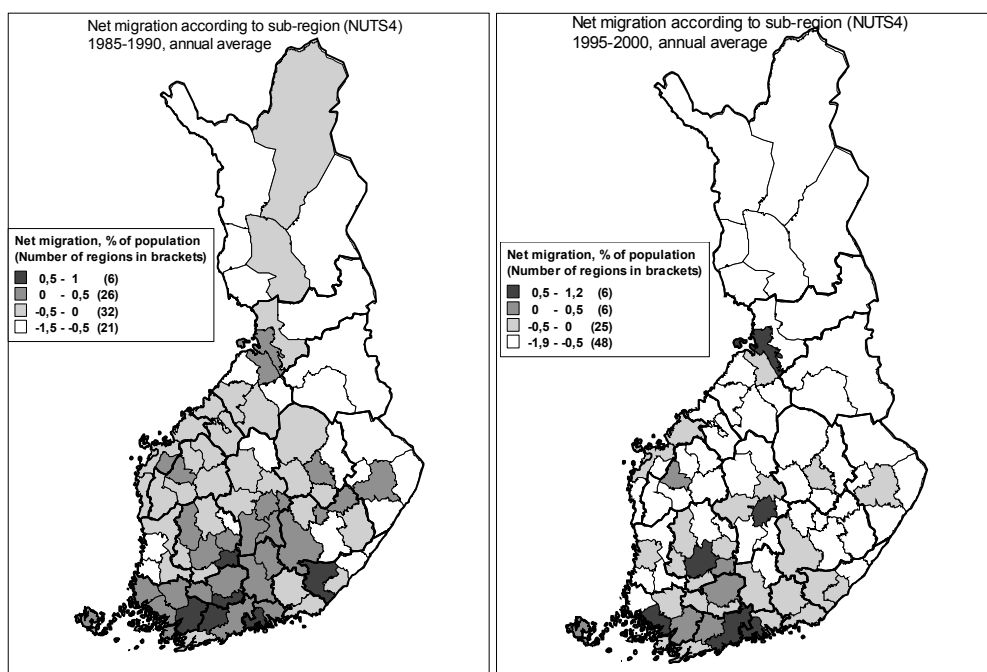
Figure 4. *Net migration per population (annual average) in Finnish sub-regions (NUTS4) in 1985-90 and 1995-2000*

Moreover, a new law (Home Municipality Act) in 1994 allowed students to register themselves as permanent residents in the municipality in which they study. The law further strengthened the concentration tendency of the population, since most of the growing regions are also educational centres. Young, 18-24-year old persons migrate most actively (Figure 5). After the mid 1990s, migration propensities of this age group has increased constantly, and for example in 2000 around 20 % of this age group migrated. Before the mid-1990s (starting at least from the mid-1970s) the respective figure was only 8-12 % per year. However, this alone does not explain changes in internal migration. There was a genuine change in migration behaviour of the population, since after the mid-1990s, migration activity has increased in older age groups as well, in particular among 25-34 year old persons.

For many years, internal migration has been the most important factor in regional population development in Finland (Figure 6). It can affect regional population very quickly. The intensity of the effect depends for

example on volume and age composition of migration flows, and how migration flows are directed from and to different regions.
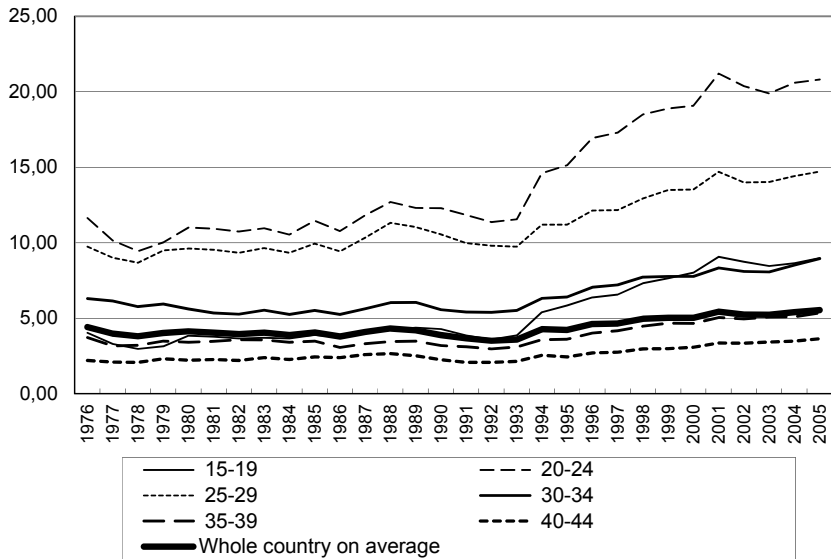
Figure 5. *Migration propensities by age group in 1976-2005, %*
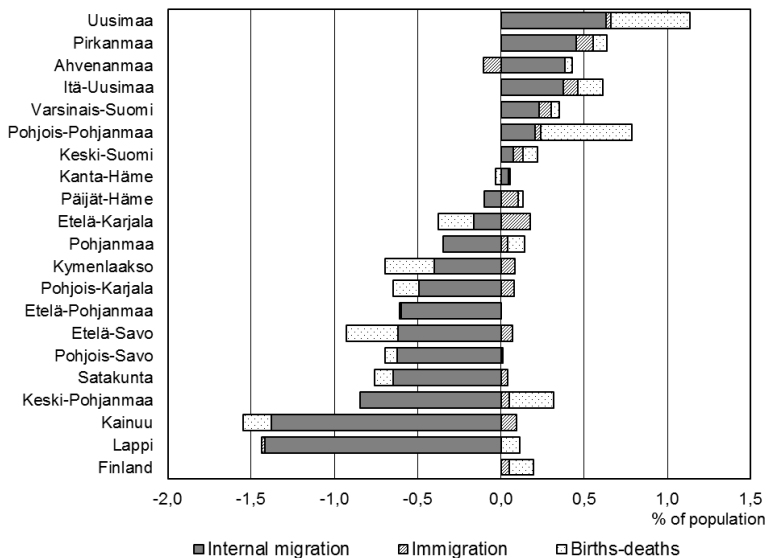
Figure 6. *Population changes according to region (NUTS3, % of population), and the effect of different components on these changes in 2000*

4.1 On urban and rural dimension of migration

The radical change in migration activity and destination choices of migrants can especially clearly be seen in the urban-rural context. After the recession, urban concentration has been a dominant feature of the Finnish migration system; migration flows have been heavily directed towards the few largest urban centres located mainly in the southern parts of the country. A similar phenomenon has been observed in all Nordic countries, but in Finland the regional polarisation has been very strong. While the largest urban centres have been growing, three out of every four Finnish municipalities have been suffering from out-migration. Hanell et al. (2002). Rural areas have been hardest hit; since mid-1990s there has been a clean break between the aggregate losses of the rural areas and the net gains of urban regions[19] (Figure 7).
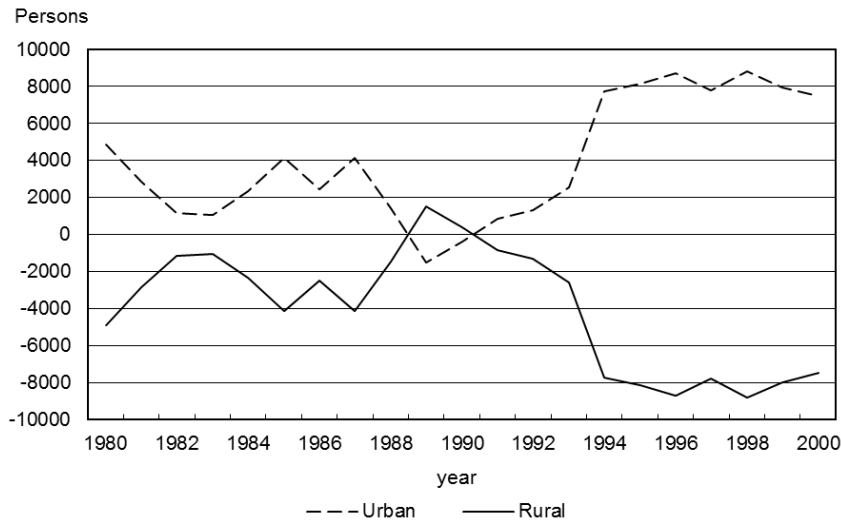
Figure 7. Net-migration in urban and rural areas in 1980-2000, persons

After the mid-90s, out-migration and population decline in rural areas has been very fast, to the extent that fears about depopulation of rural areas have been expressed (Figure 8). For example, in 2001, rural areas lost as

---

[19] Map of urban-rural classification of municipalities is presented in Chapter 4, Figure 1.

much as 0.7 percent of their population through out-migration (Table 2). Negative natural change further accelerates rural population decline.
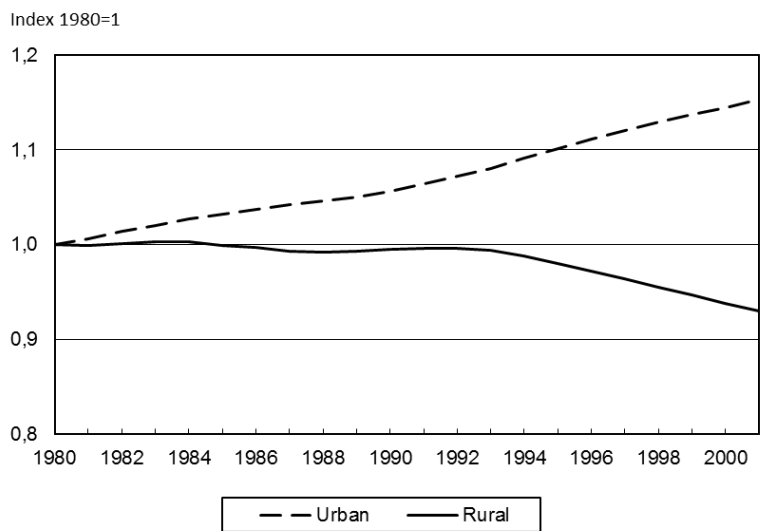
Index 1980=1

Figure 8. Population development in urban and rural areas, 1980-2000, index (1980=1)

Finnish population is ageing very fast and regionally the existing age structure varies substantially. For example, in 2001 the proportion of the elderly in rural areas was over 19%, in comparison with 13.5% in urban areas. Nivalainen and Haapanen (2002) show that in the case uninterrupted high level of internal migration, the demographic structure of rural areas in Finland will deteriorate during the next decades. According to Hanell et al. (2002), the current trend of migration in Finland constitutes a severe threat to the settlement structure in the periphery.

Table 2. The components of population change in urban and rural areas in 2001

	% of population			
Region	Internal migration	International migration	Natural increase	Total change
Urban	0.3	0.1	0.3	0.8
Rural	-0.7	0.1	-0.2	-0.8
Whole Finland	0.0	0.1	0.1	0.3

Nevertheless, despite the strong concentrating trend, all migrants do not head to urban areas and growth centres, but there is a constant inflow of migrants also to peripheral and more distant regions. In fact, rural in-migration flows also have risen after the recession, although not to a similar degree than the outflows. This has not received much attention, and so far migration analysis in Finland has mainly concentrated on general determinants of out-migration (e.g. Ritsilä & Tervo, 1999). It is of course important to recognize the factors underlying out-migration decisions and characteristics of out-migrants, but from the regional perspective the destination choices of migrants are equally important. Inspection of out-migration or net migration only gives a partial picture of the effect of migration on different regions.

Some Finnish studies have also dealt with in-migration, i.e. destination choices of migrants, but these have typically focused on moves (from undefined origins) towards urban areas or growth-centres.[20] Moreover, the few studies concentrating on in-migration usually use sub-regional classification (in total there are 85 sub-regions in Finland), and draw a distinction between the "growth-centre" regions (5-9 regions, depending on the study) and the rest of the country, defined as "periphery" or "rural" (Pekkala, 2000, Haapanen & Ritsilä, 2001, Ritsilä, 2001, Haapanen, 2003). In these studies, everything outside the few fastest growing regions is considered as rural; in this case even many of the regional (NUTS3) centres with university in their area are counted as periphery. Moreover, in reality there are rural areas also within the growth-centre regions.

In other words, earlier Finnish studies usually have concentrated only on one dimension of moving, and have not considered both origin and destination together, even though it is the difference between the number and characteristics of in- and out-migrants that defines the regional composition of population and development potential, and changes in these.

The quantitative effect of migration on regional population is clear: urban areas are growing and rural areas declining. Nevertheless, in-migration is by no means insignificant from the rural perspective. For example, in 2001 the number of in-migrants represented around 4% of rural population. Hence, rural in-migration partly balances the negative

---

[20] Exceptions to this are Kauhanen & Tervo, 2002, who studied migration to depressed and more backward regions, and Nivalainen, 2003, who studied rural in-migration. However, neither of these studies considers both the origin and destination of migrants.

effect of out-migration, at least quantitatively. An interesting question, however, is what happens to the quality of rural inhabitants as a result of migration? For example, several studies show a positive connection between regional development and educational level of the population (e.g. Glaeser, 2000; Glaeser & Saiz, 2004). Earlier Finnish studies indicate that migrants in general are young and educated persons (see e.g. Ritsilä & Tervo, 1999, Haapanen, 2003), and depart from the characteristics of the average population. If rural in-migrants are not as educated and capable as migrants on average, a continuing high level of migration will have a substantial diverging effect on regional population structures and their growth capacity. Therefore, to be able to evaluate the total impact of migration on different areas, not only place-to-place migration streams but also potential spatial variation in migrants' characteristics according to origin and destination need to be investigated. From the regional perspective, rural-to-urban and urban-to-rural streams are of primary interest, as it is expressly these counterstreams that define the total impact of migration on rural and urban areas. These will be inspected in Chapter 4.

4.2 On families and migration

Given its magnitude and direction, it is not surprising that migration has aroused considerable interest in Finland during the past decade or so, and the public debate has been lively. Finnish economists have also focused considerable attention on migration. However, migration research has mainly been targeted at the individual level determinants and consequences of migration, and no attention has been given to family migration, despite the fact that families account for as much as 80 per cent of the population (Statistics Finland, 1999a). There are 1.2 million couples (married or cohabiting), which means that the number of potential migrants with family relations (excluding children) is about 2.4 million, i.e. almost half of the population. Of course, only minority of them migrates[21].

---

[21] Empirical evidence shows that family relations generally reduce mobility (Mincer, 1978, Haapanen, 1998, Ritsilä & Tervo, 1999, Haapanen, 2003).

There are no specific statistics on family migration, but something of its magnitude can be concluded from the general statistics (see e.g. Statistics Finland, 1999b, 2001). In 2001, for example, 282 000 persons changed their municipality of residence. Of these about 50 000 were children (0-17 years)[22]. In addition, nearly 60 000 of migrants were married. This means that about 3 per cent of all married persons moved during one year. The respective figure for unattached individuals is over 10 per cent (see Figure 9).[23] The complexity of family migration decisions is thus reflected in the migration propensities. Unfortunately, data on the migration of cohabiting couples does not exist, but as cohabiting couples are usually younger than married ones, the percentage of migrants is likely to be higher among them[24].
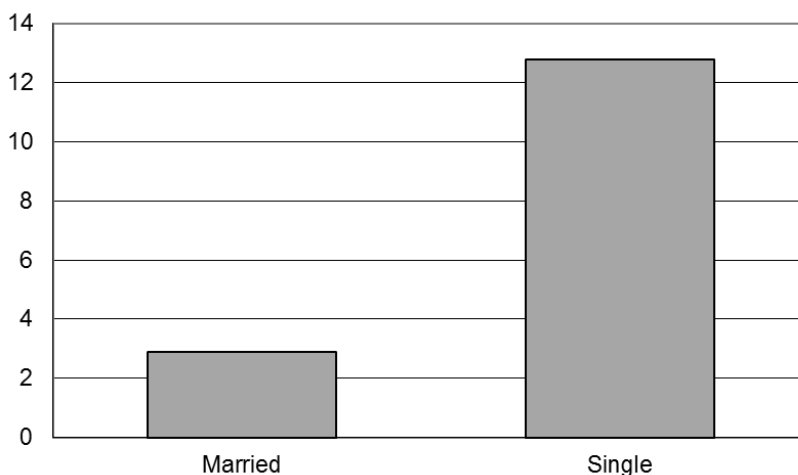
Figure 9. Migration propensities of married and single individuals in 2001, % of respective group

---

[22] In relative terms, this means that four in a hundred children migrates during one year. This figure is fairly high, because if age-specific migration propensities remained for example at the 1998 level, 77 per cent of children would migrate to another municipality at some point during their childhood (Kaartovaara & Sauli, 2000). In recent years in particular migration activity of small children has increased. On average, every child moves from municipality to another 1.7 times during their childhood. The migratory distance of children was on average 96 kilometers in 2005. (Statistics Finland, 2007)

[23] The figure reflects migration propensities between municipalities of those over 15 years of age.

[24] For example, young mobile couples entering the labour force are seldom married.

Vast evidence from several countries indicates that family migration, while generally advancing a husband's career, in many ways weakens the married female's labour market position. For example, migration has a detrimental effect on wives' incomes (Polachek and Horvath 1977, Sandell 1977, Mincer 1978, Grant and Vanderkamp, 1980, Holmlund 1984, Maxwell, 1988), on their employment, the number of weeks worked and labour force participation (Duncan and Perrucci 1976, Sandell, 1977, Lichter 1980, Morrison and Lichter, 1988, Shihadeh 1991). It has even been argued that a proportion of the gender wage gap is due to family migration[25] (see Long, 1974, Bielby and Bielby, 1992).

Hence, family migration is necessarily a gender-related subject. Earlier Finnish research has not adequately addressed the gender dimension in migration. Controlling for family relations is extremely important, especially when studying the outcomes of migration. For example, pure sex comparisons from individual-based data are uninformative because they may include tied migrants. Tied migrants are those individuals who give up their personal gains to accompany the family, and in doing so may suffer losses.

Finland offers an excellent setting to explore family migration. The labour force participation of women is high, being about 70 per cent, and the country is more egalitarian than most. The proportion of female higher education graduates in the working-aged population exceeds that of males (34% vs. 28%). Despite all this, the prevailing gender wage gap is about 20 per cent, and a part of the gap cannot be explained by differences in observable characteristics (Vartiainen, 2002). With a high female labour force participation and gender-equality, family migration and compromises over geographic relocation are probably more relevant issues today than in the 1970s or 1980s, when much of the work on the subject was carried out. Determinants and employment consequences of family migration will be inspected in Chapters 2 and 3.

---

[25] One explanation is that tied moves, just like child rearing, interrupt the continuity of women's work (Mincer, 1978), which reduces income directly, due to lesser work experience, and indirectly, due to slower skill development. In part the wage gap is seen to result from women's inability to use migration to further their careers in the same ways that men do (Sandell, 1977).

4.3 On commuting in Finland

In Finland, as in many other countries, commuting is much more common form of geographical mobility than internal migration. Therefore, investigations concentrating on migration only give a partial picture on geographical mobility and functioning of the labour market. As mentioned above, over 700,000 persons commute between municipalities, while the respective number of migrants is only about 280,000. From labour market point of view the difference is even larger, since all commuters have a job, while only about half of the migrants are employed. The magnitude of commuting has constantly increased; three decades ago only 10% of employed persons had a job and home in different municipalities, nowadays every third worker commutes. At the same time, travel-to-work distances have become longer and labour market areas have become larger.[26] Despite that, commuting has received far less attention than migration.

Location of jobs defines regional demand for workers. Those regions with more jobs than workers need labour from other areas, while the opposite is true for the regions with lagging employment opportunities. Work-place self sufficiency rate indicates the proportion of jobs in the region in relation to employed persons living in the region. Typically largest centres have highest work-place self sufficiency rates. For example, regional classification based on sub-regions shows that metropolitan region has around 5% more jobs than workers; hence it needs workers from other areas (Table 3).[27] In general, the more peripheral and sparsely populated region, the lower the work-place self sufficiency rate is.[28] Nevertheless, commuting flows occur between all regional types.

---

[26] This development is not unique to Finland, similar observations have been made for example in Great-Britain and Denmark (see e.g. Green et al., 1999; Andersen, 2002).

[27] Map of sub-regional classification into different regional types is presented in Chapter 5, Appendix 1.

[28] In municipality-based urban-rural context the difference in work-place self sufficiency between urban and other areas is even larger; in urban areas there 10% more jobs than workers, while the opposite is true in rural areas (Palttila & Niemi, 2003). Geograhpically commuting is most common in southern Finland, and least common in eastern and northern Finland.

Table 3. *Commuting inside and between different regional types in 2001, persons*

Home region	Work-place region						Comm. in total	Employed inhabitants
	Metrop.	University	Reg. centre	Industrial centre	Country-side	Sparsely pop. reg.		
Metropolitan region	258 364	5 149	6 433	1 882	2 213	482	274 523	695 138
University region	13 761	124 413	8 057	6 591	8 754	3 241	164 817	526 888
Regional centre	15 384	7 400	75 260	3 739	6 629	2 909	111 321	399 902
Industrial centre	5 676	10 572	4 345	29 634	2 916	838	53 981	208 308
Countryside	6 554	18 720	9 983	4 487	34 455	1 207	75 406	286 516
Sparsely populated reg.	2 027	6 015	8 725	2 224	2 186	5 802	26 979	118 565
Commuting in total	301 766	172 269	112 803	48 557	57 153	14 479	707 027	
Work places in the region	722 381	534 340	401 384	202 884	268 263	106 065		2 235 317
Work-place self sufficiency, %	104	101	100	97	94	89		
Net-commuting	27 243	7 452	1 482	-5 424	-18 253	-12 500		

The figures in the diagonal give the amount of commuters between municipalities inside the regional type. The figure does not include those living and working in the same municipality. A proportion of commuting inside certain regional type can be commuting between sub-regions.

In addition to abundance of jobs, metropolitan region and the largest centres have also the highest commuting activity of inhabitants (Figure 10). For example, in metropolitan region around 40% of the inhabitants have home and work in different municipalities. In these regions commuting distances are, however, fairly short: only about 20% of commuters have home and job in different sub-regions. In more peripheral regions commuting is clearly less common than in the largest centres. On the other hand, commuting distances are longer; most of the commuters cross sub-regional borders in their way to work.
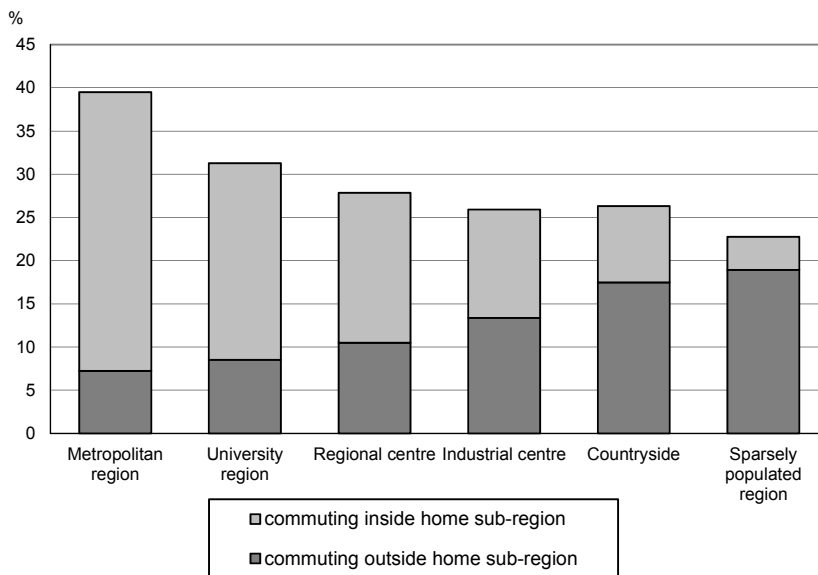
Figure 10. Commuting activity in different regional types, % of employed inhabitants

Just like migration, the impact of commuting can differ significantly between regions, depending on the quantity and quality of commuters. What makes inspection of migration and commuting especially interesting, is the difference in their regional impact. While migration has immediate, permanent and opposite effect on origin and destination regions' population and labour force, commuting moves people only temporarily from region to another, and it can have a positive effect on both ends of the journey. In regions with positive net-commuting, commuting has an important effect on the supply and availability of

labour force, while in regions with negative net-commuting, commuting is an important factor in securing population development and employment of the inhabitants. Naturally, commuting has other effects as well. For example, internationally there is some evidence that commuting would diminish regional income differences (Hazans, 2004). This has received some empirical support also in Finland; for example those commuting to work to the capital region have higher incomes than those living and working in the region (see Montén & Tuomala, 2003). Moreover, according to Palttila & Niemi (2003), due to commuting, the net flow of incomes from urban to other areas was around 4 million euros in 1999. Commuting has a significant effect also on housing markets. Due to commuting, population doesn't need to concentrate in a similar manner as jobs. It has been estimated that if all commuters and their family members would move to municipality where the job is located, around 1.5 million persons would be forced to move between municipalities. In the capital Helsinki, alone, this would mean around 200,000 new inhabitants. (Myrskylä, 2006).

It is clear that from regional point of view it is not irrelevant in which form the geographical mobility of labour takes place. As seen above, a large number of people choose commuting instead of migration. In spite of that, there is practically no information on the selection process between these two forms of mobility, i.e. what kind of people choose commuting instead of migration. This will be inspected in Chapter 5.

5. Summary of the findings

The present study concentrates on family migration and geographical mobility in Finland during the 1990s and early 2000s. The study consists of four separate papers, which are presented in Chapters 2-5, and summarized below. It is worth pointing out that each paper has been written independently from each other. Hence, if comparing the findings of Chapters 2-5 with each other, one may find some of the results contradicting.

It should be noted, however, that the samples used, the targets of investigation, as well as some of the time periods differ considerably between these studies and articles. Therefore, rather than comparing the

findings of different studies with each other as such, one should read and interpret the results as complementary information, inspecting the complicated phenomenon of migration and geographical mobility from many separate perspectives.

Chapter 2 investigates the determinants of family migration. A family is defined as consisting of two married or cohabiting adults of opposite sexes, with or without children. As the motives underlying different types of moves are likely to vary, a distinction is made between short- and long-distance migration. The study uses unique family data containing all the relevant characteristics of both spouses. The empirical analysis is carried out with multinomial logit models.

The results show that in Finland young, educated families are the most eager to move, and there is a strong negative association between the family life-cycle and migration. Having only pre-school-aged children does not affect migration propensities, while the presence of school-aged children strongly inhibits migration. With regard to family ties, the evidence indicates that more weight is given to the husband's career and, consequently, wives are more likely to be the tied parties in family migration. At the same time, participation of the wife in the labour force significantly inhibits migration, and in that sense the husbands of working wives are tied to certain locations.

Differences between short and long moves emerge. Stronger ties to the current location counteract, and general human capital (of the husband) boosts inter-provincial migration. Larger income dispersion between the spouses increases the likelihood of long-distance migration. The unemployed are more likely to move between provinces. In addition, the size and the economic structure of the existing region influence the distance of the move. Local economic conditions are also important: a high area unemployment rate augments long-distance migration, and has an inhibiting effect on short moves.

Chapter 3 concentrates on the employment returns from interregional migration in the family context. A large data set consisting of actual families and including a wide variety of characteristics of both spouses is utilised. To be able to investigate both genders, the analysis focuses on two-earner families. In other words, different from Chapter 2, here both spouses are in the labour force before migration. The primary concern of the empirical examination is to investigate the post-move employment probabilities of husbands and wives, and to determine whether gender

differences exist in the outcomes of migration. The study also takes the potential migration selectivity into account by using recursive bivariate probit models, where the potential correlation between the unobserved effects of migration and employment probabilities is appropriately controlled for. In addition, the study addresses the issue of heteroskedasticity.

Heteroskedasticity does not appear to be a great problem, but the results demonstrate the importance of the selectivity correction: unobservable characteristics exist that both increase the migrants' employment potential and make them more mobile. It is worth pointing out that in the family context these unobservables do not necessarily relate to the individuals themselves but might also relate to their spouses and families. Nevertheless, migration itself generally exerts a negative effect, i.e. migrants have a lower tendency to be employed than stayers. With regard to sex, a much larger negative impact of migration on women is demonstrated. However, average inspections may mask a wide variation in the outcomes of migration. Extended analyses where the original (pre-move) labour market status of the spouses is taken into account show that the move is seldom simultaneously optimal for both spouses, and usually one or both has to compromise. The results show that migration in fact leaves the majority of husbands unaffected, and that some husbands actually benefit from moving. The husband appears to have lower post-migratory employment odds only when both spouses were unemployed before migration. Instead, migration has a negative impact on wives in all cases. Hence, the results suggest that the husband's employment considerations are weighted more, and that wives are often the tied parties in family migration.

Chapter 4 investigates place-to-place migration streams and potential spatial variation in the determinants of migration in the urban-rural context. Each end of population movement is equally important from the regional perspective, and therefore all possible origin-destination combinations of migrants are accounted for in the analyses. However, special emphasis is placed on the rural dimension of migration, i.e. rural-to-urban and urban-to-rural migration and characteristics of these migrants are of primary interest. Descriptive analysis shows that migration streams occur between all areas. The majority of migrants head to urban areas, but every year around 20% of migrants select a rural destination.

Empirical inspections are based on a large individual level panel data set and are carried out with multinomial logit models. The age interval of the sample is 20-69 years. Hence, in addition to the mobility of the working-aged population, the sample enables an examination of the migratory behaviour of retirees. The results demonstrate that locational preferences vary with the life cycle: Young and single individuals move to urban destinations, while couples and retired persons tend to head from urban to rural areas. Moreover, the unemployed do not solely move to urban locations, but they move also from urban to rural areas. Those moving from urban to rural areas also tend to have lower than average incomes. Retirement migration is an integral part of rural in-migration, and the rural destined retirees distinctively originate from urban locations. With regard to regional development these results demonstrate that migration has a negative impact on rural areas both quantitatively and qualitatively. Urban areas absorb the young and educated individuals from rural areas; hence migration not only distorts the age structure of the rural areas but also deprives them of critically needed human capital. Furthermore, the loss tends to be permanent, since those moving in the opposite direction, from urban to rural, are less educated. In fact, both rural-to-urban and urban-to-rural migration seems to work to the benefit of the urban areas, i.e. helps to keep their age structure young and development potential high. Overall, the results indicate that the accumulation of population and human capital in urban areas is rapid, and that regional disparities are likely to increase rather than decrease upon migration.

Chapter 5 examines migration and commuting patterns in Finland. Descriptive analysis shows that commuting is a much more important form of labour mobility than migration. Moreover, while migration tends to concentrate population to the largest regions, commuting helps to distribute population regionally more evenly. Commuting increases employment and significantly slows down population decrease in the weaker regions, and at the same time it secures labour supply and inhibits population growth in the growing regions.

Empirical analysis utilises a large individual level data, and inspects commuting as an alternative for migration. The analysis concentrates on job-related mobility, and unlike in previous Chapters, all individuals are employed at the end of the inspection period. Both short- and long-distance mobility is inspected. Analyses are carried out with discrete

choice models; in particular a mixed multinomial logit modelling technique is utilised. The results show that to some degree migration and commuting are similarly selective processes. For example, mobility in general increases with higher education. The effect of high education is especially pronounced in inter-regional mobility; highly educated individuals and couples both move and commute more than others. Hence, while migration generally tends to increase regional differences in educational levels, commuting may help to slow down the growth of these differences. There are also differences in the determinants of migration and commuting. For example, migration odds are highest when young, but the age profile in commuting is more even, i.e. commuting is not as strongly concentrated to youngest age groups. Moreover, there are differences relating to labour market status, in particular in longer distance mobility. Personal unemployment significantly increases the likelihood of commuting. In other words, for the unemployed commuting seems to be an important way of finding a job. Instead, on migration personal unemployment, on average, has no effect. However, a large variation in the effect of unemployment on migration is discovered. Hence, the results also show that people with similar observable characteristics make different choices. Differences in the choice between alternative mobility forms are also found in the case of family related factors. Family relations in general impede migration. Instead, they do not hinder commuting, and in shorter distance commuting these factors even have an augmenting effect. In particular two-earner families are more prone to commute than migrate.

Note: In the thesis, the statistical source of all figures and tables is Statistics Finland, unless otherwise mentioned

APPENDIX 1. Finnish NUTS3 regions and their location

References:

Alonso, W. (1964): Location and Land Use: Toward a General Theory of Land Rent. Cambridge, MA, Harvard University Press.

Andersen, A. K. (2002) Are Commuting Areas Relevant for the Delimitation of Administrative Regions in Denmark? Regional Studies 36, pp. 833-844.

Bielby, W. T. & Bielby, D. D. (1992): I Will Follow Him: Family Ties, Gender-role Beliefs, and Reluctance to Relocate for a Better Job. American Journal of Sociology, vol. 97, pp. 1241–1267.

Clark, W. A. V. & Dieleman, F. M. (1996): Households and Housing; Choice and Outcomes in the Housing Market. New Jersey: CUPR Press.

Costa, D. L & Kahn, M. E. (2000): Power Couples: Changes in the Locational Choice of the College Educated, 1940–1990. The Quarterly Journal of Economics, 115(4), 1287–1315.

Cromartie, J.B. & Nord, M. (1996): Migration and Economic Restructuring in Nonmetro America, 1989–94. ERS Staff Paper #96 15. Washington, DC: Economic Research Service, United States Department of Agriculture.

Duncan R.P. and Perrucci C. C. (1976) Dual Occupation Families and Migration. *American Sociological Review*, vol. 41, pp. 252-261.

England P., Farkas G., Kilbourne B. and Dou T. (1988) Explaining Occupational Sex Segregation and Wages: Findings from a Model with Fixed Effects. *American Sociological Review*, vol. 53, pp. 544-558.

Eurobarometer (2006): Mobility in Europe. European Foundation for the Improvement of Living and Working Conditions. Office for Official Publications of the European Communities, Luxembourg.

Evans, A. W. (1990): The assumption of equilibrium, the analysis of migration and interregional differences: a review of some recent research. Journal of Regional Science, 30, 515–531.

Evers, G.H.M. (1990): The residential location and workplace choice: a nested multinomial logit model. In Fischer M.M., Nijkamp P. & Papageorgiou Y.Y. (eds.) Spatial Choices and Processes. Elsevier Science B.V., 313–329.

Glaeser E. (2000): The New Economics of Urban and Regional Growth. Oxford handbook of economic geography, (ed.) Gordon C., Meric G., Feldman M. Oxford: Oxford University Press.

Glaeser, E. and Saiz, A. (2004) The Rise of the Skilled City. Brookings-Wharton Papers on Urban Affairs, pp. 47-94

Grant, E. K. and Vanderkamp, J. (1980): The Effects of Migration on Income: A Micro Study with Canadian Data 1965-1971, *Canadian Journal of Economics*, 13, pp. 381-406.

Green, A.E. (1997): A Question of Compromise? Case Study Evidence on the Location and Mobility Strategies of Dual Career Households. Regional Studies 31, 641–657.

Green, A. E., Hogarth, T. and Shackleton, R. E. (1999) Longer Distance Commuting as a Substitute for Migration in Britain: A Review of Trends, Issues and Implications. International Journal of Population Geography, 5, 49-67.

Greenwood, M. (1997): Internal Migration in Developed Countries. In Rosenzweig M.R. & Stark O. (eds.) Handbook of Population and Family Economics. Elsevier Science B.V., 647–720.

Haapanen M. (1998) *Internal Migration and Labour Market Transitions of Unemployed Workers*. Government Institute for Economic Research, Helsinki.

Haapanen, M. (2003): Studies on the determinants of migration and spatial concentration of labour. Jyväskylä Studies in Business and Economics, University of Jyväskylä. Doctoral Dissertation.

Haapanen M., Ritsilä J.,2001, *Can migration decisions be affected by income taxation policies?*, University of Jyväskylä, School of Business and Economics, Working Paper No. 238.

Hacker R. S. (2000) Mobility and Regional Economic Downturns, Journal of Regional Science 40, 1, pp. 45-65.

Halfacree, K. H. (1995): Household migration and the structuration of patriarchy: evidence from the USA, *Progress in Human Geography*, 19, 2, pp. 159-182.

Hanell,T., Aalbu,H. and Neubauer,J (2002) *Regional Development in the Nordic Countries 2002*, Nordregio Report 2002:2.

Hazans, M. (2004) Does Commuting Reduce Wage Disparities? Growth and Change 35, 3, 360-390.

Herzog, H.W.Jr., Schlottmann, A.M. & Boehm, T.P. (1993): Migration as Spatial Job-search: A Survey of Empirical Findings. Regional Studies 27, 327–340.

Holmlund B. (1984) *Labor Mobility: Studies of Labor Turnover and Migration in the Swedish Labor Market*. The Industrial Institute for Economic and Social Research, Stockholm.

Hämäläinen K. & Böckerman P. 2004. Regional Labour Market Dynamics, Housing and Migration. Journal of Regional Science, 44, 3, 543-568.

Jolkkonen, A. & Koistinen, P. (2001): Travel-to-work distances have become longer in urban areas (Työmatkat pidentyneet kaupunkiseuduilla). Kuntapuntari 1/2001, 13–20. (in Finnish)

Kaartovaara, L. and Sauli, H. (2000): *Finnish Child*. Statistics Finland, Väestö 2000:7.

Kangasharju, A., Kataja, J-P. & Vihriälä, V. (1999): Is there a need for regional policy? (Tarvitaanko aluepolitiikkaa?) Working paper 18. Pellervo economic research institute, Helsinki. (in Finnish).

Kauhanen, M. and Tervo, H. (2002): Who moves to depressed regions? An analysis of migration streams in Finland in the 1990s. *International Regional Science Review*, 25, 2, pp. 200-218.

Krugman, P.R. (1991): Increasing returns and economic geography, Journal of Political Economy, 99, 483-499.

Lichter D. (1980) Household Migration and the Labour Market Position of Married Women. *Social Science Research*, vol. 9, pp. 83-97.

Long L. H. (1974) Women's Labour Force Participation and the Residential Mobility of Families. *Social Forces*, vol. 52, pp. 342-348.

Maxwell, N. L. (1988): "Economic Returns to Migration: Marital Status and Gender Differences", Social Science Quarterly, 69, pp. 108-121.

McQuaid, R., Greig, M. & Adams, J. (2001): Unemployment Job Seeker Attitudes Towards Potential Travel-to-Work Times. Growth and Change 32 (1), 355–368.

Mills, E.S. (1967): An Aggregate Model of Economic Activity in an Urban Area. American Economic Review 57, 197–210.

Mincer, J. (1978): Family Migration Decisions. Journal of Political Economy, vol. 86, pp. 749–773.

Molho, I. (1986): Theories of Migration: a Review. Scottish Journal of Political Economy 33, 396–419.

Molho, I. (2001): Spatial Search, Migration and Regional Unemployment. Economica, 68, 269–283.

Montén, S. & Tuomala, J. (2003): Migration, commuting and labour resources in the Uusimaa-region (Muuttoliike, työssäkäynti ja työvoimavarat Uudellamaalla). VATT Research Reports 105. Government Institute for Economic Research, Helsinki, Finland (in Finnish).

Morrison, D. and Lichter, D. (1988): Family Migration and Female Employment: The Problem of Under-employment Among Migrant Married Women. *Journal of Marriage and the Family*, vol. 50, pp. 161-172.

Muth, R. (1969): Cities and Housing: The Spatial Pattern of Urban Residential Land Use. Chicago, University of Chicago Press.

Myrdal, G. (1957): Economic Theory and Under-Developed Regions. Duckworth, London.

Myrskylä P. (2006) Migration and labour markets (Muuttoliike ja työmarkkinat). Työpoliittinen tutkimus 321. Työministeriö, Helsinki (in Finnish)

Nivalainen, S. (2003): *Who move to rural areas? Micro evidence from Finland.* Paper presented in ERSA-congress 2003 in Jyväskylä, Finland. A Finnish version published as: Nivalainen, S. (2002) Maallemuuttajat – millaisia he ovat? Pellervo Economic Research Institute Working Papers N:o 59.

Nivalainen S.& Haapanen M.(2002) *Ageing and centralizing Finland: population development in urban and rural areas, 1975-2030* (In Finnish), Aluekeskus- ja kaupunkipolitiikan yhteistyöryhmän julkaisuja 1/02.

Nivalainen, S. & Volk, R. (2004): Regional population development until 2030 and factors affecting it (Alueellinen väestökehitys vuoteen 2030 ja siihen vaikuttavat tekijät). In Kautto M. 2004. Regional population development and renewal need for the policy (Alueellinen väestökehitys ja politiikan uudistamistarpeet). Tulevaisuusselonteon liiteraportti 2. Valtioneuvoston kanslian julkaisusarja 30/2004 (in Finnish).

Ottaviano, G. I. P. & Pinelli, D. (2004): The challenge of globalization for Finland and its regions: The new economic geography perspective. Prime Minister's Office: Publications 24/2004.

Palomaki, M. (1991): Units of Settlement Systems and Postwar Urbanization in Finland. Teoksessa: Bannon, M. J., Bourne, L. S. ja Sinclair, R. (toim.): *Urbanization and Urban Development. Recent Trends in a Global Context.* Service Industries Research Centre, Department of Regional and Urban Planning, University College, Dublin, Ireland.

Palttila, Y. ja Niemi, E. (2003) Rural areas in the beginning of the EU-programme period 2000-2006- Rural indicators (Maaseutu EU-ohjelmakauden 2000-2006 alussa – Maaseutuindikaattorit.) Katsauksia 2, Tilastokeskus (in Finnish).

Pekkala, S. (2000): Regional Convergence and Migration in Finland 1960-1995. Jyväskylä Studies in Business and Economics, University of Jyväskylä. Doctoral Dissertation.

Pekkala, S. & Tervo, H. (2002): Unemployment and migration: Does moving help? The Scandinavian Journal of Economics 104, 4: 621–639.

Polachek, S. and Horvath, F. (1977): "A Life-Cycle Approach to Migration". In R. Ehrenberg (ed.): *Research in Labor Economics*, Greenwithc, Conn. JAI Press.

Prime Minister's Office (2000): Regional development and regional policy in Finland (Alueellinen kehitys ja aluepolitiikka Suomessa). Työ-

ryhmäraportti, Valtioneuvoston kanslia, Talousneuvosto, Valtioneuvoston kanslian julkaisusarja 2000/6 (in Finnish).

PTT Economic Forecast 1/2002. Pellervo Economic Research Institute.

Ravenstein E. G. (1889) The Laws of Migration. *Journal of the Royal Statistical Society*, vol. 52, pp. 214-301.

Ritsilä, J. (2001): Studies on the spatial concentration of human capital. Jyväskylä Studies in Business and Economics, University of Jyväskylä. Doctoral Dissertation.

Ritsilä, J. and Tervo, H. (1999): Regional differences in the Role of Migration in Labour-Market Adjustment: The Case of Finland. In Crampton, G. (Ed.) *Regional Unemployment, Job Matching and Migration, Series of European Research in Regional Science*, 9, London, Pion, pp. 166-182.

Romaní, J., Suriñach, J. & Artís, M. (2003): Are Commuting and Residential Mobility Decisions Simultaneous?: The case of Catalonia, Spain. Regional Studies 37 (8), 813–826.

Sandell, S. H. (1977): Women and the Economics of Family Migration. The Review of Economics and Statistics, vol. 59, pp. 406–414.

Shihadeh E. S. (1991) The Prevalence of Husband-Centered Migration: Employment Consequences for Married Mothers. *Journal of Marriage and the Family*, vol. 53, pp. 432-444.

Sjaastad, L. A. (1962): The Costs and Returns of Human Migration. In Richardson H. W. (ed.) Regional Economics. The University Press, Glasgow.

Solow, R. M. (1956): A Contribution to the Theory of Economic Growth. Quarterly Journal of Economics, vol. 70, pp. 65–94.

Statistics Finland, (1999a): *Families 1998*. Väestö 1999:12.

Statistics Finland, (1999b): *Vital Statistics*. Väestö 1999:14.

Statistics Finland, (2001): *Vital Statistics*. Väestö 2001:13.

Statistics Finland (2007): Finnish child 2007. Väestö 2007.

Swan, T. W. (1956): Economic Growth and Capital Accumulation. Economic Record, vol. 32, pp. 334–361.

Tervo, H. (2000a): Migration and labour market adjustment: empirical evidence from Finland 1985-90, *International Review of Applied Economics* 14, pp. 343-60.

Tervo, H. (2000b): Post-migratory Employment Prospects: Evidence from Finland. *Labour*, vol. 14, pp. 331-350.

Tiebout, C. M. (1956): A Pure Theory of Local Expenditures. Journal of Political Economy, 64, 416–24.

Van Dijk, J., Folmer, H., Herzog, H. W. Jr. and Schlottmann, A. M. (1989): Labor Market Institutions and the Efficiency of Interregional Migration: a Cross-nation Comparison. In Van Dijk, J., Folmer, H., Herzog, H. W. Jr. and Schlottmann, A. M. (eds.)

Migration and Labor Market Adjustment. Kluwer Academic, Dordrecht, pp. 61-83.

Van Ommeren, J.N., Rietveld, P. & Nijkamp, P. (1997): Commuting: In Search of Jobs and Residences. Journal of Urban Economics 42, 402–421.

Van Ommeren, J.N., Rietveld, P. & Nijkamp, P. (1998): Spatial Moving Behaviour of Two-Earner Households. Journal of Regional Science 38, 23–41.

Vartiainen P. (1978) Muuttoliiketutkimuksen nykytila ja kehityslinjat – kriittinen katsaus. *Terra,* vol. 90, pp. 153-161 (in Finnish).

Vartiainen, J. (2002): *Gender wage differentials in the Finnish labour market*. Labour Institute for Economic Research Working Papers 179.

Zelinsky, W (1971) The hypothesis of the mobility transition. *The Geographical Review* LX1, 219-249.

CHAPTER 2

Determinants of Family Migration: Short moves vs. Long moves[*]

Satu Nivalainen

Abstract. This paper examines factors underlying family migration. Based on a sample of stable Finnish families, both short- and long-distance migration is investigated. The empirical analysis carried out using multinomial logit modelling shows a strong negative association between the family life-cycle and migration. The findings indicate that migration takes place mainly due to the demands of the husband's career, resulting in the wives being tied migrants. Two-earner families are less migratory, and in that sense the husbands are tied stayers. Distance matters; several differences are noticed between short- and long-distance migrants.

---

1. Introduction

Migration can be defined as the movement of a population from one geographical area to another. In fact, mobility has always been one of the fundamental characteristics of the human species. However, while unattached people are free to move, family relations may restrict the mobility of family members. Hence, the factors underlying migration are likely to differ between attached and unattached people. Therefore, the present study examines the determinants of family out-migration in Finland. A family as defined here consists of two married or cohabiting adults of opposite sexes, with or without children. As the motives underlying different types of moves are likely to vary, a distinction is made between short- and long-distance migration. Short moves occur between municipalities but within a province, whereas long moves are made between provinces[i].

During the last few years, the rate of migration in Finland has risen rapidly in conjunction with the continuing urbanisation of the country. As a consequence, increasing interest has been shown in migration research. In spite of this, micro-economic analyses of migration have been in short supply in Finland. Migration at the micro-economic level has recently been researched (see Tervo 1997, Laakso 1998, Ritsilä and Tervo 1999, Ritsilä 2001, Haapanen 2002, Pekkala 2002), but these studies have concentrated on individual persons or workers. Family migration has not been investigated, even though families account for about 80% of the Finnish population (Statistics Finland 1995b). Furthermore, earlier studies have mainly investigated long-distance migration, and have not dealt in particular with short moves.

Earlier Finnish research has shown that the most eager migrant is an unmarried, educated, young adult (Korkiasaari 1991, Tervo 1997, Laakso 1998, Ritsilä and Tervo 1999). It has been noted that family status and children affect migration propensities (Laakso 1998, Haapanen 1998), and that the likelihood of moving decreases with the size of the household (Tervo 1997, Ritsilä and Tervo 1999). Longer moves seem to take place mainly for job-related reasons, whereas housing and family matters are more important in shorter moves (Korkiasaari 1991).

Migration is directed towards a few large towns located mainly in southern Finland (Laakso 1998), and in-migration has become highly

focused on urban areas, with even middle-sized towns experiencing negative net migration (Vartiainen 1997). Evidence shows that the migration process in Finland has the feature of cumulative causation (Tervo 1997, Ritsilä and Tervo 1999), which may lead to increasing disparities between areas. As in many European countries, the trend in Finland seems to be towards a greater concentration of the population and economic activity.

The aim of the present study is to answer two questions. First, what are the factors underlying family migration? Specifically, are the family life-cycle and family ties important in migration decisions? And second, are there any differences between the determinants of short- and long-distance migration? The study uses unique family data containing all the relevant characteristics of both spouses. The empirical analysis is carried out with multinomial logit models. The results show that, in Finland, young educated families are the most eager to move, and that there is a strong negative association between the family life-cycle and migration. The evidence indicates that more weight is given to the husband's career and, consequently, that wives are the tied parties in family migration. At the same time, two-earner families are less migratory, and in that sense the husbands of working wives are tied to certain locations. Moreover, there are differences between short- and long-distance migration, and these relate to both individual and regional characteristics.

The remainder of the paper is organised so that the second section introduces the theoretical background and provides a short review of earlier research relevant to the objectives of this study. The data, model and variables used are presented in the third section. Section four discusses the empirical findings and section five concludes the study.

2. Theoretical framework

The theory of family migration introduced here draws mainly on Mincer (1978), who uses Sjaastad's (1962) human capital framework as a starting point. The framework suggests that by devoting time to activities whose benefits accrue in the future, individuals are making investments in their human resources. Education and training are examples of such

investments; migration can also be regarded as an investment in human capital.

As families aim at maximising their total lifetime utility, those facing a migration decision have to evaluate the profitability of this investment. In the human capital setting, this is done by comparing the difference in returns and costs that arise as a consequence of migration. The returns may include a higher income in the destination, or a more pleasant environment (social or physical), or some other non-monetary gains. In addition to the direct expenses of moving [2], costs may derive from the psychological difficulties of changing one's environment and from uncertainty. Despite their potentially great importance to some migrants, the non-monetary components are, for simplicity, commonly excluded from the basic framework.

Thus, when a family is deciding whether to move or not, net family gain from moving from location i to j is assessed. That is, the family weighs up the present value of expected changes in future family income, net of the discounted migration costs. The net family gain from relocation is the sum of the personal net gains of the family members. Migration takes place only if this sum is greater than zero, i.e. if the family's utility increases as a result of moving. From the set of J possible locations, the family chooses the one that maximises the gains of the family as a whole.

The complexity of the migration decision becomes clear as soon as one realizes that net gains may differ between the spouses. Firstly, the signs may differ. If one spouse moves together with the other, even if s/he would be better off in the current location, s/he becomes a tied mover. Conversely, if one spouse's potential loss exceeds the potential gain of the other, the family will not move and the result is a family with one tied stayer. Secondly, even if both spouses stand to benefit from moving, the destination that maximizes the wife's gain need not to be the same as that one which maximizes the husband's. This may result in the family not moving, or moving to a destination where neither of the spouses' personal gains is maximized but where the sum of both is greatest. In this sense both spouses can be tied stayers or movers. However, in this case, too, one spouse can suffer more than the other.

2.1 The family life-cycle and other determinants of migration

A variety of factors affect migration. Among these are individual-specific characteristics such as age, education, accumulated job skills, earnings, unemployment experience, and migration history (see Greenwood 1985, for a survey; see also DaVanzo 1978, Tervo 1997, Ritsilä and Tervo 1999). In addition, several studies have demonstrated the importance of family relations. According to Rossi (1955), migration that takes place due to life-cycle changes constitutes an important part of all geographic mobility. In addition, age variations in migration rates are shown to reflect the effect of both work careers and life-cycle stages (Carter and Glick 1970, Sandefur and Scott 1981).

The family life-cycle has conventionally been divided into several phases (see Grundy 1992), and the highest probability of moving is associated with the beginning of married life and the arrival of children. After a more stable phase, mobility again increases while the children are still at a pre-school age. There tends to be greater stability when the children are at school and the parents are consolidating their careers (Sandell 1977, Mincer 1978). Mobility often increases again when the children leave home and less living space is required (Cadwallader 1992).

With regard to family ties, a nearly unanimous finding is that families migrate in response to economic motivations on the part of the husband (Duncan and Perrucci 1976, Long 1974, Snaith 1990, Shihadeh 1991, Battu et al. 1998, Gardner et al. 2001), and that the wife's employment considerations are of minor importance in migration decisions (Bielby and Bielby 1992). On the other hand, families with working wives have been shown to be less migration-prone (Long 1974, Sandell 1977, Mincer 1978, Lichter 1980, Holmlund 1984).

The characteristics of the origin and destination regions, such as wage differentials, job opportunities, unemployment rates, the region's economic structure, conditions in housing markets and location-specific amenities (unpolluted environment, climate, landscape etc.) may also provide an incentive for moving (see Greenwood 1985, for a survey). Concerning the distance over which relocation occurs, stronger ties to the current location (children at school, contacts with friends and relatives, home-ownership etc.) have been shown to discourage long-distance migration (Holmlund 1984, Westerlund and Wyzan 1995, Antolin and

Bover 1997, Gardner et al. 2001). Location-specific human capital (job experience) also tends to inhibit long moves, while a higher amount of general human capital (education) improves the ability to move over longer distances (see, for example, Holmlund 1984, Shields and Shields 1993, Westerlund 1993). Regional characteristics, in turn, seem to play a more important part in short moves. For example, the size and diversity of the current location, cost-of-living differentials, local unemployment and public sector attributes are evidenced to contribute to residential choices (Widerstedt 1998, Westerlund and Wyzan 1995, Dahlberg and Fredriksson 2001).

3. Data, model and variables

3.1 Data

The data are from the longitudinal census file of Statistics Finland, which contains information collected in population and housing censuses, completed with information from various official registers. Consequently, the data offer rich information on the Finnish population, and cover the years 1970, 1975, 1980, 1985 and 1987-96. This large data set contains information on individuals' characteristics (for example education, occupation, socioeconomic status, economic activity, income) as well as on individuals' family relations (for example type and size of family, number and ages of children). Of especial interest for the purposes of this study is that all the persons belonging to same family can be identified[3]. Another virtue is that all the characteristics of both spouses can be observed. A drawback, however, is that there is no information on the motives for migration or on its specific destination. Moreover, the data only indicate the province of residence at the end of year, and whether or not the person moved between municipalities during the year. Hence, the specific timing of migration cannot be observed.

A basic sample[4] was drawn from the census file containing information on over 600 000 individuals. The data used in this study are a stratified subset of this sample. First, only adults belonging to two-adult families in 1990[5] were selected. Second, to obtain the family as an observation unit,

men and women belonging to same family were merged. In order to focus on economically active families, the sample was restricted to families where the husband was in the labour force at the end of 1993. To avoid cases of elderly spouses unable to migrate for medical reasons, only families in which the husband was under 63 years of age in 1994 were selected.

As the interest here is in husband-wife migration, only 'permanent' two-adult families were selected, i.e. the sample was restricted to cases where the man and woman had been living together in the same household during each of the years 1990-1995. This means that every family in the data had been a family for at least three years before the move and remained a family for at least one year after the move[6]. In addition, families migrating from and to abroad were excluded from the analysis. After these restrictions the final sample consisted of 77 340 families[7] of whom 1 747 had moved during 1994.

As expected, the migration rates calculated from the data are below the actual figures[8] for the population as a whole. Firstly, we are investigating families, not individuals. Families in general are less prone to migrate than single individuals. Secondly, among families we are restricting ourselves to a subset with certain characteristics. Young families (i.e. those starting their married or cohabiting lives), who often are quite migration-prone, are not included in the data. Moreover, a particularly mobile group, students, constitutes only a small minority in the sample. Taking into account all these restrictions the small number of migrants is, in fact, quite reasonable.

3.2 Model and variables

In the present study, the choice of the family relates to the question of whether to remain in the current location, migrate between municipalities inside the current province[9] (short-distance migration), or migrate to another province[10] (long-distance migration). Even though this distinction is not ideal, it is typical of empirical work on this topic (see, for example, Widerstedt 1998, Westerlund and Wyzan 1995, Shields and Shields 1993). Migration only refers to joint moves by the two spouses, and the rest of

the province/country is treated as a single destination for migrants from a given municipality/province.

As Finnish provinces are comparatively large, long-distance migration most likely means a change of local labour market and a change of job[11]. With short-distance moves, the labour market usually does not change, and although a change of job is possible, short moves are more likely to be associated with housing needs and family reasons (for Finnish evidence, see Korkiasaari 1991; see also Lansing and Mueller 1967, Reitsma and Vergoosen 1988).

The probability of family migration is a function of family and regional variables, and the multinomial logit model[12] is utilized in exploring the effect of these variables on migration. The use of this model requires the Independence of Irrelevant Alternatives (IIA) condition to hold, which means that the ratio of any two alternatives may not be influenced by any other alternative. This was checked with a test developed by Hausman and McFadden (1984), and the IIA condition was found to hold[13] (see Table 3). In addition, the appropriateness of the distinction between short- and long-distance migration was checked with a pooling test described in Cramer and Ridder (1991)[14], according to which these two migration classes cannot be pooled (see Table 3).

Variables used in the analyses are described in Table 1 and categorical means are presented in Table 2. Except for the variables relating to age, children and migration history, all independent variables are measured in 1993 (i.e. before migration).

Family migration studies have traditionally only concentrated on the husband's age, which mainly reflects the effect of his work career on migration. However, the age of the wife is also important, as it is closely associated with stages in the life-cycle of the family. Therefore, the present study utilizes the average age of the spouses, and examines age in terms of age groups. Earlier studies have investigated the effect of school-aged children, but the present study goes a bit further as families are separated into several groups on the basis of children. These groups correspond to the stages in the family life-cycle.

In principle, at least five life-cycle stages can be identified. The first stage ends with the arrival of the first dependant. Stage two lasts until one dependant reaches school age. Stage three includes couples with two or more dependants, where the ages are mixed (i.e. pre-school age and school age children). Stage four includes couples with school-aged children only.

The final stage begins when the last dependant living at home reaches the age of eighteen. Due to limitations of the data, the first and last stage could not be distinguished, thus four stages are actually used. Moreover, the existence and ages of children are, as an exception, measured in 1995, a year after the move[15], but this is unlikely to affect the results.

Family ties are investigated through the variables describing education of the spouses and participation in the labour force of the wife. The remaining variables are selected on theoretical grounds and/or on the basis of their significance in earlier migration studies.

A number of empirical studies suggest that the determinants of migration differ with respect to the distance moved (see, for example, Holmlund 1984, Molho 1986, Reitsma and Vergoosen 1988, Widerstedt 1998). Expected effects of independent variables in short and long moves are shown in Table 1. As regards personal or family characteristics, higher education is expected to boost the likelihood of long moves. The process of schooling expands an individual's general human capital, which is easily transferable to distant locations. Moreover, those with higher education often have narrower career opportunities in certain locations and moving may be the only way to develop their career. In turn, specific human capital resulting from job experience and training is usually tied to a certain workplace. As this form of human capital tends to accumulate with age, older individuals should be more resistant to longer moves. The shorter time interval to enjoy the benefits together with higher costs of moving also tend to reduce older people's incentives for migration.

Table 1. *Definitions of the variables and the expected effects of the independent variables*

VARIABLE	EXPECTED EFFECT		DEFINITION
DEPENDENT VARIABLE			
MIGRATION			1 if the municipality changed during 1994 but the province remained the same, 2 if the province changed during 1994, 0 otherwise
INDEPENDENT VARIABLES	**SHORT DIST.**	**LONG DIST.**	
AGE	- / - / -	- - / - - / - -	Dummy variables designating the average age of the spouses in 1994: up to 35 (ref.); 35-44; 45-54; 55 upwards
CHILDREN	?/ - / -	- / - / -	Dummy variables indicating the existence of children in 1995: no children under 18 (ref.); children under 7 years only; children 0-17 years; children 7-17 years only.
HUSBAND'S EDUCATION	+ / +	+ / ++	Dummy variables indicating whether the husband has less than upper level of upper secondary education (ref.); upper level of upper secondary education; higher education
WIFE'S EDUCATION	+	+ +	1 if the wife has higher than upper level of upper secondary education; otherwise 0
WIFE'S LABOUR FORCE PARTICIPATION	-	- -	1 if the wife participates in the labour force; otherwise 0
MIGRATION HISTORY 1990- 1993	+	+	1 if the family changed municipalities at least once during 1990-1993; otherwise 0
IN-MIGRATION IN 1993	++	+	1 if the family moved into the province in 1993; otherwise 0
HOME OWNERSHIP	-	-	1 if the family owns their own home; otherwise 0
FAMILY INCOME	?	-	Husband's and wife's income subject to state taxation/FIM 1000
COMMUTING	+ +	+	1 if the husband and/or the wife were commuters in 1993; otherwise 0
UNEMPLOYMENT EXPERIENCE	+	++	1 if the husband and/or the wife were unemployed (over 2 weeks) during 1993; otherwise 0
AREA UNEMPLOYMENT RATE	+	++	Unemployment rate in the travel-to-work area where the family lives
SIZE OF MUNICIPALITY	? / ? / +	? / ? / -	Dummy variables indicating the number of inhabitants in the municipality: up to 15 000; 15-39 999; 40-69 999 (ref.); 70 000 and above
SHARE OF AGRICULTURE	-	+	The share of employed labour force in agriculture and forestry (0-9.99% =0,..., 90-100% = 9)
SHARE OF INDUSTRY	?	+	The share of employed labour force in industry (0-9.99% =0,..., 90-100% = 9)

Notes: (1) all variables are measured in 1993 if not otherwise stated (2) + = positive effect, + + = stronger positive effect, - = negative effect, - - = stronger negative effect, ? = positive or negative effect (3) (ref.) indicates the reference group (4) all regional variables refer to the region of origin.

Table 2. Means of the independent variables according to migration category

VARIABLES	STAYERS	SHORT-DISTANCE MIGRANTS	LONG-DISTANCE MIGRANTS
FAMILY CHARACTERISTICS	Mean	Mean	Mean
AGE			
- 35 YEARS	0.27	0.56	0.51
35 – 44	0.46	0.33	0.34
45 – 54	0.22	0.09	0.11
55 -	0.05	0.02	0.04
CHILDREN			
NO CHILDREN UNDER 18 YEARS	0.30	0.24	0.24
ALL UNDER 7 YEARS	0.17	0.40	0.37
0 – 17 YEARS	0.17	0.19	0.20
ALL 7 – 17 YEARS	0.36	0.17	0.19
HUSBAND'S EDUCATION			
LOWER THAN UPP. LEV. OF UPP.SEC.	0.67	0.57	0.49
UPPER LEVEL OF UPPER SECONDARY	0.17	0.22	0.17
HIGHER	0.16	0.21	0.34
WIFE HAS HIGHER EDUCATION	0.16	0.19	0.22
WIFE IN THE LABOUR FORCE	0.84	0.76	0.67
MIGRATED 1990 – 1993	0.07	0.26	0.30
MIGRATED INTO PROVINCE 1993	0.01	0.04	0.08
HOME OWNER	0.84	0.58	0.57
FAMILY INCOME/FIM 1000	217	215	202
COMMUTING	0.34	0.51	0.41
UNEMPLOYMENT EXPERIENCE	0.35	0.45	0.53
REGIONAL CHARACTERISTICS			
AREA UNEMPLOYMENT RATE	22.5	21.3	22.5
SIZE OF MUNICIPALITY			
- 15 000	0.40	0.28	0.35
15 000 - 39 999	0.26	0.27	0.23
40 000 – 69 999	0.06	0.04	0.09
70 000 -	0.28	0.41	0.33
SHARE OF AGRICULTURE	0.58	0.34	0.46
SHARE OF INDUSTRY	2.18	2.04	2.21
NUMBER OF OBSERVATIONS	75 593	1 176	571

A negative association is expected between family income and long-distance migration: the lower the family income, the lower the opportunity costs of moving and the larger the number of attractive job offers. In short moves the effect of income is less evident, and could be positive or negative. A number of empirical studies show that personal (or family) unemployment augments migration (see, for example, DaVanzo 1978, Schlottmann and Herzog 1981, Van Dijk et al. 1989, Ritsilä and Tervo 1999). The unemployed, most likely, move for labour market reasons, and therefore the probability of long-distance migration should be higher for them.

Short moves are often related to life-cycle events: by moving, families adjust to their changing needs. Due to larger moving costs, families with children are generally less eager to move, but the need for a larger house or the prospective schooling of children might accelerate short-distance mobility when the children are at preschool age[16]. When children are at school, locational ties are stronger, and migration is less likely to occur. Ties to the current locality are also stronger in families where both spouses work (see Mincer 1978, Lichter 1980, Holmlund 1984). Thus the wife's labour force participation is expected to deter migration, and this effect should be accentuated in long moves.

The distance to work influences migration decisions (see Clark and Burt 1980), and therefore commuters should be more prone to short moves. Prior mobility is also an important determinant of migration (Krumm and Kelly 1988, Widerstedt 1998, Böheim and Taylor 2000), and several studies have concluded that the longer is the distance of the original move, the higher is the likelihood of a subsequent (adjustment) move (see, for example, DaVanzo 1983, Yezer and Thurston 1976). Hence the probability of short-distance mobility might be augmented shortly after the family has moved into the province, since the final municipality of residence is not necessarily chosen at the time of in-migration, but only after the location has become familiar enough.

With regard to regional characteristics, a high area unemployment rate is thought to reflect diminished labour market opportunities. Therefore, the likelihood of moving, especially over longer distances, is expected to increase with the unemployment rate. Inhabitation in larger cities with more varied economic structures and more opportunities for employment should prevent long-distance migration. However, at a certain stage of life families tend to prefer more peaceful neighbourhoods within a reasonable

commuting distance (Green 1997). As the largest centres are surrounded by closely situated smaller municipalities with varying characteristics (differences in costs of living, tax rates, public services etc.), families living in the biggest towns are expected to have a higher likelihood of short moves. In the countryside, job opportunities are fewer, distances are longer and commuting between municipalities is relatively limited. Therefore, the higher the share of agriculture, the more likely long-distance migration should be in relation to short moves.

4. Results

The results[17] of the basic model (model 1) are presented in Table 3. Since interpretation of the estimated parameters of the multinomial logit model would be difficult, marginal effects are reported. The parameter estimates and odds-ratios are presented in the Appendix (Table 1).

When using both macro- and micro-level variables in the study of micro-units, the random disturbances within groups may be correlated, and doubt has been cast on the reliability of such results (see Moulton 1990). To avoid this pitfall, the standard errors of the models were adjusted for the general correlation of disturbances[18]. Even though no large changes emerged in relation to the unadjusted models[19], the results presented here refer to adjusted models.

In general, the results show that almost all the coefficients are statistically significant and have the expected signs, and are thus in accordance with the theory and earlier empirical findings. Looking at the figures one notices that the marginal effects are relatively small, which stems from the small number of migrants. Therefore, it is not so much the magnitude, but rather the signs that we are interested in.

Table 3. *Determinants of family migration; marginal effects of the multinomial logit model (model 1)*

VARIABLES	STAYING		SHORT-DISTANCE MIGRATION		LONG-DISTANCE MIGRATION	
	Marginal effect	t-ratio	Marginal effect	t-ratio	Marginal effect	t-ratio
FAMILY CHARACTERISTICS						
AGE						
35 – 44	0.00571***	6.38	-0.00432***	-5.96	-0.00140***	-2.76
45 – 54	0.01286***	9.51	-0.01020***	-8.85	-0.00267***	-3.54
55 -	0.01224***	5.41	-0.01053***	-5.39	-0.00171	-1.50
CHILDREN						
ALL UNDER 7 Y.	-0.00054	-0.50	0.00024	0.28	0.00030	0.48
0 – 17 YEARS	0.00549***	4.78	-0.00412***	-4.37	-0.00137**	-2.12
ALL 7 – 17 Y.	0.00888***	8.10	-0.00680***	-7.33	-0.00208***	-3.35
HUSBAND'S ED. *UPPER LEV.*						
OF UPP. SEC.	-0.00287***	-3.10	0.00160**	2.21	0.00127**	2.29
HIGHER	-0.00589***	-5.92	0.00130	1.62	0.00459***	8.86
WIFE HAS HIGHER EDUCATION	-0.00096	-1.00	0.00033	0.42	0.00064	1.23
WIFE IN THE LABOUR FORCE	0.00465***	5.58	-0.00203***	-2.98	-0.00262***	-5.82
MIGRATED 1990-1993	-0.00975***	-10.04	0.00619***	8.26	0.00356***	6.54
MIGRATED INTO PROVINCE 1993	-0.01178***	- 5.80	0.00654***	3.96	0.00525***	5.62
HOME OWNER	0.01290***	16.41	-0.00868***	-13.98	-0.00422***	-9.37
FAMILY INCOME	-6.2E-07	-0.19	3.8E-06**	2.18	-3.2E-06	-1.17
COMMUTING	-0.00820***	-10.82	0.00630***	10.44	0.00190***	4.31
UNEMPL. EXPERIENCE	-0.00611***	-8.42	0.00340***	5.89	0.00271***	6.49
REGIONAL CHARACTERISTICS						
AREA UNEMPL. RATE	0.00023**	2.35	-0.00034***	-4.28	0.00011**	2.02
SIZE OF MUNICIPALITY						
-15 000	0.00108	0.58	0.00208	1.24	-0.00316***	-3.59
15 000 - 39 999	0.00029	0.17	0.00312**	2.01	-0.00341***	-4.34
70 000 -	-0.00303*	-1.74	0.00456***	2.94	-0.00153**	-1.98
SHARE OF AGRICULTURE	0.00104	1.58	-0.00131**	-2.41	0.00027	0.72
SHARE OF INDUSTRY	0.00004	0.09	-0.00067*	-1.72	0.00062**	2.48

Number of observations	77 340	Number of migrants	1 747	
Log likelihood	-8 435.14	Restricted log likelihood	-9 452.76	
Model: χ^2 (44)	2 404.2	Likelihood ratio index	0.11	
Pooling: χ^2 (22)	168.2[a]	*, **, *** significant at the 10, 5, 1% level		
IIA: χ^2 (23)	23.2[a]	[a] test values refer to unadjusted model		

4.1 Determinants of family migration

The family life cycle influences migration. Children, in general, have an inhibiting effect (result not shown here), but families with only under seven-year-old children are as migration prone as those without children. The presence of school-aged children significantly reduces migration propensities (cf. Long 1974, Sandell 1977, Mincer 1978). On the other hand, there are differences in migration propensities between families with school-aged children, too: the older the children, the less likely the family to move.

As expected, the younger the spouses, the more prone they are to move. The difference between the youngest and oldest age group is insignificant in longer moves, though. In addition, the age variables become stronger when the children variables are removed from the analysis (result not shown here), which implies that the ages of parents also partly reflect the stages of the family life-cycle.

The probability of long-distance migration increases with the husband's education (cf. Sandell 1977, Mincer 1978), and short-distance migration is most likely to occur when the husband has completed the upper level of upper secondary education. Surprisingly, the wife's education appears to be an insignificant, although positive, determinant of family migration. This corroborates Lichter (1982) and Axelsson and Westerlund (1998), but differs from the findings of Holmlund (1984) and Shields and Shields (1993), who found the wife's education to significantly increase migration propensities.

Contradictory results in separate studies concerning the effect of the wife's education might reflect problems with collinearity, i.e. a correlation between spouses' education due to assortative mating. In our sample the correlation between the educational level of the spouses is about 0.4 (significant at the 0.01 level). In a sample this large, significance is not surprising. A closer inspection reveals that among long-distance migrants both spouses have a high educational level in 15% of the cases. In turn, the husband alone is highly educated in as many as 18% of long-distance migrant families, while the respective figure for the wives is only 7%. This compares with 10/11/9 for short-distance migrants and to 8/9/8 for non-migrants. Thus, while long-distance migrants are more often highly educated, the difference between spouses' education also tends to be much

larger. In this sense, selective mating does not appear to be a major problem.

Hence, the result suggests that family migration is more often associated with the development of the husband's career. Even if this implication is consistent with many previous studies (see, for example, Long 1974, Shihadeh 1991), it is a little surprising in Finland, where men and women are more equal and women even tend to be more highly educated[20] than men. On the other hand, a rationale underlying men's domination might be the gender wage gap: despite theoretical gender equality, Finnish men still earn more than women, and might have more weight in migration decisions due to their higher earnings capacity[21].

To further examine the husband-wife relations in migration decisions, a measure of intra-family income dispersion was formed[22]. Model 1 was then re-run with this variable (and excluding the wife's characteristics). The income dispersion is positive in all moves, but significant only in long ones (see Appendix, Table 2). As the husband's income is higher in 75% of the sample families, in practice this means that families with a larger husband/wife income ratio tend to be more inclined towards long-distance migration.

Participation of the wife in the labour force reduces the likelihood of moving. Hence two-earner families are less eager to move (cf. Long 1974, Sandell 1977, Mincer 1978, Lichter 1980). In addition, the deterrent effect of the wife's work increases with distance, with the odds for short and long moves (vs. staying) of 0.80 and 0.56, respectively. The negative association between the wife's participation in the labour force and family migration suggests that the husbands of working wives tend to be tied to certain locations.

As hypothesized, the experience of unemployment boosts long-distance migration (on Finland, see Ritsilä and Tervo 1999; see also DaVanzo 1978, Herzog and Schlottmann 1984, Hughes and McCormick 1989). On the other hand, the positive effect of personal unemployment on shorter moves differs somewhat from findings in other countries (cf. DaVanzo 1978, Westerlund 1993), and is most probably explained by the large size of Finnish provinces.

In line with earlier studies (Tervo 1997, Ritsilä and Tervo 1999, Widerstedt 1998), the variable indicating migration history is positive, and suggests that previous migration experience facilitates migration and encourages families to move again. Recent in-migration also increases

migration probabilities, thus lending support to the existence of imperfect information and unpleasant surprises. Disappointment at the outcome of one move may become the cause of the next.

On the other hand, the effect of migration history may also reflect unobserved heterogeneity, which means that certain individuals are migrants because of their (unobserved) personal characteristics, and therefore move more often than others. This being the case, previous migration per se does not have any effect on subsequent migration propensities, but appears to be a significant determinant of migration simply because it serves as a proxy for the unmeasured variables. The literature often refers to "true state dependence" and to "spurious state dependence" (for further discussion see Heckman 1981, Hsiao 1986, Baltagi 1995).

Homeowners are less likely to move (cf. Haapanen 1998, Ritsilä 2001). They may have stronger locational ties, but the finding may also reflect higher transaction costs for owner-occupants; even though in 1994 Finland started to recover from the recession, considerable difficulties in selling properties at reasonable prices continued to exist. As expected, commuters are migration-prone. Family income seems to play no part in long-distance migration, but it is positively related to short moves. At a certain stage of life, families often want to move to more congenial neighbourhoods away from city centres.

Families living in middle-sized towns are the most eager to undertake long moves, and the likelihood of short moves is greatest in the biggest towns. The probability of long-distance migration increases with the share of labour force working in industry, which is in line with a recently observed development; one-sided industrial regions are losing population in Finland (see Vartiainen 1997, Laakso 1998). The effect on short moves is the opposite. As distinct from earlier Finnish findings (Tervo 1997, Ritsilä and Tervo 1999), the share of agriculture has no importance in long moves, but is negatively related to short-distance migration.

Higher area unemployment augments long-distance migration. This supports earlier Finnish findings (Tervo 1997, Ritsilä and Tervo 1999), but at the same time differs from results obtained in several other countries (for example, Van Dijk et. al. 1989, Hughes and McCormick 1989). Somewhat surprisingly, there is a negative association between unemployment rates and short moves. A family that migrates out of a municipality because of the bad unemployment situation is unlikely to

move a short distance, as the circumstances will be the same in all the surrounding areas. Hence high unemployment rates reduce mobility inside a province, and increase migration between provinces.

4.2 Short moves vs. long moves

The basic model indicated that differences might exist between different moves. For example, the signs for family income and the characteristics of areas changed in short and long moves. To examine the differences more carefully, a multinomial logit model was run with short-distance migration as a basic category (model 2). The parameter estimates and odds-ratios are presented in the Appendix (Tables 1 and 2).

The estimates verify the differences suggested by the basic model. Long-distance migrants do indeed have lower incomes than short-distance migrants. Furthermore, the poorer the economic situation in the travel-to-work area, i.e. the higher the unemployment rate, the more probable the long-distance move (odds-ratio 1.51). There is also a clear relation between a region's economic structure and long-distance migration. That is, families who migrate out of municipalities dominated by agriculture or industry are likely to move across provincial borders (odds-ratios 1.22 and 1.23, respectively).

Against expectations, the older the spouses are, the more likely they are to move over longer distances. The odds on a long vs. short move are twice as high for those over 55 as for those under 35 years of age. This phenomenon may relate to return migration, but can also be caused by older people's relatively weak employment opportunities[23]. Those with experience of unemployment are inclined to move between provinces. Recent in-migrants also tend to move farther away. As hypothesized, the probability of long moves increases with the husband's education: those with higher qualifications are more than twice as likely to change province as those with the lowest ones (odds-ratio 2.41). In addition, larger intra-family income dispersion augments migration across provincial borders (odds-ratio 1.48).

As expected, migration to another province becomes less likely if there is a working wife or a commuter in the family (odds-ratios 0.69 and 0.78, respectively). Finally, the wife's education, ages of children and home

ownership are non-significant factors in determining the migratory distance.

5. Summary and conclusions

The aim of the present study was to investigate the factors affecting Finnish family migration, especially the effects of the family life-cycle and family ties. Furthermore, to explore the differences between different types of moves, a distinction was drawn between short- and long-distance migration. Unique family data were used, and empirical analysis was carried out using multinomial logit models.

In general, the findings are in line with those reported earlier; family migration seems to behave quite similarly around the world. The results show a strong negative association between the family life-cycle and migration. Childless couples and those with only pre-school-aged children are the most eager to move. When their children are at school, mothers are likely to work, which, in addition to children's ties to their schools and friends, creates stronger ties to current locations.

Rather surprisingly, the findings lend support to the existence of the traditional pattern of migration – the husband leads and the wife follows– in Finland as well. That is, families more likely migrate due to the demands of the husband's career, and their wives move along with them because of family ties[24]. As a result, wives may become unemployed, underemployed or exit the labour force at the destination. On the other hand, two-earner families are less migration-prone, and the deterrent effect of the wife's work status increases with distance. This implies that the tied stayer in the family is more often the husband. The restriction of the husband's mobility to short distances may reduce his opportunities for career advancement and increase the probability of job mismatch or even unemployment.

There are differences between short and long moves. Stronger ties to the current location counteract, and general human capital (of the husband) boosts inter-provincial migration. Larger income dispersion between the spouses increases the likelihood of long-distance migration. The unemployed also more likely move between provinces. In addition, the size and the economic structure of the existing region influence the distance of the move. Local economic conditions are also important: a

high area unemployment rate augments long-distance migration, and has an inhibiting effect on short moves.

The findings lend support to Ritsilä and Tervo (1999), who suggested that in Finland both personal and area unemployment operate towards reducing regional unemployment differentials. However, at the same time, it is not only families with experience of unemployment who are moving out of high unemployment regions, but also other families. As young couples are the most eager to move, the demographic structure of depressed regions skews towards the older age groups. In addition to having a direct negative effect on population structure, migration also decreases population size through reduced birth rates. Provinces with high unemployment may lose their valuable human capital in the form of whole families. This in turn brings about even more unfavourable effects, eventually leading to a widening gap between successful and poor areas. Therefore, the effect of migration on the composition of regional population structure in the longer run is a topic deserving more attention in future research.

I also feel that our knowledge of family migration is far from complete. The use of estimation methods that utilize the panel nature of the data would allow family migration to be analyzed more closely. Despite the fact that the educational level, participation in the labour force and earning power of women have increased, and men and women have become more equal, the effect of family ties seems to have remained unchanged for decades; it continues to be the human capital of the husband that rules. Hence, the interaction between the wife's locational ties, her general human capital and family migration decisions is clearly an issue that merits further investigation. Moreover, both short- and long-term consequences of family migration deserve examination. Shedding light on these issues is the major challenge facing future research.

Endnotes

[i] In 1994, there were 19 provinces ("maakunta") in Finland.

[2] These include the actual moving costs, as well as a potential increase in living costs, transportation etc., necessitated by migration.

[3] All persons belonging to the same family have identical household-dwelling unit codes and family numbers.

[4] The basic sample is a 1% sample drawn from the longitudinal data, complemented with individuals belonging to same household dwelling unit as the sample individuals.

[5] Families can be identified every fifth year (family number is given in 1990 and 1995). For the purposes of this study the most convenient year was 1990.

[6] In families where both spouses move simultaneously, and also stay together after the move, the complexity of migration decision-making is most probably the greatest, and many compromises have to be made. It is, however, recognized that decision to move can result in family dissolution if the gain from being a couple is less than the cost of family ties (see Mincer 1978). Family dissolution can result in moving, too. These events, however, cannot be investigated with the data set at hand.

[7] In 1994 there were nearly 1.2 million two-adult families in Finland, constituting 87% of all Finnish families (Statistics Finland 1995b).

[8] In 1994 about 4.2% of the Finnish population migrated between municipalities (Statistics Finland 1995a). The corresponding figure in the sample was 2.3%.

[9] The data set does not contain information on intra-municipality moves, and therefore those moving inside a municipality are not classified as migrants.

[10] A minor shortcoming of the classification is that those moving between neighbouring provinces are categorised as long-distance migrants. However, the number of these moves is minimal, and the results are unlikely to be affected by this.

[11] For example, Korkiasaari (1991), in the Finnish case, found that about 50% of all longer distance moves took place for job reasons. Similar evidence has also been obtained in other countries (see Harkman 1989).

[12] For discussion of the multinomial logit model see Greene 1997.

[13] The omitted category was short-distance migration. The test requires estimation of both the unrestricted and restricted (smaller choice set) model. For further details, see Hausman and McFadden 1984.

[14] Pooling vs. non-pooling can be tested by the likelihood ratio test. To carry out the test, both the pooled and non-pooled model have to be estimated. For further details, see Cramer and Ridder 1991.

[15] Information about children was available only from the years 1990 and 1995. Since the year of interest is 1994, the situation in 1995 gives the best available approximation of the ages of children.

[16] Among children aged 0-17 years, those aged 0-6 years have the highest propensity to migrate from one municipality to another. In over 50% of children's moves the moving distance is under 50 kilometres. (Kaartovaara and Sauli 2000)

[17] All results referred to but not shown here are available from the author on request.

[18] See STATA 7 manual for additional information.

[19] The basic model was also estimated without the regional variables. The effects of family characteristics remained almost unchanged (no significant variable changed its sign or became insignificant), thus no major problems seem to exist.

[20] Finnish women under 50 have a higher level of education than Finnish men, if the proportion of the population with at least an upper secondary education is used as a criterion (European Commission 1996).

[21] Average earnings of Finnish women are about 80% of the average earnings of men.

[22] Intra-family income dispersion is measured by the difference (in absolute value) between the husband's and the wife's income, divided by the sum of their income.

[23] In 1994, 25.6% of those aged 55 or more and in the labour force were unemployed, while the average unemployment rate for all age groups was 18.4% (European Commission 1996)

[24] Due to the sampling method, this result may be a feature of our data and not of the population as a whole, and the finding will be tested in subsequent studies.

APPENDIX

Table 1. *Determinants of family migration; coefficients of the two multinomial logit models (model 1 and 2) and the respective odds-ratios*

VARIABLES	SHORT-DIST. MIGRATION VS. STAYING (model 1)		LONG-DISTANCE MIGRATION VS. STAYING (model 1)		LONG- VS. SHORT-DIST. MIGRATION (model 2)	
	Coefficient	Odds-Ratio	Coefficient	Odds-ratio	Coefficient	Odds-ratio
CONSTANT	-2.665***		-4.451***		-1.786***	
FAMILY CHARACTERISTICS						
AGE						
35 – 44	-0.469***	0.63	-0.316***	0.72	0.153	1.17
45 – 54	-1.107***	0.33	-0.604***	0.54	0.503**	1.65
55 -	-1.142***	0.32	-0.392	0.66	0.750**	2.11
CHILDREN						
ALL UNDER 7 Y.	0.026	1.03	0.067	1.06	0.041	1.04
0-17 YEARS	-0.448***	0.64	-0.309**	0.73	0.139	1.15
ALL 7-17 YEARS	-0.739***	0.48	-0.471***	0.62	0.268	1.31
HUSBAND'S ED.						
UPPER LEV OF UPP SEC.	0.175**	1.19	0.284**	1.33	0.109	1.12
HIGHER	0.146	1.16	1.025***	2.79	0.879***	2.41
WIFE HAS HIGHER EDUCATION	0.036	1.04	0.142	1.15	0.106	1.11
WIFE IN THE LABOUR FORCE	-0.223***	0.80	-0.585***	0.56	-0.362***	0.69
MIGRATED 1990 – 1993	0.674***	1.96	0.801***	2.23	0.127	1.13
MIGRATED INTO PROVINCE 1993	0.713***	2.04	1.176***	3.24	0.463*	1.59
HOME OWNER	-0.944***	0.39	-0.949***	0.39	-0.005	0.99
COMMUTING	0.684***	1.98	0.432***	1.54	-0.252**	0.78
UNEMPL. EXPERIENCE	0.371***	1.45	0.607***	1.83	0.236**	1.27
FAMILY INCOME[a]	4.1E-04**	1.04	-7.1E-04	0.93	-1.1E-03*	0.89
REGIONAL CHARACTERISTICS						
AREA UNEMPL. RATE[a]	-0.036***	0.78	0.025**	1.19	0.062***	1.51
SIZE OF MUNICIPALITY						
- 15 000	0.221	1.24	-0.705***	0.49	-0.925***	0.39
15 000 - 39 999	0.333**	1.39	-0.760***	0.47	-1.093***	0.33
70 000 -	0.491***	1.63	-0.337**	0.71	-0.828***	0.43
SHARE OF AGRICULTURE[a]	-0.142**	0.87	0.057	1.06	0.199**	1.22
SHARE OF INDUSTRY[a]	-0.071*	0.93	0.137**	1.15	0.208***	1.23
Number of observations 77 340 *,**,*** significant at the 10, 5, 1% level						
[a] odds-ratios for continuous variables are calculated at the values of the 25th and 75th percentiles						

Table 2. *The effect of intra-family income dispersion on migration propensities*

VARIABLE	SHORT-DIST. MIGRATION VS. STAYING		LONG-DISTANCE MIGRATION VS. STAYING		LONG- VS. SHORT-DIST. MIGRATION	
	Coefficient	Odds-ratio	Coefficient	Odds-ratio	Coefficient	Odds-ratio
INCOME DISPERSION	0.173	1.19	0.563***	1.76	0.390*	1.48
Note: Variables "Wife in the labour force" and "Wife has high education" are not included; other variables as in Table 1						

References:

Antolin P, Bover O (1997) Regional Migration in Spain: The Effect of Personal Characteristics and of Unemployment, Wage and House Price Differentials Using Pooled Cross-Sections. *Oxford Bulletin of Economics and Statistics* 59(2):215-235

Axelsson R, Westerlund O (1998) A Panel Study of Migration, Household Real Earnings and Self-Selection. *Journal of Population Economics* 11:113-126

Baltagi B (1995) *Econometric Analysis of Panel Data.* Chisester, UK, Wiley

Battu H, Seaman PT, Sloane PJ (1998) *Are Married Women Spatially Constrained? A Test of Gender Differentials in Labour Market Outcomes.* Paper presented at the European Regional Science Association Conference in Vienna in August 1998

Bielby WT, Bielby DD (1992) I Will Follow Him: Family Ties, Gender-role Beliefs, and Reluctance to Relocate for a Better Job. *American Journal of Sociology* 97:1241-1267

Böheim R, Taylor M (2000) *Residential mobility, housing tenure and labour market in Britain.* The Institute for Labour Research Discussion Paper Series 99/35

Cadwallader M (1992) *Migration and Residential Mobility.* The University of Wisconsin Press, Wisconsin

Carter H, Glick PC (1970) *Marriage and Divorce: A Social and Economic Study.* Harvard University Press, Cambridge MA

Clark WAV, Burt JE (1980) The Impact of Workplace on Residential Relocation. *Annals of the Association of American Geographers* 70:59-67

Cramer JS, Ridder G (1991) Pooling States in the Multinomial Logit Model. *Journal of Econometrics* 47:267-272

Dahlberg M, Fredriksson P (2001) *Migration and Local Public Services.* Uppsala University Working Papers 2001:12, Uppsala

DaVanzo J (1978) Does Unemployment Affect Migration? Evidence from Micro Data. *The Review of Economics and Statistics* 60:504-514

DaVanzo J (1983) Repeat Migration in the United States: Who Moves Back and Who Moves On? *The Review of Economics and Statistics* 65:552-559

Duncan RP, Perrucci CC (1976) Dual Occupation Families and Migration. *American Sociological Review* 41:252-261

European Commission (1996) *Labour Market Studies, Finland.* Luxembourg

Gardner J, Pierre G, Oswald AJ (2001) *Moving for Job Reasons.* (http://www.warwick.ac.uk/fac/soc/Economics/oswald/GPOeconomica01.pdf)

Green AE (1997) A Question of Compromise? Case Study Evidence on the Location and Mobility Strategies of Dual Career Households. *Regional Studies* 31(7):641-657

Greene W (1997) *Econometric Analysis* (3rd edition). Prentice-Hall, Inc., New Jersey

Greenwood MJ (1985) Human Migration: Theory, Models and Empirical Studies. *Journal of Regional Science* 25:521-544

Grundy E (1992) The Household Dimension in Migration Research. In: Champion T, Fielding T (eds.) *Migration Processes & Patterns. Volume 1. Research Progress & Prospects*. Belhaven, London, 165-174

Haapanen M (1998) *Internal Migration and Labour Market Transitions of Unemployed Workers*. Government Institute for Economic Research, Helsinki

Haapanen M (2002) Labour Migration and Wages. University of Jyväskylä, Reports from the School of Business and Economics N:o 29/2002 (licentiate thesis). Jyväskylä

Harkman A (1989) Migration Behaviour Among the Unemployed and the Role of Unemployment Benefits. *Papers of Regional Science Association* 66:143-150

Hausman J, McFadden D (1984) Specification Tests for the Multinomial Logit Model. *Econometrica* 52:1219-1240

Heckman J (1981) Heterogeneity and State Dependence. In: Rosen S (ed.) *Studies in Labour Markets*. University of Chicago Press 91-139

Herzog HW Jr, Schlottmann AM (1984) Labour Force Mobility in the United States: Migration, Unemployment and Remigration. *International Regional Science Review* 9:43-58

Holmlund B (1984) *Labour Mobility: Studies of Labour Turnover and Migration in the Swedish Labour Market*. The Industrial Institute for Economic and Social Research, Stockholm

Hsiao C (1986) *Analysis of Panel Data*. Cambridge, UK, Cambridge University Press

Hughes G, McCormick B (1989) Does Migration Reduce Differentials in Regional Unemployment Rates? In: Van Dijk J, Folmer H, Herzog HW Jr, Schlottmann AM (eds.) *Migration and Labour Market Adjustment*. Kluwer Academic, Dordrecht, 85-108

Kaartovaara L, Sauli H (2000) *Finnish Child*. Statistics Finland, Väestö 2000:1

Korkiasaari J (1991) *Mobility and Structural Change*. Työministeriö, Työpoliittinen tutkimus 11, Helsinki (in Finnish)

Krumm RJ, Kelly A (1988) Multiperiod Migration Patterns: The Timing and Frequency of Household Response. *Journal of Regional Science* 28:255-270

Laakso S (1998) *Inter-regional Migration In Finland*. City of Helsinki Urban Facts, Research Series 4 (in Finnish, Abstract in English)

Lansing JB, Mueller E (1967) *The Geographic Mobility of Labor*. Michigan Survey Research Center, Ann Arbor

Lichter D (1980) Household Migration and the Labour Market Position of Married Women. *Social Science Research* 9:83-97

Lichter D (1982) The Migration of Dual-Worker Families: Does the Wife's Job Matter? *Social Science Quarterly* 63:48-57

Long LH (1974) Women's Labour Force Participation and the Residential Mobility of Families. *Social Forces* 52:342-348

Mincer J (1978) Family Migration Decisions. *Journal of Political Economy* 86:749-773

Molho I (1986) Theories of Migration: a Review. *Scottish Journal of Political Economy* 33:396-419

Moulton BJ (1990) An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units. *The Review of Economics and Statistics* 72:334-338

Pekkala S (2002) Migration and Individual Earnings in Finland: A Regional Perspective. *Regional Studies* 36(1):13-24

Reitsma RF, Vergoosen D (1988) A causal typology of migration: the role of commuting. *Regional Studies* 22:331-340

Ritsilä J, Tervo H (1999) Regional Differences in the Role of Migration in Labour Market Adjustment: The Case of Finland. In: Crampton G (ed.) *Regional Unemployment, Job Matching and Migration, Series on European Research in Regional Science*. Pion, London, 166-182

Ritsilä J (2001) *Studies on the Spatial Concentration of Human Capital*. Jyväskylä Studies in Business and Economics, Doctoral Dissertation, University of Jyväskylä

Rossi PH (1955) *Why Families Move*. Glencoe, Illinois

Sandefur GD, Scott WJ (1981) A Dynamic Analysis of Migration: An Assesment of the Effects of Age, Family and Career Variables. *Demography* 18:355-368

Sandell SH (1977) Women and the Economics of Family Migration. *The Review of Economics and Statistics* 59:406-414

Schlottmann AM, Herzog HW Jr (1981) Employment Status and the Decision to Migrate. *Review of Economics and Statistics* 63:590-598

Shields MP, Shields GM (1993) A Theoretical and Empirical Analysis of Family Migration and Household Production: U. S. 1980-1985. *Southern Economic Journal* 59:768-782

Shihadeh ES (1991) The Prevalence of Husband-Centered Migration: Employment Consequences for Married Mothers. *Journal of Marriage and the Family* 53:432-444

Sjaastad LA (1962) The Costs and Returns of Human Migration. *Journal of Political Economy* 70:80-93

Snaith J (1990) Migration and Dual Career Households. In: Johnson J, Salt J (eds.) *Labour Migration*. David Fulton, London, 155-171

Stata Reference Manual Release 7. College Station, Texas, Stata Corporation 2001

Statistics Finland (1995a) *Vital Statistics by Municipality 1994*. Väestö 1995:10

Statistics Finland (1995b) *Families 1994*. Väestö 1995:14

Tervo H (1997) *Long-Distance Migration and Labour Market Adjustment: Empirical Evidence from Finland 1970-90*. University of Jyväskylä, Working Paper 168, Jyväskylä

Van Dijk J, Folmer H, Herzog HW Jr, Schlottmann AM (1989) Labour Market Institutions and the Efficiency of Interregional Migration: a Cross-nation Comparison. In: Van Dijk J, Folmer H, Herzog HW Jr, Schlottmann AM (eds.) *Migration and Labour Market Adjustment*. Kluwer Academic, Dordrecht, 61-83

Vartiainen P (1997) *Muuttoliikkeen uusi kuva*. Sisäasiainministeriö, Aluekehitys-osaston julkaisu 4 (in Finnish)

Westerlund O (1993) *Internal Migration in Sweden – The Role of Fiscal Variables and Labour Market Conditions*. Umeå Economic Studies No. 293, University of Umeå

Westerlund O, Wyzan ML (1995) Household Migration and the Local Public Sector: Evidence from Sweden, 1981-1984. *Regional Studies* 29(2):145-157

Widerstedt B (1998) *Moving or Staying? Job Mobility as a Sorting Process*. Umeå Economic Studies No. 464, University of Umeå

Yezer AM, Thurston L (1976) Migration Patterns and Income Change: Implications for the Human Capital Approach to Migration. *Southern Economic Journal* 42:693-702

CHAPTER 3

Interregional Migration and Post-Move Employment in Two-Earner Families: Evidence from Finland[*]

Satu Nivalainen

Abstract. This paper investigates the post-move employment of men and women in Finnish two-earner families, taking account of selection bias and heteroskedasticity. A unique data set consisting of actual couples is utilised. Heteroskedasticity does not seem to be a great problem, but the results demonstrate the importance of the selectivity correction: unobservable characteristics exist that both increase migrants' employment potential and make them more mobile. Migration itself generally exerts a negative effect, i.e. migrants have a lower tendency to be employed than stayers. However, average inspections may mask a wide variation. Extended analysis shows that migration in fact leaves the majority of husbands unaffected, and that some husbands actually benefit from moving. Instead, migration has a negative impact on wives in all cases. Hence, the results suggest that the husband's employment considerations are weighted more, and that wives are often the tied parties in family migration.

1. Introduction

Over the last two decades, interest in the economic returns from migration has increased, bringing about a flow of studies examining the individual consequences of moving. These investigations have typically concentrated on potential earnings gains (NAKOSTEEN and ZIMMER, 1980; HUNT and KAU, 1985; ERIKSSON, 1993; AXELSSON and WESTERLUND, 1995; NILSSON, 2001). The effect of migration on employment has received far less attention (HERZOG and SCHLOTTMAN, 1984; VAN DIJK et al., 1989; HAAPANEN, 1998; TERVO, 2000), even though it is often employment, or more precisely the lack of it, that forces people to leave their familiar surroundings in the first place. Moreover, employment prospects of migrants are in a central position when assessing the micro-economic efficiency of interregional labour migration.

Issues become even more interesting within the family context. Unless all family members have identical tastes and needs, family ties may give rise to tied movers and stayers. This means that even if a family's welfare would increase as a result of migration, one of the spouses may suffer. Thus, outcomes of migration may differ between males and females. The husband's career is often given more weight (e.g. LONG, 1974; SNAITH, 1990) and women's employment considerations are of minor importance in family migration decisions (see BIELBY and BIELBY, 1992). Therefore, family migration is generally beneficial to men, both in terms of income and employment. Previous empirical evidence lends support to 'wife's sacrifice', i.e. usually women bear the negative outcomes. Studies based on US and Canadian data have shown, for example, that migration of families has negative impacts on their number of weeks worked (SANDELL, 1977; MORRISON and LICHTER, 1988), labour force participation (LONG, 1974; DUNCAN and PERRUCCI, 1976; LICHTER, 1980) and probability of employment (SHIHADEH, 1991).

As the pace of migration has accelerated in Finland, Finnish economists have devoted more attention to migration during the past few years. However, studies investigating the employment returns from migration have merely concentrated on individuals, and used persons as units of study

[1] Moreover, earlier research has not adequately addressed the gender dimension. In the Finnish context, TERVO (2000) shows that migration has a positive, but insignificant, effect on the employment probabilities of the unemployed or new entrants in the labour force. Likewise, migration has a negative, but insignificant, impact on those in the labour force before the move. HAAPANEN (1998) reported that the unemployed moving to growth-centre regions realize gains in terms of employment, but those moving outside the growth-centres are more likely to be transferred outside the labour force. Moreover, it has been observed that even though a large proportion of migrants are students or unemployed persons at the time of migration, the migrants' employment in subsequent years tends to improve more quickly than that of the original population (LAAKSO, 1998).

An important issue connected with the consequences of migration, which none of the above-mentioned studies has dealt with, is potential selection bias, i.e. the results are obtained without identifying the fact that migrants and non-migrants may differ in ways that are systematically related to their employment.[2] Using US data on married parents, COOKE and BAILEY (1996) observed a positive selectivity in family migration. Migration itself had no effect on men's employment probabilities. In contrast, migrant women benefited from moving. However, LEE and ROSEMAN (1999), while studying US married white and black couples with children, detected a negative relationship between migration and wives' employment probability. The effect of migration on husbands' employment was negligible. For whites, no significant selection was observed, while black migrants appeared to be positively selected over non-migrants. Clearly, the results are inconclusive. In addition, to control for selectivity, both of the above-mentioned studies applied a variant of the HECKMAN (1979) model, where the inverse of Mill's ratio (lambda) derived from the (probit) migration model was used as the selection bias control variable in the (probit/logit) employment model. A similar procedure has been widely applied in linear outcome studies (e.g. DAVANZO and HOSEK, 1981). However, as noted by O'HIGGINS (1994), in a non-linear context this kind of method is not necessarily valid.

The present study concentrates on employment returns from migration in the family context. To be able to investigate both spouses, the analysis is focused on two-earner families. The potential migration selectivity is taken into account by using recursive bivariate probit models,

where the potential correlation between migration and employment is appropriately controlled for (O'HIGGINS, 1994; GREENE, 1998). In addition, the present study also addresses the issue of heteroskedasticity. Unlike most previous family migration studies, where the unit of analysis has been a married/co-habiting individual (e.g. COOKE and BAILEY, 1996; BAILEY and COOKE, 1998), here a very large data set is used that consists of actual families (i.e. pairs of linked partners) and includes a wide variety of characteristics for both spouses. The primary concern of the empirical examination is to investigate post-move employment probabilities of husbands and wives, and to determine whether differences exist in the outcomes of migration between men and women. In addition, determinants of employment among migrants are examined.

The paper is organised as follows. The second section briefly introduces the theoretical background and describes the method used. Data and variables are introduced in the third section. The fourths section presents the empirical results relating to family migration and employment. The fifth section has a summary and conclusions.

2. Analytical framework

Like much of the work in the labour migration field, this study utilises a human capital framework, and considers migration as an investment producing both costs and benefits. MINCER (1978) applies the human capital theory to family migration decisions. In the family context, migration is a joint welfare maximisation decision. The family evaluates the expected benefits and costs of moving, and migration takes place only if the benefits exceed the costs.

As family migration affects several persons simultaneously, the processes preceding family migration are much more complicated than those preceding solo migration. Clearly, the more persons involved, the larger are the costs of migration. In addition to direct monetary expenses, there are many indirect and non-monetary costs. In particular, a family can have various kinds of ties to the place of residence. Besides social ties, there are skills, abilities and assets that are attached to the current location, and these 'location-specific insider-advantages' would be lost in the case of migration (see FISCHER and MALMBERG, 2001).[3] Therefore, family

migration requires collective decision-making. Usually it is the potential wage earners' (spouses') net benefits that are evaluated in the decision-making process.[4] Net benefits of the spouses may, however, have opposite signs. This being the case, family migration gives rise to tied movers, who follow their families and in doing so suffer a personal loss. As noted above, usually it is the wife who bears the negative outcomes. On the other hand, spouses' personal interests may also refer to different destinations, and as a result, a family may move to a region where neither of the spouses' personal gains are maximised but the sum of both is the greatest. Therefore, two-earner families may especially wish to move into large diversified labour markets, or as FIELDING (1992) puts it, to 'escalator regions' where accelerated upward social mobility can be achieved and which offer the best chances for both spouses to optimize their future employment, career development and earnings.[5]

As mentioned earlier, the possible selection bias should be taken into account when inspecting the consequences of moving. In the present setting, this means that there might be some unobservable factors that affect both migration and employment propensities (motivation or ambition, for example), and without controlling for these, the effect of migration on employment cannot be assuredly assessed. Due to the non-linearity of the outcome variable, selectivity cannot be corrected here by HECKMAN's (1979) two-step procedure or its variant (O'HIGGINS, 1994). Therefore, a recursive bivariate probit model is used (GREENE, 1998).[6] The model can be written as:

$$m_i^* = W_i \delta + v_i \qquad\qquad (1)$$
$$e_i^* = X_i \beta + \gamma m_i + \varepsilon_i, \qquad\qquad (2)$$

where m_i^* and e_i^* are unobservable latent variables that measure the propensity to migrate and the propensity to be employed, respectively, W_i and X_i contain the variables affecting the probability of migration and the probability of employment, respectively, and m_i is a dummy variable indicating migration. In reality, data only reveal whether or not a particular event occurred, i.e. only the signs of m_i^* and e_i^* are observed. The signs are captured by indicator variables m_i and e_i : $m_i = 1$ iff

$m_i^* > 0$, and otherwise zero. Likewise, $e_i = 1$ iff $e_i^* > 0$, and otherwise zero.

The error terms, v_i and ε_i, are assumed to be bivariate standard normally distributed with $\text{cov}[v_i, \varepsilon_i] = \rho$. The correlation coefficient, ρ, indicates the effect of unobserved characteristics. If the correlation between the two models is positive and significant, there is positive selectivity. That is, the unobserved factors that increase the likelihood to migrate are also likely to have a positive effect on employment. Similarly, a negative and significant correlation means negative selection (i.e. the unobservables have diverse impacts on migration and employment). If no significant correlation exists, separate probit models can be used.

Yet another issue requires attention. Since there is no information on the scales of m_i^* and e_i^*, the error variances in equations (1) and (2) cannot be estimated (MADDALA, 1983). Usually, homoskedasticity is assumed, i.e. error variances are assumed to be constant across individuals. However, if this does not hold, biased standard errors and parameter estimates will result. A solution applied here is to allow for multiplicative heteroskedasticity, which means that the error terms are specified as $[v_i, \varepsilon_i] \sim N[0, (\exp(Z_{ij}\alpha_j))^2]$, j = m, e, where matrices Z_{im} and Z_{ie} include the variables affecting error variances and α_m and α_e are the respective parameter vectors (e.g. GREENE, 1995). In practise, the terms included in the variance function are determined so that the simplest form of the function is detected with univariate probit models, and this specification is thereafter used for the bivariate models (cf. O' HIGGINS, 1994).

3. Data and variables

3.1 Data

The data are from the longitudinal census file of Statistics Finland, which contains information collected in population and housing censuses, completed with information from various official registers. Consequently, this large data set contains rich information on individuals' characteristics

as well as on individuals' family relations. Of especial interest for the purposes of this study is that all the persons belonging to same family as well as a large number of characteristics of both spouses can be identified. A drawback, however, is that the specific timing of migration and the actual reasons for moving are unknown.

The basic sample is a 1% representative sample drawn from the census file, complemented with individuals belonging to the same household dwelling unit as the sample individuals.[7] This cross-sectional data comprise the years 1990-1996 (partly earlier years also; not all variables are measured every year). The focus here is on 1993-95 (migration) and on 1996 (employment), and the subset used in the empirical part was formed from the basic sample in the following way. First, only adults belonging to two-adult families in 1990 were selected.[8] Second, men and women belonging to same family were merged, after which the observation unit in the data was the family. In order to minimize the incidence of non-economically motivated moves, families in which the husband (or cohabiting male) was over 60 years or more in 1996 were dropped.[9] Families including students or retired persons were also excluded from the sample. Furthermore, to concentrate on the behaviour of two-earner couples and to be able to examine the employment of both men and women, only families where both spouses were in the labour force at the end of 1992 were selected. Moreover, to focus on stable couples, the sample was limited to cases where the spouses had been living together (i.e. married or cohabiting) in the same household during each of the years 1990-1996. Thus, every family in the sample had been a family for at least 2 years before the move and remained a family for at least 1 year after the move (migration takes place in 1993-95, see below). This excludes migration due to marriage and moves without the partner, and ensures that the migration decision does not result in family dissolution (MINCER, 1978). The above sampling process yielded over 54 000 families, i.e. the data included information on nearly 110 000 individuals.

3.2 Dependent variables

In the present study, a family that moved between the Finnish provinces (NUTS3) in 1993-95 is defined as a migrant, i.e. the focus is on long-

distance migration. The provinces are comparatively large, so a move between these most likely also means a change in the labour market area. Figure 1 shows the size and the population of the NUTS3-regions. It is recognized that the use of a 3-year migration interval is not ideal, especially when studying returns from migration; the analysis does not separate those who moved more than once from those who made only one move, even though their returns may differ (NILSSON, 2001). In addition, some of the migrants will have had a longer time to adjust to the destination labour market. Nevertheless, several studies investigating the outcomes of moving have used migration intervals (see BORJAS and BRONARS, 1991; COOKE and BAILEY, 1996; LEE and ROSEMAN, 1999; TERVO, 2000; LEE and ZHEE, 2001; PEKKALA and TERVO, 2002).
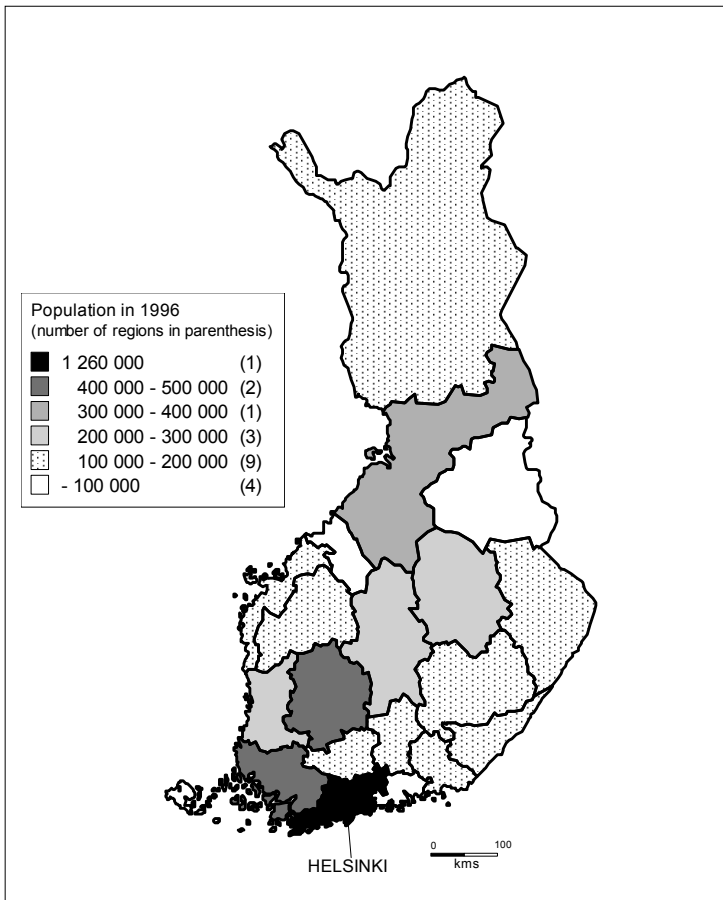
Figure 1. *The size and the population of the Finnish NUTS3-regions*

Employment as a dependent variable contrasts employed persons and the non-employed (unemployed or outside labour force), so that a person is categorised as employed if he or she worked at the end of 1996, and otherwise as non-employed. This is a standard procedure in studies on this field (e.g. COOKE and BAILEY, 1996; PEKKALA and TERVO, 2002).[10] It would have been interesting to be able to inspect full- and part-time employment separately, but unfortunately the data did not allow this.

3.3 Independent variables

The independent variables and their categorical means for migrants and non-migrants are presented in Table 1. The figures refer to pre-migration situation. In the empirical part, the independent variables in the migration equation are measured in 1992 (i.e. before moving), and the explanatory variables in the employment equation refer to the situation at the end of 1995, if not otherwise stated. The variables were selected on theoretical and/or empirical grounds, and their expected effects are next presented shortly.

It is universally acknowledged that migration propensities tend to decrease with age and increase with (the husband's) education (e.g. GREENWOOD, 1997). The influence of the wife's education is less clear. LONG (1974), for example, suggested that professional women might be more resistant to geographical relocation than others. On the other hand, an augmenting effect has also been discovered (HOLMLUND, 1984; SHIELDS and SHIELDS, 1993). It is often noted that the impact of personal (or household) income is ambiguous (e.g. BARTEL, 1979; FINNIE, 2000). However, a negative relationship is typically observed between migration and the wife's employment, or hours of work (DAVANZO, 1976; SANDELL, 1977; DAVANZO and HOSEK, 1981), and therefore her income is expected to have a hindering effect. Moreover, a larger income difference between the spouses is anticipated to increase the migration likelihood (NIVALAINEN, 2004). In general, because of lower migration costs, personal unemployment and commuting should augment migration. Due to stronger ties to a current location and larger migration costs, home ownership and children, especially school-aged children, are anticipated to deter migration. A larger family size should

operate in a similar manner. On the other hand, if a family has moved before, ties have already been broken. Hence, it is assumed that migration probability increases with the number of previous migration events (FISCHER and MALMBERG, 2001). With regard to regional characteristics, the likelihood of moving should rise with the local unemployment rate (e.g. HERZOG and SCHLOTTMANN, 1984). A positive association is also expected between migration and the variables describing a region's economic structure (NIVALAINEN, 2004).

Although, as seen above, earlier evidence concerning the effect of migration on employment is inconclusive, numerous studies show that the position of females in the labour market is inferior to males (e.g. BOOTH et al., 1997; GONZALO and SAARELA, 2000). Family responsibilities tend to have a much greater effect on women than they do on men. A differential impact of family size on women and men has been found, and especially the existence of young children seems to weaken the employment odds of women (GOMULKA and STERN, 1990; BOOTH et al., 1997; HÄMÄLÄINEN and PEHKONEN, 2001). The effect on men is less obvious, but, for example, THOURSIE (1998) has demonstrated a positive relationship. Typically, employment propensities increase with education and age. However, evidence indicates that women's employment patterns are closely tied to the family life cycle (WAITE, 1980; YU et al., 1993), and to consider the diversity of age-related life-cycle effects, age groups instead of age in years are used.

At this point it is worth mentioning that by international standards Finland is a very gender-equal society. For example, the labour force participation rate of Finnish women is very high and unlike many other countries, women are not secondary earners in Finland, i.e. there is a dual-breadwinner system.[11] Moreover, Finnish women tend to be even better educated than men. Nevertheless, women and men are in very different positions in the labour market: women's wages are lower (around 80% of men's wages), and they more often work part-time and have fixed-term contracts (SAVOLA, 2000).[12] There also is some evidence that the closer labour market attachment of males and greater family responsibilities of females hold true in Finland too (see GONZALO and SAARELA, 2000; SAVOLA, 2000; HÄMÄLÄINEN and PEHKONEN, 2001).[13]

Independent of sex, employment probabilities are expected to be lower for those with unemployment experience; there tends to be a strong association between past and present work behaviour, and previous

unemployment has been proven to have a negative effect on the probability of working (NAKAMURA and NAKAMURA, 1985; HÄMÄLÄINEN, 2003). Furthermore, BÖHEIM and TAYLOR (2000) show that a working spouse increases the employment odds, and spouse's income is anticipated to operate in the same direction. Several studies have demonstrated a positive relationship between home ownership and employment (BOYLE et al., 2001; HÄMÄLÄINEN, 2003); owner-occupied housing is thought to reflect a more stable work career, commitment to certain labour market etc., which increase the probability of being employed. Finally, variables describing local unemployment rate and urban residential area are used to control for varying regional job opportunities; a higher unemployment rate should impede employment and urban location is expected to have a positive effect.

Table 1. *Variable definitions and descriptive statistics, according to migration status*

VARIABLE	DEFINITION	MEAN (SD)			
		Migrants		*Non-migrants*	
		Husb.	*Wives*	*Husb.*	*Wives*
Employed in 1996	Dummy: 1 if employed at the end of year, otherwise 0	0.80	0.62	0.87	0.83
Age	Average age of spouses (years)	34.6 (7.0)		38.1 (6.8)	
Age2	Age squared/100	12.5 (5.2)		15.0 (5.3)	
Education1	Dummy: 1 if upper level of upper sec. education, otherwise 0	0.21 (0.41)	0.28 (0.45)	0.17 (0.38)	0.23 (0.42)
Education2	Dummy: 1 if higher education, otherwise 0	0.33 (0.47)	0.27 (0.44)	0.17 (0.37)	0.17 (0.37)
Unemployed	Dummy: 1 if unemployed at the end of 1992, otherwise 0	0.20 (0.40)	0.22 (0.41)	0.12 (0.32)	0.11 (0.31)
Income	Taxable income/FIM 100 000	1.39 (1.46)	0.90 (0.47)	1.33 (0.85)	0.95 (0.46)
Income dispersion	Difference between the husband's and wife's income divided by the sum of their income (absolute value)	0.30 (0.23)		0.25 (0.21)	
Commuter family	Dummy: 1 if husband's and/or wife's job locate in different municipality than their home, otherwise 0	0.44 (0.50)		0.38 (0.48)	
House owner	Dummy: 1 if a family owns their home, otherwise 0	0.60 (0.49)		0.84 (0.37)	
Number of prev. moves	Number of inter-municipal moves between 1989-92	0.58 (0.75)		0.14 (0.41)	
Family size	Number of family members	3.12 (1.17)		3.60 (1.18)	
Children under 7y. **Children 7-18y.**	Dummy variables: 1 if children under 7 years of age, otherwise 0; 1 if children aged 7-18, otherwise 0	0.45 (0.50) 0.28 (0.45)		0.44 (0.50) 0.52 (0.50)	
Unemployment rate	Ratio of unemployed to labour force/100	0.19 (0.03)		0.19 (0.04)	
Primary production	Share of employed labour force working in primary production/100 (scale:0-0.9)	0.05 (0.09)		0.07 (0.10)	
Industry	Share of employed labour force working in industry/100 (scale:0-0.9)	0.25 (0.09)		0.24 (0.10)	
Urban area	Dummy: 1 if over 90% of municipality's inhabitants live in densely built-up areas	Not available in 1992			
Number of observations		778		53 995	

Notes: Unless otherwise stated, figures refer to 1992. FIM, Finnish mark.

3.4 Migrants versus non-migrants: a descriptive analysis

As shown Table 1, migrants are endowed with somewhat different characteristics from non-migrants. Younger and more educated families tend to move more frequently. The proportion of unemployed is higher among migrants and migrant wives are more often unemployed than their husbands. On the other hand, the tendency to migrate is reduced for home-owners and for those with school-aged children. Migrants also seem to have smaller families. Commuters and those who have migrated earlier have higher migration rates. It can also be seen that migrant husbands' income tends to be higher and migrant wives' lower compared to non-migrants, and that spouses' income dispersion is wider in migrant families. In addition, the share of agriculture is somewhat lower in the migrants' places of origin.

As the primary concern here is to determine the effect of migration on employment, migrants versus non-migrants are next compared with regard to their activity. Table 1 shows that 80% of migrant men and 62% of migrant women were in employment in 1996 (i.e. after moving). The respective figures for non-migrants are higher, being 87% and 83%, respectively. The transfers of men and women with respect to the main type of activity in 1992 and 1996, measured in the last week of the respective year, are more closely portrayed in Table 2.

Table 2. *Men and women according to migrant status and main type of activity*

Main type of activity in 1992		Main type of activity in 1996					
		Employed (%)		Unemployed (%)		Outside labour force (%)	
		Husb.	Wife	Husb.	Wife	Husb.	Wife
Migrants	Employed	87	66	8	18	6	16
	Unemployed	48	45	41	37	11	18
Non-migrants	Employed	92	88	6	6	2	5
	Unemployed	51	43	43	42	7	15
Migrants versus non-migrants, 1992, p = 0.000 (t-test) Migrants versus non-migrants, 1996, p = 0.000 (t-test)							

Notes: Due to rounding the figures may not sum to 100.

For migrant men, it appears that 87% of those employed in 1992 remained employed in 1996. For non-migrants, the respective figure is even higher

at over 90%. Although the proportion of those unemployed in both 1992 and 1996 is somewhat higher for non-migrants, migrants more often transferred outside the labour force between these two years. Among women, the differences between migrants and non-migrants are even more noticeable. Of migrants, 66% were employed in both years, while the respective figure for non-migrants was almost as high as for men (nearly 90%). Nearly one fifth of originally employed migrant women became unemployed between 1992 and 1996. Again, the proportion of those remaining unemployed is lower for migrants. On the other hand, the incidence of transferring outside the labour force is high among migrant women: 16% of those employed before the move were outside the labour force in 1996.

Furthermore, significant differences are observed in the unemployment rates. At the end of 1996, 14.3% of migrant men and 22.2% of migrant women were unemployed. The respective figures for non-migrants are 10.1% and 10.3%. Hence, the proportion of unemployed is significantly higher among migrants (t-test: $p < 0.001$). The difference is particularly clear among women, as the unemployment rate of migrant women is twofold higher than that of non-migrants. Moreover, the gap between men and women is most striking among migrants: migrant women are 1.5 times more likely to be unemployed than their husbands.

Although the sample was restricted to those in the labour force before the move, it is unknown how many actually moved for labour market reasons. The above results may simply derive from the fact that many migrants left the labour force 'voluntarily' (e.g. due to disability, or some other reasons). In addition, various aspects besides migration affect the labour market status of an individual. Therefore, no far-reaching conclusions can be drawn on the basis of the above tabular comparison alone.

4. Empirical analysis of family migration and employment

Before turning to estimation results, it is worth pointing out that explanatory variables in the bivariate probit setting should be chosen with care. Here standard variables employed in earlier empirical studies plus some additional variables thought to influence on migration/employment

propensities were used (e.g. BOYLE et al., 2001; PEKKALA and TERVO, 2002). Furthermore, the robustness of the results was checked by employing many different specifications, i.e. including additional determinants in the models.[14] Note also that bivariate probit may be weakly identified unless either of the two equations has at least one variable that does not enter the other (e.g. MADDALA, 1983). Here, two identification variables are used in the migration equation: intra-family income dispersion and family commuting. The absolute income difference between the spouses is likely to affect family's migration propensities (NIVALAINEN, 2004) but should not directly influence individual's employment probability.[15] Similarly, previous commuting experience of the spouses should not affect the personal employment likelihood. Moreover, the fact that the variables in the migration equation are measured in different years from those in the employment equation should further secure identification.

As seen in the third section, there might be great variation in labour market status between migrants and non-migrants even before migration. Nevertheless, partly due to data shortcomings, in many studies the impact of migration on employment has been investigated without considering the potential pre-move differences (BOYLE et al., 2001; LEE and ZHEE, 2001; COOKE and BAILEY, 1996). Moreover, as mentioned above, there exists a strong association between past and present labour market status. Therefore, in addition to the whole sample, separate models are estimated for the originally (i.e. before the migration interval) employed and unemployed. This should add to the reliability of the results.

4.1 Migration and employment

The main results are presented in Tables 3 and 4. The estimation proceeded so that separate univariate migration and employment probits were first run. After that, the respective homo- and heteroskedastic bivariate probit models were estimated. The significance of the variance function was determined with the Likelihood ratio (LR) test, and in all cases the heteroskedastic model was preferred over the homoskedastic one (Table 4). Nevertheless, only few differences emerged between the models (homoskedastic estimates not shown).[16] Moreover, almost all of the

changes were associated with the variables employed in modelling the variance function (for similar observation, see HÄMÄLÄINEN, 2002). Hence, at least in this case, the heteroskedasticity correction seems to produce little additional information about the determinants of migration/employment.

Table 3. *Determinants of family migration; coefficients and marginal effects*

Variable	All families	
	Coefficient	Marg. effect
Age	-0.019	-0.000
Age2	0.017	0.000
Husband's education1	0.287***	0.006
Husband's education2	0.627***	0.016
Wife's education1	0.159***	0.003
Wife's education2	0.210***	0.004
Husband's income	0.035*	0.000
Wife's income	-0.187***	-0.000
Income dispersion	0.239***	0.000
Husband unemployed	0.328***	0.007
Wife unemployed	0.588***	0.015
Commuter family	0.100**	0.002
House owner	-0.447***	-0.010
Family size	-0.293***	-0.001
Children under 7y.	0.040	0.001
Children 7-18y.	-0.210***	-0.004
Number of previous moves	-0.056	0.018
Unemployment rate	2.039***	0.004
Primary production	-0.238	-0.000
Industry	1.097***	0.002
Variance function:		
Family size	0.073***	
Number of prev. moves	0.228***	
*Number of observations	54 773	
*Number of migrant families	778	

Notes: */**/***: significant at 10, 5, 1% level. Variables are measured at the end of 1992 if not otherwise stated (see Table 1). Results are obtained by heteroskedastic bivariate probit model. The equation includes a constant. Marginal effects are calculated from the marginal probabilities. For any variables that appear more than once, marginal effect is the sum of the individual terms.

In addition to coefficients, marginal effects are presented. Note that in the bivariate probit setting, many kinds of marginal effects can be calculated. Here the marginal effects for other than migration variables are derived from the marginal probabilities (i.e. Prob[Migrated 1993-95=1] and

Prob[Employed96=1]). For the migration variables the marginal effects for the conditional probability of outcome 2 given outcome 1 (i.e. Prob[Employed96=1|Migrated 1993-95=1]) are presented. The marginal effect thus compares the migrants' actual outcome to the hypothetical one in case of no migration. Note that if the variable appears both in "body" equation and in the variance function, the signs of coefficients and marginal effects may differ. This being the case, the marginal effect captures the correct sign.

With regard to migration, it can be seen that for the most part the results are in accordance with the human capital view (Table 3). Age has a negative (although non-significant) and education a positive effect on migration probabilities. The presence of a commuter in a family and personal unemployment boost migration propensities, while school-aged children, larger family size and home-ownership diminish them. Previous migration experience has a positive, though insignificant, impact. Moreover, the odds of moving increase with the local unemployment rate and share of industry, while agriculture seems to have no effect on migration.

The fact that the wife's education also significantly increases the probability of moving is somewhat surprising, as in a recent study (NIVALAINEN, 2004) the wife's education was an insignificant factor in family migration. This discrepancy is, most likely, explained by the fact that the present sample differs from that of the above-mentioned investigation, as the present paper concentrates on two-earner families. Nevertheless, a husband's education imposes a much stronger effect. Moreover, a closer inspection of the highly educated reveals that the husband-wife difference in migrant families is much larger than in stayer ones.[17] This implies that wives might migrate more often as tied persons.

This view is further supported by the fact that family migration odds increase with the husband's income, and families with a larger (absolute) income dispersion between the spouses also tend to move more often. As the husband's income is higher in 74% of the sample families, in practice this means that families with a larger husband-wife income ratio tend to be more inclined to migration. On the other hand, and in line with, for example, SHIELDS and SHIELDS (1993), wives with higher incomes appear to inhibit migration - and thus the mobility of their husbands.

The significance of a wife's characteristics is interesting. It even seems that compared with men, a wife's unemployment experience has a

stronger positive effect on family migration. This corroborates DAVANZO's (1976) and LICHTER's (1980) suggestion that in some cases a wife might in fact have an augmenting effect on migration. On the other hand, note that it is unknown why these families moved and who initiated the move; it might be just that the unemployed wives adjust more easily to the migration of their husbands.

The results for the employment equations are presented in Table 4. Columns 1 and 2 report the estimates for all wives and husbands, while columns 3-6 give the results for the originally employed and unemployed wives and husbands, respectively. Four different specifications are shown. The first gives the effect of migration on employment in a simple univariate probit, while specification 2 presents the full results of the heteroskedasticity corrected bivariate probit. Specifications 3 and 4 show the effect of additional variables on employment (for simplicity, models are homoskedastic).

Before considering the impact of migration, the results for the other explanatory variables are briefly introduced (columns 1 and 2, specification 2). When looking at the coefficients, nearly all of them are significant and most of the estimates conform to expectations. Age has a non-linear effect, and employment probabilities increase with education. For both sexes, employment odds are positively associated with their spouse's earnings. Owner-occupants are more likely to be in employment. Furthermore, the higher the local unemployment rate, the lower the odds of being employed. A little surprisingly, urban areas show a negative effect. On the other hand, this corroborates the findings of PEKKALA and TERVO (2002) who, when using Finnish data, evidenced a lower likelihood of employment for town and city inhabitants.

Table 4. *Results for employment equations for men and women; coefficients and marginal effects of probit and bivariate probit models*

VARIABLE	All				Originally employed				Originally unemployed			
	Wives		Husbands		Wives		Husbands		Wives		Husbands	
	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.
SPECIFICATION 1: Univariate; homoskedastc												
Migrated 1993-95	-0.565***	-0.169	-0.284***	-0.064	-0.647***	-0.167	-0.278***	-0.046	0.033	0.013	-0.088	-0.035
SPECIFICATION 2: Bivariate; heteroskedastic												
Migrated 1993-95	-2.063***	-0.231	-1.548***	-0.086	-1.399***	-0.209	-0.400	-0.053	-2.003***	-0.370	-2.065***	-0.374
Age 35-44	0.233***	0.039	0.037	0.006	0.207***	0.026	0.104***	0.013	-0.086	-0.018	-0.306***	-0.069
Age 45-54	0.177***	0.029	0.052	0.009	0.165***	0.020	0.191***	0.023	-0.457***	-0.096	-0.687***	-0.153
Age 55-	-0.410***	-0.079	-0.422***	-0.086	-0.499***	-0.075	-0.234***	-0.034	-1.487***	-0.272	-2.244***	-0.418
Education1	0.323***	0.051	0.275***	0.042	0.237***	0.028	0.116***	0.014	0.554***	0.119	0.551***	0.122
Education2	0.733***	0.102	0.503***	0.070	0.640***	0.067	0.301***	0.033	0.802***	0.171	0.631***	0.139
Spouse's income	0.389***	0.005	0.342***	0.006	0.448***	0.005	0.326***	0.004	0.234***	0.005	0.253**	0.006
Family size	-0.049***	-0.010	0.055***	0.009	-0.034***	-0.004	0.059***	0.007	-0.045	-0.010	0.027	0.006
Children under 3 y.	-0.280***	-0.051	0.037	0.006	-0.164	-0.021	0.000	0.000	-0.752***	-0.154	0.151	0.034
Children 3-6 y.	0.024	0.004	0.012	0.002	-0.040	-0.005	0.000	0.000	0.075	0.016	0.079	0.018
House owner	0.369***	0.069	0.460***	0.091	0.288***	0.039	0.328***	0.048	0.300***	0.063	0.520***	0.116
Unemployment rate	-3.320***	-0.065	-5.089***	-0.111	-2.128***	-0.029	-5.535***	-0.099	-6.081***	-0.124	-7.152***	-0.157
Urban area	-0.069***	-0.012	-0.045***	-0.008	-0.087***	-0.011	-0.045**	-0.006	-0.072	-0.015	-0.088	-0.020
Variance function:												
Age (years)			0.008***			-	0.011***			-	0.014*	
Spouse's income	0.159***		0.102***		0.180***		0.107***			-		-
Children under 3 y.	0.417***			-	0.554***			-		-		-
Unemployment rate		-	-1.640***			-	-2.610***		2.899***			-
ρ	0.410***		0.500***		0.124*		0.054		0.552***		0.505***	
SPECIFICATION 3: Additional variable, otherwise like Specification 2 (homosked.)												
Mx Spouse unempl. 1992	-0.138	-0.001	0.110	0.000	-0.296**	-0.021	0.106	0.016	0.263	0.025	0.118	0.012

Table 4. Continued

VARIABLE	All				Originally employed				Originally unemployed			
	Wives		Husbands		Wives		Husbands		Wives		Husbands	
	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.
SPECIFICATION 4: Interaction variables added, otherwise like Specification 2 (homosked.)												
MxAge 35-44	-0.286***	-0.003	-0.153	-0.001	-0.211	-0.005	-0.385**	-0.011	-0.075	-0.005	0.522**	0.004
MxAge 45-54	-0.403***	-0.004	-0.233	-0.002	-0.331*	-0.008	-0.218	-0.006	-0.085	-0.006	-0.073	-0.001
MxAge 55-	-0.476*	-0.004	-0.304	-0.003	-0.587*	-0.015	-0.614	-0.018	0.504	0.033	0.637	0.005
MxEducation1	-0.032	-0.000	0.339**	0.003	0.069	0.002	0.267	0.008	-0.165	-0.011	0.329	0.003
MxEducation2	0.195*	0.002	0.677***	0.006	0.255*	0.006	0.658***	0.019	0.181	0.012	0.299	0.002
MxSpouse's income	-0.003	-0.000	-0.136	-0.001	0.008	0.000	-0.048	-0.001	-0.166	-0.011	-0.502**	-0.004
MxFamily size	-0.050	-0.000	-0.048	-0.000	-0.061	-0.002	-0.026	-0.001	-0.063	-0.004	-0.157*	-0.001
MxChildren under 3 y.	0.280**	0.003	0.116	0.001	0.313**	0.008	0.094	0.003	0.196	0.013	0.058	0.000
MxChildren 3-6 y.	0.095	0.001	-0.015	-0.000	0.082	0.002	0.016	0.000	0.151	0.010	-0.103	-0.001
MxHouse owner	-0.406***	-0.004	-0.412***	-0.003	-0.284***	-0.007	-0.247*	-0.007	-0.439**	-0.029	-0.401**	-0.003
MxUnempl. rate	-0.088	-0.001	-2.782**	-0.023	-2.301*	-0.058	-4.728***	-0.140	0.757	0.050	-1.292	-0.011
MxUrban area	0.188**	0.002	0.074	0.001	0.200*	0.005	0.192	0.006	0.296	0.019	-0.211	-0.002
*N	54 773		54 773		48 800		48 225		5 973		6 548	
*N of migrants	778		778		604		623		171		155	
*Log likelihood	-26 586.84		-23 173.98		-19 546.33		-15 635.55		-4 573.25		-4 905.91	
*Wald-test for select.	64.65 (p=0.000)		64.94 (p=0.000)		2.94 (p=0.086)		0.26 (p=0.611)		13.96 (p=0.000)		8.99 (p=0.003)	
* LR-test for heterosked.	227.42 (p=0.000)		97.36 (p=0.000)		114.96 (p=0.000)		86.64 (p=0.000)		16.36 (p=0.000)		7.98 (p=0.005)	

Notes: */**/***: significant at 10, 5, 1% level. The dependent variable is 1 if the individual is employed and 0 if not employed at the end of 1996. All models include a constant. All specifications include same variables as specification 2. Independent variables (excl. migration) are measured at the end of 1995, if not otherwise stated. Marginal effects are calculated from the marginal probabilities, except for migration-variables, for which the marginal effects are derived from the conditional probabilities. For any variables that appear more than once, marginal effect is the sum of the individual terms. Test statistics refer to Specification 2 (heteroskedastic). Migration interaction terms in Specifications 3 and 4 are read as: Mx Spouse unempl. 1992= Migrated 1993-95 & spouse unemployed in 1992, etc.

There are some clear differences in the determinants of employment between women and men. First, the presence of children under 3 years of age significantly decreases women's employment probabilities, but has the opposite (though insignificant) effect on men. Likewise, a larger family size decreases women's likelihood of being employed, while it increases that of men. Second, men over 55 years of age have a significantly lower likelihood of employment than those who are younger. For women, the situation is somewhat different, as those between 35 and 54 years of age have higher employment odds than younger women. This most probably reflects the effect of child bearing and caring on women. The results relating to the originally employed and unemployed are mostly in concordance with the above (columns 3-6). Nevertheless, young children do not significantly impede employment among originally employed wives, and the employed husbands' employment likelihood is highest between 35 and 54 years of age. It also appears that the younger the unemployed person, the higher is her/his employment likelihood, and that family size and location do not affect employment odds of the unemployed.

The correlation coefficient, ρ, is positive and significant (columns 1 and 2). This indicates the presence of positive selection, i.e. migrants (and/or their spouses or families) have such unobservable characteristics that make these persons' employment potential higher in relation to others. Nevertheless, moving itself exerts a significant negative effect on both spouses. This holds both in uni- and bivariate setting, although the negative coefficient of migration becomes much larger in the latter one. Note also that the negative impact on wives is over twice as large as that on their husbands (marginal effect -0.231 vs. -0.086).

Separate inspection of the originally employed and unemployed (columns 3-6) sheds some light on the wives' larger negative outcome, as it appears that migration does not affect the employment odds of the originally employed husbands; both the migration variable and selectivity term are insignificant (specification 2). This, together with the significantly negative effect of migration on the originally employed wives, suggests that women more often sacrifice their employment to follow their husbands, rather than vice versa. Note too that among the originally unemployed the uncorrected specification (specification 1) would show a positive sign for the wives and a negative one for the husbands (which is in line with Table 2). However, this does not reflect the effect of migration

itself, but rather the effect of unobserved factors: when the error correlation is accounted for, the migration coefficients become significantly negative (and ρ's significantly positive). In other words, those unemployed at the outset of the migration interval are less likely to be in employment after moving than those who were unemployed but not moving (cf. PEKKALA and TERVO, 2002). Naturally, it is an interesting question where the positive selectivity of the unemployed (and migrants in general) comes from, and the phenomenon clearly deserves consideration in future studies.

Note that the negative coefficient of migration does not necessarily mean that none of the migrants would benefit from moving. The employment status states nothing about the quality of employment (career development, promotion etc.). It is very likely that the results reflect the special nature of family migration: in the family context moving is rarely optimal for both spouses simultaneously. The negative migration coefficient may also partly reflect unobserved dynamics, i.e. the fact that, due to the migration interval, the unemployed are over-represented among migrants. It might well be the case that a proportion of those employed at the outset of the migration interval became unemployed during 1993-95 and migrated as a response.[xviii] However, due to limitations of the data it is impossible to determine exactly if the migrant was unemployed at the time of the move. The use of a 1-year migration interval would not eliminate this drawback.[xix] A similar problem exists in virtually all studies based on census data, and as indicated above, several studies have employed migration intervals. Likewise, many studies considering returns on migration have used pre-migration (un)employment to control for (un)employed migrants (e.g. HERZOG and SCHLOTTMANN, 1984; DULEEP and SANDERS, 1993; PEKKALA and TERVO, 2002).

4.2 A closer look at the differences between husbands and wives in the outcomes of moving

The above results show that there is at least some variation in the post-move outcomes of men and women, and here the potential differences are further examined. As personal unemployment generally increases

migration odds, it can be assumed that the unemployed persons in the family are often the ones who initiate the move (e.g. DAVANZO, 1978). On the other hand, tied migration is most likely to occur when either both spouses are employed or one spouse is employed and the other unemployed. Therefore, an interactive dummy capturing the effect of moving with an unemployed spouse was added to the models (Table 4, specification 3). The idea behind this is that if there are no sex-related differences in family migration, the variable should have similar effects on both women and men. As can be seen, in most cases diverse impacts are observed: negative for wives and positive for husbands. Although significant only for originally employed women, the signs again point into direction of the tied migrant wives. Note, however, that among the originally unemployed the situation is not so clear-cut; for both wives and husbands the sign is positive (not significant though).

As the above suggest that the employment consequences of migration might vary in different families, the sample was split into smaller parts according to the pre-move status of both spouses, after which employment models for husbands and wives in these families were estimated. Table 5 shows the effect of migration on employment in families with employed and unemployed wives and husbands in different combinations.

Table 5. *The effect of migration on employment according to pre-move status of the spouses*

	Wife employed				Wife unemployed			
	Wives		*Husbands*		*Wives*		*Husbands*	
	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.
Husband employed	-1.154***	-0.194	0.177	0.044	-1.168**	-0.395	-1.395	-0.075
Husband unemployed	-1.428*	-0.343	0.957*	0.328	-1.297***	-0.389	-1.552***	-0.460

Notes: */**/***: significant at 10, 5, 1% level. Number of families: employed wife-employed husband 43 675 (of which 510 migrated), employed wife-unemployed husband 5 125 (97), employed husband-unemployed wife 4 550 (113), unemployed wife-unemployed husband 1 423 (58). Dependent variable and other explanatory variables as in Table 4 (Specification 2; homoskedastic). Marginal effects are calculated from the conditional probabilities.

Indeed, there appears to be considerable variation in the consequences of moving according to the pre-move position of the spouses. It can be seen that independent of the wife's employment status, relocation does not

affect an originally employed husband's employment likelihood. Furthermore, a significant positive impact on husbands emerges in families where the wife was originally employed and the husband unemployed. Note that migration has a significant negative impact on wives in all cases. The husband appears to have lower post-migratory employment odds only when both spouses were unemployed before migration, and in this case the negative effect on husband is even larger in relation to their wives. Hence it seems that in the family context moving indeed tends to be sub-optimal for one or both spouses. At the same time the findings also suggest that the wife is more often the one who bears the negative consequences of family migration.

4.3. Who gets a job after migration?

It can be assumed that the determinants of employment differ at least in some respects according to migration status. To inspect these differences, migration interaction terms were added to the models, i.e. every variable in the employment model was interacted with a migration dummy. The estimates of the interaction terms are presented in Table 4 (specification 4). One should keep in mind that the estimates do not reflect the determinants of employment among migrants, but show the difference between migrants and non-migrants.

The results reveal significant differences between migrants and non-migrants with respect to many factors. The effect of age shows variation, and in particular older age has a larger negative impact on migrant wives. Moreover, the effect of higher education is pronounced among migrants, especially among migrant men. Furthermore, the connection between employment and home-ownership is different among migrants and non-migrants. The effect of unemployment rate also shows variation. Furthermore, in relation to other women, for migrant wives the negative effect of small children is less aggravated. Interestingly, the effect of urban location also differs between migrant and other women. Moreover, among the originally unemployed men the effect of family size and spouse's income varies according to migrant status.

As the above suggests that the factors underlying employment likelihood of migrants and non-migrants diverge, the next rational step is

to examine these two groups separately. The samples used in following analysis are formed by separating families that migrated between 1993 and 1995 (n=778) and families that stayed in the same location (n=53 995). For both groups, simple univariate probit employment models were run; estimation results are presented in Table A1. The dependent variable was the same as before, indicating whether or not the person was employed. The effect of being unemployed at the beginning of the inspection period is here captured with an unemployed dummy. Since the majority of the families did not move, the employment determinants of non-migrants closely reflect the results seen in Table 4 (specification 2). Therefore, it is the factors underlying migrants' employment that are discussed below.

Indeed, greater age has a significant negative impact on migrants. Note, however, that the weaker performance of older migrants could at least partly be explained by other than labour market related reasons for moving (return migration). Among migrants the positive effect of higher education is very clear: the likelihood of being employed significantly increases for those with a university degree or equivalent. On the other hand, in contrast to migrant men and to stayers (and findings in Table 4), secondary education has no effect on migrant women. The better success of the highly educated women might indicate that some of them may actually initiate family migration, or that the career prospects of both spouses are considered in families where the wife is highly educated. Moreover, the impact of children shows variation: young children significantly reduce migrant mothers' employment probabilities (although, as shown above, in lesser degree in relation to non-migrants). However, they have no effect on fathers. Note also that unlike non-migrants, family size and spouse's income do not influence the employment odds of either migrant wives or husbands.

Not surprisingly, the unemployed and those migrating to a high-unemployment region have weaker chances of getting a job. On the other hand, migration to urban areas has a positive effect on wives' employment. This differs from the pattern observed with the whole sample, and supports SHIELDS and SHIELDS' (1992) suggestion that families tend to move to those areas where they believe it will also be fairly easy to find employment for the tied mover; in practice, this would mean that families tend to head to urban areas in general and to growth centres in particular. Finally, note that many of the variables have no impact on migrants,

which suggests that there are some important factors outside those employed in the analysis that influence their prospects.

5. Summary and conclusions

This study examined the employment consequences of interregional migration in two-earner families in Finland. The aim was to analyse the post-move employment probabilities of husbands and wives, and to find out whether differences exist between men and women. Moreover, determinants of employment among migrants were inspected. A large data set consisting of actual couples was used, and the issues of selection bias and heteroskedasticity were addressed in the estimations.

The results show that migration generally has a negative effect on employment, i.e. controlling for other factors, migrants are less likely to be in employment than non-migrants. With regard to sex, a much larger negative impact of migration on women is demonstrated. Heteroskedasticity correction seems to produce little additional information. Instead, the findings clearly show a significant and positive error correlation between migration and employment. In other words, unobservable characteristics exist that both increase migrants' employment potential and make them more mobile. It is worth pointing out that in the family context these unobservables do not necessarily relate to individuals themselves but might also relate to their spouses and families.

Family migration is a complex event, and average inspections may mask wide variation in the outcomes of moving. An extension of the analysis reveals that the move is seldom simultaneously optimal for both spouses, and usually one or both has to compromise. The results show that migration in fact leaves the majority of the husbands unaffected, and that some migrant husbands actually have higher employment likelihood than the respective stayers. Instead, wives never realise positive returns (at least when the employment status is considered), and in fact migration has a significant negative impact on women in all cases. Hence, the results suggest that husband's employment considerations are weighted more, and that wives more often are the tied parties in family migration. These indications are very interesting - especially when considering Finland, a country of high gender equality - and confirm the need for additional

research on the outcomes of family migration. Moreover, the findings clearly demonstrate the need for more disaggregated analyses and the importance of controlling for family ties.

With regard to migrants' employment, the present study shows that one of the central factors is education: migrants with a university degree or equivalent succeed significantly better than others. In turn, older migrants and those with unemployment experience are less likely to be employed after migration. These results hold for both men and women. However, note that we did not differentiate between the unemployed and economically inactive, and to some degree this may limit the ability to interpret the findings, especially those related to age; older migrants' weaker performance may simply reflect different motives for migration. In the future it would also be worth examining the factors underlying migrants' unemployment and exit from the labour force.

When assessing the results, note that the employment status at one point in time states nothing about the development of employment. Moreover, due to the limitations of the data, the authors are unaware of the future plans of the couples and do not know how many of the families in fact moved for labour market reasons. For example, KORKIASAARI (1991) observed that about half of long-distance moves in Finland took place for job-related reasons. This might also be true with the present sample. Furthermore, the destination of migrants was not controlled here. For example, NIVALAINEN (2003) shows that unemployed persons do not merely head to urban areas but also move to rural destinations; some might actually relocate due to lower living costs, and not for of employment.

To conclude, the present study has uncovered new evidence on family migration, but it has also raised new questions. Clearly, it would be more fruitful to direct investigation to the development of employment, measured, for example, by hours worked. Social mobility and transitions between different labour market statuses would also shed more light on the outcomes of moving. Moreover, the returns do not necessarily remain constant over time (e.g. LAAKSO, 1998). It might well be that the interval used here (employment is examined 1-3 years after moving) is not long enough; hence a longer post-migration time-interval should be inspected with panel data. Moreover, besides employment, the economic benefits may include a higher income at the destination. Therefore, the outcomes

of family migration should also be examined in terms of earnings changes. Future work will concentrate on these topics.

Endnotes

[1] Families account for about 80% of Finland's population. Nearly 87% of these families are two-adult families. The remaining 13% are one-parent families.

[2] Recently, PEKKALA and TERVO (2002) investigated the employment consequences of moving in Finland with a sample of unemployed persons. Their results showed a negative effect of migration and a positive selectivity.

[3] FISCHER and MALMBERG (2001) suggest that location-specific insider advantages, which increase with duration of stay, strongly influence migration decisions. These advantages consist of non-transferable abilities and knowledge, familiarity of certain location and society, and different kinds of cultural, social and political relations and ties. Migration not only results in the loss of these accumulated advantages but also requires investments (time, information etc.) in acquiring new insider advantages at the new location.

[4] Children affect decisions through increased costs.

[5] Escalator regions attract especially young people with promotion potential. On the other hand, at the same time as the young and the ambitious step on the escalator, some people, typically in the middle of their working lives or near retirement, will want to step off, i.e. move out of these dynamic regions (see FIELDING, 1992). In other words, people tend to prefer different locations in different phases of the life-cycle.

[6] It could also be argued that the wife's and husband's employment are correlated. Therefore, a trivariate probit model might be used, where all three equations are estimated simultaneously. However, due to the large size of the data set and limited computer resources, the use of trivariate probit turned out to be impossible. The potential correlation between the spouses' employment is partly taken into account by the use of household- or spouse-related variables in the employment equations.

[7] One should note that the 1% representative sample complemented with individuals belonging to the same household dwelling unit results in information on over 600 000 individuals, which in fact is over 10% of the Finnish population (during the study period the number of Finns was around 5.1 million).

[8] Family number, which identifies persons belonging to the same family, is given every five years, i.e. in 1990 and 1995. In addition, individuals living in the same household have the same household-dwelling unit code, which is given each year. This means that once we have identified a family, we can ensure with the household-dwelling unit code that the spouses live together in each year of the study.

[9] The official retirement age in Finland is 65 years, but the actual retirement age is 59 years.

[10] Since the labour market status at the end of the year does not take the seasonal nature of certain occupations into account, an experiment was done where employment was defined as follows: participates in the labour force at the end of the year and has worked at least nine months during that year. The results were not sensitive with respect to different employment definitions.

[11] As much as 69% of 15-64-year women participate in the labour force, while the respective figure for men is 75%. In Finland, women have accounted for 47-48% of the total work force since the beginning of the 1980s. Finland has well-developed work-family reconciliation policies, i.e. the society in many ways encourages mothers' and married women's employment. For example, spouses have separate taxation and all parents, regardless of their employment status, are guaranteed municipal day care for pre-school

children. Moreover, Finland gives its mothers nearly a year of paid maternity leave plus a further two years of optional parental leave (homecare leave), after which they have the right to return to a former employer.

[12] Nearly 70% of all part-time employees were women in 1998. It should be noted, however, that by international comparison relatively little part-time work is done in Finland. In general, part of the gender differences result from fairly strong occupational segregation (in particular public sector and services are female-dominated fields). In fact, Finland, along with other Nordic countries, UK and Ireland is among the most occupationally segregated countries in Europe (see DIJKSTRA, 1997).

[13] For example, childless women aged 25 to 39 have a higher labour force participation rate than mothers of the same age. For men the situation is just the opposite (see SAVOLA, 2000).

[14] Models were also estimated without home-ownership, with and without occupations, with and without socio-economic status and with and without regional dummies. Moreover, spouse's education and unemployment status, as well as school-aged children were added to employment models. In all cases the results remained practically unchanged.

[15] Family income dispersion may have an effect on labour force participation, but should not affect individual employment propensities.

[16] The only differences that emerged were: age group 45-54 and under 3-year-old children lost significance among all husbands; husband's income turned from negative to positive among employed wives and under 3-year-old children became insignificant; younger age groups turned into significant among employed husbands; under 3-year-old children became insignificant among unemployed husbands.

[17] In migrant families only the husband is highly educated in 14% of cases, while the respective figure for wives is 8%. In 19% of migrant families both spouses have higher qualifications. This compares to 8, 8 and 9%, respectively, for stayers.

[xviii] This relates to the job-search process of the unemployed, and specifically to the question of speculative vs. contracted migration, the former undertaken in the hope of finding a job, and the latter undertaken after having secured one (see SILVERS, 1977; MOLHO, 1986; see also VAN OMMEREN et al., 1998, for an extension of a search model to a two-earner household case).

[xix] To check whether the use of migration interval has any effect on the results, separate migration-employment models for migrants from different years were run (homoskedastic whole sample models). In every case migration had a significant negative coefficient.

APPENDIX:

Table A1. *Results for employment equations for migrants and non-migrants; coefficients and marginal effects of probit models*

VARIABLE	Migrants				Non-migrants			
	Wives		Husbands		Wives		Husbands	
	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.	Coeff.	M.eff.
Age 35-44	0.024	0.009	-0.063	-0.015	0.110***	0.024	-0.063**	-0.011
Age 45-54	-0.092	-0.035	-0.175	-0.045	0.062**	0.013	-0.141***	-0.025
Age 55-	-0.722**	-0.282	-0.798**	-0.258	-0.466***	-0.126	-0.647***	-0.154
Education1	0.192	0.072	0.429***	0.091	0.199***	0.041	0.132***	0.021
Education2	0.643***	0.228	0.798***	0.171	0.466***	0.086	0.273***	0.042
Spouse's income	-0.012	-0.005	0.006	0.001	-0.001	-0.000	0.112***	0.019
Family size	-0.069	-0.026	0.023	0.006	-0.022***	-0.005	0.049***	0.008
Children under 3 y.	-0.359**	-0.138	0.105	0.025	-0.620***	-0.166	0.023	0.004
Children 3-6 y.	0.072	0.027	-0.034	-0.008	-0.027	-0.006	0.019	0.003
Unemplo-yed in 1992	-0.525***	-0.204	-0.986***	-0.302	-1.305***	-0.419	-1.323***	-0.374
House owner	-0.081	-0.031	0.071	0.017	0.241***	0.057	0.334***	0.066
Unempl. rate	-3.489***	-1.322	-7.193***	-1.749	-1.627***	-0.355	-2.522***	-0.432
Urban area	0.175*	0.067	0.045	0.011	-0.046***	-0.010	-0.043***	-0.007
*Number of observa-tions	778		778		53 995		53 995	
*Log likelihood	-471.91		-311.95		-20 219.16		-16 741.35	

Notes: */**/***: significant at 10, 5, 1% level. The dependent variable is 1 if the individual is employed and 0 if not employed at the end of 1996. All models include a constant.

References:

AXELSSON, R. and O. WESTERLUND, 1995, A Panel Study of Migration, Household Real Earnings and Self-Selection, in: O. WESTERLUND, 1995, *Economic Influences on Migration in Sweden*, Umeå Economic Studies 379/1995 (University of Umeå, Umeå) 1-23.

BAILEY, A. J. and T. J. COOKE, 1998, Family Migration and Employment: The Importance of Migration History and Gender, *International Regional Science Review* 21, 99-118.

BARTEL, A. P., 1979, The migration decisions: what role does job mobility play?, *American Economic Review* 69, 775-786.

BORJAS G. J. and S. G. BRONARS, 1991, Immigration and the Family, *Journal of Labor Economics* 9, 2, 123-147.

BIELBY, W. T. and D. D. BIELBY, 1992, I Will Follow Him: Family Ties, Gender-role Beliefs, and Reluctance to Relocate for a Better Job, *American Journal of Sociology* 97, 1241-1267.

BOOTH, A. L., S. P. JENKINS and C. G. SERRANO, 1997, *New men and new women? A comparison of paid work propensities from a panel data perspective*. CEPR Discussion Paper No. 1775.

BOYLE, P., T. J. COOKE, K. HALFACREE and D. SMITH, 2001, A cross-national comparison of the impact of family migration on women's employment status, *Demography* 38, 2, 201-213.

BÖHEIM, R. and M. TAYLOR, 2000, *Unemployment duration and exit states in Britain*, CEPR Discussion Paper No. 2500.

COOKE, T. J. and A. J. BAILEY, 1996, Family Migration and the Employment of Married Women and Men, *Economic Geography* 72, 38-48.

DAVANZO, J., 1976, *Why Families Move: A Model of the Geographic Mobility of Married Couples*, (Rand Corporation, Santa Monica).

DAVANZO, J. and J. R. HOSEK, 1981, *Does migration increase wage rates? An analysis of alternative techniques for measuring wage gains to migration*. Rand Note N-1582-NICHD, (Rand Corporation, Santa Monica).

DIJKSTRA, A. G., 1997, Women in Central and Eastern Europe: A Labour Market in Transition, in: DIJKSTRA, A. G. and PLANTENGA, J., eds, *Gender and Economics* (Routledge, London) 118-135.

DULEEP, H. O. and S. SANDERS, 1993, The Decision to Work by Married Immigrant Women, *Industrial and Labor Relations Review* 46, 4, 677-690.

DUNCAN, R. P. and C. C. PERRUCCI, 1976, Dual Occupation Families and Migration, *American Sociological Review* 41, 252-261.

ERIKSSON, T., 1993, Mobility and Individual Earnings Growth, in: H. BUNZEL, P. JENSEN and N. WESTERGÅRD-NIELSEN, eds, *Panel Data and Labour Market Dynamics* (North-Holland, Amsterdam).

FIELDING, A. J., 1992, Migration and Social Mobility: South East England as an Escalator Region, *Regional Studies* 26, 1, 1-15.

FINNIE, R., 2000, *The Who Moves? A Panel Logit Model Analysis of Interprovincial Migration in Canada*, Statistics Canada Analytical Studies Branch, Research Paper Series No. 142.

FISCHER, P. A. and G. MALMBERG, 2001, Settled People Don't Move: On Life Course and (Im-)Mobility in Sweden, *International Journal of Population Geography* 7, 357-371.

GOMULKA, J. and N. STERN, 1990, The Employment of Married Women in the United Kingdom 1970-83, *Economica* 57, 171-199.

GONZALO, M T. and J. SAARELA, 2000, Gender differences in exit rates from unemployment: Evidence from a local Finnish labour market, *Finnish Economic Papers* 13, 2, 129-139.

GREENE, W. H., 1995, *Limdep Version 7.0 User's Manual* (Econometric Software, Inc).

GREENE, W. H., 1998, Gender Economics Courses in Liberal Arts Colleges: Further Results, *Journal of Economic Education*, Fall 1998, 291-300.

GREENWOOD, M. J., 1997, Internal migration in developed countries. In ROSENZWEIG, M. R. and O. STARK (eds.) *Handbook of Population and Family Economics*. (Elsevier Science B. V.).

HAAPANEN, M., 1998, *Internal Migration and Labour Market Transitions of Unemployed Workers* (Government Institute for Economic Research, Helsinki).

HECKMAN, J., 1979, Sample Selection Bias as a Specification Error, *Econometrica* 47, 153-161.

HERZOG, H. W. Jr. and A. M. SCHLOTTMANN, 1984, Labour Force Mobility in the United States: Migration, Unemployment and Remigration, *International Regional Science Review* 9, 43-58.

HOLMLUND, B. (1984) *Labour Mobility: Studies of Labour Turnover and Migration in the Swedish Labour Market.* (The Industrial Institute for Economic and Social Research, Stockholm).

HUNT, J. and J. KAU, 1985, Migration and Wage Growth: A Human Capital Approach, *Southern Economic Journal* 51, 697-710.

HÄMÄLÄINEN, K., 2002, Unemployment, selective employment measures and inter-regional mobility of labour, *Papers in Regional Science* 81, 423-441.

HÄMÄLÄINEN, K., 2003, *Education and Unemployment: State Dependence in Unemployment Among Young People in the 1990s,*

Government Institute for Economic Research, Discussion Papers 312.

HÄMÄLÄINEN, K. and J. PEHKONEN, 2001, *Gender, labour market training and employment*, University of Jyväskylä, School of Business and Economics, Working Paper N:o 243/2001.

KORKIASAARI, J., 1991, *Mobility and Structural Change*, Työministeriö, Työpoliittinen tutkimus 11, Helsinki (in Finnish).

LAAKSO, S., 1998, *Inter-regional Migration In Finland*, City of Helsinki Urban Facts, Research Series 4 (in Finnish, Abstract in English).

LEE, S. W. and C. C. ROSEMAN, 1999, Migration Determinants and Employment Consequences of White and Black Families, 1985-1990, *Economic Geography*, 109-133.

LEE, S. W. and W. S. ZHEE, 2001, Independent and linked migration: Individual return of employment opportunity and household return of poverty status to African American interstate migration, *The Annals of Regional Science* 35, 605-635.

LICHTER, D., 1980, Household Migration and the Labour Market Position of Married Women, *Social Science Research* 9, 83-97.

LONG, L. H., 1974, Women's Labour Force Participation and the Residential Mobility of Families, *Social Forces* 52, 342-348.

MADDALA, G., 1983, *Limited-Dependent and Qualitative Variables in Econometrics* (Cambridge University Press, Cambridge).

MINCER, J., 1978, Family Migration Decisions, *Journal of Political Economy* 86, 749-773.

MOLHO, I, 1986, Theories of Migration: A Review, *Scottish Journal of Political Economy* 86, 749-773.

MORRISON, D. and D. LICHTER, 1988, Family Migration and Female Employment: The Problem of Under-employment Among Migrant Married Women, *Journal of Marriage and the Family* 50, 161-172.

NAKAMURA, A and M. NAKAMURA, 1985, *The Second Paycheck: A Socioeconomic Analysis of Earnings*, (Academic Press, Orlando).

NAKOSTEEN, R. A. and M. A. ZIMMER, 1980, Migration and Income: The Question of Self-Selection, *Southern Economic Journal* 46, 840-851.

NILSSON, K., 2001, Migration, Gender and the Household Structure: Changes in Earnings Among Young Adults in Sweden, *Regional Studies* 35, 6, 499-511.

NIVALAINEN, S., 2003, *Where do migrants go? An analysis of rural and urban destined/originated migration in Finland in 1996-1999.* Pellervon taloudellisen tutkimuslaitoksen työpapereita N:o 66 (December 2003).

NIVALAINEN, S., 2004, Determinants of Family Migration: Short Moves vs. Long Moves, *Journal of Population Economics* 17, 1, 157-75.

O'HIGGINS, N., 1994, YTS, Employment, and Sample Selection Bias, *Oxford Economic Papers* 46, 605-628.

PEKKALA, S. and H. TERVO, 2002, Unemployment and migration: Does moving help? *Scandinavian Journal of Economics* 104:4, 621-39.

SANDELL, S. H., 1977, Women and the Economics of Family Migration, *The Review of Economics and Statistics* 59, 406-414.

SAVOLA, L., 2000, *Women in the Finnish Labour Market in the 1990s*, Labour Market 2000:4, Gender Statistics 2000:001, Statistics Finland, Helsinki (in Finnish, abstract in English).

SHIELDS, M. P. and G. M. SHIELDS, 1993, A Theoretical and Empirical Analysis of Family Migration and Household Production: U. S. 1980-1985. *Southern Economic Journal* 59, 768-782.

SHIHADEH, E. S., 1991, The Prevalence of Husband-Centered Migration: Employment Consequences for Married Mothers, *Journal of Marriage and the Family* 53, 432-444.

SILVERS, A., 1977, Probabilistic Income Maximising Behaviour in Regional Migration, *International Regional Science Review* 2, 29-40.

SNAITH, J., 1990, Migration and Dual Career Households, in: JOHNSON J. and J. SALT, eds, *Labour Migration* (David Fulton, London) 155-171.

TERVO, H., 2000, Post-migratory Employment Prospects: Evidence from Finland, *Labour* 14, 331-350.

THOURSIE, A., 1998, *Kvinnors och mäns vägar ut ur arbetslöshet – likheter och skillnader*, Institutet för social forskning, Stockholms universitet.

VAN DIJK, J., H. FOLMER, H. W. Jr. HERZOG and A. M. SCHLOTTMANN, 1989, Labor Market Institutions and the Efficiency of Interregional Migration: a Cross-nation Comparison, in: VAN DIJK, J., H. FOLMER, H. W. Jr. HERZOG and A. M SCHLOTTMANN, eds, *Migration and Labor Market Adjustment* (Kluwer Academic, Dordrecht) 61-83.

VAN OMMEREN, J. N., P. RIETVELD and P. NIJKAMP, 1998, Spatial moving behavior of two-earner households, *Journal of Regional Science* 38, 1, 23-41.

WAITE, L. J., 1980, Working wives and the family life cycle, *American Journal of Sociology* 86, 2, 272-294.

YU, L. C., M. Q. WANG, L. KALTREIDER and Y.Y. CHIEN, 1993, The Impact of Family Migration and Family Life Cycle on the Employment Status of Married, College-Educated Women, *Work and Occupations* 20, 2, 233-246.

CHAPTER 4

Where Do Migrants Go? An Analysis of Rural and Urban Destined/Originated Migration in Finland in 1996-1999[*]

Satu Nivalainen

Abstract: This study examines urban and rural destined/originated migration in Finland in 1996-1999 using a large micro-level data set. Three conclusions stand out from the results. Firstly, migrants not only differ from stayers but there are also many differences between migrants from and to rural and urban areas. In particular, rural-to-urban migrants are highly educated while those moving from urban to rural areas are not. Secondly, locational preferences vary according to the life-cycle: young and single individuals head to urban areas, whereas couples and retired persons tend to relocate from urban to rural areas. Thirdly, the results suggest that both rural-to-urban and urban-to-rural migration work to the benefit of the urban areas; hence regional disparities are likely to increase rather than decrease upon continuing migration.

Keywords: Migration, rural, urban

---

1. Introduction

Finland experienced an exceptionally deep economic crisis during the first half of the 1990s. It was the most severe economic crisis in the Finnish peacetime history.[1] During the recession, output fell by more than 10 per cent and unemployment quadrupled to almost 20 per cent. The crisis marked the end of a long period of steady regional economic development: when a remarkably rapid recovery started in 1994, regional production and employment differences began to increase. At the same time, the rate of migration accelerated at a level not witnessed in nearly two decades, and a migration boom has been prevailing ever since.[2] For example, between 1995 and 2000 about 1.5 million Finns migrated between municipalities (on average 5% of the population per year), while the respective figure for the period 1985-1990 was only 1.2 million (around 4 % of the population per year). After the mid 1990s, migration activity has constantly remained at high levels.

Even though the boom following deep economic crisis was itself an exceptional period, compared with earlier migration waves, the one of the late 1990s possessed new features in many respects. Partly due to uneven regional development in employment, the regional polarisation of migration became very strong; post-recession migration flows were heavily directed towards the largest urban centres located mainly in the southern parts of the country. After the recession not only the peripheral regions but even some of the regional centres and middle-sized towns which earlier managed to attract net in-migrants started to lose population. For example during 1995-2000, three out of every four Finnish municipalities experienced average migration loss (Hanell et al., 2002). Even though a centralizing process has also been evident in other Nordic countries, the tendency in Finland has been peculiarly strong. For example, in the late 1990s the capital, Helsinki, was one of the fastest growing centres in the European Union (EU), and at the same time some 90% of Finnish territory was losing population through out-migration (Hanell et al., 2002). Rural areas have been hardest hit; since the mid-1990s the population decline has been very fast, and seems to be increasing with the continuous out-migration, negative natural growth and rapid ageing of the population (see Hanell et al., 2002; Nivalainen and Haapanen, 2002).[3]

Traditional economic theories consider migration as an important equilibrating mechanism in the economy. Nevertheless, regional imbalances in Finland have not diminished with intense internal migration, but rather the reverse (e.g. Tervo, 2002). In the latter part of the 1990s regional divergence was much faster than earlier. For example, regional income differences showed a growing tendency towards the end of the 1990s, and the regional unemployment spread in Finland was the widest among the Nordic countries, and very large within the EU context, too (Hanell et al., 2002; Taipale, 2002).[4] A clear spatial differentiation is evident; unemployment rates are highest in rural areas in northern and eastern Finland, and lowest in the largest centres in the south (see Hanell, 2002a).

The new features of migration, the demographic development and the advantage that urban centres have over the rest of the country have not escaped public attention in Finland. Fears about depopulation of rural areas have been expressed, and migration has become a very popular research topic. Considerable evidence now exists of the determinants of moving, based mainly on countrywide analyses of regional out-migration (e.g. Tervo, 2000; Ritsilä and Tervo, 1999). Some studies have also dealt with in-migration, i.e. destination choices of migrants, but these have typically focused on moves (from undefined origins) towards urban areas or growth-centres (e.g. Pekkala, 2000a; Haapanen, 2002).[5] In other words, earlier studies usually have concentrated only on one dimension of moving, and have not considered both origin and destination simultaneously.

Nevertheless, every migrant has both origin and destination, and not all migrants go in the same direction. Each end of population movement is equally important from the regional perspective. In particular, it is not in- or out-migration alone but it is both that define the total impact of migration on different regions. Moreover, not only the quantity, but also the quality of migrants is important. Especially the human capital content of place-to-place[6] migration is vital; human capital plays a central role in the economic growth and future prospects of a region, and an uneven distribution of educated and capable people may have severe effects on the regional development potential in the longer run (see e.g. Forslid, 1999).

Clearly, a more profound understanding of the relationship between the components of the migration nexus is required. In particular, to be able to evaluate the impact of migration on different areas, not only place-

to-place migration streams but also potential variation in migrants' characteristics need to be investigated. It is not likely that all migrants are similar; there might be considerable spatial variation in the role of many variables. In fact, at least partly, the stubbornness of regional differentials in Finland might be due to diversity in migrants' characteristics. However, practically nothing is currently known about the determinants of place-to-place migration in Finland, and there are also surprisingly few attempts in the international micro-economic literature to provide evidence on the origin-destination specific characteristics of movers. [7]

This paper aims at filling this gap by analysing migration to and from urban and rural areas in Finland during the latter part of the 1990s. Not only the migration streams but also the determinants of migration are examined. The urban-rural gradient is especially interesting since, as mentioned above, the divergence between urban and rural areas in recent years has been very sharp. In the empirical part, a large micro-level panel data set from the years 1995-1999 is utilised, and migration is defined as occurring between municipalities, which are the lowest regional units in Finland. Since the general characteristics of migrants have been well documented in earlier studies, particular emphasis is placed here on the rural dimension.[8]

The paper is set out as follows. The next section introduces the regional classification and shortly describes the recent regional development in Finland. The theoretical background, data and variables are introduced in the third section. Section four presents the empirical findings and a summary and conclusion are provided in section five.

2. Regional classification and a closer look at migration streams

Finland is a large and sparsely populated country, and on the European scale almost the whole Finland could, roughly speaking, be considered as rural.[9] Nevertheless, Statistics Finland's (1997) regional classification divides municipalities into urban, semi-urban and rural according to the proportion of population living in urban settlements and the population of the largest urban settlement (see Figure 1).

More specifically, rural municipalities are those in which *i)* less than 60% of the population lives in urban settlements, and the population of the largest urban settlement is less than 15 000 or *ii)* at least 60% but less than 90% of the population lives in urban settlements, and the population of the largest urban settlement is less than 4 000. To simplify the analyses, all other municipalities, i.e. urban and semi-urban, are here combined as urban areas. Naturally, this classification has its drawbacks. Ideally, one would have liked to use regional classification that would separate for example cities, urban-adjacent rural areas and more peripheral rural areas, or make a distinction between functional urban and rural areas. Unfortunately, due to data limitations this was not possible. However, most semi-urban municipalities are located in the neighbourhood of urban centres and typically have a high share of commuters to urban areas, so in practice the group of urban and semi-urban areas can be considered as functional urban areas.[10]
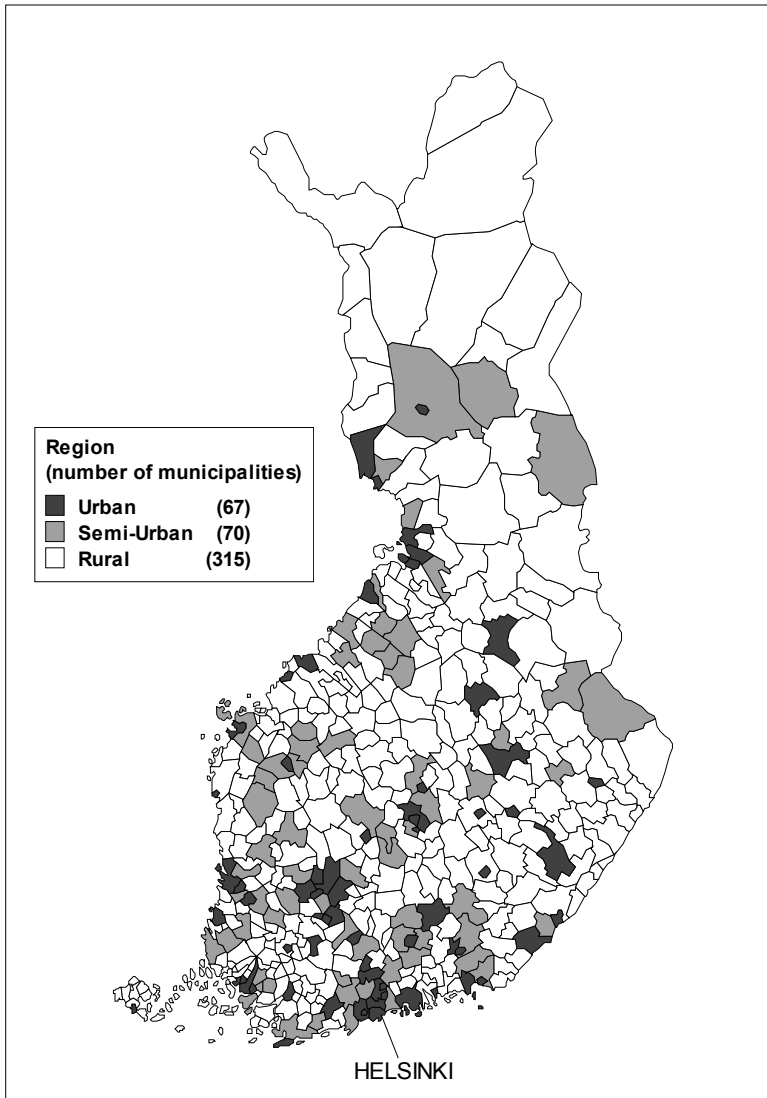
Figure 1. *Urban, semi-urban and rural areas in Finland*

In the latter part of the 1990s there were 452 municipalities in Finland. Based on the above definition, 315 of these were rural. Generally speaking, rural municipalities are characterised by scattered settlement (population density 5 per square kilometre as compared with 170 in urban areas), a high share of primary production and a more distant location from the large centres. At present around 1.2 million Finns, i.e. about quarter of the population, live in rural areas.

Due to low birth rates and modest immigration, internal migration is the major source of variation in regional population growth in Finland. It is of great importance in general, and in rural areas in particular. The population in rural areas has slowly declined since the 1970s with the ongoing structural change and continuing urbanisation of the country, but after the mid-1990s the countryside has been losing inhabitants at an accelerating rate. For the largest part, this is due to intense internal migration (Figure 2).
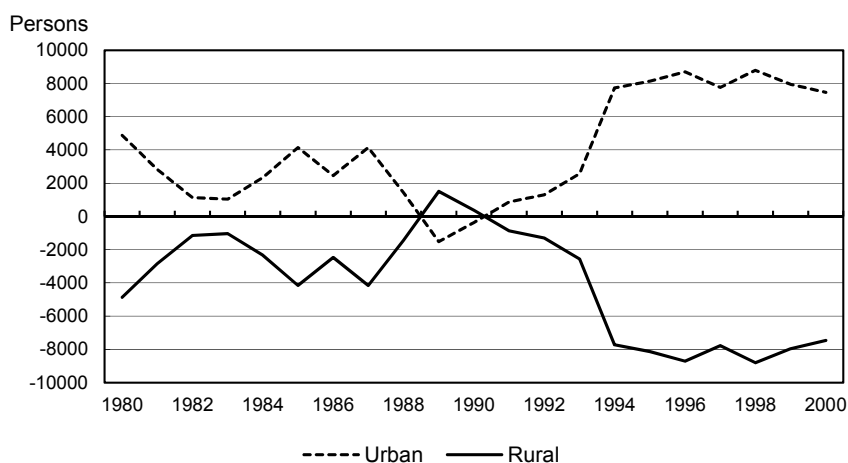
Note: Urban consist of urban and semi-urban municipalities

Figure 2. *Net migration in urban and rural areas in Finland in 1980-2000*

Mobility in Finland dramatically speeded up around the mid-1990s and has remained high ever since. For example, during 1996-99 a total of about one million Finns migrated between municipalities (Table 1). In recent years the polarisation of the population has been very strong, and there has been a clean break between the aggregate losses of the rural areas and the net gains of urban regions. For example, in 1996-99 rural areas experienced a net loss of over 30 000 inhabitants, which corresponds to around 3% of their population. Moreover, due to earlier migration and historical differences in birth rates, existing regional age structures vary considerably. The age structure in rural areas is older than average. For example, the proportion of the elderly (over 64-year old people) in rural areas is over 19%, in comparison with 13.5% in urban areas. Due to age

structure, negative natural change (-0.2% per year) further accelerates the population decline in rural areas.

Table 1. *Migration streams according to origin and destination in 1996-99 (persons, % of total moves in parenthesis)*

	Destination		
Origin	*Urban*	*Rural*	Total
Urban	645 700 (65%)	132 800 (13%)	778 500
Rural	165 800 (17%)	46 900 (5%)	212 700
Total	811 500 (82%)	179 700 (18%)	991 200
Net-migration	33 000	-33 000	
% of pop.	0.83	-2.86	
Note: Urban consists of urban and semi-urban municipalities			

One explanation for the post-recession divergence of net migration between urban and rural areas lies in differences in their economic situation and development (Table 2). For example, between 1994 and 1999, employment growth was heavily concentrated in urban areas. In the latter part of the 1990s the number of urban jobs increased by over 17%, while the respective figure for rural areas was only around 3%. Moreover, inspection of regional GDP and income differentials demonstrates that the highest GDP per capita as well as highest incomes are concentrated in urban regions, while rural locations lag far behind. For example, in 1997 average disposable income in urban areas was 5 % higher than in Finland on average, while in rural areas it was 10 % lower than in the whole country (see also e.g. Loikkanen et al., 2000; Rusanen et al., 2000).

Table 2. *Economic and labour market differences between urban and rural areas*

Area	GDP per capita	Average Disposable Income	Unemployment rate (%) in 1999	Employment growth 1994-99, %
Urban	1.22	1.05	13.4	17.5
Rural	0.64	0.90	15.7	3.7
Notes: GDP per capita and disposable income are measured relative to the country average (Finland=1) in 1997. Sources: Loikkanen et al. (2000); Palttila and Niemi (2003); own calculations from regional database Altika				

With regard to place-to-place migration streams, the statistics show that between 1996 and 1999 about 80% of all internal migrants headed to urban areas (Table 1). The majority of urban oriented moves were taking place between urban areas (urban-to-urban migration), but around 17% occurred from rural to urban locations (rural-to-urban migration). It should be noted, however, that there also exists a continuous flow of migrants to rural areas (see also Figure 3). In fact, rural in-migration also rose at the same time as general migration activity in the latter part of the 90s, although not to the same degree as out-migration. Every year about 20% of movers head to rural areas. Rural in-migration partly balances the negative effect of out-migration stream, at least quantitatively: for example, in 1999 newcomers represented around 4% of the rural population. A notable share of rural in-migrants originates from urban locations (urban-to-rural migration), but rural-to-rural migration also exists.
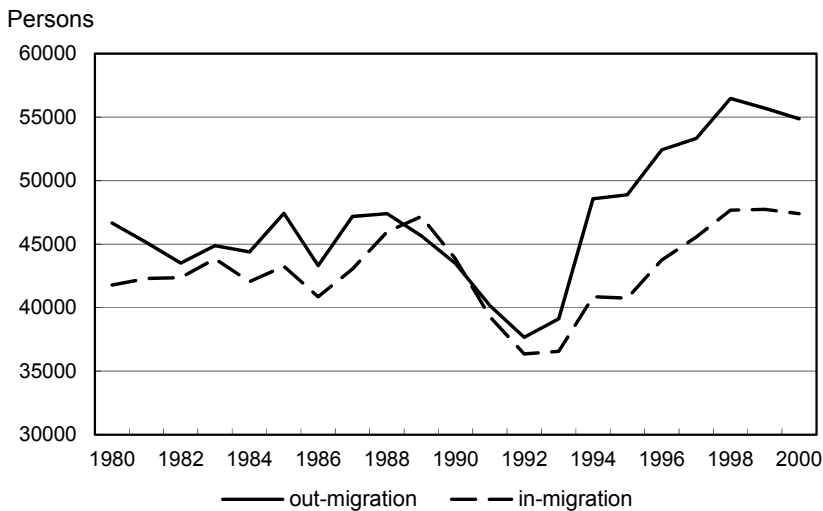
Figure 3. *Rural in-migration and out-migration in 1980-2000*

Based on the above figures, the quantitative effect of migration is clear; urban areas are growing and rural areas declining. Besides redistribution of population, the role of migration in the spatial allocation of human capital and economic activity can be assumed to be crucial. At present, the educational level of urban Finns is almost 50% higher than that of rural inhabitants (Havén, 1999). Human capital plays a key role in the economic growth and future prospects of a region (e.g. Krugman, 1991;

Barro and Sala-i-Martin, 1995). Earlier Finnish studies show that the highly educated tend to head to urban locations (see Ritsilä, 2001). Moreover, Pekkala and Tervo (2002) demonstrate that in addition to observable characteristics (i.e. education), migrants tend to be better equipped in terms of unobservable characteristics (e.g. ability and other human capital factors) as well. If rural in-migrants are not as educated and qualified as out-migrants, migration continuously absorbs critically needed resources from lagging to prosperous areas. This may have severe negative effects in the longer run; the loss of physical capital can be temporary, but the loss of human capital tends to be permanent (Forslid, 1999). To be able to assess the qualitative effect of migration on different regions, information on the quality of migrants is needed. Therefore, the rest of the paper investigates origin-destination specific determinants of migration and potential spatial variation in the characteristics of migrants in the rural-urban context.

3. Theoretical underpinning, data and variables

3.1 Theoretical considerations

Economists have traditionally argued that people migrate in order to maximise personal welfare or utility. Sjaastad's (1962) human capital approach, in which migration is viewed as an investment in human capital, is widely used as a starting point in empirical migration analyses. In this view, the potential migrant weighs the benefits against the costs of moving: if the benefits outweigh the costs, then the individual should move.

The benefits and costs can be broken down into monetary and non-monetary components. Even though the basic human capital model often views individuals almost entirely in terms of the income they could earn, and ignores many non-pecuniary aspects of a move, it is clear that the non-monetary factors may be of great importance in migration decisions, especially when considering rural destined moves. For example, Stevens (1980) points out that many non-metropolitan in-migrants expect to find some things that money could not buy in metropolitan areas (unpolluted

environment, quality of life, etc.). Morrison and Wheeler (1976) also stress the significance of life-style and other non-monetary factors in migration decisions. Moreover, housing considerations, among others, are important determinants of moving (see Rossi, 1980).

Furthermore, decisions about migration are usually made at the household, rather than individual, level (Mincer, 1978). A household can consist of any number of persons, including a single individual, and the migration decision depends on the household's expected utility flows in the current and other locations, as well as on migration costs (e.g. Böheim and Taylor, 1999). It is clear that choices of where to live involve many trade-offs. Expected utility depends not only on the wages of household members but also on other labour market features, such as employment opportunities. Housing market related factors (such as house prices), the condition and suitability of the current/alternative house of residence and the costs of living also are important in determining utility flows, not to mention tastes and preferences, which are of primary importance and do not depend on the location. Moreover, one should remember that migration is a costly process; both material and emotional costs are involved in moving. Whether or not a household changes location will depend on whether the outcome of such a change is positive or negative, i.e. migration takes place only if the expected net gains (expected utility minus costs) from relocation are greater than those from staying.

It should be noted that when a household's situation and preferences change, the migration decision can be revised. Due to diverse preferences, different areas meet the requirements of different categories of the population (Clark and Hunter, 1992). A household's migration behaviour tends to vary especially according to life-cycle, which is considered as one of the strongest factors underlying migration decisions (Plane and Heins, 2003). In particular, in the early years of working life, career-related motives and economic opportunities are likely to operate as the driving force behind the location choice. In turn, residential reasons such as housing and environment presumably become more important in later stages of the life cycle, following the arrival of dependants, in retirement, etc. (see e.g. Millington, 2000).

3.2 Data and variables

The empirical analysis is based on a 1% representative sample drawn from the longitudinal population census file of Statistics Finland. This dataset covers the years 1995-1999 (partly also earlier years) and contains information collected in population and housing censuses, completed with employment data and information from various official registers. The data are ideally suited to the study of migration, providing detailed information on individuals' characteristics as well as on their family relations.[11]

From the 1% sample, a subsample consisting of individuals aged 20-69 was selected.[12] In addition to the mobility of the working-aged population, this age interval enables an examination of the migratory behaviour of retirees.[13] This perspective is particularly interesting, as the baby-boomers, born in 1945-50, will exit working life during this decade, and can thereafter choose their location more freely. The final sample, an unbalanced panel, comprises 112 109 individual-per-year-observations.[14] Of these, around 87 000 originally lived in urban and 25 000 in rural areas. In total, the data include 3 927 moves across the Finnish municipalities during the period under scrutiny (1996-99). More precisely, there were 2 600 (66% of all moves) urban-to-urban, 600 (15%) urban-to-rural, 500 (13%) rural-to-urban and 200 (5%) rural-to-rural migration events. [15]

Independent variables as well as their means according to destination are presented in Table 3. Migration takes place in the year t+1. The independent variables are measured prior to moving, most often in year t. Explanatory variables were selected on theoretical grounds and/or on the basis of their significance in earlier migration studies. The names of the variables are largely self-explanatory, but a definition is given in some cases. The covariates can be grouped into personal and family characteristics. Personal characteristics control for observable differences in an individual's age, human capital accumulation, labour market status and other variables that have been found in earlier studies to be important determinants of migration. Family-related variables define family relations, the existence of children and the spouse's characteristics. All variables except age, age2 and income are dummies. Discussion of earlier evidence and the expected effects of the variables will follow below.

Table 3. *Means of independent variables according to the destination of migrants*

Variables	Stayers	Urban in-migrants	Rural in-migrants
		MEAN	
PERSONAL CHARACTERISTICS			
Age	45.46	35.46	39.12
Age2 (Age/10 squared)	20.67	12.57	15.30
Female	0.53	0.52	0.55
Education			
Secondary (1 if higher secondary)	0.45	0.52	0.50
Higher (1 if university of equivalent)	0.19	0.26	0.16
Main type of activity			
Unemployed	0.11	0.15	0.18
Student	0.03	0.10	0.05
Retiree	0.19	0.07	0.14
Self-employed	0.08	0.04	0.06
Recently graduated	0.01	0.05	0.03
Income (1000e)	18.7	17.2	14.9
Rented apartment	0.22	0.45	0.45
Car	0.49	0.47	0.53
Swedish-speaking	0.05	0.03	0.05
Commuter (1 if home and job in different municip.)	0.17	0.28	0.20
Migrated earlier (betw. 1990 and t)	0.21	0.60	0.54
FAMILY/HOUSEHOLD CHARACTERISTICS			
Couple (1 if married or cohabiting)	0.80	0.70	0.76
Children under 18 y. (in 1995)	0.40	0.33	0.38
Maternity leave (1 if on maternity leave)	0.09	0.12	0.14
Home care allowance (1 if on home care allowance)	0.04	0.07	0.09
Household size change (t-(t-1))			
Increased	0.08	0.18	0.17
Decreased	0.09	0.15	0.14
Spouse employed	0.49	0.41	0.36
Spouse highly educated	0.15	0.17	0.11
N	108 182	3 130	797

Notes: Migration takes place in year t+1.Variables are measured in the year prior to migration (i.e. in t), unless otherwise stated.

Vast evidence shows that migrants are typically young persons (see e.g. Greenwood, 1997). The shorter time interval to enjoy the benefits together with higher costs of moving (more ties to current locations) tend to reduce older people's migration incentives. Moreover, life-cycle events typically occur at certain ages, and age also strongly determines the geographic channels of area-to-area movement; both the opportunities for moving

and attractiveness of destinations vary greatly depending on the life-course. Starting or ending an education, getting or loosing a job, getting married, separated or divorced, having a child and children leaving home are among the major life events that are known to affect mobility (Häkkinen, 2000; Haapanen, 2002; Nivalainen, 2003; Plane and Heins, 2003). Retirement can also be considered as an important life-cycle event; the location of retirees does not depend on the job, and their income is largely independent of location (e.g. Graves and Knapp, 1988). Due to retirement migration the generally expected negative relationship between age and migration can even change into a bimodal association (see Mangalam, 1977; Rogers, 1988). Indeed, empirical evidence suggests that retirement migrants are a specific rural in-migrant group (e.g. Cross, 1990). On the other hand, the origin of retirees has so far remained unexplored.

The process of schooling generally increases migration propensities, and the more educated a migrant is, the less his mobility is restricted by the distance: those with higher education have usually better ability to collect information concerning circumstances in distant regions (e.g. Greenwood, 1997). Moreover, those with higher education may also have narrower career opportunities in certain locations, and this may result in moving.

The unemployed do not have as strong ties to current locations as the employed persons, and a number of empirical studies indicate that personal unemployment augments migration (see, e.g, Van Dijk et al., 1989). Furthermore, there is evidence that the length of the journey to work is a significant factor in the relocation, and commuting experience is typically found to increase migration propensities (Clark and Burt 1980; Nivalainen, 2004). The effect of income is not self-evident, even though it is commonly used as an explanatory variable in migration studies inspecting determinants of migration (e.g. Clark and Huang, 2004; Barcus, 2004). On one hand, higher incomes might inhibit migration due to larger opportunity costs associated with relocation, but on the other hand higher incomes could also provide more finance for moving.[16] Likewise, car ownership has no a priori sign. Car may enable longer commuting distances, thus reducing the need to move. Based on the same argument, a car could also enhance migration, in particular to rural areas. Hardill and Green (1998), for example, observed that rural in-migrants are extensive car users.

Those with stronger locational ties are likely to experience a greater loss upon moving, especially if they move longer distances, and therefore tend to move less frequently. For example, home-ownership and length of living time in a region can reflect ties. Earlier migration experience indicates that the ties to home region have been broken at least once, and therefore it is typically found to boost mobility (Tervo, 2000; Nivalainen, 2004). Owner-occupancy is very common in Finland, and home-ownership typically acts as a deterrent of migration (e.g. Tervo, 2000; Avikainen et al., 2001). Renters tend to be more mobile than owners (Clark and Withers, 1999). Furthermore, for many reasons self-employed persons may be tightly rooted in their home region, and therefore a negative association is expected between self-employment and moving. With regard to language, Finland is a bi-lingual country with Finnish and Swedish as official languages. Nevertheless, only 5% of the population speaks Swedish as their mother tongue, and the Swedish-speaking population is concentrated mainly on the southern and western coasts of Finland. Due to the small number of potential destinations, it is reasonable to expect the Swedish-speaking population to be less mobile (see Häkkinen, 2000).

As noted above, the household, rather than the individual, is frequently the key unit in migration decisions. Therefore, controlling for family status is very important. Family relations in general should deter migration (e.g. Nivalainen, 2004).[17] The expenses of migration increase with family size; when a family with children moves, costs, both material and emotional, are involved in migration. For example, new arrangements have to be made for schooling, childcare and recreation, and children must establish new friendship networks (e.g. Bielby and Bielby 1992). Especially school-aged children tend to tie families to current locations. Note, however, that the existence of under 18-year-old children is here measured in 1995 (there is no information on children in 1996-99); as a result, the variable only captures the effect of older children.[18] An employed spouse is also expected to hinder migration. On the other hand, a spouse's high education might increase the family's mobility. Finally, changes in household size reflect various life-cycle changes, including, for example, the birth of children, death of a spouse, divorce and marriage, or children leaving home. These have all been observed to boost mobility, mainly due to changing housing needs (see Cadwallader 1992; Clark et. al, 1994; Clark and Dieleman, 1996).

Before proceeding, one should note that due to data shortcomings, regional information is not available for the inspection period. Hence, regional variables cannot be used in the analysis, even though earlier studies show a clear connection, for example, between out-migration and higher local unemployment rates (e.g. Ritsilä and Tervo, 1999; Häkkinen, 2000). Availability of job opportunities may also be an important factor underlying migration, but presumably only for those who move for labour market reasons (Harkman, 1989).

Moreover, housing prices, housing-space and cost-of-living differentials might also be important migration determinants (e.g. Westerlund and Wyzan 1995, Dahlberg and Fredriksson 2001), and ideally these effects would also be tested. Unfortunately the data do not allow this. While this is a drawback, it should be noted that unlike in many other countries (e.g. Hughes and McCormick, 2000; So et al., 2001), in Finland housing prices as such do not seem to affect out-migration, but only have effect on in-migration so that higher housing prices deter in-migration. However, at the same time, the pull-effect of labour market related factors like higher income and faster economic growth is stronger than the inhibiting effect of tighter housing market conditions. (Hämäläinen and Böckerman, 2004). Since urban areas typically have lower unemployment rates, higher housing prices and higher incomes than rural areas, it can be argued that the need for regional variables is at least to some degree reduced by the control of the migrants' origin and destination. Nevertheless, these data restrictions should be kept in mind when reading the results.

4. Empirical analysis of migration from and to rural and urban areas

In this section, the determinants of migration across municipalities are examined, and in the analysis the origin and destination of migrants is acknowledged. It can be assumed that the residents of urban and rural areas differ in many ways. Therefore, to be able to assess the characteristics of migrants in relation to each area's current population, the sample is split into urban and rural populations, after which migration decisions are modelled in each part separately.[19] The probability of migration is a

function of personal and family variables, and the multinomial logit framework is utilized in exploring the effect of these variables on migration behaviour.

In the present study, the dependent variable, *Migration (*M_i*)*, has three classes: 0 = non-migrant, 1 = urban in-migrant and 2 = rural in-migrant. An individual with characteristics x_i has the following migration and destination choice probabilities:

$$P(M_i = j) = \frac{\exp(\beta_j 'x_i)}{1 + \sum_{k=1}^{2} \exp(\beta_k 'x_i)} \quad , j = 0, 1, 2 \qquad (1)$$

where β_j's are the vectors of parameters. [20]

The results are presented in Table 4. Models 1 and 2 refer to a rural origin, and models 3 and 4 to an urban origin. In practise, one of the choices has to be selected as a base category, against which the other choice alternatives are mirrored. In models 1 and 3, the base category (coefficients set to 0) is non-migrants, i.e. the estimates give the probability of urban and rural in-migration relative to the reference state of not moving. In model 2, the base category is rural in-migrants, i.e. the presented estimates give the probability of rural-to-urban migration relative to reference state of migration from rural to other rural area. In model 4, the base category is urban-to-urban migration.

The standard errors are corrected for repeated observations on the same persons. MacFadden's Pseudo R2 indicates the goodness of fit of the models. [21] It is relatively low in all models, but this is very common in discrete choice models (see e.g. Greene, 2003). In addition to coefficients (β_j), the results are reported as relative risk ratios (RRR), i.e. exp(β_j), which give the relative risk associated with an one-unit change in the explanatory variable given the other variables in the model are held constant.[22] For example, in models 1 and 3 figures greater than (less than) one indicate a higher (lower) risk of moving relative to not moving. For continuous variables (e.g. income), the basic RRR is not a very reasonable measure, and therefore the RRR for income is calculated at 75th vs. 25th percentiles.

Note also that in the case of multinomial logit checking the marginal effects is important (e.g. Greene, 2003). Marginal effect of a certain factor is the change in migration probabilities following one unit change in that factor (explanatory variable). However, in the present study the migration categories have an uneven number of observations, and the marginal effects (which give the absolute change in probability) may not be the most illustrative way of analysing results. Therefore, the interpretation here is based mainly on relative risk ratios. For comparison, marginal effects are presented in the Appendix.

As mentioned earlier, semi-urban and urban municipalities are combined into an urban category. This is reasonable, since the main focus is on rural areas. However, as a robustness check, all models were also estimated after excluding those living in or moving to semi-urban locations.[23] For the most part the results remained unchanged and only a few changes emerged. When necessary, these are discussed below (the results are not shown but are available from the author upon request).

Table 4. *Estimation results from multinomial pooled logit models: coefficients and relative risk ratios (RRR)*

Variables	Model 1		Model 2	Model 3		Model 4
	Move from Rural to Urban vs. Stay	Move from Rural to Rural vs. Stay	Move from Rural to Urban vs. Rural	Move from Urban to Urban vs. Stay	Move from Urban to Rural vs. Stay	Move from Urban to Rural vs. Urban
	Coeff. RRR	Coeff. RRR	Coeff. RRR	Coeff. RRR	Coeff. RRR	Coeff. RRR
Constant	-1.08*	-5.67**	4.58**	-2.24**	-5.58**	-3.35**
PERSONAL CHARACTERISTICS						
Age	-0.12**	0.02	-0.15**	-0.05**	0.03	0.08**
	0.88	1.02	0.86	0.95	1.03	1.08
Age2	0.11**	-0.05	0.15**	0.01	-0.07**	-0.08**
	1.11	0.95	1.17	1.01	0.93	0.92
Female	0.08	0.27	-0.19	-0.03	0.10	0.13
	1.09	1.31	0.83	0.97	1.10	1.13
Education						
Secondary	0.40**	0.01	0.38*	0.03	-0.15	-0.18
	1.49	1.01	1.47	1.03	0.86	0.83
Higher	0.70**	-0.25	0.95**	0.19**	-0.23*	-0.42**
	2.01	0.78	2.58	1.21	0.79	0.66
Main type of activity						
Unemployed	0.41**	0.24	0.18	0.26**	0.26**	0.00
	1.51	1.27	1.19	1.30	1.30	1.00
Student	0.47**	0.58*	-0.12	0.39**	-0.33	-0.73**
	1.60	1.79	0.89	1.48	0.72	0.48
Retiree	-0.07	0.13	-0.20	0.04	0.55**	0.51**
	0.93	1.14	0.82	1.04	1.73	1.66
Self-employed	-0.22	0.38	-0.59*	-0.00	-0.24	-0.24
	0.81	1.46	0.55	1.00	0.79	0.79
Recently graduated	0.04	-0.19	0.23	0.45**	0.48**	0.03
	1.05	0.83	1.26	1.56	1.61	1.03
Income	0.00	-0.02	0.02	0.00	-0.01**	-0.01**
	1.02	0.80	1.30	1.01	0.83	0.83
Rented apartment	0.59**	1.04**	-0.46**	0.35**	0.45**	0.10
	1.80	2.83	0.63	1.41	1.56	1.10
Car	-0.22**	0.29*	-0.51**	0.10**	0.43**	0.33**
	0.80	1.34	0.60	1.10	1.53	1.39
Swedish-speaking	-0.56**	0.34	-0.90**	-0.04	0.16	0.19
	0.57	1.41	0.41	0.97	1.17	1.21
Commuter	0.49**	0.11	0.37	0.50**	0.23**	-0.27**
	1.63	1.12	1.45	1.65	1.26	0.76
Migration history	1.04**	1.53**	-0.48**	1.00**	0.98**	-0.02
	2.84	4.61	0.62	2.72	2.66	0.98

Table 4. *Continued*

Variables	Model 1		Model 2	Model 3		Model 4
	Move from Rural to Urban vs. Stay	Move from Rural to Rural vs. Stay	Move from Rural to Urban vs. Rural	Move from Urban to Urban vs. Stay	Move from Urban to Rural vs. Stay	Move from Urban to Rural vs. Urban
	Coeff. RRR	Coeff. RRR	Coeff. RRR	Coeff. RRR	Coeff. RRR	Coeff. RRR
FAMILY/HOUSEHOLD CHARACTERISTICS						
Couple	-0.40**	-0.21	-0.19	-0.13**	0.31**	0.45**
	0.67	0.81	0.82	0.88	1.37	1.56
Children	-0.16	0.16	-0.32	-0.30**	-0.31**	-0.01
	0.85	1.17	0.73	0.74	0.73	0.99
Maternity leave	-0.33*	0.24	-0.57**	-0.11	0.03	0.14
	0.72	1.27	0.57	0.90	1.04	1.15
Home care allowance	0.16	0.31	-0.15	0.15	0.34*	0.19
	1.18	1.36	0.86	1.16	1.40	1.20
Household size						
Increased	0.39**	0.09	0.30	0.46**	0.51**	0.05
	1.47	1.09	1.35	1.58	1.66	1.05
Decreased	0.49**	0.12	0.37	0.27**	0.36**	0.09
	1.63	1.12	1.45	1.31	1.44	1.10
Spouse employed	-0.61**	-0.73**	0.12	-0.22**	-0.47**	-0.25**
	0.54	0.48	1.13	0.80	0.63	0.78
Spouse highly educ.	0.09	0.30	-0.21	0.16**	-0.21	-0.37**
	1.10	1.35	0.82	1.17	0.81	0.69
N	25 115			86 994		
Log likelihood	-3 118.07			-13 669.47		
Model chi2(52)	1 022.19 (p=0.000)			3 390.98 (p=0.000)		
Pseudo R2	0.13			0.11		
Notes: All models incl. year-dummies. Std. errors corrected for multiple observations. */** significant at 10/5% level. In models 1 and 3 the base category is staying, in model 2 the base category is rural-to rural migration and in model 4 urban-to-urban migration.						

From the regional perspective, rural-to-urban and urban-to-rural streams are of primary interest, as it is expressly these counterstreams that define the total impact of migration on rural and urban areas. Rural-originated migration is analysed first (models 1 and 2). The results show that rural-to-urban migration likelihood is highest when young, i.e. rural-to-urban migrants are younger than the existing population of the rural areas.[24] They are also younger than those moving between rural areas.[25] Moreover, rural-to-urban migrants are educated persons, and higher education in particular increases the probability of moving away from a rural area (by a factor of 2). Rural-to-urban migrants are also more educated than rural-to-rural migrants. Furthermore, the unemployed and students have a

significantly higher likelihood of leaving rural areas and heading to urban locations. On the other hand, students also seem to move from one rural location to another (significant at 10% level). This is most likely explained by the rural location of some secondary education institutes.

Previous inter-municipal commuting significantly increases the likelihood of rural-to-urban migration (by 60%). By contrast, Swedish-speaking individuals and those with a car have lower probabilities of moving from rural to urban areas. On the other hand, a car increases rural-to-rural mobility (significant at 10% level). Self-employment as such does not significantly influence the likelihood of migration, but if a rural-originated self-employed person moves, the move is likely to occur between rural areas (significant at 10% level).

As expected, family relations are of importance in migration decisions. Being a couple reduces the propensity of a rural-to-urban move (by 30%). Moreover, maternity leave, i.e. the presence of a very young child, inhibits migration away from the countryside (significant at 10% level). A negative, yet insignificant, sign is also attached to the children variable. As mentioned earlier, this variable is likely to capture the effect of older children (see section 3.2).

With regard to urban-to-rural migration (models 3 and 4), it can be seen that the age-variable does not have any significant impact, but age squared is significantly negative, which means that urban-to-rural migration likelihood starts to decrease fairly soon after the beginning of the age interval.[26] Nevertheless, in relation to urban-to-urban migrants urban-to-rural migrants are significantly older. Moreover, it can be seen that the probability of an urban-to-rural move decreases with education, and highly educated individuals in particular are less likely to head to rural destinations (significant at 10% level). Note also that this is the only direction where the spouse's higher education shows a negative sign. At this point it is also worth mentioning that when the semi-urban municipalities were excluded, the negative effect of education further strengthened (secondary and higher education as well as spouse's higher education showed significant negative signs in urban-to-rural moves).

Moreover, the results explicitly show that retirement migration is an integral part of urban-to-rural migration: being a retiree significantly increases the probability of an urban-to-rural move (by 70%). This is the only instance where retirement is a significant determinant of moving. Furthermore, it can be seen that the unemployed do not solely move to

urban destinations, but they are also likely to move from urban to rural locations. Most probably, the finding relates to the migration behaviour of those unemployed who wait for retirement.[27] This was checked by entering an interaction variable between personal unemployment and age. The coefficient on this variable was positive, although insignificant, and by the inclusion of the interaction personal unemployment lost its significance.[28]

Being a student has a negative sign in urban-to-rural mobility, but the effect is insignificant. It is notable that in all other moves the student-variable displays a positive impact. Rather surprisingly, recent graduation not only increases the likelihood of moving between urban areas but also from an urban to a rural location. On the other hand, this only demonstrates that not all graduates stay in cities. Commuting also has a positive effect on urban-to-rural migration. These findings imply that at least some of the moves to rural destinations might be job-related. Furthermore, car ownership increases the likelihood of an urban-to-rural move, indicating that a car is an important rural in-migration enhancing factor. Note also that if a person with a car moves, the destination is more likely to be rural than urban. Current income in general does not seem to play a part in migration decisions, but urban-to-rural moves are an exception: individuals with lower than average incomes tend to head from urban to rural locations.

Influences of family composition on migration are again apparent. Being a couple has a positive and significant effect on urban-to-rural mobility. Even though the existence of children in general diminishes migration propensities, home care allowance increases the odds of rural in-migration (significant at 10% level). As explained above, the children variable is likely to reflect the effect of older children, while the positive effect of home care allowance signals that urban-to-rural moves tend to occur when children are still small. Note, however, that when the semi-urban inhabitants were removed from the analysis, the children variable became insignificant and home-care allowance just failed to reach significance at conventional levels (significant at 10.2% level).[29]

With regard to urban-to-urban migration, those moving between urban areas tend to possess the characteristics of typical migrants (see Ritsilä, 2001; Haapanen, 2002): they are young and educated, and so are their spouses. Being a commuter, unemployed or student also increases the likelihood of relocation between urban areas. Instead, family relations

(being a couple and having children) significantly reduce urban-to-urban mobility. Rather surprisingly, a car enhances migration between urban areas. This, however, mainly reflects the quality of semi-urban in-migrants, since after their exclusion the car became insignificant.

Independent of origin and destination, mobility increases when living in a rented apartment and with migration history and decreases when a spouse is working. This is in line with earlier studies (see section 3.2). Changes in the household size also generally augment migration, but there is supposedly considerable variation according to factors underlying the household size change. Unfortunately we could not control for these here.

5. Conclusions

The purpose of the present paper was to extend the knowledge about migration by exploring origin and destination specific population movements and potential spatial variation in the factors influencing migration in the urban-rural context. In these attempts, the determinants of migration to and from urban and rural areas in Finland were examined with a large representative micro-level panel data set from the years 1995-99.

The results show that migrants not only differ from stayers but there are also many differences between migrants from and to rural and urban areas. In particular, rural-to-urban migrants are highly educated while those moving from urban to rural areas are not. Urban-to-rural migrants also have lower than average incomes. Moreover, the findings confirm that locational preferences vary with the life-cycle: young and single individuals move to urban destinations, while couples and retired persons tend to head from urban to rural areas. This corroborates evidence from other countries (see, for example, Lewis et al., 1991; Hardill and Green, 1998). The finding that retirement migration is an integral part of urban-to-rural migration has interesting implications with regard to the forthcoming retirement of the baby-boom generation, and supports the view that rural in-migration will most likely increase during the next 10 years or so. The exact magnitude of these flows is, of course, difficult to evaluate.

As it is expressly the young and educated individuals that urban areas absorb from rural areas, migration not only decreases rural population base but also distorts the (already skewed) age structure of rural areas and deprives rural regions of critically needed human capital. Furthermore, the loss tends to be permanent, since those moving in the opposite direction, from urban to rural, are less educated. In practice this means that both rural-to-urban and urban-to-rural migration works to the benefit of the urban areas, and this two-way impact strengthens the unbalancing effect of internal migration. Hence, regional disparities are likely to increase (rather than decrease) upon continuing migration. This, in fact, is in line with the observed development and the persistence of regional differences in Finland.

In some countries it has been proposed that improvements in transportation that lower commuting times might be an effective means of supporting rural economic development (see Renkow and Hoover, 2000; So et al., 2001). Commuting has remained largely unexplored in Finland. Obviously, patterns of commuting and factors affecting them, as well as the choice between moving and commuting should be analysed; without a proper understanding of individual behaviour it is impossible to develop and target policy measures, for example. Nevertheless, when considering the cure, one should keep in mind that, due to the special character of Finland, the experiences and actions of other countries may not be directly applicable.[30] In particular it seems clear that in a country with a large area and sparse population the means to alleviate the problems of rural and remote areas cannot be profitably based upon urban strengths and reflective effects of urban growth alone.[31]

Even though migration seems to fasten regional polarisation of population and human capital in Finland, it is quite evident that the majority of migrants seek a better life. Earlier Finnish research, however, has suggested that relocation does not increase migrants' employment propensities, not even in the case of unemployed migrants (Pekkala and Tervo, 2002). This intuitively unappealing result might at least partly be explained by the destination choices of movers. Therefore, the success of migrants and the potential variation according to destination merits investigation. Moreover, it would be important to be able to acknowledge the effect of tastes and preferences and other unobserved factors on migration choices, which might explain a notable proportion of rural-

destined moves, in particular.[32] Future work will concentrate on these topics.

Endnotes

[1] Before the deep economic crisis of the early 1990s, Finland enjoyed several decades of fairly steady economic growth. There were no strong booms or busts. There were less dramatic recessions in the 1950s and late 1970s (GDP did not decline), but before the beginning of the 1990s the most severe economic crisis was at the 1930s. (see e.g. Kalela et al., 2001; Hjerppe, 2008)

[2] Before the post-recession period of the 1990s there was a period of high migration activity from the early 1960s to the mid 1970s. For example, in 1975 about 5 % of population migrated between municipalities. This was not, however, related to any specific economic boom, but was mostly due to out-migration of the baby-boom generation (born in 1945-50) from rural areas. After mid 1970s the pace of migration slowed down (to around 4 % of population), and remained quite stable for about 20 years. For example, during the economic upswing of the late 1980s, internal migration was actually at relatively low level. One explanation underlying the period of quite harmonious regional development before the recession of the early 1990s is active regional policy. A systematic regional policy in Finland began in the 1960s. Finnish regional policy has traditionally aimed at maintaining equal standards of living and employment opportunities in all regions, attracting economic activity into lagging regions and securing the efficient operation of market forces. Enthuastic regional policy together with the practice of using the welfare state institutions has resulted in that, compared to many other European countries, the Finnish regional structure has historically been relatively even and regional inequalities fairly narrow. (in more detail, see e.g. Pekkala, 2000b)

[3] In the early 2000s, out-migration from rural areas and in-migration to urban areas abated somewhat. However, this was most likely due to a slight economic recession, and is therefore assumed to be temporary. Nevertheless, rural areas still lose population through migration.

[4] In the 1960s and mid 1970s the level of unemployment in Finland was practically zero (it varied from 1.0 to 4.8 % regionally). Unemployment started to rise in the late 1970s, but regional differences remained constant or even narrowed until the recession of the early 1990s (Kangasharju et al., 1999). During the recession and thereafter regional differences in unemployment were large. For example, in 1998 regional (NUTS3) unemployment rates varied from 1.4 to 19.8 % (see Pekkala, 2000b). At the end of the 1990s, Finland held both the highest and lowest positions in regional unemployment rates among the Nordic countries (Hanell et al., 2002).

[5] In the case of Finland, Kauhanen and Tervo (2002) and Nivalainen (2003) are exceptions. Both use cross-sectional data. The former examines the characteristics of in-migrants in depressed regions, and finds out that those moving to more backward destinations are older and more likely unemployed in relation to other migrants. The latter inspects the determinants of migration to rural areas. Among other things, the results show that rural in-migrants tend to be older and less educated than those moving to other areas. However, neither of these studies considers both the origin and destination of migrants.

[6] The term place-to-place migration is here used to draw a distinction to earlier studies that do not consider each end of migration (origin and destination) simultaneously.

[7] Rural-to-urban migration has been studied mainly in LDCs (e.g. Stark, 1984; Sabatés, 2000). In developed countries some work has been done on urban directed migration (see

Cadwallader, 1992; Fielding, 1993). Much less is known about urban-to-rural population movements.

[8] Since most migrants relocate between urban areas, earlier Finnish studies are likely to mainly reflect the characteristics of urban-to-urban migrants.

[9] Finland's urbanisation rate is one of the lowest in the EU.

[10] Of course, urban and semi-urban municipalities are a heterogeneous group in the sense that some people may move from urban municipalities to semi-urban municipalities due to reasons related to housing, for example. However, the main objective of the present study was to examine urban-to-rural and rural-to-urban migration, not migration between cities and surrounding municipalities. For that purpose, the regional classification used here is appropriate.

[11] A drawback is that the actual reasons for moving are unknown.

[12] Children (i.e. those living with their parents) and those living in institutions were dropped.

[13] The official retirement age in Finland is 64, and the actual retirement age is 59 years.

[14] The data were originally in cross-sectional form, but I transferred it to panel-form in order to increase place-to-place migration events.

[15] As a referee suggested, it would be interesting to inspect short- and long-distance moves separately. However, due to small number of place-to-place migrants, this was not possible. A closer inspection of the data used in the present study revealed that for example among those who migrated in 1996 or 1997, around 40 % of all moves were of long distance. This holds in all place-to-place moves. Short-distance migration was defined to occur between municipalities but inside a certain region (NUTS3) and long-distance migration between regions. Finnish NUTS3 regions are comparatively large, so a move across regional borders typically also means change in labour market area (i.e. these moves are more likely to be motivated by labour market reasons, while moves within the regional borders may more often be associated with housing needs and family reasons etc).

[16] As a referee suggested, change in income or change in regional difference in incomes given individuals' characteristics might also influence migration decisions. Change in individual income prior to migration can augment migration in case of job loss, for example, but in that case it reflects the effect of job loss, which can be assumed to be the driving force behind migration. Personal unemployment experience is controlled for in the models, and the effect of duration of unemployment spell was also tested. On the other hand, change in income (or change in income difference) after migration relates on the consequences of moving, which are beyond the scope of this paper. Consequences of moving (measured in terms of change in incomes) are left to be considered in subsequent studies.

[17] It should be noted that the event of marriage may encourage migration, but the state of marriage tends to hinder it (see Greenwood, 1997). Unfortunately the effect of events such as getting married or divorced could not be tested with the present data.

[18] For example, those who were 1 year old in 1995 were 5 years old in 1999. Moreover, the children variable does not take into account new births between 1995 and 1999, even though having children is considered a major life cycle event. Additional births increase the space requirements of a family, and may result in moving. The effect of young children is partly captured by the variables indicating maternity leave and home care allowance, but both are far from perfect measures (for example, they are associated only to females in the sample).

[19] The need to estimate separate models for urban and rural-originated migration was checked by estimating a model for out-migrants from different origins (multinomial logit, where the dependent variable was non-migrant, out-migrant from urban area, out-migrant from rural area). The model showed many significant differences between out-migrants

from urban and rural areas (the results are available upon request). This serves as a further argument for estimating separate models for migrants from different origins.

[20] For further discussion of the multinomial logit model see e.g. Greene (2003).

[21] See Stata 8 manual for further information.

[22] Relative risk ratio is the ratio of probabilities, i.e. if the base category is non-migrants (like in models 1 and 3), RRR= $\frac{P(M_i = j)}{P(M_i = 0)} = \exp(\beta_j' x_i)$. It is straightforward to show that this equals $\exp(\beta_j)$.

[23] Likewise, the results were checked by combining semi-urban areas into rural areas. The results remained almost unchanged.

[24] Even though the age2-variable is significant and positive, i.e. after some point rural-to-urban migration odds start to (slowly) increase again, the migration likelihood still peaks at young age.

[25] In model 2, those who migrate from rural area to urban area are mirrored against those who migrate from rural area to another rural area (rural-to-rural migration is the reference group). Age gets a significant and negative coefficient (and age2 significant and positive). This means that the propensity to migrate from rural to urban area peaks at young age, and in relation to those who move between rural areas, those moving from rural to urban areas are younger (migration propensities peak at young age and start decrease thereafter).

[26] If age squared is excluded from the model, age has a significant and negative coefficient in urban-to-rural moves.

[27] Another explanation could be that living costs are lower in rural areas.

[28] The duration of the unemployment spell was also tested out but it was insignificant.

[29] As pointed out in section 3.2, housing related factors, such as costs and qualities of housing may play an important role in migration decisions. It can be assumed that housing related factors might be especially relevant in case of family migration. For example, Nivalainen (2003) shows that in Finland living space is a significant factor underlying rural in-migration; those with less living space tend to move to rural destinations. It is therefore unfortunate that housing related factors could not be taken into account in the analysis. At the same time it should be noted that earlier Finnish studies also show that the most important motives underlying urban-to-rural migration are related to life-cycle stage and social factors (such as marriage, divorce or getting older), and purely housing related factors are only the second most important reason (Virtanen, 2003).

[30] The regional structure in Finland (as in other Nordic countries, too) is very different from the rest of the Europe, for example. Finland has a small population base and a large area. Population density in the continent of Europe is usually ten times or more than of Finland, and distances in Finland are considerably longer.

[31] There is little evidence of the reflective effects of being able to penetrate the areas beyond the immediate vicinity of the urban centres themselves (Eskelinen and Schmidt-Thomé, 2002; see also Hanell, 2002b).

[32] The variation in tastes and preferences can be taken into account by using e.g. mixed multinomial logit model, which allows for variation in estimated coefficients (for discussion of the model see e.g. Hensher and Greene, 2001).

Appendix.

Estimation results from multinomial pooled logit models: marginal effects

Variables	Model 1			Model 3		
	Move from Rural to Urban	Move from Rural to Rural	Stay in Rural	Move from Urban to Urban	Move from Urban to Rural	Stay in Urban
	Marg.eff.	Marg.eff.	Marg.eff.	Marg.eff.	Marg.eff.	Marg.eff.
PERSONAL CHARACTERISTICS						
Age	-0.14**	0.01	0.13**	-0.09**	0.02	0.07**
Age2	0.12**	-0.02	-0.10**	0.01	-0.03**	0.02
Female	0.09	0.12	-0.21	-0.05	0.05	0.00
Education						
Secondary	0.44**	0.00	-0.44**	0.05	-0.08	0.02
Higher	0.77**	-0.11	-0.66**	0.35**	-0.12*	-0.23
Main type of activity						
Unemployed	0.46**	0.10	-0.56**	0.47**	0.13**	-0.60**
Student	0.52**	0.25	-0.77**	0.72**	-0.17	-0.56**
Retiree	-0.08	0.06	0.02	0.07	0.27**	-0.33
Self-employed	-0.24	0.17	0.07	-0.00	-0.12	0.12
Recently graduated	0.05	-0.08	0.03	0.81**	0.23**	-1.04**
Income	0.20e-04	-0.81e-04	0.61e-04	0.85e-05	-0.65e-04**	0.56e-04**
Rented apartment	0.64**	0.45**	-1.10**	0.63**	0.21**	-0.84**
Car	-0.25**	0.13*	0.12	0.17**	0.21**	-0.38**
Swedish-speaking	-0.62**	0.15	0.47	-0.06	0.08	-0.01
Commuter	0.54**	0.05	-0.59**	0.91**	0.11*	-1.02**
Migration history	1.15**	0.67**	-1.81**	1.82**	0.47**	-2.29**
FAMILY/HOUSEHOLD CHARACTERISTICS						
Couple	-0.44**	-0.09	0.53**	-0.24**	0.15**	0.09
Children	-0.18	0.07	0.11	-0.55**	-0.15**	0.70**
Maternity leave	-0.37*	0.11	0.26	-0.19	0.02	0.18
Home care allowance	0.18	0.13	-0.31	0.27	0.16*	-0.44**
Household size						
Increased	0.43**	0.04	-0.47**	0.83**	0.24**	-1.08**
Decreased	0.54**	0.05	-0.59**	0.49**	0.17**	-0.67**
Spouse employed	-0.67**	-0.32**	0.99**	-0.40**	-0.23**	0.62**
Spouse highly educated	0.10	0.13	-0.23	0.29**	-0.10	-0.19
Notes: The figures are marginal effects multiplied by 100. */** significant at 10/5% level						

References:

Avikainen, A., Vallström, A ja Tervo, H. (2001): Re-migration and its determinants in Finland. (In Finnish, abstract in English). *Kunnallistieteellinen aikakauskirja* 2/01.

Barcus, H. R. (2004) Rural In-Migration: Migrant Motivations and Residential Consequences.

Regional Studies 38(6):643-658.

Barro R., Sala-i-Martin X.,(1995) *Economic Growth*. Boston, MA, McGraw-Hill.

Bielby W. T. and Bielby D. D. (1992) I Will Follow Him: Family Ties, Gender-role Beliefs, and Reluctance to Relocate for a Better Job. *American Journal of Sociology,* vol. 97, pp. 1241-1267.

Böheim, R. and Taylor, M. (1999): *Residential mobility, housing tenure and the labour market in Britain.* The Institute for Labour Research Discussion Paper Series 99/35.

Cadwallader, M. (1992): *Migration and Residential Mobility: Macro and Micro Approaches*. Madison, University of Wisconsin Press.

Clark W. A. V. and Burt J. E. (1980) The Impact of Workplace on Residential Relocation. *Annals of the Association of American Geographers*, vol. 70, pp. 59-67.

Clark, W.A.V., Duerloo, M.C. and Dieleman, F.M. (1994): Tenure Changes in the Context of Micro-Level Family and Macro-Level Economic Shifts. *Urban Studies*, 31, pp. 137-154.

Clark, W.A.V. and Dieleman, F.M. (1996): *Households and Housing: Choices and Outcomes in the Housing Market.* New Brunswick, NJ: Rutgers University Press, Center for Urban Policy.

Clark, W. A, V and Huang, Y. (2004) Linking Migration and Mobility: Individual

and Contextual Effects in British Housing Markets", *Regional Studies*, 38(6):617-628

Clark, D. E. and Hunter, W. J. (1992): The Impact of Economic Opportunity, Amenities and Fiscal Factors on Age-Specific Migration Rates. *Journal of Regional Science*, vol. 32:3, pp. 349-365.

Clark, W., and Withers, S. (1999). Changing Jobs and Changing Houses: Mobility Outcomes of Employment Transitions. *Journal of Regional Science, 39*, 653-673.

Cross, D. (1990): *Counterurbanisation in England and Wales*, Avebury, Aldershot.

Dahlberg, M. and Fredriksson, P. (2001): *Migration and Local Public Services*. Uppsala University Working Papers 2001:12, Uppsala.

DaVanzo, J. (1978): Does Unemployment Affect Migration? Evidence from Micro Data. *The Review of Economics and Statistics*, vol. 60, pp. 504-514.

Eskelinen, H. and Schmidt-Thomé, K. (2002): *Rural Finland, Urban Europe – partnership*, Nordregio Report, 2002:1.

Fielding, A. J. (1993): Migration and the metropolis: An empirical and theoretical analysis of interregional migration to and from South East England. Pergamon, U.K., Oxford Press.

Forslid, R. (1999): Agglomeration with human and physical capital: an analytically solvable case. CEPR Discussion Paper no. 2102.

Graves, P. E. and Knapp, T. A. (1988) Mobility behavior of the elderly, Journal of Urban Economics, Elsevier, vol. 24(1), pp. 1-8.

Green, A. E. (1997): A Question of Compromise? Case Study Evidence on the Location and Mobility Strategies of Dual Career Households. *Regional Studies*, vol. 31, pp. 641-657.

Greene, W. (2003) Econometric Analysis, 5th Edition. Prentice Hall.

Greenwood, M. (1997): Internal Migration in Developed countries, in Rosenzweig, M.R. and Stark, O. (eds.) *Handbook of Population and Family Economics*, North-Holland, Amsterdam.

Haapanen, M. (2002): *Labour Migration and Wages*. University of Jyväskylä, Reports from the School of Business and Economics N:o 29/2002 (licentiate thesis). Jyväskylä.

Hanell, T (2002a): *Nordic Labour Markets within National Confines*, Journal of Nordregio, vol. 2, 2, pp. 14-18.

Hanell, T. (2002b): *Size Matters*, Journal of Nordregio, vol.2, 4, pp. 4-5.

Hanell, T., Aalbu, H. and Neubauer, J. (2002): *Regional Development in the Nordic Countries 2002*, Nordregio Report 2002:2.

Hardill, I. and Green, A. (1998): *In search of the 'rural idyll': towards a more holistic understanding of implications of rural in-migration.* Paper presented in the congress: New Lifestyles, New Regions: Intergrated Approaches to Local and Regional Development and Planning Policy, November 1998.

Harkman A. (1989) Migration Behaviour Among the Unemployed and the Role of Unemployment Benefits. *Papers of Regional Science Association*, vol. 66, pp. 143-150.

Havén, H. (ed.) (1999): *Education in Finland 1999*, Statistics and Indicators. Tilastokeskus. Helsinki.

Hensher, D.A. and Greene, W. (2001) The mixed logit model: the state of practise and warnings for the unwary. Working Paper ITS-WP-02-01, University of Sydney.

Hjerppe, R. (2008) "An Economic History of Finland". EH.Net Encyclopedia, edited by Robert Whaples. February 10, 2008. URL http://eh.net/encyclopedia/article/hjerppe.finland

Hughes G. & McCormick B. (2000). Housing Policy and Labour Market Performance. DETR 2000.

Häkkinen, I. (2000): *Determinants of migration and choice of destination in Finland*. Valtion taloudellinen tutkimuskeskus, tutkimuksia 65 (in Finnish).

Hämäläinen K. & Böckerman P. (2004). Regional Labour Market Dynamics, Housing and Migration. Journal of Regional Science, 44, 3, 543-568.

Kalela, J., Kiander, J., Kivikuru, U., Loikkanen, H.A., Simpura, J. (eds.) (2001): Down from the heavens, Up from the ashes, The Finnish economic crisis of the 1990s in the light of economic and social research. Government Institute for Economic Research, Helsinki.

Kangasharju, A., Kataja, J-P. & Vihriälä, V. (1999): Regional development in Finland (Suomen aluerakenteen viimeaikainen kehitys) Working paper No. 17. Pellervo economic research institute, Helsinki. (in Finnish).

Kauhanen, M. ja Tervo, H. (2002): Who moves to depressed regions? An analysis of migration streams in Finland in the 1990s. *International Regional Science Review*, 25, 2, pp. 200-218.

Krugman, P.R. (1991): Increasing returns and economic geography. *Journal of Political Economy*, vol. 99, pp. 483-499.

Lewis, G., McDermott, P. and Sherwook, K. (1991): The counterurbanisation process: demographic restructuring and policy response in rural England. *Sociologia Ruralis* 31, pp. 309-320.

Loikkanen, H., Riihelä, M. and Sullström, R. (2000): *Income and consumption differences between and within urban, semi-urban and rural municipalities*. VATT-Discussion Papers 213, Government Institute for Economic Research (in Finnish).

Mangalam J. J. (1977): Review symposia. *Demography* 14, 562-69.

Millington, J. (2000): Migration and Age: The Effect of Age on Sensitivity to Migration Stimuli. *Regional Studies*, vol. 34:2, pp. 521-533.

Mincer, J. (1978): Family Migration Decisions. *Journal of Political Economy*, vol. 86, pp. 749-773.

Morrison, P. A., Wheeler, J. P. (1976): Rural renaissance in America? *Population Bulletin* 31, pp. 3-26.

Nivalainen, S. (2003): *Who move to rural areas? Micro evidence from Finland*. Paper presented in ERSA-congress 2003 in Jyväskylä, Finland. A Finnish version published as: Nivalainen, S. (2002) Maallemuuttajat – millaisia he ovat? Pellervo Economic Research Institute Working Papers N:o 59.

Nivalainen, S. (2004): Determinants of Family Migration: Short Moves vs. Long Moves, *Journal of Population Economics* 17, 1, 157-75.

Nivalainen, S. and Haapanen, M. (2002): *Ageing and centralizing Finland: population development in urban and rural areas, 1975-2030*,

Aluekeskus- ja kaupunkipolitiikan yhteistyöryhmän julkaisuja 1/02 (In Finnish).

Palttila, Y. ja Niemi, E. (2003) Rural areas in the beginning of the EU-programme period 2000-2006- Rural indicators (Maaseutu EU-ohjelmakauden 2000-2006 alussa – Maaseutuindikaattorit.) Katsauksia 2, Tilastokeskus (in Finnish).

Pekkala, S. (2000a): *Migration in a Core-Periphery Model: Analysis of Agglomeration in Regional Growth Centres.* University of Jyväskylä, School of Business and Economics, Working Paper N:o 216/2000.

Pekkala, S. (2000b): Regional Convergence and Migration in Finland 1960-1995. Jyväskylä Studies in Business and Economics, University of Jyväskylä. Doctoral Dissertation.

Plane, D. A. and Heins, F. (2003): Age Articulation of U.S. inter-metropolitan migration flows. *The Annals of Regional Science*, vol. 37, pp. 107-130.

Pekkala, S. and Tervo, H. (2002): Unemployment and migration: Does moving help? *Scandinavian Journal of Economics,* vol. 104:4, pp. 621-39.

Renkow, M. and Hoover, D. (2000): Commuting, Migration and Rural-Urban Population Dynamics. *Journal of Regional Science*, vol. 40, pp. 261-287.

Ritsilä, J. (2001): *Studies on the Spatial Concentration of Human Capital.* Jyväskylä Studies in Business and Economics, Doctoral Dissertation, University of Jyväskylä.

Ritsilä, J., Tervo, H. (1999): Regional Differences in the Role of Migration in Labour Market Adjustment: The Case of Finland. In: Crampton G (ed.) *Regional Unemployment, Job Matching and Migration, Series on European Research in Regional Science.* Pion, London, pp. 166-182

Rogers, A. (1988): Age patterns of elderly migration: an international comparison. *Demography* 25, pp. 355-70.

Rossi, P. H. (1980): *Why Families Move.* 2nd ed. Sage, Beverly Hills.

Rusanen, J., Colpaert, A., Muilu, T. and Naukkarinen, A. (2000): Permanent and growing income differences. *Tietoaika* 2/2000. Statistics Finland (in Finnish).

Sabatés, R. (2000): Job Search and Migration in Peru. *The Journal of Regional Analysis & Policy*, vol. 30:2, pp. 55-79.

Sjaastad, L.A. (1962): The Costs and Returns of Human Migration. In Richardson H. W. (ed.) *Regional Economics*. The University Press, Glasgow.

So, K. S., Orazem, P. and Otto, D. M. (2001): The Effects of Housing Prices, Wages, and Commuting Time on Joint Residential and

Job Location Choices, *American Journal of Agricultural Economics*, 83, 4, pp. 1036-1048.

Stark, O. (1984): Rural-to-urban migration in LDCs: a relative deprivation approach. *Economic Development and Cultural Change*, vol. 32 (3), pp. 475-486.

Statistics Finland (1997): Regional classifications: municipalities 1997. Käsikirjoja (in Finnish).

Stevens, J. B. (1980): The demand for public goods as a factor in the non-metropolitan migration turnaround. In Brown, D. L. and Wardwell, J. M. (eds.) *New Directions in Urban-Rural Migration: The Population Turnaround in Rural America,* New York, Academic Press, pp. 115-35.

Taipale, M. (2002): *Convergence of production and incomes between Finnish subregions* (in Finnish, abstract in English), Pellervo Economic Research Institute Working Papers No. 58.

Tervo, H. (2000): Migration and labour market adjustment: empirical evidence from Finland 1985-90, *International Review of Applied Economics* 14, pp. 343-60.

Tervo, H. (2002): *Migration does not solve the unemployment problem* (in Finnish), Talous & Yhteiskunta 4/2002, Palkansaajien tutkimuslaitos.

Van Dijk, J., Folmer, H., Herzog, H. W. Jr. and Schlottmann, A. M. (1989): Labor Market Institutions and the Efficiency of Interregional Migration: a Cross-nation Comparison. In Van Dijk, J., Folmer, H., Herzog, H. W. Jr. and Schlottmann, A. M. (eds.) *Migration and Labor Market Adjustment*. Kluwer Academic, Dordrecht, pp. 61-83.

Virtanen, V. (2003): Finns like to move, *Tietoaika* 4/2003, Tilastokeskus (in Finnish).

Westerlund O. ja Wyzan M. L. (1995): Household Migration and the Local Public Sector: Evidence from Sweden, 1981-1984. Regional Studies, vol. 29, 2, pp. 145-157.

CHAPTER 5

Geographical Labour Mobility: Commuting as an alternative for migration*

Satu Nivalainen

Abstract. This paper investigates migration and commuting in Finland. Descriptive analysis shows that commuting increases employment and slows down population decrease in the weaker regions, and at the same time it secures labour supply and inhibits population growth in the growing regions. In the empirical analysis a large individual level data is utilised, and commuting is treated as an alternative for migration. The analysis concentrates on job-related mobility, and both short- and long-distance mobility is inspected with mixed multinomial logit modelling technique. To some degree migration and commuting are similarly selective processes. For example, mobility in general increases with higher education. Hence, while migration tends to increase regional differences in educational levels, commuting may help to slow down the growth of these differences. There are also differences in the determinants of migration and commuting. For example, migration odds are highest when young, but the age profile in commuting is more even. Moreover, the results show that personal unemployment increases likelihood of longer distance commuting, while on average it has no impact on migration. However, a large variation in the effect of unemployment on migration is discovered. Family relations also have diverse impacts on migration and commuting. In general they impede migration. Instead, they do not hinder commuting. In particular two-earner families are more prone to commute than migrate.

Key words: Migration, commuting

1. Introduction

Individuals and households make choices throughout their lives. One important set of choices concerns residential and job locations; people have to decide where to live and where to work.[i] These choices and the interaction between housing and labour markets are reflected in commuting patterns and behaviour. Migration decisions also, at least indirectly, reflect choices relating to workplace and residential locations. It can be argued that the connection between workplace and home is central from the viewpoint of regional development.

Without doubt, both commuting and migration are crucial for well-functioning labour market. However, from the regional perspective, there is a major difference between these two. Perhaps most clearly this difference can be seen in population development. While the effect of migration on population and labour is permanent and of opposite directions in origin and destination regions, population movements occurring due to commuting are only temporary, and unlike migration, commuting may have positive effects in both ends of the journey: it can simultaneously expand labour in some regions and population in others. Due to commuting, labour doesn't need to concentrate to certain locations to similar degree as jobs.[ii]

Commuting and migration flows observed at the regional level are a result of individual decision making – decisions of where to live and where to work. These decisions are closely related (see e.g. Zax, 1991; Zax and Kain, 1991), and as a result, commuting and migration are in many ways interrelated. In particular, commuting, at least to contiguous regions, is often an alternative for migration. One can take a job located in different region, while continuing to live in the current one. On the other hand, commuting may also enable moving; once individual (or household) migrates he or she still may choose whether to work and live in the same region. If work and residence locate in different places after moving, commuting serves as migration's complement. For example migration to suburban areas typically leads to complementary commuting. Due to these connections, investigations focusing on only one form of mobility do not necessarily give correct picture of regional mobility and the functioning of the labour market. Indeed, Romaní et al. (2003) argue that a model that concentrates only on moving or commuting is incomplete. Van Ommeren et al. (1997) also stress that

commuting behaviour explicitly depends on moving behaviour. Despite this, most previous research treats commuting and migration as a separate phenomena, i.e. does not investigate them simultaneously.

Generally speaking, preferences and spatial variations in utility underlie mobility decisions (e.g. Greenwood, 1997). However, in an integral analysis of workplace and residential location, it should be recognized that different individuals and households may have different preferences (Rouwendal and Meijer, 2001). On the other hand, not only different individuals behave differently, but there may also be variation in the behaviour of people with the same observed characteristics. This is due to variation in tastes, preferences or some other unobservable factors that affect their behaviour. They may, for example, place different weights on the characteristics of residential locations.

Differences in unobserved factors can be accounted for by selecting a suitable modelling method. In recent years, the use of a highly flexible model form, mixed multinomial logit (hereafter MMNL, also called random parameters multinomial logit), has increased, and it is also utilised in the present paper. The advantage of this model is that it allows for relaxation of certain restrictive assumptions of many other discrete choice models, as well as random taste variation across decision makers. As a result, heterogeneity in the impact of independent variables on the mobility choices can be examined. Hence, the model allows for a wide range of human behaviour and should be able to capture more real-world-like behavioural patterns than many other discrete choice models. So far, this method has been fairly little utilised in mobility research.

Obviously, there is still much to be done in terms of understanding workplace and residential choice and how those manifest themselves in terms of migration and commuting. This paper aims at shedding additional light on this phenomenon by investigating the determinants of outward commuting and out-migration with a large individual level data. The paper links mobility to the change of region of workplace, and hence assures that all mobility examined here are primarily job-market related. It is assumed that when an individual gets a job outside the home region, he or she faces a choice situation between moving and commuting. In other words, migration and commuting are here viewed as alternative forms of mobility. The idea is to seek potential similarities and differences in the determinants of migration and commuting, and this way find out information about the factors underlying different mobility choices.

The structure of the paper is as follows: the second chapter shortly describes recent trends of regional mobility in Finland, and chapter three deals with theoretical framework and modelling aspects. Data and variables are described in chapter four. Chapter five presents the empirical analysis of migration and commuting, and a summary and conclusions are presented in chapter six.

2. Regional mobility in Finland

In Finland mobility has constantly increased, especially after the severe recession of early 1990s.[iii] With regard to different forms of mobility, commuting is much more common than migration: around 5% of the Finns migrate yearly between municipalities (the lowest regional unit in Finland), and at the same time almost 15% of the population commutes to work (Figure 1).[iv] In practise this means that nearly every third employed individual has home and job in different municipalities. In relation to its' commonness, the role of commuting as a link between home and work has been fairly little pronounced in empirical research.
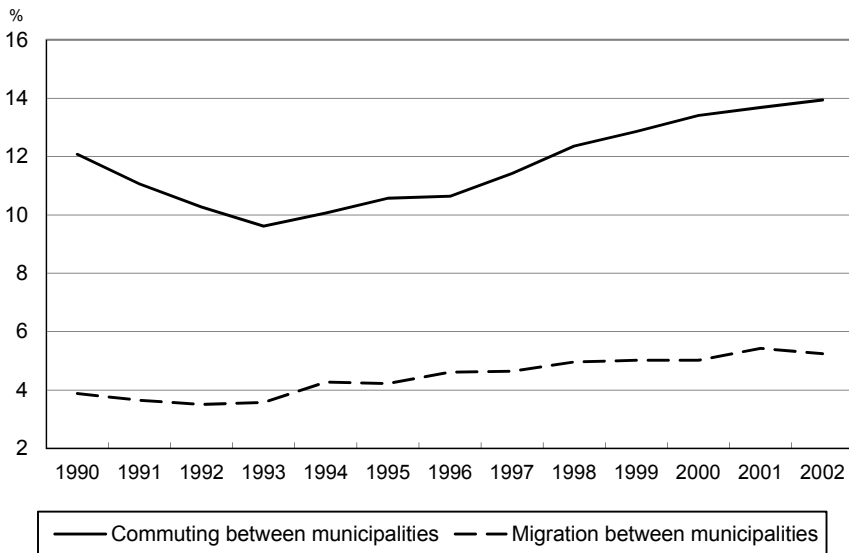
Figure 1. Migration and commuting in Finland 1990-2002, % of population

There is no systematic information on commuting distances in Finland, but at least to some degree length of commuting journeys can be

measured by crossings of sub-regional borders (NUTS4, see Map in the Appendix 1). Based on this measure most work trips are fairly short, about two out of three commuters travel inside the home region. Still, surprisingly many have home and job in different regions. For example in 2001 the number of these cases was almost 240,000, which is over 10% of all employed people.

Through individual level decision making migration and commuting are in many ways related to each other, and this connection can also be seen at regional level. There is a clear resemblance between regional net migration and net commuting patterns (Figure 2; see Map in the Appendix 1 for regional classification). Regions with net migration surplus also tend to have positive commuting balance. For example, population increase in the metropolitan region due to migration was around 0.5% in 2001, while net commuting to region equalled to 2% of the population. Likewise, in regions with negative net migration out-commuting is typically greater than in-commuting. For example, sparsely populated regions lost a bit over 1% of their inhabitants through migration during 2001. At the same time, commuting decreased these regions' "day population" for nearly 4%.[v]

Figure 2. Net migration and commuting in different types of regions in 2001, % of population

Clearly, commuting helps to distribute population regionally more evenly. Generally speaking, in the largest centres commu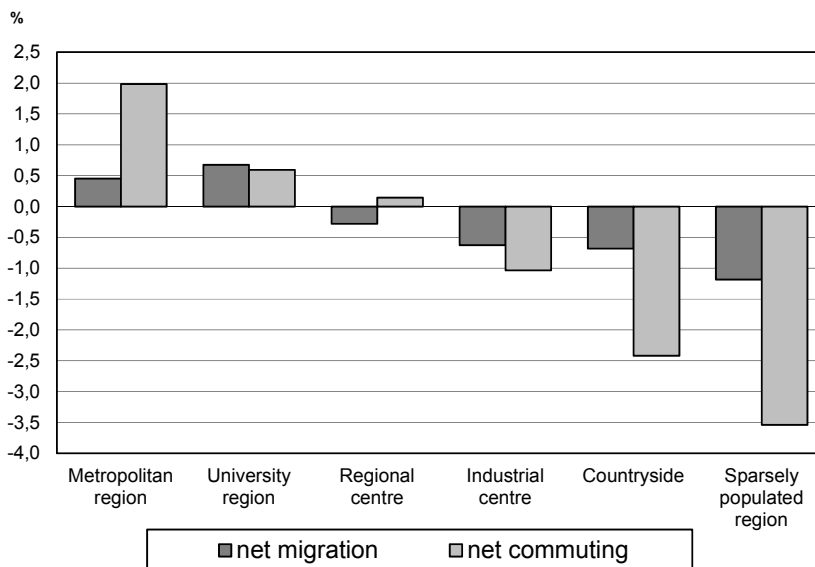ting is an important source of labour, and at the same time it inhibits population growth of these regions.[vi] This way commuting may help to reduce the housing market constraints in efficient regional allocation of labour and jobs, for example. On the other hand, in regions suffering from population loss commuting is very important to employment and population development. It significantly slows down population decrease. For example, between 1995-2001 regions suffering from net migration loss lost almost 100 000 inhabitants to regions gaining migration surplus, and during 2001 alone the population net flow from regions with negative migration balance to growing regions was 16 000 persons. Without commuting alternative, population loss of declining regions would most likely have been much greater.

It is also worth pointing out that in addition to its immediate impact, migration also affects population in the longer run through natural increase (migrants are typically young persons in their most fertile age). Hence, the hindering effect of commuting on population decrease also has longer run impacts and may have significant effects on the long term vitality of certain regions.[vii]. Besides population development, location choices are important for regional tax revenues and purchasing power of the population, and this way they may influence on location decisions of firms, as well as on regional growth and income differences, for example.[viii] Therefore, from the regional perspective it is not irrelevant in which form mobility takes place.

3. Analytical framework

3.1 Theoretical considerations

There are many theoretical frameworks that could be used, and the choice of an appropriate one is largely depending on the focus of the study. Location models of Alonso (1964), Mills (1967) and Muth (1969) concentrate on urban areas and are the cornerstone of urban location theory. They are commonly used as a theoretical framework underlying

commuting behaviour. However, the present study does not differentiate between different types of areas. Hence, a search theoretic approach, which has been widely applied in labour market literature, is chosen as a basis of the study. A thorough description of the theory is beyond the scope of this paper, but a short overview is in place.

In its basic form the search theory concentrates on job search and job related moving behaviour. Workers randomly receive job offers, which are assumed to have regional variation, and based on their reservation wage decide whether or not to accept the wage offered. The search terminates when an offer either equalling or exceeding the optimal reservation wage is reached. The optimal reservation wage is determined to equate the marginal cost of obtaining one more offer with the expected marginal return from continued search (Herzog et al., 1993). However, the decisions to move job and residence are closely related, as both may involve a change in commuting distance and behaviour. This connection has been recognized e.g. by van Ommeren et al. (1997), who add commuting and residential moving into the search theoretic model. This is rational, since change in residential location is tightly connected to job-related moving: when moving due to a job, a residence inevitably also changes. Commuting in turn is in closely related to both job and residential moving: change in either job location or both job and home location can give rise to commuting.[ix] If commuting acts as an alternative for migration, changing job location does not result in change in residential location (moving), but is reflected in commuting behaviour.

As usual, individuals (or households) are assumed to maximise their utility. Utility is derived from wages, which characterize jobs, from "place utilities", which characterize residences, and from commuting distance. It is assumed that workers continuously search for better jobs and dwellings, and receive both job and residence offers with a pace depending on the search effort. When receiving an offer, the individual has to decide whether or not to accept it, taking into account commuting costs. In addition to commuting costs, the costs of job and residence relocations also have to be considered. Costs include foregone earnings, time, and other resources devoted to looking for a job or residence. In addition to monetary costs, there are nonmonetary costs as well (e.g. psychic costs). Moreover, search is more costly in more distant locations, and the problems of imperfect information and uncertainty are present in the

process. (See van Ommeren et al., 1997, for more detailed discussion of the model).

Decision making is based on individual's (or household's) long-term utility or well-being. In essence, a match with a higher wage results in job change, while a residence change occurs due to increase in place utility. However, it should be noted that, due to uncertainty about future relocations, a residence-job combination chosen is not necessarily one with unique optimal commuting, but rather workers are willing to accept a wide range of workplace and residence combinations (van Ommeren et al., 1997). In particular this may be true when dealing with households, and especially with households with two workers; they have to consider their residential location with respect to two job locations instead of single one.[x] For example, Green (1997) observed that households tend to prefer residential locations with good connections, so that the need for future migration is minimized.

Molho (1986) points out that a distinction should be made between speculative migration, undertaken in the hope of finding a suitable opportunity at the destination, and contracted migration, undertaken after having already secured employment. In the former case migration is a part of the search process, in the latter it is the outcome. Evidence indicates that the latter type of migration is more common, and migration is assumed as contracted in this study too (Molho, 2001). Commuting, obviously, is of contracted nature – one cannot commute without a job.

In sum, there are two choices: where to live and where to work (see Romaní et al., 2003). These choices are reflected in differential behaviour. If job location is given, i.e. a worker gets a job outside home region, the choice boils down into selection of residence location: the worker can choose to live in the job region or outside it. The choice of home location is reflected in mobility behaviour. As mentioned above, the choices are driven by attempt to maximise utility; households change the current state of affairs only if the expected net benefit of doing so is positive. Assuming that job locates outside home region, migration indicates that place utility increases through moving. Choice of commuting in turn implies that the place utility of current home location is greater than the utility of the alternative location plus commuting costs.

Hence, commuting, just like migration, represents response to economic incentives, and it is possible to model both in expected utility framework. However, as usual, the utility of an individual or a household

is not observable for the researcher. All we see from the data is the reflection of utility, i.e. the actual choice that was made. Therefore, the empirical model naturally falls into category of discrete choice models. Indeed, Freedman and Kern (1997) suggest that discrete choice modelling is an appropriate way of analysing workplace and residence choices.

3.2 Modelling aspects

Even though migration and commuting are in many ways related to each other, simultaneous modelling of these is rare. Empirical work has mainly concentrated on either migration or commuting, exceptions being Romaní et al. (2003) and Eliasson et al. (2003), who utilised correlated and bivariate probit modelling, respectively. Indeed, Zax (1994) points out that bivariate discrete choice models can be used in cases where there are two choices and the distance of mobility is ignored (i.e. no distinction between inter- and intraregional mobility is made). However, when there are more than two choices, as we have here, bivariate models cannot be applied, but instead, multinomial logit, conditional logit or nested logit models can be used.

Due to its easy implementation, multinomial logit is frequently used in empirical applications. A drawback of the model is the independence of irrelevant alternatives (IIA) condition, which follows from the assumption that the disturbances are i.i.d, i.e. independent and identically distributed (see e.g. Greene, 2003). IIA implies that the odds-ratio between two alternatives does not change by the exclusion (or inclusion) of any other alternative.[xi] In some cases this is not very realistic, and hence IIA can lead to unrealistic estimates of individual behaviour when the set of alternatives vary. In the present context the assumption would mean, for example, that the ratio of the probability of migrating over the probability of staying remains unchanged when commuting enters or leaves the choice set. If the IIA-condition does not hold, an alternative to the multinomial logit is needed.

One way to relax the homoskedasticity assumption would be to group the alternatives into subgroups (or nests), and use a nested logit model where the IIA is assumed within each subgroup but not between the subgroups. Nested logit models have been used in migration studies e.g.

by Falaris (1987), Liaw and Ledent (1987), Odland and Ellis (1987), Knapp et al. (2001), and Haapanen (2003). However, one should note that - just like standard logit - nested logit assumes that the coefficients of variables that enter the model are the same for all people. In reality, however, people with the same observed characteristics may have different tastes and preferences or they may differ in some other unobservable respect. They may, for example, place different weights on the characteristics of residential locations. Moreover, since migration and commuting are treated as substitutes here, by assumption, IIA does not hold.[xii]

In recent years, the use of highly flexible model form, mixed multinomial logit (MMNL, also called random parameters multinomial logit), has increased in empirical applications. The advantage of this model is that it obviates the limitations of logit and nested logit models: it allows for complete relaxation of IIA (i.e. unrestricted substitution patterns), as well as behavioural heterogeneity across decision makers (it is also capable of accounting for correlation in unobserved factors over time/in repeated choices) (see e.g. Hensher and Greene, 2001). Hence, it can be argued that MMNL model is capable of giving a more accurate representation of real-world behaviour than other logit-type models.

As usual, individuals are assumed to maximise their utility, i.e. select the alternative that yields the highest reward. Let U_{ij} indicate the utility of individual i from alternative j. Utility function depends on the attributes of the alternatives and/or the characteristics of the individual. In standard multinomial logit the utility of individual i from alternative j is decomposed into two parts:

$$U_{ij} = \beta_j'x_{ij} + \varepsilon_{ij} \qquad j=0,1,\ldots,J \qquad (1)$$

where $\beta_j'x_{ij}$ is the deterministic term, consisting of the vector of observed variables, x_{ij}, and vector of fixed coefficients specific to alternative j, β_j. Unobservable, stochastic part, ε_{ij} is assumed to be i.i.d extreme value over individuals and alternatives. In MMNL unobserved preference heterogeneity is accounted for by decomposing the coefficient vector into two components:

$$U_{ij} = b_j'x_{ij} + \gamma_{ij}'x_{ij} + e_{ij} \qquad j=0,1,\ldots,J \qquad (2)$$

where b_j is the fixed component (as in mlogit), γ_{ij} is the unobservable random component that represents the person's tastes or other unobservable factors relative to average ones in the population, and e_{ij} is a random term that is i.i.d extreme value. Note that standard multinomial logit implicitly assumes $\gamma_{ij} = 0$, so in this model unobserved preference heterogeneity is absorbed by the general error term (see e.g. Brownstone and Train, 1999, for discussion). Even though the utility of an individual is unobservable, utility maximisation means that if the individual chooses alternative j among the available choices, then $U_{ij} > U_{ik}$ for all $k \neq j$. In the present application there are three choices, i.e. an individual has three mutually exclusive alternatives: be immobile, migrate or commute.

In case of large data, in practise a separate coefficient cannot be estimated for every individual in the sample. Random parameters are however assumed to follow a certain distribution, $f(\gamma|\Omega)$, where Ω are the parameters that describe the distribution of γ. It is these parameters, such as mean and standard deviation (or spread), that are estimated. Therefore, selecting the distribution of the random parameters is an important consideration in mixed logit context (e.g. Hensher and Greene, 2001). Many different distributions can be used. For example, Revelt and Train (1998) and Ben-Akiva and Bolduc (1996) used normal or lognormal distribution. The lognormal distribution is useful when the coefficient is known to have the same sign for every individual. Triangular and uniform distributions have also been used (e.g. Revelt and Train, 2000; Hensher and Greene, 2001). The advantage of triangular and uniform distribution over normal distribution is that these are bounded on both sides. Normal distribution has infinite tails, which would require that some individuals have near-infinite coefficient values. In the end, the selection of distribution is more or less an empirical matter; distributions are arbitrary approximations to the expected real behavioural profile. In most empirical applications normal, triangular and uniform distributions tend to lead to similar means and comparable measures of standard deviation (Hensher and Greene, 2001).

MMNL is much more time-consuming to estimate than standard multinomial logit model. In mixed logit, each individuals choice probabilities depend on b_j and γ. For given γ, the conditional choice probability that individual i selects alternative j is (see e.g. Brownstone, 2001):

$$L_{ij}(\gamma) = \exp(b_j'x_{ij} + \gamma_{ij}'x_{ij})/ \Sigma_{j \in J} \exp(b_j'x_{ij} + \gamma_{ij}'x_{ij}) \qquad (3)$$

which is a standard multinomial logit probability. However, since γ is unobserved, to obtain the unconditional choice probability the probability in equation (3) must be integrated over all values of γ with the density of γ as weights:

$$P_{ij} = \int L_{ij}(\gamma)f(\gamma|\Omega)d\gamma \qquad (4)$$

This integral however does not have closed-from solution and it has to be approximated through simulation. Estimated parameters are those that maximise the simulated log-likelihood function (see e.g. Train, 2003, for more detailed description).

4. Data and variables

4.1 Data

The data originate from longitudinal census data file maintained by Statistics Finland. The data are completely register based linking a multitude of information contained in various registers. Information has been collected for example from the Finnish Population Census and Longitudinal Employment Statistics File. The data includes years 1970-1985 (5-year interval) and 1987-2002 (yearly information, year 2002 is not complete). Extracting from these data, a 7 % representative sample of the Finnish population in 2001 was drawn for this study (around 400 000 individuals). In addition, the data set was complemented with some information on the spouses of the sample individuals. Moreover, several location attributes were matched with personal characteristics. Hence the basic data set contains rich information on the individuals and their families as well as their locations, and suits well to for the study of geographical mobility. Sample selection process is presented in Figure 3.

Since we are concentrating on labour mobility, the sample was further restricted by including only employed (at the end of 2001) individuals aged 20 to 59 whose incomes in 2001 were at least 1000 euros (and who

are still alive at the end of the inspection period).[xiii] Self-employed persons, those living in Åland, as well as all children and those living in institutions were removed.[xiv] Exclusion of those under 20 years diminishes complications relating to young persons who may be making residential choices based on other than labour market or residence related reasons. Similarly, those over 59 years may have their locational choices influenced by retirement plans and other factors outside the working life. Of course, in certain sense employed individuals are a selected sample (where selectivity might be present); not only have these individuals chosen to participate in the labour force but they also have managed to get a job. Nevertheless, one has to remember that the choice of participation/non-participation in the labour force or the success of job search is not what we are interested in here. However, the nature of the data should be kept in mind when reading the results.

Representative sample of the Finnish population in 2001
(about 400 000 persons)

20-59-year old persons who are employed at the end of year 2001 + a couple of additional restrictions (see the text) (about 120 000 persons)

Migrants:
Individuals who get a job outside their home municipality or who change their municipality of work place AND who change their municipality of residence during 2001 (3428 persons)

Commuters:
Individuals who get a job outside their home municipality or who change their municipality of work place AND who do not change their municipality of residence during 2001 (7998 persons)

Immobile persons:
Individuals whose home and job locate in the same municipality and who do not change their municipality of job or residence during 2001 (75608 persons)

Migrants + Commuters + Immobile persons = The sample used in the study (in total. 87034 persons)
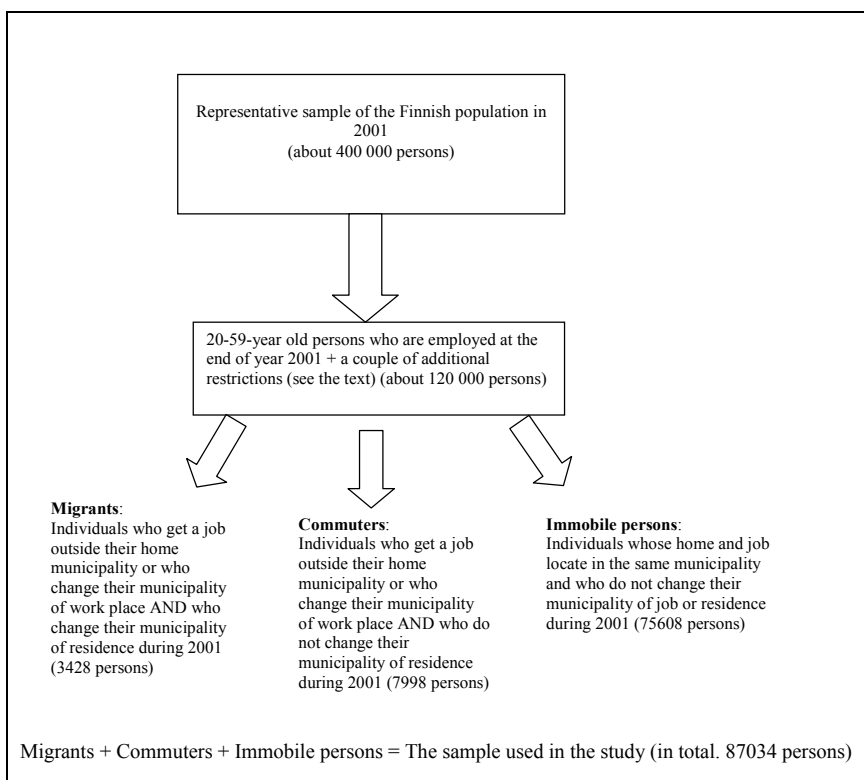
Figure 3. *Selection of the sample used in the study*

If we would only concentrate on migration, definition of mobility would be easy; it could be based on change of region of residence. However, since we are dealing with migration and commuting as alternative forms of mobility, definition of mobility has to be carefully considered. Moreover, the focus in this paper is on job-market related labour mobility, as opposed to purely housing market motivated mobility (e.g. residence changes, workplace remains the same). Taking these considerations into account, mobility is here defined through municipality of work place (see Eliasson et al., 2003, for similar kind of definition).

The definition differs somewhat depending on the original labour market status. Those employed at the end of year 2000 are defined as mobile if the municipality of work place changes during 2001 (and the job is not in the home municipality).[xv] For those unemployed or outside labour force at the end of year 2000, mobility occurs if they get work outside the home municipality in 2001. In both cases individuals have two options: *a*) change their municipality of residence[xvi], *b*) do not change their municipality of residence and start commuting or change their commuting destination. From now on, the term migration is used for category *a*), and commuting for category *b*).[xvii] This definition ensures that most of the observed mobility is job-related. Moreover, when an individual gets a job outside the home municipality, he or she has exactly two options: to migrate or to commute. Hence, we can investigate who in this situation moves and who chooses to commute.

After these restrictions, there were 3428 (3.9%) migrants between municipalities in the sample. The number of commuters was 7998 (9.2%). The rest of the sample (75608 individuals) was defined as immobile (i.e. their home and job located in the same municipality throughout the year).[xviii] In total, the final sample included 87034 observations.

4.2 Variables

Definition of different types of mobility and their means in the data are shown in Table 1. Independent variables, their definition and means are presented in Table 2. Independent variables are selected on the basis of theoretical considerations and/or earlier empirical findings. Since determinants of migration have been examined considerably more than

those of commuting, the expected effects of different factors on mobility are here mainly mirrored through their effect on migration behaviour. Moreover, it is worth pointing out that, following Eliasson et al. (2003), we use a simplified system where there are two regions: the origin and all others lumped into one. Hence, destination of mobility is not modelled here, but mobility is viewed from the perspective of origin regions.

Moreover, besides the general determinants of mobility, the distance of mobility might also be of interest; those moving or commuting over different distances might well differ from each other in some respects. In many previous studies commuting, for example, is measured by distance or time. Here, due to data shortcoming, we cannot use time or actual distance. Instead, we observe whether the individual commutes or migrates inside or outside of certain sub-region.[xix] Sub-regions closely correspond to actual labour market areas. Mobility occurring inside a sub-region can be defined as short distance (intraregional) mobility, and mobility between sub-regions can be defined as long distance (interregional) mobility. Table 1 shows that largest share of migrants (over 70%) move over longer distances, while almost 60% of commuters have home and job in the same sub-region. In spite of this variation, we will concentrate in this chapter on factors affecting migration and commuting, without systematically differentiating these according to distance. The main focus of the paper is labour mobility, and the definition of migration and commuting used here ensures that all mobility, whether over shorter or longer distances, is related to labour markets, rather than being purely housing related, for example. However, in the empirical part, mobility between sub-regions will be examined.

Table 1. *Intra- and interregional mobility in the data*

Mobility type	Definition	Mean	
		Migrant	**Commuter**
Intraregional migration	1 if migrated between municipalities inside a sub-region in 2001	0.289	-
Interregional migration	1 if migrated to another sub-region in 2001	0.711	-
Intraregional commuting	1 if started commuting/changed commuting destination in 2001. Home and job locate in different municipalities but inside the same sub-region	-	0.565
Interregional commuting	1 if started commuting/changed commuting destination in 2001 and home and job locate in different sub-regions	-	0.435
Note: Migration and commuting as dependent variables are measured in 2001.			

Age is among the most important determinants of migration (see Greenwood, 1997). Life-cycle events typically occur at certain ages, and age can be considered as an important indicator in locational preferences over the life cycle (e.g. Sandefur and Scott, 1981). Migration likelihood is expected to be highest when young. The connection between age and commuting is not necessarily similar; in some studies it has been found that commuting propensity falls with age (e.g. van Ommeren et al., 1997) but it has also been noticed that middle-aged workers commute more than younger ones (Romaní et al. 2003). In other words, the connection between age and mobility is not necessarily linear. Here age squared is used to control for potential non-linear effects.

Another often cited mobility enhancing factor is education; those with higher education have usually better ability to collect information over longer distances and they typically have a narrower set of suitable job opportunities in a certain region (Bowles 1970; Pacione 1984). Hence, highly educated persons are expected to move more often. Educational attainment might have importance in commuting behaviour too; it has been found that in particular people with low educational level tend to work closer to home (Shen, 2000; Romaní et al., 2003). Occupation or sector of work might also have effect on mobility. For example, Montén and Tuomala (2003) observed with Finnish data that construction workers and those working in transportation commute more than others.

Table 2. Variables, their definition and mean according to mobility status

Variable	Definition	Mean		
		Immo-bile	Migrant	Commuter
Personal/family characteristic				
Age	Age in years/10	4.049	2.860	3.640
Female	1 if female; 0 otherwise	0.564	0.250	0.451
Unemployed	1 if unemployed at the end of 2000; 0 otherwise	0.046	0.138	0.137
Education (lower than secondary)				
Secondary	1 if has secondary education (i.e. 11-12 years of schooling); 0 otherwise	0.443	0.498	0.435
Higher	1 if has at least lower level of higher education (i.e. at least 13 years of schooling); 0 otherwise	0.361	0.394	0.392
Sector of occupation (other sectors)				
Services	1 if works in services; 0 otherwise	0.167	0.101	0.091
Processing	1 if works in processing; 0 otherwise	0.093	0.052	0.071
Construction	1 if works in construction; 0 otherwise	0.027	0.017	0.048
Income	Annual taxable income (10000e)	2.498	1.563	2.290
Head of the household	1 if is head of the household ; 0 otherwise	0.381	0.265	0.444
Married	1 if married or cohabiting; 0 otherwise	0.731	0.453	0.741
Number of children	Number of children under 18 y. (1-9; 9 incl. 9+more)	0.796	0.508	0.885
Children (no children/no children under 18 y.)				
Children under 3 y.	1 if youngest child is under 3 years old; 0 otherwise	0.092	0.108	0.151
Children 3-6 y.	1 if has children aged 3-6 years; 0 otherwise	0.143	0.102	0.189
Children 7-17 y.	1 if has children 7-17 years; 0 otherwise	0.329	0.171	0.302
Increase in family size	1 if family size has increased in 2001; 0 otherwise	0.076	0.218	0.100
Single parent	1 if is a single parent; 0 otherwise	0.067	0.082	0.050
Spouse working	1 if spouse is employed; 0 otherwise	0.583	0.295	0.587
Spouse highly educated	1 if spouse has university degree; 0 otherwise	0.253	0.170	0.278
Swedish-speaking	1 if native language Swedish; 0 otherwise	0.046	0.032	0.042
Has a car	1 if has a car; 0 otherwise	0.507	0.455	0.571
Migrated earlier	1 if migrated between municipalities betw. 1995 and 2000; 0 otherwise	0.185	0.557	0.373
Lives in birth region	1 if lives in the NUTS3-region where born; 0 otherwise	0.605	0.518	0.582
Home owner	1 if home owner; 0 otherwise	0.645	0.403	0.600
Tightness of living space	Persons/rooms (without kitchen)	0.943	1.015	0.993

Table 2. Continued

Variable	Definition	Mean		
Regional characteristics (origin)				
Local unempl. rate	Unemployment rate at travel to work area/10	1.259	1.286	1.166
House prices	House prices in sub-region/house prices in Finland	1.040	1.015	1.093
Regional income	Incomes subject to state taxation after taxes per housing unit in sub-region (10000 euro)	2.568	2.537	2.638
Type of municipality (urban and densely populated)				
Rural	1 if municipality of residence is rural; 0 otherwise	0.145	0.185	0.193
Regional type (other reg. types)				
Metropolitan region	1 if lives in Helsinki, Lohja, Porvoo or Riihimäki region; 0 otherwise	0.285	0.253	0.370
University region	1 if lives in Turku, Tampere, Kuopio, Joensuu, Jyväskylä, Vaasa, Oulu region; 0 otherwise	0.250	0.266	0.238
Sparsely populated region	1 if lives in Pohjois-Pirkanmaa, Länsi-Saimaa, Juva, Koillis-Savo, Ilomantsi, Pielisen-Karjala, Kehys-Kainuu, Keuruu, Saarijärvi, Viitasaari, Ii, Siikalatva, Koillismaa, Torniolaakso, Koillis-Lappi, Tunturi-Lappi, Pohjois-Lappi region; 0 otherwise	0.053	0.056	0.038
Geographical location (South)				
Middle Finland	1 if lives in middle Finland	0.129	0.135	0.111
East Finland	1 if lives in eastern Finland	0.129	0.144	0.089
North Finland	1 if lives in northern Finland	0.104	0.128	0.093
N		75608	3428	7998
Notes: Comparison group in parenthesis. Independent variables measured in 2000 if not otherwise stated.				

The unemployed typically move actively (e.g. Laakso, 1998; Ritsilä, 2001), and they are expected to be more mobile than others. The effect of income on migration is not self-evident, and may vary depending on the distance of the move. In long-distance moves a negative relationship is typically observed (e.g. Nivalainen, 2004). On the other hand, opposite results have also been presented. With regard to commuting, there is some evidence that households with higher income would commute longer distances, but the workplace location also affects commuting behaviour. In particular, households may be segregated into certain residential "rings" around workplaces (e.g. White, 1988). Shen (2000) also observed that higher income households tend to live in more suburban locations, i.e. commute longer distances. Environmental amenities, public services and better

quality housing are often cited as factors underlying high income households' longer commutes.

In previous Finnish migration studies gender has not appeared as significant determinant of migration (see e.g. Tervo, 2000), but it may influence commuting behaviour. Eliasson et al. (2003), for example, found out that in Sweden males tend to be more mobile. Similar observation has been made in other countries too (e.g. Madden, 1981, for US). Partly this might have something to do with family responsibilities, since women in general commute less and their commuting likelihood has been found to decrease with the presence of children, in particular young ones (e.g. Rouwendal, 1999; Romaní et al., 2003). Several studies suggest that women's lower incomes contribute to their shorter work trips (Madden, 1981; Hanson and Johnston, 1985). Moreover, Kain (1962) points out that women often are secondary wage earners and therefore are less prone to search employment than men. In Finland the labour force participation rate of women is very high, so the latter explanation seems less rational in the present context. Nevertheless, head of the household-status is used to control for the effect of being the primary earner in a family (head is the person with the highest income).

For numerous reasons families may have stronger ties to current location than single individuals. Married persons typically have lower migration propensities, and migration odds tend to decrease with larger family size (e.g. Nivalainen, 2004). In particular, if there are two earners or school-aged children in the family, the costs of breaking up locational ties may be very high. Van Ommeren et al. (1997) found that those who live with a spouse commute more, and even more so if the spouse is employed. Hence a negative effect on migration and positive on commuting is anticipated from family relations.

Home ownership has been proved as important factor in both migration and commuting behaviour: home owners tend to have lower likelihood of migration, but they typically commute more than renters (e.g. Nivalainen, 2004; Romaní et al., 2003). Those owning their home obviously have stronger ties to current location, and they also face higher transaction costs when moving. With regard to living space, there exists some evidence that those with lesser living space would move more likely than others (see Nivalainen, 2003). The connection between commuting and living space is not clear based on earlier research. On the other hand, those with a car are expected to be more mobile (e.g. Nivalainen, 2003;

Shen, 2000). Mobility history also has been demonstrated to have a positive impact on migration propensities (see e.g. DaVanzo, 1983).

In the US it has been observed that minorities tend to commute more, at least when measured with commuting time (Shen, 2000). It is worth pointing out that relatively low share the Finnish population is foreign born, so with respect to mobility, the racial issue is not likely to be of great importance. On the other hand, there is a Swedish-speaking minority in Finland, who may have different commuting and migration behaviour in relation to the Finnish-speaking majority. For example, Häkkinen (2000) noticed that Swedish-speaking individuals are more tightly rooted to their current locations than the Finnish-speaking ones.

Motives for migration or commuting may also derive from cost of living differentials between regions. These can, at least partly, be measured by relative house prices (Cameron and Muellbauer, 1998). In some cases housing prices may also reflect accessibility and number of job opportunities (see Song, 1996). Basically, higher house prices should be negatively connected with the probability of residing in an area (So et al., 2001), but for example Hämäläinen and Böckerman (2004) did not find any significant relationship between housing prices and out-migration in Finland. Likewise, Eliasson et al. (2003) demonstrated that in Sweden average regional housing prices have no impact on mobility. It should be noted that Statistics Finland does not collect information on sub-regional house prices and therefore house prices used here are obtained from the study of Huovari et al. (2002).

Shen (2000) demonstrated a relationship between employment accessibility and commuting duration. Even though we are not modelling duration here, employment opportunities are likely to be of importance. Often local unemployment rate is used as a measure of regional employment opportunities, and typically a positive effect between higher unemployment rates and outward mobility has been discovered (Romaní et al., 2003). In addition, regional wages may also partly reflect labour market conditions. Original location in the largest urban areas is also controlled for, and due to these areas' wider set of employment opportunities it is expected that those living in these areas have lower migration likelihood. For example, Eliasson et al. (2003) demonstrated that in Sweden individuals living in metropolitan areas are more likely to commute than migrate. On the other hand, for example in Britain it has been observed that small regions with good transport connections have

higher interregional commuting rates than the largest and most populous region (see Cameron and Muellbauer, 1998). In addition, in some countries regional temperature, for example, has been found important for migrants (e.g. Liaw and Ledent, 1987). In Finland, due to the country's northern location, the temperature varies so little between regions that it is not likely to be an important factor in mobility decisions.

5. Empirical inspection of commuting and migration

5.1 Intraregional mobility

The mixed multinomial logit results for intraregional mobility (i.e. mobility between municipalities) are presented in the first two columns of Table 3. As mentioned above, here an individual has three mutually exclusive choices. Hence, the dependent variable has three classes: immobile=0, migrant=1 and commuter=2. The mixed multinomial logit model was estimated using Halton draws with 500 replications[xx] (see e.g. Train, 1999, for discussion on Halton draws). Despite its weaknesses, Hensher and Greene (2001) state that multinomial logit should always be the starting point for empirical investigation. It is a good device to investigate the data and to ensure that sensible results are obtained (see also Louviere et al., 2000). Therefore, as a reference, results from a standard multinomial logit (obtained assuming $\gamma_{ij} = 0$) are listed in Appendix 2. As can be seen, based on likelihood ratio index, explanatory power of the mixed logit is dramatically greater than with standard multinomial logit (0.63 vs. 0.13).

As mentioned above, normal, triangular and uniform distributions have been widely applied. Here triangular distribution is used.[xxi] The density function of the triangular distribution (also called "tent") is symmetric and has more mass in middle than in the tails: it is zero before some endpoint, a, rises linearly to mean c, decreases linearly to the other endpoint b, and is zero beyond b.[xxii] It is worth pointing out that allowing all coefficients to vary would make identification empirically difficult (e.g. Ruud, 1996). Therefore, random parameters in the models were selected so that first as many random parameters as possible was included in the

model, after which these were removed sequentially based on the significance of their spreads. The final model includes only statistically significant random parameters.

The interpretation of the results is based mainly on the coefficients.[xxiii] It should be noted, however, that due to different number of observations, the magnitude of the coefficients of migration and commuting cannot be compared.[xxiv] The magnitude of the effect of certain factor can be described with the difference in predicted probabilities (marginal effect).[xxv] It is worth pointing out that marginal effect is an absolute change, i.e. if the number of observations differs between different classes of the dependent variable, larger marginal effect does not necessarily mean larger relative change in the probability. Nevertheless, in particular in the case of random parameters, it is reasonable to inspect also average changes in predicted probabilities, and even more so if one wants to compare the results obtained with different modelling procedures. In other words, the coefficients of multinomial logit and mixed multinomial logit are not comparable, but marginal effects of these models can be compared with each other. Predicted probabilities and marginal effects are described in Appendix 4 and 5.[xxvi]

Let's first look at the results relating to random parameters (columns 1 and 2 in Table 3). In the final model the random parameters were statistically significant for unemployment experience and personal income in migration and commuting, for certain regional characteristics in migration, and for secondary education and tightness of living space in commuting. This means that there is unobserved heterogeneity in the effect of these factors. In case of each random parameter the estimated mean and spread is presented, and these together describe the distribution of the effect in the sample population. The mean coefficient gives the average effect of the variable, and the spread mirrors the variation around the mean.

Table 3. *Determinants of migration and commuting; estimates of mixed multinomial logit models (Coefficients of immobile-alternative normalized to zero)*

	Intraregional mobility		Interregional mobility	
Variable	**Migrant vs. Immobile**	**Commuter vs. Immobile**	**Migrant vs.Immobile**	**Commuter vs.Immobile**
Personal characteristics	**Coeff. Std.error**	**Coeff. Std.error**	**Coeff. Std.error**	**Coeff. Std.error**
Age	-1.489*** (0.234)	0.111 (0.158)	-1.541*** (0.290)	0.071 (0.180)
Age2 (Age sq/100)	0.053 (0.033)	-0.058*** (0.021)	0.052 (0.040)	-0.040* (0.024)
Female	-0.538*** (0.073)	-0.601*** (0.067)	-0.489*** (0.087)	-0.672*** (0.076)
Unemployed	-0.119 (0.198)	-0.475 (0.638)	-0.107 (0.214)	0.756*** (0.072)
Spread. (T)	4.678*** (0.640)	9.454*** (2.269)	3.878*** (0.766)	-
Secondary education	0.243*** (0.081)	-0.354*** (0.122)	0.127 (0.138)	-0.074 (0.059)
Spread. (T)	-	2.634*** (0.538)	2.458*** (0.547)	-
Higher education	0.629*** (0.095)	0.167*** (0.058)	0.862*** (0.114)	0.170** (0.069)
Service sector	-0.638*** (0.083)	-0.607*** (0.061)	-0.792*** (0.104)	-0.429*** (0.072)
Processing	-0.595*** (0.113)	-0.293*** (0.071)	-0.673*** (0.136)	-0.217*** (0.083)
Construction	-0.454** (0.191)	0.753*** (0.103)	-0.721*** (0.243)	0.641*** (0.107)
Income	-1.265*** (0.095)	-1.054*** (0.081)	-1.286*** (0.118)	-1.035*** (0.094)
Spread. (T)	1.986*** (0.135)	1.963*** (0.133)	2.006*** (0.166)	1.796*** (0.134)
Swedish-speaking	-0.360** (0.155)	-0.287*** (0.092)	-0.456** (0.199)	-0.197* (0.113)
Has a car	0.269*** (0.060)	0.438*** (0.044)	0.185*** (0.071)	0.309*** (0.049)
Migrated 1995-2000	1.196*** (0.064)	1.030*** (0.059)	1.087*** (0.080)	0.785*** (0.055)
Lives in birth region	-0.524*** (0.058)	0.019 (0.040)	-0.862*** (0.073)	-0.206*** (0.046)

Table 3. Continued

Variable	Intraregional mobility		Interregional mobility	
	Migrant vs. Immobile	**Commuter vs. Immobile**	**Migrant vs.Immobile**	**Commuter vs.Immobile**
	Coeff. Std.error	**Coeff. Std.error**	**Coeff. Std.error**	**Coeff. Std.error**
Family related characteristics				
Head of the household	-0.492*** (0.092)	0.042 (0.073)	-0.391*** (0.110)	0.114 (0.086)
Married	-0.465*** (0.093)	0.161** (0.074)	-0.632*** (0.111)	0.010 (0.086)
Number of children	-0.111* (0.062)	0.047 (0.040)	-0.070 (0.072)	0.061 (0.045)
Children under 3 y.	-0.070 (0.110)	0.286*** (0.074)	-0.395*** (0.133)	0.023 (0.084)
Children 3-6 y.	-0.210* (0.114)	0.150** (0.070)	-0.176 (0.133)	-0.027 (0.081)
Children 7-17 y.	0.238** (0.120)	0.076 (0.076)	0.049 (0.142)	-0.124 (0.088)
Family size increased	0.889*** (0.073)	0.026 (0.063)	0.801*** (0.089)	0.176** (0.071)
Single parent	0.387*** (0.125)	-0.105 (0.115)	0.308** (0.148)	-0.214 (0.138)
Spouse working	-0.769*** (0.086)	0.109* (0.059)	-0.902*** (0.103)	-0.018 (0.062)
Spouse highly educ.	0.493*** (0.083)	0.074 (0.049)	0.614*** (0.100)	0.162*** (0.057)
Home owner	0.159*** (0.060)	0.249*** (0.044)	0.139* (0.072)	0.185*** (0.051)
Tightness of living space	0.342*** (0.053)	-0.752*** (0.164)	0.391*** (0.061)	-0.440*** (0.167)
Spread. (T)	-	2.408*** (0.384)	-	1.562*** (0.368)

Table 3. Continued

Variable	Intraregional mobility		Interregional mobility	
	Migrant vs. Immobile	Commuter vs. Immobile	Migrant vs.Immobile	Commuter vs.Immobile
	Coeff. Std.error	Coeff. Std.error	Coeff. Std.error	Coeff. Std.error
Regional characteristics (origin)				
Local unempl. rate	-0.448*** (0.126)	-0.489*** (0.099)	-0.587*** (0.144)	-0.896*** (0.106)
Regional income	-1.106*** (0.272)	-0.644*** (0.171)	-1.651*** (0.358)	-1.167*** (0.246)
House prices	-	-	-1.660*** (0.320)	-2.189*** (0.212)
Metropolitan region	-2.103*** (0.383)	1.042*** (0.133)	-2.670*** (0.697)	1.037*** (0.130)
Spread. (T)	7.585*** (0.642)	-	9.049*** (1.128)	-
University region	-1.775*** (0.236)	0.299*** (0.055)	-2.046*** (0.236)	0.343*** (0.071)
Spread. (T)	5.915*** (0.538)	-	6.646*** (0.673)	-
Sparsely pop. region	-0.152 (0.125)	-0.565*** (0.111)	-0.066 (0.137)	-0.097 (0.101)
Rural	0.683*** (0.077)	1.042*** (0.069)	0.526*** (0.088)	0.550*** (0.062)
Middle Finland	-0.006 (0.082)	-0.337*** (0.064)	-0.010 (0.096)	-0.362*** (0.067)
East Finland	0.082 (0.097)	-0.567*** (0.082)	0.064 (0.109)	-0.427*** (0.081)
North Finland	0.389*** (0.093)	0.014 (0.074)	0.403*** (0.111)	-0.060 (0.083)
Log likelihood	-34990.91		-21041.30	
Likelihood ratio index	0.634		0.765	

***/**/* Significant at 1, 5, 10 % level. Models include a constant. Likelihood ratio index=1-Log likelihood(full model)/Log likelihood(constants only).

With regard to personal unemployment experience, the results show that the mean coefficient is not significantly different from zero in either migration (-0.119) or commuting (-0.475), while the spread is large and highly significant in both (4.678 and 9.454, respectively). This indicates that there is a wide variety in the impact of recent unemployment experience on intraregional mobility: for some it has a significant hindering effect, and for some a significant augmenting impact (in migration the coefficient varies between -4.797 and 4.559, and in commuting -9.929 and 8.979, respectively).[xxvii] The standard multinomial logit masks this: based on it it would be concluded that personal unemployment has a positive, constant impact throughout the sample. In

this case the impact of personal unemployment, for example, would be represented by a fixed coefficient, 0.734 (see Appendix 2).[xxviii] In reality, however, the impact is positive for only about half of the sample and negative for another half (see Figure A1 in Appendix 3).[xxix]

In fact, the variation in case of all random parameters is so wide that the coefficients obtain both negative and positive values. Hence, even though the results show that the mean effect of personal income is significantly negative, the effect is not similar for everyone. For example, in case of commuting the spread is 1.963 which in practice means that the effect varies around the mean coefficient by this amount, and that the lower and upper end of the coefficient is -3.017 and 0.909, respectively. In migration the coefficient of personal income varies between -3.251 and 0.721. In other words, for many the relationship between personal incomes and intraregional mobility is negative, but at the same time for many higher incomes actually increase mobility likelihood. Likewise, on average secondary education decreases commuting propensities, but there is variation in this impact. Furthermore, the mean effect of tightness of living space shows that the less persons per room, the higher the likelihood of commuting. There is however significant heterogeneity in this impact; for some individuals (around 25%) in the sample the effect is exactly the opposite (see Figure A2 in Appendix 3). In case of migration secondary education and tightness of living space both have significantly positive coefficients, and there is no significant variation in these factors.

Instead, behavioural variation in the impact of living in metropolitan and university regions on migration is found. The mean coefficients of metropolitan and university origin dummies are significantly negative, but in both cases there is vast variation around the mean: for many living in these regions actually increases intraregional migration likelihood. Note that the standard multinomial logit would indicate a positive connection between metropolitan origin and migration. In commuting there is no variation in the impact of living in metropolitan and university regions: both have a significant positive effect on working outside the home municipality.

Due to variation in the coefficients, the effect of variables in the random component on the probability of different choices is not self evident. The average impact of different factors on probabilities can be found out through changes in predicted probabilities (see Appendix 4 and 5). Appendix 4 shows that on average personal unemployment, for

example, increases the probability of both migration and commuting (by 1 and 9 percentage points, respectively), holding other things equal. It is worth stressing that this is an average effect, since due to variation of the coefficients, predicted probabilities also vary within the sample. In the standard multinomial logit the respective marginal effects would be 1.9 percentage points in migration and 13 in commuting.[xxx] The modelling method and the variation in the coefficients are thus also reflected in the magnitude of predicted probabilities. Nevertheless, the signs of the marginal effects are similar in both models. The same holds with respect to other random parameters (see Appendix 5).

With regard to fixed parameters, the result show that migration likelihood decreases with age. In commuting the influence is a bit different: age gets a positive (but insignificant) coefficient, and age squared is significantly negative. This means that commuting likelihood first remains fairly stable, but after a certain point starts to decrease. Note that the standard multinomial logit would indicate totally different (u-shaped) age profile in commuting. Intuitively, the result of MMNL is more appealing. As expected, education in general increases migration likelihood, and higher educated individuals also commute more likely. This is an interesting finding as it shows that not only migration, as typically observed, but also mobility in general is selective according to higher education. When it comes to occupations, those working in services, processing and construction sectors have lower likelihood of migration. Service and processing workers also have smaller commuting odds, but construction workers tend to commute more likely. This is quite rational, since in the construction sector the actual location of work does not necessarily remain in the same area all the time.

In line with findings from other countries, females in general are less mobile than men. The results also indicate that belonging to Swedish-speaking minority decreases intraregional mobility, while car and home ownership increases it. The relationship between home owning and commuting is as expected, but in case of migration it is quite surprising; typically a negative effect is observed. Explanation for this is not clear, but it might have something to do with the sample: we are dealing with only those who are employed after migration, and migration is here defined differently from most previous studies (it is related to change of the municipality of workplace). Instead, it is not surprising that previous migration experience boosts mobility in general. Previous migrants have

already once left their familiar surroundings, and ties to current place are not necessarily as strong as for immobile persons. It is also possible that the outcome of earlier migration was a disappointment. On the other hand, previous migration may have been related to housing, and the current place of living may even have been chosen on the basis of good commuting possibilities. The effect of ties is also reflected in that those still living in their birth region tend to move less likely. On commuting living inside or outside birth region has no impact.

As anticipated, family relations are important determinants of mobility, and in many cases they seem to work in the opposite directions in migration and commuting. Married individuals have higher likelihood of commuting and lower likelihood of migration. Being the head of the household also significantly hinders migration. Spouse's characteristics are of importance: high education of the spouse has a clear augmenting impact on moving likelihood, while working spouse deters migration of families. In commuting the effect of spouse's work is just the opposite: working spouse significantly increases intraregional commuting odds (significant at 10% level), i.e. two-earner families commute more likely than others. Instead, spouse's education has no impact.

It also seems that in commuting decisions the ages of children are more important than the number of children; parents of under school-aged children are more prone to commute, while family size does not have any effect. In case of migration family size matters: larger number of children decreases intraregional migration likelihood (significant at 10% level), but growing family size augments it. This might have something to do with housing and changing housing needs, but it is also possible that changes in family size and migration often just happen to occur in the same stage of the life cycle. Moreover, the results show that the existence of children under 3 years of age have no effect on migration, but children between 3-6 years have an hindering effect (significant at 10% level). Surprisingly, school-aged children increase intraregional migration likelihood. This is an unexpected finding; typically an opposite effect on migration is demonstrated. The explanation for this is not clear, but might again have something to do with the sample used. Interestingly, the results also show that single parents have higher than average likelihood of migration, but they are no less or more prone to commute. In other words, if they happen to find a job outside the home municipality, they more likely migrate closer to the job.

Results relating to regional factors give support to observations made in Chapter 2: there are regional differences in mobility patterns. Location in rural municipality has a boosting effect on both intraregional migration and commuting, which most likely signals lack of jobs in these areas on one hand and close enough location of employment opportunities of urban areas on the other. With regard to geographical location, the results indicate that those living in middle or eastern Finland have lower likelihood of mobility in relation to those living in southern parts of the country (which is the comparison group). In turn, those living in northern Finland have higher likelihood of migration. Inhabitants of sparsely populated regions have significantly lower commuting odds in relation to those of more densely populated areas. At least partly this may reflect more distant location from large centres, i.e. lack of larger centre with abundant job-opportunities in the region. On the other hand, living in sparsely populated regions has no effect on migration.

Against expectations, a negative coefficient is attached to local unemployment rate in both mobility types. At least in case of migration one would have expected an opposite sign. One possible explanation might be that in the areas of high unemployment rate people in general do not change jobs as much as in low unemployment regions. In case of commuting the negative effect of unemployment rate may, at least partly, reflect shortage of commuting opportunities in regions suffering from high unemployment. Finally, mobility in general decreases with rising regional incomes.

5.2 Interregional mobility

As indicated in Chapter 3, there might be differences in determinants of mobility according to distance. To examine this, attention is next given to interregional mobility (i.e. mobility between sub-regions). In other words, here mobility between municipalities but inside a sub-region is left away from the analysis. In this case the number of migrants is 2436 (3% of the sample) and the number of commuters 3483 (4.2%).The findings are presented in the third and fourth column of Table 3. As can be seen, the results are surprisingly similar to intraregional ones, and to save space, mainly the differences are described here.

The random parameters in the model are for the most part same as before. However, few differences emerge. Now previous unemployment experience has a significant positive effect on commuting, and there is no variation in this impact. In other words, recent unemployment significantly increases commuting likelihood between sub-regions. The variation observed earlier thus seems to be related mainly to shorter distance commuting. In case of migration the effect of unemployment remains exactly the same as before: on average the unemployed do not move more or less likely than others, but there is significant variation in the sample; part of those with unemployment experience are more prone to migrate than others, while part of them stay tightly put in the origin region. Yet another difference between intra- and interregional mobility relates to secondary education. Unlike in shorter distance moves, the mean effect of secondary education on migration between sub-regions is not significant, but the spread is large, which in practice means that for some individuals in the sample secondary education augments migration, while for others it hinders it. On interregional commuting secondary education has no impact (and there is no variation either).

With regard to fixed parameters, the effect of higher education is worth mentioning. Higher education increases both migration and commuting odds between sub-regions. This does not differ from the findings concerning intraregional mobility, but now also spouse's education has a boosting impact in both. Recall that earlier it had no influence on shorter distance commuting. This signals that the selective nature of mobility is particularly pronounced in longer distance journeys; highly educated couples both move and commute over longer distances more than others. With regard to family relations, growing family size increases likelihood of mobility in general. Other family related factors (being head of the household, being married, small children) continue to have a clear inhibiting effect on migration. On commuting family relations don't have any significant effect; they don't increase commuting between sub-regions but do not deter it either. The result might reflect the fact that couples or parents of small children, for example, do not search longer distance commuting possibilities very actively. On the other hand, the effect of working spouse deserves a special mention. While working spouse significantly decreases interregional migration likelihood, it has no effect on commuting. In practise this means that, when facing the choice

between alternative forms of mobility, two-earner families are more prone to commute than migrate.

Most regional characteristics have a fairly similar influence on longer and shorter distance mobility. The only larger difference is that house prices included in the model have a negative impact on mobility. In other words, the lower the house prices in sub-region, the higher the likelihood of out-migration and commuting. Of course this holds other way round too. This at least partly reflects labour market conditions; in regions with abundant job opportunities the house prices also tend to be high, and vice versa.

6. Conclusions

Among other things, regional mobility of labour – migration and commuting – has a significant role in the functioning of regional labour markets. In recent years, a lot of attention has been devoted to migration research, but much less is known about commuting. Especially in Finland commuting has remained almost untouched in empirical research. Fairly rarely it is also stressed that individuals' choices of where to live and where to work are underlying regional mobility, and it is expressly these choices and changes in these that are reflected as commuting and migration flows at the regional level. Through individual decision making different forms of mobility are in many ways interrelated. In particular, they can be substitutes or complements. Despite their obvious connections, previous studies have typically concentrated on either migration or commuting, and simultaneous investigation of these two is rare.

This study aimed at filling this gap by inspecting determinants of commuting and migration with a large individual level data. Individuals and households engage in geographical mobility for a range of different reasons, but this paper concentrated on job-related mobility, and focused on setting where migration and commuting can be viewed as alternative forms of mobility (substitutes). Therefore, different from most studies, here only those getting a job outside home municipality were defined as mobile individuals. In this situation an individual has two choices: to migrate or to commute. Mobility was viewed from the perspective of sending regions, i.e. the focus is on out-migration and out-commuting. In

addition to individual level inspection, a brief descriptive analysis of migration and commuting at regional level was also presented.

The study shows that commuting is much more common form of labour mobility than migration, and hence relatively much more important factor in the functioning of labour market. There is a connection between migration and commuting at the regional level: commuting balance is typically positive in growing regions, and negative in regions suffering from population loss. Hence, while migration tends to concentrate population, commuting helps to distribute population regionally more evenly. Commuting has an important influence in particular on weaker regions: it increases employment in these regions and significantly slows down population decrease. In addition to short run population effects, this may also have longer run effects through impact on age structure and natural population growth. Without doubt, commuters are important tax payers to their home regions. It is also worth pointing out that declining regions often struggle with problems relating to built infrastructure, organization of services and underutilization of real property and housing stock. Had commuters moved away, these problems would likely be even larger than they currently are. On the other hand, commuting is important also to growing regions; it has a marked influence in securing labour supply, and at the same time it slows down the pace of population growth in these regions. This way it may also have significant balancing effects on housing markets, even though this particular issue was not inspected in this study.

Individual level inspection shows that to some degree migration and commuting are similarly selective processes. For example gender and personal income act in a similar way in both cases. Interestingly, the results also show that mobility in general increases with higher education. In particular in interregional mobility the effect of high education is pronounced; highly educated individuals and couples both move and commute more than others. Hence, while migration generally tends to increase regional differences in educational levels through concentrating highly educated people to certain locations, commuting may help to slow down the growth of these differences. Without commuting possibilities the regional differences most likely would be even larger than they currently are.

There are also differences in the determinants of migration and commuting, and these can be interpreted to reflect factors underlying

different mobility choices. For example, migration odds are highest when young, but the age profile in commuting is more even, i.e. it is not as strongly pronounced to youngest age groups. There are also clear differences between alternative mobility forms in case of family related factors. In general family characteristics, such as being married or having small children, impede migration. Instead, they do not hinder commuting. In shorter distance commuting these factors even seem to have an augmenting effect. In particular two-earner families are more prone to commute than migrate.

Moreover, there are differences relating to labour market status, in particular in longer distance mobility. Personal unemployment significantly increases commuting likelihood. Hence, for the unemployed commuting seems to be an important way of finding a job. Instead, on average, personal unemployment has no impact on migration. However, a large variation in the effect of unemployment on migration is discovered. Also geographic location and characteristics of origin region affect mobility choices; for example, those living in largest centres or in their surroundings have increased commuting odds. On average, inhabitants of these regions move less than average, but there is large variation in this effect; for some living in largest centres actually increases migration likelihood. In addition to above mentioned variation, behavioural heterogeneity was also observed for example in case of personal income. All in all, the empirical results show that people with similar observable characteristics may make very different choices. Clearly, taking this variation into account in empirical work is important.

Even though commuting is an individual level choice, this choice in many ways reflects to the surrounding society and to the economy as a whole. In addition to above mentioned effects on regional imbalances, commuting is likely to result in lower unemployment, better utilisation of skills and increased productivity. These all have an effect on economic growth. Moreover, regional mobility has even been named as one of the most important factors securing competitiveness (e.g. Green, 2004). On the other hand, depending on the perspective, commuting is not necessarily solely a positive phenomenon. At the society level it causes environmental effects and social costs, for example. At the individual level commuting may burden and make coordination of work and family life more complicated. These facts are worth pointing out, even though - at

least in principle - individuals take also the negative sides into account in their decision making.

This paper has increased our understanding about regional mobility, but many interesting questions remain still unanswered. The present paper concentrated on job-related mobility, so the next rational step would be to investigate housing-related mobility. Moreover, the results showed that commuting has a positive impact on population development of certain regions. We also know that for some people commuting is only a temporary solution, while for others it may be a longer term choice. However, at present we do not know the characteristics of commuters residing in certain regions. Likewise we have no information on where their job is located, and how long term solution commuting is. Therefore, it would be important to investigate commuting streams and characteristics of commuters according to origin and destination. Different commuting-migration "careers" would also be an interesting topic. This kind of inspection would allow a more detailed recognition of factors affecting development of different regions.

Endnotes

.

[i] Of course, before deciding where to work, individuals have to decide whether to participate in the labour force or not, but for simplicity we abstract here from labour force participation decisions

[ii] Jobs and economic activity in general tend to concentrate to certain locations more strongly than other locations. In Finland employment growth in recent years has typically been strongest in growth centre regions, largest cities and their surroundings.

[iii] A severe recession hit Finland at the beginning of the 1990s. Recession can be seen in mobility figures.

[iv] In persons the difference is also noticeable. For example in 2001, about 280,000 individuals changed their home municipalities, while at the same time over 700,000 persons had a home and job in different municipalities.

[v] It should be remembered that commuting is often a longer term choice, i.e. same persons can commute from one year to another. Every move instead only happens once, and for example persons moving out from a certain region are different persons every year. In that respect longer term inspection could give a different picture than an analysis based on one year figures. Longer time inspection of commuting is however difficult and would require much better data than was available for this study.

[vi] Remember that not all migrants participate in labour force, but all commuters are employed. Hence the importance of commuting would be even clearer relative to labour force.

[vii] This perspective is important especially in Finland, where population decrease (both through migration and negative natural growth) is a severe problem in many regions.

[viii] Hazans (2004), for example, shows that commuting diminishes welfare differentials between regions.

[ix] Change only in residential location can also cause commuting. However, the theory assumes a workplace change, and purely housing related moving is left outside of the present analysis. If change in both job and residence location results in commuting, commuting acts as a complement for migration.

[x] Commuting and moving behaviour of two-earner families has been theoretically handled by van Ommeren et al. (1998).

[xi] In fact, IIA is not unique to multinomial logit model. It holds in any discrete choice model that assumes that unobserved portions of utility are independently and identically distributed (see e.g. Hensher and Greene, 2001). Hence, conditional logit, for example, has the same limitation as multinomial logit.

[xii] The IIA assumption was tested by the test developed by Hausman and McFadden (1984). In practise the "commute" alternative was dropped from the model, and then the model was re-estimated over the restricted choice set. The null hypothesis, of no systematic difference in the parameter values, could not be rejected at conventional levels of significance.

[xiii] The theoretical model deals with employed persons; see also Romaní et al., 2003; So et al., 2001 for similar type of sampling.

[xiv] Åland is an autonomous island, and it is in many respects very different from the mainland Finland. Self-employed persons were left away from the analysis because their choice of job location in many ways differs from that of employees.

[xv] The exact timing of the change in municipality of workplace is not observed, the data only indicate if person's municipality of workplace changes during 2001.

[xvi] One should note that about one third of migrants also commute after migration. They change their municipality of residence (e.g. nearer to new job), and start commuting to yet another municipality. Instead of daily commuting, part of the commuting may also be long-distance weekly commuting. This means that an individual lives near his/her workplace during the week and returns to the main family home at weekends. The data do not allow separating daily and weekly commuting.

[xvii] Note that all other migrants and commuters were excluded from the analysis.

[xviii] They may or may not have changed their work place during the year; the data have no information on workplace changes that occur inside the home municipality.

[xix] There were 79 sub-regions in mainland Finland during the time of the analysis.

[xx] To check the robustness of the results, the models were also estimated using 1000 replications. In practice, the results remained unchanged.

[xxi] Uniform distribution was also experimented, but it produced very similar results.

[xxii] The spread, i.e. distance between the mean and endpoint, equals standard deviation multiplied by square root of 6 (see Hensher and Greene, 2001).

[xxiii] As usual, one of the classes has to be selected as a reference category, against which the other classes are mirrored. Here the reference group in the case of both migration and commuting is immobile persons.

[xxiv] For example, if a certain factor affects positively on both migration and commuting, one cannot conclude that the effect would be larger or smaller on the basis of the magnitude of the coefficients. Instead, if the effect of a certain factor is positive in the case of migration and negative in the case of commuting, for example, it can be concluded that the effect differs between different forms of mobility.

[xxv] Marginal effect gives the absolute change in probability of certain mobility choice for a person with certain characteristics in relation to otherwise similar person without that particular characteristics.

[xxvi] When using both macro- and micro-level variables in the study of micro-units, the random disturbances within groups may be correlated, and doubt has been cast on the reliability of such results (see Moulton 1990). However, Nivalainen (2004) demonstrated in almost similar setting that in the Finnish case this doesn't seem to be a problem.

[xxvii] The lower and upper end of the coefficients are calculated as follows: Mean coefficient $\pm$ Spread coefficient. For example, in commuting the effect of unemployment varies between -0.475 ± 9.454. See also Appendix 3.
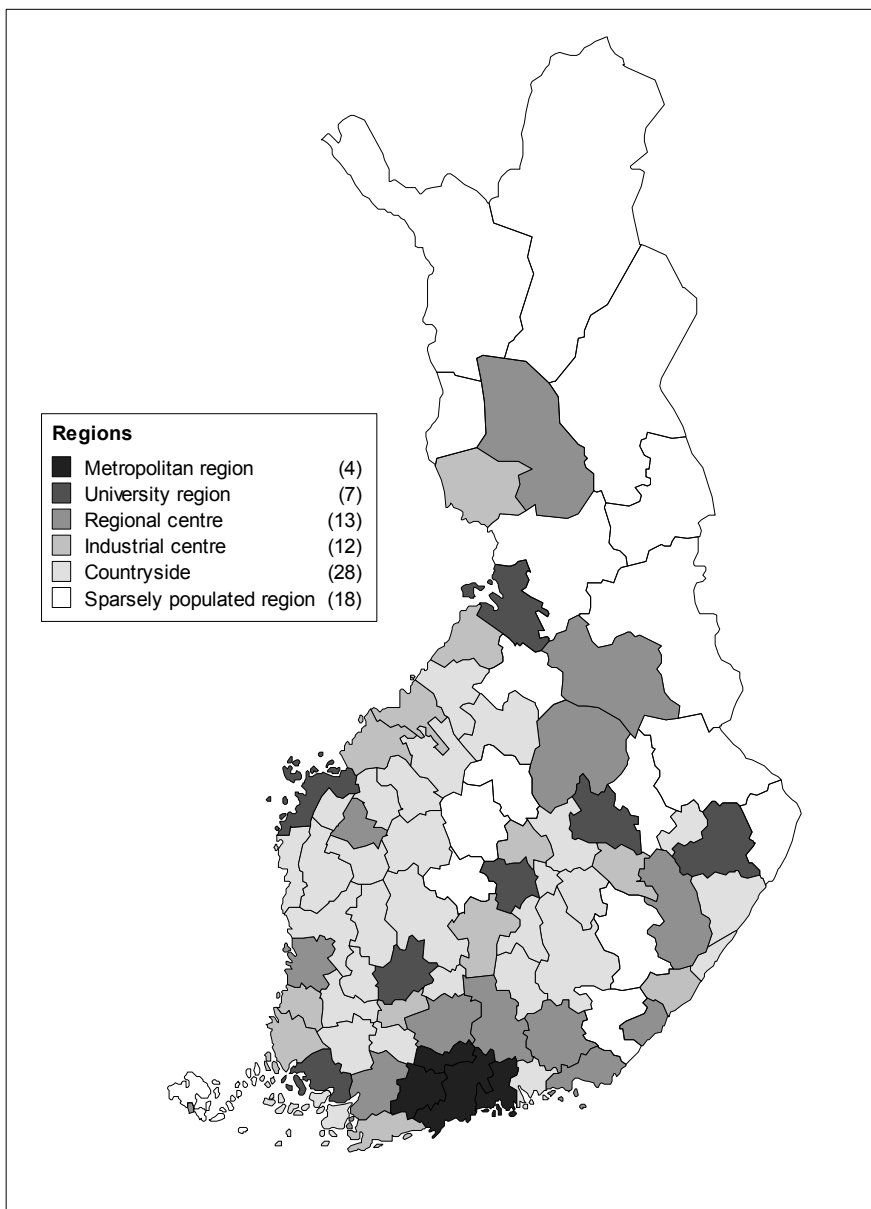
[xxviii] As a figure, the coefficient of multinomial logit would be a vertical line.

[xxix] A model with previous commuting experience as an explanatory variable was also estimated. In that case the average effect of personal unemployment on commuting was significant and positive. Variation in the effect was evident in this case too, even though the variance was not quite as large as now. Moreover, after adding commuting experience in the model, the age profile in commuting became linearly decreasing and working spouse failed to reach significance. These differences in certain sense reflect differences in characteristics of "old" and "new" commuters. The results relating to migration remained for the most part unchanged, the only difference was that home ownership and 3-6 year old children became insignificant. It is also worth mentioning that commuting experience increases both commuting and migration likelihood. In other words, for some commuting is a longer term choice, and for some it is only a temporary solution. Previous commuting experience was left away from the final model because the main interest here is on general characteristics of commuters and otherwise the results remained fairly stable. The results including previous commuting experience are available from the author upon request.

[xxx] In standard multinomial logit model the marginal effect is constant in the whole sample.

Sub-regions (NUTS4) and regional classification into different types of regions

Regions

■ Metropolitan region	(4)
■ University region	(7)
■ Regional centre	(13)
■ Industrial centre	(12)
□ Countryside	(28)
□ Sparsely populated region	(18)

APPENDIX 2.

Results of multinomial logit models; intraregional mobility

Variable	Migrant vs Immobile	Commuter vs. Immobile	Commuter vs. Migrant
	Coeff. Std.error	Coeff. Std.error	Coeff. Std.error
Personal characteristics			
Age	-1.867*** (0.170)	-0.565*** (0.105)	1.302*** (0.192)
Age2 (Age squared/100)	0.128*** (0.024)	0.036*** (0.014)	-0.092*** (0.027)
Female	-0.355*** (0.051)	-0.426*** (0.045)	-0.071 (0.063)
Unemployed	0.734*** (0.061)	1.203*** (0.041)	0.469*** (0.067)
Secondary education	0.122** (0.060)	-0.061* (0.035)	-0.183*** (0.066)
Higher education	0.337*** (0.069)	0.036 (0.039)	-0.300*** (0.076)
Service sector	-0.589*** (0.063)	-0.486*** (0.043)	0.103 (0.074)
Processing	-0.595*** (0.084)	-0.311*** (0.049)	0.284*** (0.094)
Construction	-0.419*** (0.142)	0.440*** (0.061)	0.859*** (0.150)
Income	-0.166*** (0.021)	-0.049*** (0.008)	0.117*** (0.022)
Swedish-speaking	-0.168 (0.107)	-0.186*** (0.062)	-0.018 (0.119)
Has a car	0.136*** (0.043)	0.247*** (0.028)	0.112** (0.048)
Migrated 1995-2000	0.863*** (0.043)	0.709*** (0.029)	-0.154*** (0.049)
Lives in birth region	-0.371*** (0.041)	0.015 (0.026)	0.387*** (0.046)

APPENDIX 2. Continued

Variable	Migrant vs Immobile	Commuter vs. Immobile	Commuter vs. Migrant
	Coeff. Std.error	Coeff. Std.error	Coeff. Std.error
Family related characteristics			
Head of the household	-0.341*** (0.066)	-0.059 (0.050)	0.282*** (0.078)
Married	-0.313*** (0.067)	0.124** (0.051)	0.437*** (0.080)
Number of children	-0.083* (0.049)	0.037 (0.025)	0.120** (0.053)
Youngest child under 3 y.	0.018 (0.083)	0.157*** (0.046)	0.139 (0.091)
Children 3-6 y.	-0.114 (0.086)	0.078* (0.044)	0.192** (0.094)
Children 7-17 y.	0.252*** (0.093)	0.077 (0.049)	-0.175* (0.101)
Family size increased	0.617*** (0.048)	0.042 (0.042)	-0.575*** (0.059)
Single parent	0.389*** (0.091)	0.016 (0.081)	-0.405*** (0.114)
Spouse working	-0.555*** (0.061)	0.047 (0.037)	0.602*** (0.068)
Spouse highly educ.	0.394*** (0.060)	0.039 (0.032)	-0.355*** (0.065)
Home owner	0.125*** (0.044)	0.197*** (0.029)	0.073 (0.050)
Tightness of living space	0.253*** (0.036)	-0.073*** (0.028)	-0.327*** (0.043)
Regional characteristics (origin)			
Local unempl. rate	-0.376*** (0.100)	-0.385*** (0.066)	-0.009 (0.111)
Regional income	-1.062*** (0.183)	-0.532*** (0.111)	0.529*** (0.202)
Metropolitan region	0.265* (0.136)	0.726*** (0.083)	0.461*** (0.151)
University region	-0.248*** (0.053)	0.210*** (0.036)	0.459*** (0.061)
Sparsely pop. region	-0.175* (0.100)	-0.390*** (0.074)	-0.215* (0.118)
Rural	0.544*** (0.059)	0.756*** (0.039)	0.212*** (0.067)
Middle Finland	-0.013 (0.062)	-0.247*** (0.043)	-0.235*** (0.071)
East Finland	0.084 (0.073)	-0.404*** (0.054)	-0.487*** (0.086)
North Finland	0.341*** (0.070)	-0.006 (0.050)	-0.347*** (0.081)
Log likelihood	-35489.88		
Likelihood ratio index	0.130		
***/**/* Significant at 1, 5, 10 % level			

APPENDIX 3.

An example of the variation in the effect of certain variables on mobility

In Table 3 of Chapter 4 the results show that the mean coefficient of personal unemployment (-0.119) on migration is not statistically significant but the spread of the coefficient (4.678) is large and significant. This means that the effect of unemployment varies in the sample. The distribution of the variation of the effect of unemployment is presented in Figure A1. In the sample the effect of personal unemployment varies between -4.797 (-0.119-4.678) and +4.559 (-0.119+4.678) (points a and b). The height of the triangular gives the probability of observing a certain value of the coefficient. For example, for the mean coefficient this probability is about 0.214 (point d). The vertical line is at zero, and based on that one can see that the effect of unemployment is positive for about half of the sample persons and negative for another half. To be more exact, 52% of the area of the triangular is on the negative side, i.e. the probability to observe a negative coefficient is around 0.5.
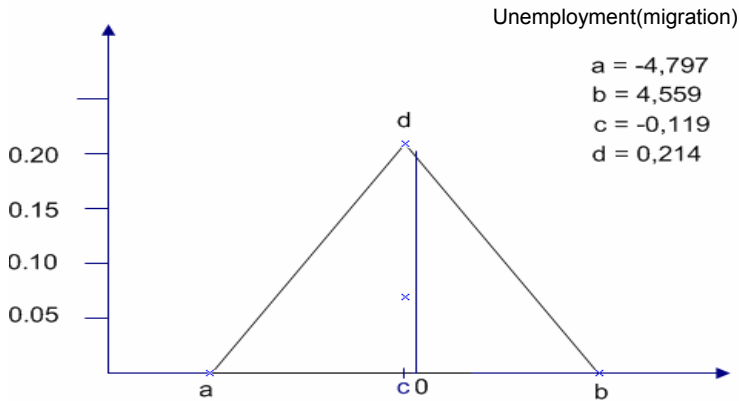

Figure A1. *Variation in the coefficient of personal unemployment on migration*

Table 3 also shows that the mean effect of tightness of living space on commuting is negative (-0.752) and the spread is 2.408. Both are statistically significant. In other words, even though those with more living space typically commute more, there is significant variation in the sample. The coefficient varies between -3.160 and +1.656. The distribution is presented in Figure A2. The vertical line is at zero. 24% of the area of the triangular is on the positive side, i.e. the coefficient is positive for about one fourth of the sample.
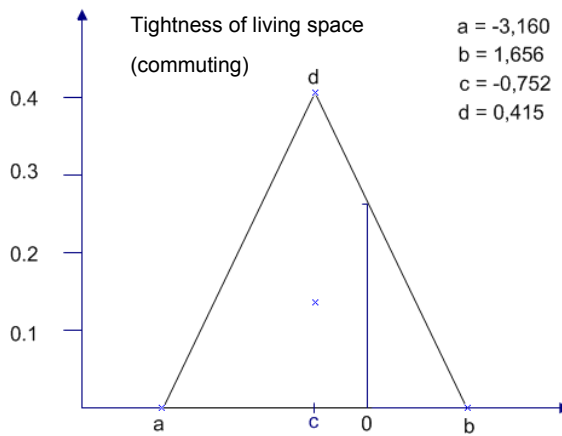

Figure A2. *Variation in the coefficient of tightness of living space on commuting*

APPENDIX 4.

The effect of personal unemployment on the probability of migration and commuting

Figure 1 shows the simulated effect of personal unemployment on the predicted probability of migration and commuting (mixed multinomial logit, intraregional mobility, i.e. mobility between municipalities) The probabilities describe the average probabilities calculated over all observations. The different values represent predicted probabilities of migration and commuting in the case where the unemployment variable gets a value 0 (not unemployed) and in the case where the variable gets a value 1 (unemployed), and other thing are held constant. The difference between the predicted probabilities is approximately the marginal effect, which indicates how much the probability of a certain choice changes in absolute terms if the value of the variable in question changes by one unit and other things remain constant. (Note that the marginal effects of migration and commuting are not comparable since the classes have different number of observations.)
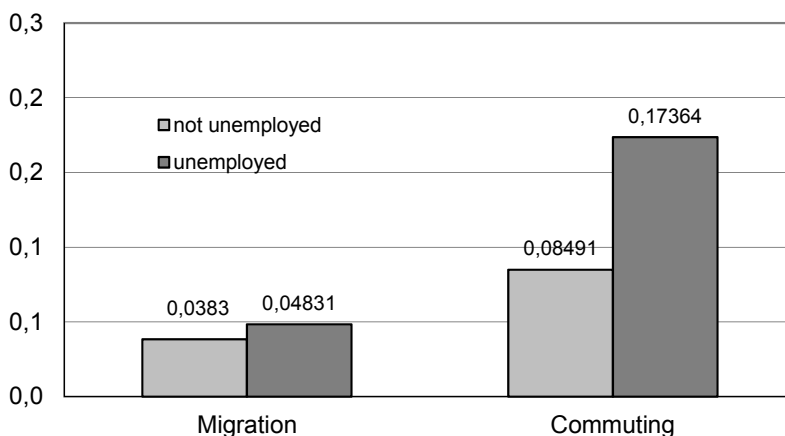

Figure 1. Predicted probability of migration and commuting for the unemployed and others (mixed multinomial logit, intraregional mobility)

On average personal unemployment increases the probability of commuting and migration. It should be noted that since the coefficient of unemployment varies in the sample, also its' effect on predicted probability varies from negative to positive. The positive effect is however larger and on average the effect on predicted probability is positive. The predicted probability of commuting for the unemployed is on average 0.17364 and for others 0.08491. Hence, personal unemployment increases probability of commuting in absolute terms by 0.0887. In other words, those with unemployment experience have on average around 9 percentage points higher probability to commute than those in other labour market statuses, holding other things equal. The respective probabilities for migration are 0.04831 and 0.03830, and absolute increase in the probability is 0.0100.

APPENDIX 5

Marginal effects for multinomial ja mixed multinomial logit models

Variable	Multinomial logit, intraregional		Mixed multinomial logit, intraregional		Mixed multinomial logit, interregional	
	Migrant	Commuter	Migrant	Commu-ter	Migrant	Commu-ter
Personal characteristics						
Age[a]	-0.0056	-0.0035	-0.0033	0.0010	-0.0026	0.0005
Age2 (Age squared/100)	0.0004	0.0002	0.0001	-0.0003	0.0001	-0.0001
Female	-0.0098	-0.0320	-0.0107	-0.0296	-0.0076	-0.0214
Unemployed	0.0186	0.1301	0.0100	0.0887	0.0068	0.0292
Secondary education	0.0044	-0.0055	0.0058	-0.0056	0.0064	-0.0029
Higher education	0.0115	0.0011	0.0145	0.0067	0.0157	0.0042
Service sector	-0.0153	-0.0316	-0.0119	-0.0268	-0.0117	-0.0117
Processing	-0.0155	-0.0202	-0.0114	-0.0128	-0.0100	-0.0059
Construction	-0.0141	0.0428	-0.0113	0.0460	-0.0115	0.0266
Income[b]	-0.0009	-0.0008	-0.0015	-0.0028	-0.0012	-0.0012
Swedish-speaking	-0.0045	-0.0131	-0.0069	-0.0129	-0.0069	-0.0055
Has a car	0.0033	0.0187	0.0049	0.0216	0.0028	0.0097
Migrated 1995-2000	0.0269	0.0591	0.0267	0.0550	0.0193	0.0271
Lives in birth region	-0.0128	0.0032	-0.0123	0.0025	-0.0154	-0.0055
Family related characteristics						
Head of the household	-0.0106	-0.0030	-0.0109	0.0035	-0.0068	0.0043
Married	-0.0113	0.0113	-0.0113	0.0094	-0.0114	0.0013
Number of children[c]	-0.0029	0.0034	-0.0026	0,0027	-0.0013	0.0021
Youngest child under 3 y.	-0.0002	0.0129	-0.0024	0.0155	-0.0064	0.0013
Children 3-6 y.	-0.0041	0.0069	-0.0050	0.0084	-0.0029	-0.0006
Children 7-17 y.	0.0085	0.0047	0.0053	0.0032	0.0010	-0.0040
Family size increased	0.0240	-0.0004	0.0234	-0.0015	0.0157	0.0045
Single parent	0.0148	-0.0035	0.0093	-0.0063	0.0060	-0.0069
Spouse working	-0.0183	0.0066	-0.0176	0.0076	-0.0154	0.0007
Spouse highly educ.	0.0142	0.0009	0.0117	0.0023	0.0113	0.0043
Home owner	0.0031	0.0147	0.0029	0.0121	0.0022	0.0057
Tightness of living space[b]	0.0009	-0.0007	0.0009	-0.0013	0.0007	-0.0004

APPENDIX 5. Continued

Variable	Multinomial logit, intraregional		Mixed multinomial logit, intraregional		Mixed multinomial logit, interregional	
	Migrant	Commuter	Migrant	Commu-ter	Migrant	Commu-ter
Regional characteristics (origin)						
Local unempl. rate[d]	-0.0011	-0.0028	-0.0009	-0.0023	-0.0009	-0.0027
Regional income[b]	-0.0076	-0.0093	-0.0055	-0.0076	-0.0060	-0.0080
House prices[b]	-	-	-	-	-0.0023	-0.0060
Metropolitan region	-0.0047	0.0622	-0.0037	0.0587	0.0003	0.0427
University region	-0.0090	0.0186	-0.0109	0.0171	-0.0071	0.0127
Sparsely pop. region	-0.0039	-0.0264	-0.0021	-0.0253	-0.0013	0.0033
Rural	0.0149	0.0684	0.0131	0.0590	0.0088	0.0190
Middle Finland	0.0008	-0.0182	0.0007	-0.0162	0.0003	-0.0108
East Finland	0.0048	-0.0288	0.0033	-0.0263	0.0017	-0.0126
North Finland	0.0126	-0.0024	0.0094	-0.0004	0.0076	-0.0025

Note. The figures are based on the results presented in Table 3 (mixed multinomial logit) and Appendix 2 (multinomial logit). Marginal effects are obtained by simulation and they represent the average of all observations.

[a] one year increase, [b] 10 % increase, [c] one child more, [d] one percentage point increase. Marginal effects of dummy variables describe situation where the factor in question is 1 in relation to situation where it is 0.

References:

Alonso, W. (1964) Location and Land Use: Toward a General Theory of Land Rent. Cambridge, MA, Harvard University Press.

Ben-Akiva, M. and Bolduc, D. (1996) Multinomial probit with a logit kernel and a general parametric specification of the covariance structure. Working paper, Department and civil and environmental engineering, MIT.

Bowles S. (1970) Migration as Investment: Empirical Tests of the Human Investment Approach to Geographical Mobility. *The Review of Economics and Statistics*, vol. 52, pp. 356-362.

Brownstone, D. (2001)

Brownstone, D. and Train, K. (1999) Forecasting new product penetration with flexible substitution patterns. Journal of Econometrics, 89, 109-129.

Cameron, G. and Muellbauer, J. (1998) The housing market and regional commuting and migration choices. Scottish Journal of Political Economy 45, 4, 420-446.

Clark, W.A.V, Huang, Y. and Withers, S. (2003) Does Commuting Distance Matter? Commuting Tolerance and Residential Change. Regional Science and Urban Economics 33, 199-221.

Eliasson, K., Lindgren, U. and Westerlund, O. (2003) Geographical labour mobility: migration or commuting? Regional Studies 37, 8, 827-837.

Evers, G. H. M. (1990) The residential location and workplace choice: a nested multinomial logit model. In: Fischer, M.M., Nijkamp, P. and Papageorgiou, Y.Y. (eds.) Spatial Choices and Processes. Elsevier Science B.V. 313-329.

Falaris, E. M. (1987) A Nested Logit Migration Model with Selectivity. International Economic Review 28, 429-443.

Freedman, O. and Kern, C. R. (1997) A Model of Workplace and Residence Choice in Two-Worker Households. Regional Science and Urban Economics 27, 241-260.

Green A. E. (1997) A Question of Compromise? Case Study Evidence on the Location and Mobility Strategies of Dual Career Households. *Regional Studies*, vol. 31, pp. 641-657.

Green, A. E. (2004) Is relocation redundant? Observations on the changing nature and impacts of employment-related geographical mobility in the UK. Regional studies, Vol. 35., 6. August 2004, 629-641.

Greene, W. (2003) Econometric Analysis, 5th Edition. Prentice Hall.

Greenwood, M. (1997) Internal migration in developed countries. In: Rosenzweig, M.R. and Stark, O. (eds.) Handbook of Population and Family Economics. Elsevier Science B.V. 647-720.

Haapanen, M. (2003) Studies on the determinants of migration and spatial concentration of labour. Jyväskylä Studies in Business and Economics, Doctoral Dissertation, University of Jyväskylä.

Hanson, S. and Johnston, I.,(1985). Gender differences in work-trip length: Explanations and implications. Urban Geography 6, pp. 193–219

Hazans, M. (2004) Does Commuting Reduce Wage Disparities? Growth and Change 35, 3, 360-390.

Hensher, D.A. and Greene, W. (2001) The mixed logit model: the state of practise and warnings for the unwary. Working Paper ITS-WP-02-01, University of Sydney.

Herzog H. W. Jr., Schlottmann A. M. and Boehm T. P. (1993) Migration as Spatial Job-search: A Survey of Empirical Findings. *Regional Studies*, vol. 27, pp. 327-340.

Huovari, J., Laakso, S., Luoto, J. and Pekkala, S. (2002). Regional forecast for housing markets. Pellervo Economic Research Institute Reports No. 185.

Häkkinen, I. (2000) Determinants of migration and destination choice in Finland. Valtion taloudellinen tutkimuskeskus, tutkimuksia 65 (in Finnish).

Kain, J. F. (1962) The journey to work as a determinant of residential location. Papers and Proceedings, Regional Science Association 9, 137-161.

Knapp, T.A, White, N.E. and Clark, D.E. (2001) A Nested Logit Approach To Household Mobility. Journal of Regional Science 41, 1, 1-22.

Liaw, K-L and Ledent, J. (1987) Nested Logit Model and Maximum Quasi-Likelihood Method. Regional Science and Urban Economics 17, 67-88.

Louviere, J.J, Hensher, D.A. and Swait, J.F. (2000) Stated Choice Methods and Analysis, Cambridge University Press, Cambridge.

Madden, J. (1981) Why women work closer to home. Urban Studies 18, 181-194.

Mills, E. S. (1967) An Aggregate Model of Economic Activity in an Urban Area. American Economic Review 57, 197-210.

Molho I. (1986) Theories of Migration: a Review. *Scottish Journal of Political Economy*, vol. 33, pp. 396-419.

Molho, I. (2001): Spatial Search, Migration and Regional Unemployment. Economica, 68, 269–283.

Muth, R. (1969) Cities and Housing: The Spatial Pattern of Urban Residential Land Use. Chicago, University of Chicago Press.

Nivalainen, S. (2003) Where do migrants go? An analysis of rural and urban destined/originated migration in Finland in 1996-99. Pellervo Economic Research Institute Working Papers N:o 66.

Nivalainen, S. (2004) Determinants of family migration: short moves vs. long moves. Journal of Population Economics, 17, 1, ss.157-175.

Odland, J. and Ellis, M. (1987) Disaggregate Migration Behaviour and the Volume of Interregional Trade. Geographical Analysis 19, 111-124.

Pacione M. (1984) *Rural Geography*. Harper & Row, London.

Revelt, D. and Train, K. (1998) Mixed logit with repeated choices: households' choices with appliance efficiency level. Review of Economics and Statistics, 80, 1-11.

Revelt, D. and Train, K. (2000) Specific taste parameters and mixed logit (Working paper no. E00-274), Department of Economics, University of California, Berkeley

Romaní, J., Suriñach, J. and Artís, M. (2003) Are commuting and residential mobility decisions simultaneous?: The case of Catalonia, Spain. Regional Studies 37, 8, 813-826.

Rouwendal, J. (1999) Spatial job search and commuting distances. Regional Science and Urban Economics, 29, 4, 491-517

Rouwendal, J. and Meijer, E. (2001) Preferences for Housing, Jobs, and Commuting: A Mixed Logit Analysis. Journal of Regional Science 41(3), 475-505.

Ruud, P., (1996) Approximation and Simulation of the Multinomial Probit Model: An Analysis

of Covariance Matrix Estimation, working paper, Department of Economics, University of

California, Berkeley.

Sandefur G. D. and Scott W. J. (1981) A Dynamic Analysis of Migration: An Assessment of the Effects of Age, Family and Career Variables. *Demography*, vol. 18, pp. 355-368.

Shen, Q. (2000) Spatial and Social Dimensions of Commuting. Journal of the American Planning Association 66, 68-82.

Singell, L. D. and Lillydahl, J.H. (1986) An Empirical Pattern of the Commute to Work Patterns of Males and Females in Two Earner Households. Urban Studies 2, 119-129.

So, K.S., Orazem, P. F. and Otto, D. M. (2001) The Effects of Housing Prices, Wages and Commuting Time on Joint Residential and Job Location Choices. American Journal of Agricultural Economics, 83(4), 1036-1048.

Tervo, H. (2000) Migration and Labour Market Adjustment: empirical evidence from Finland 1985-90. International Review of Applied Economics, vol 14, No 3, pp. 343-360.

Train, K. (1999) Halton sequences for mixed logit. Working paper, Department of economics, UC Berkeley.

Train, K. E. (2003) Discrete choice methods with simulation, Cambridge University Press, New York

Van Ommeren, J.N., Rietveld, P. and Nijkamp, P. (1997) Commuting: In Search of Jobs and Residences. Journal of Urban Economics 42, 402-421.

Van Ommeren, J.N., Rietveld, P. and Nijkamp, P. (1998) Spatial Moving Behaviour of Two-Earner Households. Journal of Regional Science, 38, 23-41.

Zax, J (1991) The Substitution Between Moves and Quits. Economic Journal 101, 1510-1521.

Zax, J. (1994) When is a Move a Migration? Regional Science and Urban Economics 24, 341-360.

Zax, J. and Kain, J.F. (1991) Commutes, Quits and Moves. Journal of Urban Economics 29, 153-165.

White, M.J. (1988) Location Choice and Commuting Behaviour in Cities with Decentralized Employment. Journal of Urban Economics 24, 129-52.

PTT julkaisuja, PTT publikationer, PTT publications

20. Terhi Latvala. 2009. Information, risk and trust in the food chain: Ex-ante valuation of consumer willingness to pay for beef quality information using the contingent valuation method.

19. Perttu Pyykkönen. 2006. Factors affecting farmland prices in Finland

18. Vesa Silaskivi. 2004. Tutkimus kilpailuoikeuden ja maatalouden sääntelyn yhteensovittamisesta.

17. Aki Kangasharju. 1998. Regional Economic Differences in Finland: Variations in Income Growth and Firm Formation.

16. Pertti Kukkonen. 1997. Rahapolitiikka ja Suomen kriisi.

PTT raportteja, PTT forskningsrapporter, PTT reports

222. Liisa Mäkijärvi – Anna-Kaisa Rämö – Paula Horne. 2010. Nykynuoret vaikuttajina ja metsänomistajina vuonna 2030

221. Anna-Kaisa Rämö – Liisa Mäkijärvi – Ritva Toivonen – Paula Horne. 2009. Suomalaisen metsänomistajan profiili vuonna 2030

220. Tie- ja liikenneinvestointien rahoitukseen lisää joustavuutta: Soveltuisivatko tie- ja liikennerahastot Suomeen? 2009. Liikenne- ja viestintäviraston julkaisuja 47/2009.

219. Kalle Laaksonen – Kyösti Arovuori. 2009 Kehityspolitiikan keinot köyhien maiden ruokaturvan edistämiseksi.

218. Ydinvoimainvestointien vaikutukset elinkeinoelämän ja kotitalouksien sähkön hintaan. 2009.

217. Perttu Pyykkönen – Sanna Tiilikainen. 2009. Töiden organisointi Suomen maataloudessa.

PTT työpapereita, PTT diskussionsunderlag, PTT Working Papers

122. Terhi Latvala – Perttu Pyykkönen. 2010. Kotieläinrakennusten kustannukset ja töiden organisointi

121. Esa Härmälä. 2010. Viljapohjaisen etanolin tuotanto Suomessa

120. Petri Mäki-Fränti – Markus Lahtinen – Hanna Karikallio. 2010. Alueellisten asuntomarkkinoiden kehitys vuoteen 2012

119. Matleena Kniivilä – Tapio Tilli. 2009. Suomen raakapuumarkkinoiden toimivuus vuosina 1986-2005.

118. Petri Mäki-Fränti. 2009. Henkilöstön työkyky ja toimipaikkojen tuottavuus.

117. Liisa Mäkijärvi. 2009. Nuorten suhtautuminen metsiin ja metsien käyttöön tulevaisuuden metsänomistajina ja päätöksentekijöinä.

116. Janne Huovari – Eero Lehto. 2009. On regional specialization of high and low tech industries.