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INTERNAL
MIGRATION AND
LABOUR MARKET
TRANSITIONS OF
UNEMPLOYED
WORKERS

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Abstract: This study examines two questions: how does internal migration affect labour market transitions of unemployed workers in 1994 and what are the determinants of migration in 1990 - 95. In both cases multinomial logit model is constructed. Results of the labour market transition model suggest that migration to a growth-centre region increases employment likelihood of the unemployed, while migration to other regions reduces it. Growth-centre migrants are also very unlikely to end their unemployment spell to active labour market programmes. Results of the migration model indicate that education increases likelihood of migration to growth-centre regions but does not affect migration to other regions. Job placements reduce and training program periods increase migration to growth-centre regions. However, they do not influence migration to other regions.

Key words: Migration, labour market transitions, growth-centre regions, labour market policies, multinomial logit model

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Tiivistelmä: Tutkimuksessa selvitetään, miten muuttaminen vaikuttaa työttömien työmarkkinasiirtymiin vuonna 1994 ja mitkä tekijät selittävät muuttamis päätöstä vuosina 1990 - 95. Molempia tutkimusongelmia mallinnetaan multinomiaalisen logit-mallin avulla. Tulosten mukaan muuttaminen kasvukeskusalueelle parantaa työttömän työllistymismahdollisuuksia, mutta muuttaminen muille alueille heikentää sitä. Lisäksi, kasvukeskuksiin muuttaneet henkilöt päättävät työttömyysjaksonsa harvoin työvoimapolitiittisille toimenpiteille. Muuttamismallin mukaan koulutus nostaa kasvukeskusalueille muuttamisen todennäköisyyttä, mutta se ei vaikuta muille alueille muuttamisen todennäköisyyteen. Tukityön havaittiin vähentävän ja työvoimakoulutuksen lisäävän henkilön kasvukeskusalueille muuttamisalttiutta. Toisaalta näillä toimenpiteillä ei havaittu olevan vaikutusta muille alueille muuttamiseen.

Asiasanat: Muuttaminen, työmarkkinasiirtymät, kasvukeskusalueet, työvoimapolitiikka, multinomiaalinen logit-malli

Summary

This study examines how internal migration affects labour market transitions of unemployed workers in 1994 and what are the determinants of migration in 1990 - 95. Firstly, theoretical migration models are reviewed. We found that most of the economic literature considers migration as a person's investment in human capital, as a person's job search process, or as labour's response to market disequilibrium (classical migration models). Secondly, the determinants of labour market transitions *and* migration are investigated with multinomial logit model (i.e. with microeconomic model). During our estimations we had micro-level panel data containing a sample of 4990 persons. The sample persons had to have a terminated spell of unemployment in 1994.

Results are illustrated in various ways. Firstly, marginal effects and odd-ratios are calculated using estimated parameters. Secondly, numerous figures are drawn to illustrate estimated labour market transition and migration probabilities with different explanatory variable values. During the calculations other explanatory variables are kept at their mean values. In both models explanatory variables describe personal, family, household, labour market, regional, and migration characteristics.

In the labour market transition model we examine where people go after they end their unemployment spell: do they get employed, do they go to the active labour market programmes (ALMPs), or do they leave the labour force. To be more specific, our main interest is what effect internal migration has on these labour market transitions. Using information about person's home region we formed explanatory variable, which shows whether person migrates permanently to a growth-centre region or a non-growth-centre region, migrates temporarily, or does not migrate at all in 1990 - 94. Migration occurs if person changes his/her home region at least once during examined period, i.e. if person migrates in 1990 - 91, 1991 - 92, 1992 - 93, or in 1993 - 94. Person migrates to a growth-centre region if his/her final destination region is Helsinki, Salo, Porvoo, Tampere, Kaakkois-Pirkanmaa, Turku, Vaasa, Jyväskylä, Oulu, Kuopio, or Lohja. Other (78) regions are referred as non-growth-centre regions. Migration is considered to be temporary (permanent), if person migrates in 1990 - 94 and migrates (don't migrate) again in 1994 - 95.

The results of the labour market transition model indicate that a person who migrates permanently to a growth-centre region has about 7 percentage points higher employment probability than a non-migrant. However, a person who migrates permanently to a non-growth-centre region has about 7 percentage points lower employment probability than a non-migrant. Permanent growth-centre migration also reduces person's probability to end his/her unemployment

spell to active labour market programmes (ALMPs) by about 10 percentage points. Migrants are also more likely to transfer outside the labour force than non-migrants, especially those who migrate temporarily.

When the other variables affecting labour market transitions were considered, firstly, we found that household's disposable income during unemployment spell has negative effect on employment likelihood and transition outside the labour force and positive effect on transition to ALMPs. Secondly, as duration of job search continues person's employment likelihood reduces and likelihood to transfer to ALMPs increases. Thirdly, our results show that ALMPs – job placements and training program periods – and short term working periods during the job search period increase worker's employment chances. In addition, workers who had training program periods are especially unlikely to transfer outside the labour force. However, results should be evaluated with caution since people are selected to ALMPs.

In the migration model dependent variable can have three mutually exclusive values: person either migrates to growth-centre region or non-growth-centre region, or does not migrate at all in 1990 – 95. In this model distinction between permanent and temporary migration is removed and migration period is one year longer in order to get more observations into different categories. Growth-centre regions are the same as in labour market transition model. Again, independent variables describe personal, family, household, labour market, and regional characteristics.

Results of our migration model indicate that migration is selective for example by age, education, and home ownership status. Relationship between age and migration has inverse U-shape and migration probability is highest when person is about 30 years old. Results also indicate that people in the old age groups are more likely to migrate to non-growth-centre than to growth-centre regions. Education increases person's migration probability to growth-centre regions but it does not have a substantial effect on non-growth-centre-migration probability. Presence of children reduces person's migration likelihood. Migration to growth-centre regions is remarkably low with persons who have children at school age. House owners have generally low migration likelihood, since they face large liquidity problems and transaction costs during migration.

As household's disposable income during the unemployment spell increases, non-growth-centre-migration probability increases but growth-centre migration reduces. One might argue that the gains from growth-centre migration could be highest for those who have lowest income levels. Although the impact of income change is very marginal at high level of income, people at those income levels are almost twice as likely to migrate to non-growth-centre regions as to growth-centre regions.

How does the quality of job search and ALMPs influence migration probability? Our results show that the duration of job search does not have a significant effect on growth-centre migration probability but increases migration to other regions markedly until the job search had lasted about two years. With longer job-search duration the relationship is reversed: we can say that a person who has experienced very long job-search period has reduced migration likelihood, especially to non-growth-centre regions.

Job placements reduce and training program periods increase growth-centre migration probability: a person who did not have job placements is almost twice more likely to migrate as one who had. On the other hand, training periods increase worker's growth-centre migration probability about 1.3 times. This leads into conclusion that a person who had training periods during the job search period is about twice as likely to migrate to growth-centre regions as a person who had job placements. However, ALMP did not have an effect on non-growth-centre migration probability. Thus, our results did not totally support the view that labour market programmes reduce the utility loss of unemployment and lower the incentive to relocate from depressed regions. Labour market programmes have potentially important implications for migration.

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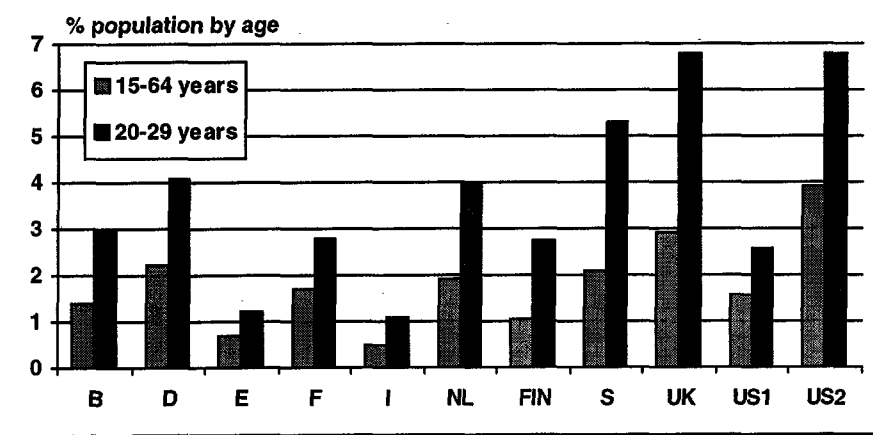
1. Introduction

After the recession of the early 1990s there has been marked increase in internal migration¹ in Finland (Laakso 1998). Once again the mainstream movement has been towards the central areas, i.e. the growth-centre regions. Thus, in most countries - including Finland - net migration has been away from high-unemployment and into low-unemployment regions (OECD 1990).

Decision to migrate can be viewed from various points of view, not only because analysis of migration is an area of many disciplines, but also because there are many directions inside economic theory as well. At the individual level, people responding to relative wages and job opportunities, while at the national level, the individual responses are important determinants of the structure of unemployment and wages across regions (Fredriksson 1997, 3). That is, labour mobility is a vital factor in achieving an efficient allocation of resources in the economy. If labour is highly mobile, the structure of labour supply adjusts quickly to the structure of labour demand, and consequently, negative shocks to a region do not result in prolonged increases of unemployment to such an extent.

But what is the scale of labour migration in Finland compared to other countries? Figure 1 shows the scale of movement in selected European countries and the United States in 1995:

Figure 1. Domestic Migration (NUTS 2) by Age Group in Europe and US, 1995



B = Belgium, D = Denmark, E = Spain, F = France, I = Italy, NL = Netherlands, FIN = Finland, and S = Sweden. US1 is moved state within same Census region; US2 is estimated NUTS 2 equivalent migration. Data for Denmark is 18-64 years and 18-24 years; F, NL and UK: 15-24 years. Data for D, E, I, UK and US is 1994. (Source: European Commission 1997, 70.)

¹ By internal or interregional migration we mean that migration occurs inside a country, not between countries.

The scale of movement varies significantly between EU-countries.² Even though migration has increased, it is still a rare phenomenon in Finland. In Italy and Spain only around 0.5 per cent of people of working age moved between one (NUTS 2) region and another. In Finland the figure was a bit higher (just over 1%). In Netherlands, Sweden and Germany the figures were around 2 per cent, and in the UK around 3 per cent. In the US the figures weren't much higher if you allow much smaller movement between member states in Europe as compared with that between different part of the US. (European Commission 1997.)³

While the determinants of migration are better covered in the literature, previous studies examining the effects of migration on employment likelihood have been far from conclusive. Migration has been found to decrease (Herzog and Schlottmann 1984), leave unchanged (Herzog and Schlottmann 1984; Van Dijk *et al.* 1989), or increase (Van Dijk *et al.* 1989, Tervo 1998) the employment likelihood of the unemployed.⁴ Thus, more research is needed in this topic.

We are focusing on the question whether or not migration to growth-centre regions or to other regions increases employment likelihood of unemployed workers. If the answer is yes, then migration is allocating human resources efficiently in the labour market.⁵ However, still we need to examine who migrates and where do they migrate, in order to target the policy instructions right. In this topic we focus on question: Who migrates into growth-centre regions and non-growth-centre regions? In both cases multinomial logit model is constructed and estimation results are illustrated with marginal effects, relative probabilities, and figures.

The remainder of this study is organised as follows: Section 2 discusses briefly the most common migration theories, namely the classical, human capital and job-search theory of migration. Section 3 begins with a short description of data and estimation methodology. Then it continues with separate estimations of labour market transition and migration model in Sections 3.3 and 3.4, respectively. Finally, Section 4 concludes the study.

² On average, about 1.5 % (1 %) of working-age population in the EU moved between NUTS 2 (NUTS 1) regions. There are 200 or so NUTS 2 regions in the EU, where as NUTS 1 consists of 77 regions. Note also that the scale of migration between European countries is relatively smaller: inflows averting under 0.2 per cent of the population of the EU. (European Commission 1997, 69 - 70.)

³ Similar figures can be seen from Nickell and Layard (1997) or OECD (1994).

⁴ Note, however, that Tervo's (1998) result was not statistically significant.

⁵ Another question is of course what is the relationship between migration and earnings development (see e.g. Falaris 1982; Farber 1983; Haut and Kau 1985; and Herzog, Hofler and Schlottmann 1985).

2. Review of Migration Theories

The purpose of this section is to provide an overview of the migration theories and related topics using numerous surveys. Perhaps the most cited of them are Michael J. Greenwood's articles (1975; 1985). More recent ones are written by Shields and Shields (1989), Greenwood *et al.* (1991), Armstrong and Taylor (1993), and Ghatak *et al.* (1996). Most frequently used migration models, both in theoretical and empirical analysis, are human capital theory and job search models. Milne (1991) and Pickles & Rogerson (1984) have written good surveys on these theories, respectively.

In the last thirty years or so, migration research has blossomed and taken a prominent place in regional science (see e.g. Greenwood 1993). At the same time the literature has become very massive and the data, theory and analytical techniques are sophisticated. As a result, comprehensive surveys are almost impossible to write and this section should not be seen as comprehensive presentation of migration theories, but as a short guide to these economic theories.⁶ Despite its limitations, it is useful to begin with the simple classical model of migration. This is followed by a discussion of more comprehensive theories of migration, namely human capital and job search models of migration.⁷

2.1 Classical Theory of Migration

In the classical theory of migration, migration is viewed as labour's response to market disequilibrium. In equilibrium, factors of production should receive the same real return in any region as long as factors are mobile. In regions where labour is relatively abundant and capital is relatively scarce, wage rates will be low and returns to capital high, and *vice versa*. The response to this disequilibrium is for labour to move to the high wage area and for capital to move to the low wage area. Adjustment will continue until regional wage differences

⁶ This development can be seen in journal *Regional Studies*: in 1993, instead of writing one survey of the migration literature, the journal (and Greenwood) decided to publish a series of mini-surveys of migration topics. They include e.g. equilibrium and disequilibrium in migration modelling (Hunt 1993), macroeconomic influences on migration (Milne 1993), and migration and the public sector (Charney 1993). However, in order to keep the story short these topics are not fully discussed here.

⁷ For the sake of brevity, only the most common (economic) models are reviewed. This leaves aside e.g. *the gravity models*, which can be used for analysing migration flows between regions. Gravity models were initially developed by geographers and they use aggregate data (see e.g. Gordon 1991; 1992; Armstrong and Taylor 1993, 127 - 128). Concepts *spatial interaction model* (Stillwell and Gongdon 1991) and *multistream model* (Gordon 1991) are used for modified or aggregated gravity models. In addition to these gravity models, migration can be viewed e.g. as a consumption activity, where people "vote with their feet", or as a part of household decision making (see e.g. Shields and Shields 1989; 1993). Geographical approaches are also included e.g. in the surveys by Berglund (1996) and Öberg (1997).

are entirely explained by moving costs, imperfect information, and artificial barriers to migration. (Shields and Shields 1989, 278.)

In the simplest version of the model, migration continues until wage rates are equalised across regions. Labour moves from region i to region j if the wage rate is higher in region j than i . Hence net migration is given by following expression (Shields and Shields 1989, 278):⁸

$$(2.1) \quad M_{ij} = \beta_{ij}(w_j - w_i),$$

where β_{ij} represents barriers to migration such as distance, imperfect information and artificial barriers which restrict the speed of adjustment. However, in reality regional wage differentials are often persisting and, in some cases, widening. This has led to extensions of the basic classical migration model. The persistence of regional wage differentials might indicate that there are factors such as costs of moving, differences in costs of living, occupational structure, regional amenities and unemployment rates, which need to be directly incorporated into the explanation of regional income differences.

Now the model can be represented as

$$(2.2) \quad M_{ij} = b_1 w_i + b_2 w_j + b_3 u + b_4 u_j + b_5 D_{ij},$$

where M_{ij} is the net labour migration from region i to j ; w_i, w_j are the relative, real wage rates in region i and j ; D_{ij} is the distance between region i and j ; and u_i, u_j are the unemployment rates in each region. In this extended model labour is expected to move from low to high wage areas and from high to low unemployment areas. Another way of summarising regional differences in employment opportunities is to use the Harris-Todaro (1970) model of migration. In their model, the appropriate regional income level is weighted by the probability of employment.⁹

Obviously these simple models have many limitations.¹⁰ As we shall see later in this study, the determinants of migration are more complex than the explanation

⁸ Note that we are talking about net migration, not about gross migration. The latter can be over zero even when wage rates are the same in both regions. That is why it is important to distinguish them. However, not everyone has done it clearly (see e.g. Shields and Shields 1989, 278 - 282). One problem with this model is that it assumes that net migration is not the only mechanism for removing earnings differentials; one should also consider gross migration (see Sjaastad 1962, 83).

⁹ Let us construct a following example (modified from Shields and Shields 1989, 281): let two regions be called urban and rural, with the rural employment rate assumed to be one and the urban employment rate be μ . Net migration is then $M_{ru} = \beta_{ru}(\mu w_u - w_r) + \Delta E / \mu$, where ΔE is the number of new urban jobs. In equilibrium, net migration is simply $\Delta E / \mu$. Hence each urban job created expands the urban labour force by $1/\mu$ persons.

¹⁰ In addition to following limitations, it is good to mention that the classical theory of labour migration usually rests upon a number of restrictive assumptions (Armstrong and Taylor 1993, 112): (i) perfect

offered by classical model. A migrant is more likely to be concerned with the time stream of expected earnings over the remainder of his or her working life with current wage differences (see e.g. Shields and Shields 1989, 282; Armstrong and Taylor 1993, 118). This is taken into account in the human capital and the job search models of migration (see Sections 2.2 and 2.3): they incorporate the timing of costs and benefits in decision process.

In the classical model of migration it is assumed that wages are perfectly flexible and labour markets adjust automatically to situations of disequilibrium. In reality, wage rates are very sticky in downwards direction (see example in Armstrong and Taylor 1993, 119). Classical model also assumes that it is the income of the head of household or principal wage earner in a household, which determines whether or not migration occurs. Yet many households include two or more wage earners, which suggests that the relevant income variable is household income.¹¹ It should also be taken into account that income gains are not the only benefit sought by migrants. The climate and amenity of the destination region also have an important role to play (see Cushing 1987).

The classical model of migration implies that it is the difference in income between destination and origin region ($w_j - w_i$) which is the main determinant of migration. Armstrong and Taylor (1993) argue, however, that while w_j indicates only the attractiveness of the destination region, w_i reflects two distinct influences. First, it reflects the attractiveness of the origin region and second, it also indicates whether migrants are able to finance the costs of a move: the higher income the more likely person is able to finance a move. One might also argue that regional income differences have a greater effect on the choice of specific destination once migrants have decided to move than they have on the initial decision to move (see Hughes and McCormick 1994). In addition, we argue that high wage level (w_j) in destination region will offer better facilities to finance the move, and consequently, will generate out migration from lower income regions.

Finally, the classical models do not emphasise individual behaviour. It is difficult for these models to explain differences in migration behaviour for what otherwise appears to be comparable individuals. However, these labour-flow models have advantages as well. According to Shields and Shields (1989, 282) they fit into formal dualistic models of labour transfer and into the neoclassical notion that factors seek their highest return.

competition exists in all markets, (ii) production functions exhibit constant returns to scale, (iii) factor migration is costless and there are no other barriers to migration, (iv) factor prices are perfectly flexible, factors of production are homogeneous, and (v) owners of labour and capital are completely informed about factor returns in all regions.

¹¹ This is taken into account in the empirical study of this paper: we found that household's disposable income had positive but not a significant effect on migration probability (see Section 3).

2.2 Human Capital Theory

Migration is clearly a more complex phenomenon than is suggested by the classical model. Human capital model can give us richer predictions. As noted above, the supreme advantage of the human capital model is that it does not assume the existence of a timeless world in which workers respond instantaneously to current regional wage differences.

Concept of human capital investment states back to the writings of Mincer (1958), Schultz (1961) and Becker (1962), but the original methodology for analysing migration as an investment is due to Larry Sjaastad (1962). Sjaastad's goal was to determine the return to investment in migration rather than to relate rates of migration to income differentials (as in the classical model). He treats migration as an investment increasing the productivity of human resources, an investment which has costs and which also gives returns. Treating migration as an investment removes difficulty to test the effectiveness of migration in reducing earnings differentials over space. Instead, now we are interested in what is the rate of return on resources allocated to migration.

Generally, let us assume that future benefits and costs of migration are discounted on the assumption that migration is a unique decision and that, once made, the person will remain in its new location. Then the human capital model can be presented as a present value of investment in migration from location i to j (PV_{ij})

$$(2.3) \quad PV_{ij} = \sum_{t=1}^n \frac{(E_{jt} - E_{it})}{(1+r)^t} - \sum_{t=1}^n \frac{(C_{jt} - C_{it})}{(1+r)^t} - I_{ij},$$

where I_{ij} represents the initial costs of the move, E gives the earnings and C the living costs in each location, time t flows from moment 1 to n , and r is the discount rate. Thus the first summation represents difference between the present value of the earnings streams in locality j and i , and the second summation represents the difference between the value of net costs associated with residence in this pair of localities. (Greenwood 1975, 399; Shields and Shields 1989, 284.)

In continuous time this model becomes

$$(2.4) \quad PV_{ij} = \int_0^n [E_j(t) - E_i(t) - C_j(t) + C_i(t)]e^{-rt} dt - I_{ij},$$

where e is an exponential function. In both cases an individual residing in i will migrate to j only if $PV_{ij} > 0$, and, moreover, he will select that destination for which PV_{ij} is maximised.¹²

Sjaastad (1962) divides costs and returns of migration into money and non-money costs and returns. These are summarised in Table 1:

Table 1. Private Costs and Returns of Migration in Sjaastad's (1962) Model

	The private costs of migration	The private returns of migration
The money costs and returns of migration	<ul style="list-style-type: none"> - increase in the expenditure of food, lodging, transportation, etc. - marginal costs associated with the distance of migration 	<ul style="list-style-type: none"> - positive or negative increment to real earnings stream - movement in consuming capacity
The non-money costs and returns of migration	<ul style="list-style-type: none"> - opportunity costs: the earnings forgone while travelling, searching for and learning a new job - "psychic" costs: people are reluctant to leave familiar surroundings, family, and friends 	<ul style="list-style-type: none"> - preference for new place as compared to former residence

The private costs can be broken down into money and non-money costs. The former include the out-of-pocket expenses of movement, while the latter include foregone earnings and the "psychic" costs of changing one's environment. In the money costs one ought to include only the increase in the expenditure of food, lodging, transportation (for both migrants and their belongings), etc.

The non-money costs include opportunity costs: the earnings foregone while travelling, searching for, and learning a new job. Part of these foregone earnings will be a function of the distance of migration. In addition the time required finding a new job is presumably affected by the level of unemployment (Sjaastad 1962, 84). Since people are often genuinely reluctant to leave familiar surroundings, family, and friends, migration also involves "psychic" costs. Although the psychic costs involve no resource cost, they do affect resource allocation: more migration would take place if psychic costs were zero for everyone, but Sjaastad argues that they do not affect the choice of migration region, as they do not vary with distance. One might also argue the opposite,

¹² The expected income model, developed by Todaro (1969; 1976), is a variant of the human capital model (Shields and Shields 1989, 284 - 285).

since for example visiting costs - which reduce psychic displeasure - increase with distance (see Shields and Shields 1989, 283).

What about the *private returns* to migration? For any particular individual, the money returns to migration will consist of a positive or negative increment to his real earnings stream (movement in consuming capacity) to be obtained by moving to another place. Sjaastad (1962) argues that we should ignore non-money returns, for example preference for new place as compared to former residence or climate, arising from locational preferences, since they represent consumption activities, which have a zero cost of production and they are included in prices, wage levels etc.

Within a human capital framework, we also need to ask how individual characteristics influence migration through affecting present value of costs and returns. Key personal variables are age, education, occupation, sex, employment status, and marital and family status. For example, change in occupation may necessitate migration: the more relevant alternatives for migrants may be among rather than between occupations. On the other hand, whether or not additional investment in oneself is worthwhile depends crucially upon the age of the individual. For young persons obsolescence is a far smaller threat than for older persons, as they have greater proportion of formal education and smaller proportion of training and experience compared to older persons (see Sjaastad 1962, 88). As age increases there is a shortening of the time period over which the migrant expects to recapture these costs. Education is generally viewed as very important characteristic in explaining labour migration (see e.g. Shields and Shields 1989, 287). One reason for this is that more education increases employment opportunities and therefore reduces the risks of migration. Another reason is that higher education increase migration because it increases person's ability to collect and process information. These topics are considered more detailed in Section 3.4.2, when results of our migration model are interpreted.

The greater realism of the assumptions underlying human capital models means that they offer a more acceptable explanation of a whole range of migration behaviour. In the human capital model it is possible that the *expectations* of migrants may favour a region that is currently a depressed region (Armstrong and Taylor 1993). It is also possible that the same occupational category, and receiving the same wage, move in opposite directions. This will occur if different migrants attach different weights to the non-money costs and benefits of migration. Human capital approach has also ability to account for the observed selective nature of migration: migrants are typically young people, and workers in managerial, professional and non-manual occupations exhibit far greater mobility than manual workers. For example these arguments can be formulated into

testable hypothesis. However, most of the hypothesis formulated from human capital model are testable only with time series data (see Milne 1991).¹³

The human capital model does have its problems, however. Armstrong and Taylor (1993, 126) argue that primary criticism is that the model is too successful in explaining migration flows. Since all the costs and benefits associated with migration are included in the model, it is possible to explain all migration flows provided the migrant behaves rationally. In practice, the model will include only a selection of what are believed to be the most critical explanatory variables.

Another criticism of this investment approach to migration lies in the stringent assumptions made about the time horizon of investment, the appropriate discount rate and ability of the potential migrant to finance the move (Shields and Shields 1989, 285). It has also been argued that migration decisions are affected by business conditions (see Milne 1993) and that migration should not be viewed as a one-time investment in human capital. Rather, migration should be analysed within a dynamic framework where first-time migrants are viewed as investing in the general knowledge of how to benefit from migration.¹⁴ Shields and Shields (1989) also argue that human investment does not only follow migration, but instead, many people migrate after investing in education, training, and information. Furthermore, several types of human capital investment may occur simultaneously. In other words, different types of human capital investments are interdependent and it may be difficult to separate the returns from an investment in migration and the returns from other types of investment.

2.3 Migration as Spatial Job-search

Failure of the human capital model to show adequately *how* migrants seek out and find information and job places is a crucial weakness. Therefore we need to consider the theory and techniques of labour market job-search analysis, which analyses more explicitly the job-search and migration processes. As a result, job search model tends to be mathematically more complex than the human capital model or the classical model.¹⁵

Although the concept of search has been well accepted in migration literature for a long period of time (see e.g. Greenwood 1985), considerable little emphasis has been placed on the formal linking of migration and job-search models (Maier

¹³ Since most of Milne's (1991) hypotheses are testable only with time series data and we are using panel data, they are not presented here.

¹⁴ See Shields and Shields (1989, 285) and references there (e.g. Herzog, Hofler and Schlottmann 1985).

¹⁵ Lippman and McCall (1976) provide a survey of job-search theory, see also Mortensen (1986) and Van den Berg (1990). However, in this study the focus is on migration and job-search theory, not on the job-search theory as such.

1987). For example, in the 1980s and 1990s most of the literature has used just a verbal job-search argumentation without strict formal considerations (Maier and Weiss 1991). One reason for this is that most of the migration literature has been empirical. However, there are some exceptions in the vast migration literature: namely the studies by Rogerson (1982), Pickles and Rogerson (1984), Maier (1985; 1987), McCall and McCall (1987), Bhattacharya (1990), and Kettunen (1990). Here we consider only the basic job-search model with out mathematical representation, so more advanced models are not evaluated.¹⁶ For example, Pickles and Rogerson (1984) and Maier (1985; 1987) provide more formal representations of job search models in spatial context.

When migration is considered as spatial job-search, unemployed workers obtain employment through optimal search practice. Now decision is not simultaneous, one time decision. Instead, the decision-maker investigates one alternative at a time and decides about accepting it on the basis of the expected return of investigating all other available alternatives.¹⁷ (Maier and Weiss 1991, 28.) Thus, the length of search, the unemployment duration, depends upon the distribution of wages that an individual knows his services can command as well as the cost of generating job offers. Under the job-search model, search should terminate when a wage offer either equals or exceeds the reservation wage, the latter determined to equate the marginal cost of obtaining one more job offer with the expected marginal return from continued search. Reservation wages, on the other hand, depend upon one's personal or human capital characteristics as well as attributes of local labour markets that affect wage distributions. (Herzog Jr *et al.* 1993, 328.)

However, the decision-maker not only has to decide about the acceptability of jobs but also the optimal sequence in which to investigate them.¹⁸ With some assumptions, which determine the sequencing of alternatives, it can be shown that the expected return of search (i.e. the attractiveness of the region) is influenced by the spatial arrangement of alternatives within the region. Because of the lower search costs, a region where the alternatives are concentrated around the individual 's potential location is more attractive to a migrant than a region where

¹⁶ One variant of the job search models is Hughes and McCormick's (1989a; 1989b; 1994) migration model. In the model the determinants of the probability of an individual beginning a job search is separated from those influencing the final choice of region. The former depends on whether the resulting job will meet the 'reservation wage' of the migrant. Their model is examined more detailed in Section 3.

¹⁷ In the standard version of the search model it is assumed that these elements are known by the decision-maker (Maier and Weiss 1991, 28; see also Maier 1985; Maier 1987). Other standard assumptions of search theory are following (Maier 1987, 190): First, the wage-offer distribution is constant over time. Second, the individual is risk neutral and income is the only element in his utility function. Third, labour and jobs are homogenous within the submarket of the individual. Fourth, the individual knows search and migration costs.

¹⁸ In general form the spatial search problem is highly complex and can be solved only for special cases (Maier and Weiss 1991, 29).

the same number of alternatives is more dispersed (see Maier and Weiss 1991, 29 and references there).

Although theory posits strong positive relationships between migration likelihood and both personal and area unemployment, the subsequent effect of migration on search duration and re-employment is indeterminate. That is, job-search theory supports both a positive and negative relationship between migration and duration of unemployment (Herzog Jr *et al.* 1993, 328). Positive relationship may occur if migration is the 'strategy of last resort'. In this case, migration coincides with the realisation that continued local search is unlikely to yield a job offer with the desired wage characteristics. Migrants raise their reservation wages in destination labour markets (in order to provide economic justification for the move) and unemployment spell is lengthened. Thus, expanding the radius of search increases search duration proportionally more than the likelihood of finding an acceptable job offer.

Alternatively, job-search theory also supports a negative causal relationship between migration and duration of unemployment. The expansion of the search radius increases the number of available jobs (within a given occupation) thereby reducing time to find acceptable wage offer, and *vice versa*. In addition, since migration is costly destination reservation wages may be lowered (particularly for the unemployed) such that relocation costs are recouped more quickly through re-employment. Although both positive and negative associations between migration and search duration are supported by the available theory, the latter is intuitively more appealing. In a like fashion, the likelihood of (post-move) employment should exhibit a positive association with migration. Now employment likelihood is an instantaneous measure of search duration.

In job search models of migration, the distinction between 'speculative migration' and 'contracted migration' becomes a matter of importance (Pickles and Rogerson 1984, 133; Armstrong and Taylor 1993, 127; Van Dijk *et al.* 1989, 65).¹⁹ For speculative migrants, migration is an integral part of the information gathering and job search process. They first move to a chosen destination and then search for employment within that location. However, a contracted migrant may undertake extensive search for employment, only moving to a particular destination having accepted a job offer. Now migration is seen as the *outcome* of the process and not as part of job search.

Van Dijk *et al.* (1989, 65) argue that there are reasons to believe that speculative migrants are at a disadvantage relative to natives during the job search process. In the first instance, such individual is less able to exploit personal information

¹⁹ Authors refer to Silvers's (1977) article when they make the distinction of speculative and contracted migration (see e.g. Van Dijk and Folmer 1985, 248; Pickles and Rogerson 1984, 133).

networks in a new location (*vis-à-vis* resident job searchers). Second, there is evidence that employers prefer native workers to in-migrants with the similar job qualifications due to fewer adaptation problems and lower relocation costs for former. So it is likely that speculative migration is a rare phenomenon for example within Finland (see also e.g. Kettunen 1993).

However, once again one must be aware of the weaknesses of job-search theory. Usually the role of employers is undermined and they are only treated as 'random number generators' in job search models (Maier 1987, 202). Employers just produce wage offers according to a specific probability function and are by no means interested in filling their vacancies or hiring the most productive applicant. Thus, it is argued that job search models deal with one side of the labour market and do not adequately represent the adjustment processes in the labour market.

3. Empirical Study of Labour Market Transitions and Migration

In this micro-oriented²⁰ empirical study we will examine various questions. Firstly, what determines the labour market transitions from unemployment in 1994, i.e. where people go after they end their unemployment spell: do they get employed, do they go to the active labour market programmes (ALMPs) or do they leave the labour force. To be more specific, our main interest is what effect internal migration has on these labour market transitions.²¹ Secondly, we consider the determinants of migration in 1990 - 95, i.e. how personal, family, household, labour market, and regional characteristics affect migration probability to growth-centre and non-growth-centre regions. These questions are answered in Sections 3.3 and 3.4, respectively.

In both cases multinomial logit model is constructed by using a sample of 4990 persons. Estimation results are illustrated by calculated marginal effects and odds ratios. Parameter estimates are given in Appendix (Tables A1 and A2). In addition, the parameter estimates and mean values of explanatory variables are used to produce illustrative figures. In the following sections, several other studies are also reviewed and related to our results.

3.1 Data²²

This study employs a sample of individuals who had to have a terminated spell of unemployment in 1994. Our panel data set covers individual background information from Finnish Labour Ministry's job search registers and Statistics Finland's working registers. Data is rich including information about individual's personal and family status, past job search record, and regional status in 1987 - 95. Especially useful for this study was the fact that we obtained information about individual's home region ("seutukunta") in 1990 - 95.²³

²⁰ With individual data one can focus upon various decision-making units (family, household, individual), and in the case of longitudinal data, examine life-cycle effects on migration (Greenwood 1985; Herzog Jr *et al.* 1993). For time-series analysis of migration flows see e.g. Eriksson (1989), Jackman and Savouri (1992), Pissarides and McMaster (1990), Westerlund (1992), Chun (1996), and Fredriksson (1997).

²¹ Tuomala (1998) and Holm and Tuomala (1998) have also examined labour market transitions. However, they don't use occupation structure or migration status as explanatory variables. Effects of income on changes in labour market status are examined in Holm and Kyrrä (1997). Rantala (1998) and Kettunen (1990; 1993; 1997) analyse unemployment spells with duration models.

²² More detailed data-analysis can be found in Tuomala (1998) and Holm and Tuomala (1998). This part is kept short, since we are using the same dataset.

²³ Individual's home region is measured the last day of each year, i.e. 31st December. Regional division into 88 regions is from 1996. Vartiainen (1997) also uses this division in his migration study. See it for further data analysis.

At the beginning, our sample consisted of 6 295 observations. However, after the estimated variables were constructed the sample size was reduced to 4 990 observations due to missing and false background information.

Information about person's home region was used for measuring whether a person migrates or not, and where he/she migrates. In the labour market transition model variable was used to examine whether person migrates permanently to a growth-centre region or a non-growth-centre region, migrates temporarily, or does not migrate at all in 1990 – 94.²⁴ In the migration model it was used for formulation of our dependent variable, which can have three mutually exclusive values: person either migrates to growth-centre region or non-growth-centre region, or does not migrate at all in 1990 – 95. In both cases person migrates if his/her home region has changed at least once during examined time period. These distinctions and explanatory variables are examined more closely, when we estimate the labour market transition and migration equations in Sections 3.3 and 3.4. But first we introduce our estimation methodology - multinomial logit model.

3.2 Multinomial Logit Model

We are using multinomial logit model (MNL) for labour market transition as well as for migration analysis. So we take a closer look at the estimation methodology. Let us assume that individual has $J + 1$ alternatives. They are labelled to alternatives 0, 1, ..., J. Individual is assumed to have preferences over these alternatives and the i^{th} individual utility of the choice j is

$$(3.1) \quad U_{ij} = \beta_j' x_i + \varepsilon_{ij} \text{ for } j = 0, 1, \dots, J.$$

The disturbances are assumed to be independently and identically distributed with extreme value distribution. If the individual i makes choice j , we assume that U_{ij} is the maximum among the J utilities, i.e. $U_{ij} > U_{ik}$ for all $j \neq k$. Since we cannot observe individual utility levels, we define an indicator variable (y_i), so that $y_i = j$ where $j = 0, \dots, J$ if alternative j is chosen.

By using the multinomial logit model we can provide a set of probabilities for the choices of an individual with characteristics x_i (see Greene 1997, 915; Maddala 1983, 43).²⁵ These probabilities are given by

²⁴ We have defined the growth-centre regions in this study so that they include Helsinki, Salo, Porvoo, Tampere, Kaakkois-Pirkanmaa, Turku, Vaasa, Jyväskylä, Oulu, Kuopio, and Lohja.

²⁵ Algebraically an equivalent model is conditional logit model. In that model we would be using characteristics of the choices as the explanatory variables, not the characteristics of individuals as in the case of MNL model. In conditional logit model the number of parameters to be estimated is equal to the number of characteristics of the choices. Of course, third alternative is to formulate a model using both the

$$(3.2) \quad \text{Prob}(y_i = j) = \frac{\exp(\beta_j' x_i)}{\sum_{k=0}^J \exp(\beta_k' x_i)}, \text{ for } j = 0, 1, \dots, J,$$

where β_j 's are unknown parameter vectors.

However, a normalisation is required, since if we replace β_j by $\beta_j + q$ for a vector q , the identical set of probabilities result. A standard normalisation is $\beta_0 = 0$.

$$(3.3) \quad \text{Prob}(y_i = j) = \frac{\exp(\beta_j' x_i)}{1 + \sum_{k=1}^J \exp(\beta_k' x_i)}, \text{ for } j = 1, 2, \dots, J$$

$$(3.4) \quad \text{Prob}(y_i = 0) = \frac{1}{1 + \sum_{k=1}^J \exp(\beta_k' x_i)}.$$

Note that if $J = 1$, the model reduces to the binary logit model.

For the estimation of multinomial logit model we require a likelihood function which to maximise. The log-likelihood is a generalisation of that for the binomial probit or logit model and is based on the $n \times (J + 1)$ indicator variables (Greene 1997, 916)²⁶

$$y_{ij} = \begin{cases} 1, & \text{if } y_i = j \\ 0 & \text{otherwise.} \end{cases}$$

Then log-likelihood is

$$(3.5) \quad \ln L = \sum_{i=1}^n \sum_{j=0}^J y_{ij} \ln \text{Prob}(y_i = j),$$

where n is the number of observations. It can be shown that the Hessian is negatively definite, so log-likelihood function has a global maximum. Newton's

attributes of the choices as well as the characteristics of the individuals (see Greene 1997, 914; Maddala 1983, 44). Usually random utility theory is used to construct the conditional logit model.

²⁶ Recall that the log-likelihood function for a binary choice model is

$$\ln L = \sum_{i=1}^n [y_i \ln F(\beta' x_i) + (1 - y_i) \ln (1 - F(\beta' x_i))],$$

where F is the cumulative distribution function (logistic or normal) (see e.g. Greene 1997, 882).

method can be used for maximising the function as for example in Limdep-software (Greene, 1995).

The coefficients in this model are difficult to interpret, so it is convenient to base the interpretation on marginal effects. They can be calculated as

$$(3.6) \quad \frac{\partial P_{ij}}{\partial x_i} = P_{ij} [\beta_j - \sum_{k=0}^J P_{ik} \beta_k],$$

where $P_{ij} = \text{Prob}(y_i = j)$. Note that for any particular x_k , $\partial P_{ij} / \partial x_k$ need not have the same sign as the corresponding estimated coefficient. Note also that the marginal effect of a dummy variable on event probability is in principal inaccurate (see e.g. Greene 1997, 878 - 879). As a result of this we calculate also estimated probabilities using estimated parameter vectors and mean values of the explanatory variables.

The model also implies that we can compute in our case J linear log-odds ratios $\ln[P_{ij}/P_{i0}] = \beta_j' x_i$. We could normalise on any other probability and obtain $\ln[P_{ij}/P_{ik}] = (\beta_j - \beta_k)' x_i$. The multinomial logit model assumes that the odds ratios are independent of the other alternatives, i.e. P_{ij}/P_{ik} must be independent of the remaining probabilities (see e.g. Greene 1997, 920). Property is termed the independence of irrelevant alternatives (the IIA-assumption). Property can be tested using for example Hausman and McFadden's (1984) or Haskel, Kersley and Martin's (1997) methodology.

We can use log-odds to calculate for example the odds for (mean) individual to belong to the employment vs. ALMP-category. However, more informative can be the calculations where we compare the odds of individuals with different characteristics. For example, what are the odds for house owner vs. non-house-owner to belong to different migration categories (see Section 3.4.2). In this simple dichotomous case, the figure is given by $\exp(\alpha_j)$, where α_j is the estimated coefficient for home-ownership in region j .²⁷ These calculations are particularly useful in Section 3.4.2, when we calculate different migration probabilities. This is because our dependent variable is not equally proportioned and therefore marginal effects are not always the most illustrative way of evaluating differences in migration probabilities to different regions.²⁸

²⁷ This can be verified by simple calculation

$$\text{Prob}(y_j | \text{house owner} = 1) / \text{Prob}(y_j | \text{house owner} = 0),$$

which equals to $\exp(1 \cdot \alpha_j - 0 \cdot \alpha_j)$.

²⁸ For example, if average migration probability is 0.1 and positive marginal effect is 0.05, then increase in absolute terms is not large but the relative increase is substantial (about 50 %). Note also that larger

3.3 Determinants of Labour Market Transitions

3.3.1 Model Estimation

In this section we use the multinomial logit model for modelling labour market transitions. We assume that job searcher can end his/her unemployment spell in 1994 to one of the following three alternatives, i.e. we constructed our dependent variable, y_i , as

$y_i = 0$ if individual got employed,

$y_i = 1$ if individual started an active labour market program (ALMP) period, and

$y_i = 2$ if individual transferred outside the labour force.

By using the multinomial logit model we can provide a set of probabilities for these three mutually exclusive choices for an individual with characteristics x_i as it was stated in Section 3.2. These probabilities are given by

$$(3.7) \quad \text{Prob}(y_i = j) = \frac{\exp(\beta_j' x_i)}{1 + \sum_{k=1}^2 \exp(\beta_k' x_i)}, \text{ for } j = 0, 1, 2,$$

where β_j is the ML-estimated parameter vector with a standard normalisation $\beta_0 = 0$.

Before we can estimate the model we need to examine relevant explanatory variables. In the following they are listed in four categories: personal characteristics, family and household characteristics, labour market characteristics, and regional and migration characteristics. The explanatory variables are either dichotomous, when they can have only two values 0 and 1, or continuous (age, household's disposable income, duration of job search, unemployment rate in person's industry, or regional unemployment rate). Mean values and brief descriptions of the explanatory variables are given in Appendix (see Table A1).

Data formulations and variables for our labour market transition equation follow largely studies done for example by Tuomala (1998) and Holm and Tuomala (1998). A few differences exist as well. Firstly, and most importantly, our main interest is in migration. That is, how different types of migration backgrounds influence person's transition likelihood in 1994? Previously only few studies have studied consequences of migration in Finland and they have normally used

marginal effect does not necessarily mean that the relative increase in dependent variable is also higher if the dependent variable is not equally proportioned.

dichotomous migration variables. For example, does employment probability change if a person migrates or not (see e.g. Tervo 1998)? However, it would be more efficient to consider how different types of migration affect different labour market transitions.

This is done in our study with a construction of a migration variable that can have four mutually exclusive values. Person can either: (i) not to migrate in 1990 – 94, (ii) migrate temporarily in 1990 – 94, (iii) migrate permanently into a non-growth-centre region in 1990 – 94, (iv) migrate permanently into a growth-centre region in 1990 – 94. Migration occurs if person changes his/her region at least once, i.e. if person migrates in 1990 – 91, 1991 – 92, 1992 – 93, or in 1993 – 94. Person migrates to a growth-centre region if his/her final destination region ("seutukunta") in 1994 is Helsinki, Salo, Porvoo, Tampere, Kaakkois-Pirkanmaa, Turku, Vaasa, Jyväskylä, Oulu, Kuopio, or Lohja. Other (78) regions are referred as non-growth-centre regions.²⁹ Migration is considered to be temporary (permanent), if person migrates in 1990 – 94 and migrates (don't migrate) again in 1994 – 95.

Secondly, we are using as explanatory variables occupational structure and household characteristics – e.g. home ownership, spouse's labour market status, and changes in family size – because migration likelihood and labour market transitions are very likely to be connected to these variables. Occupational variable was formed using ten standard categories (used e.g. by Statistics Finland; Hämäläinen 1998): technical, health care, administrative, mercantile, farming/forestry/fishing, transport, construction, manufacturing, service, and other occupations (including students and individuals with no occupation).

Thirdly, we are using continuous variables for age and duration of job search while previous studies use discrete ones. While latter approach allows for more complex unlinear effects, it also increases the need for variables. We have adopted the former policy, because it lowers the number of independent variables and gives more room for our migration and occupational variables. In addition, our estimation results were not considerably different from Tuomala's (1998) findings.

²⁹ Of course, one might argue that one region is not a growth-centre region or that we have missed some regions from our list. However, results are not likely to be sensitive to minor changes in the list of growth-centre regions. With our distinction the number of migrants in these two migration categories are relatively equally proportioned, which makes the interpretations a bit easier than if they were not.

3.3.2 Results

Estimated parameters and their significance levels are given in Appendix (see Table A1). We are mostly interested in the migration variables. However, first we consider the control variables. Calculated marginal effects and their significance levels are given in Table 2.

Table 2. *Determination of Labour Market Transitions in 1994 - Marginal Effects of Multinomial Logit Model*

Characteristic (Reference group is given in parentheses)	Unemployment spell ending to...		
	Employment	ALMP	Out of labour force
PERSONAL CHARACTERISTICS			
Male (female)	0.050**	-0.038**	-0.013
Age	0.035***	0.019***	-0.054***
(Age/10) ²	-0.051***	-0.032***	0.082***
<i>Education</i> (secondary school)			
primary school	0.011	0.037**	-0.049***
lower academic degree	0.101***	-0.046	-0.054
higher academic degree	0.242***	-0.161***	-0.081
<i>Occupation</i> (other occupations)			
technical	0.146***	-0.002	-0.144***
health care	0.151***	-0.116***	-0.035
administrative	0.075*	0.041	-0.117***
mercantile	0.109**	0.029	-0.138***
farming/forestry/fishing	0.274***	-0.142***	-0.132***
transport	0.169***	-0.059	-0.110**
construction	0.247***	-0.028	-0.219***
manufacturing	0.185***	-0.011	-0.174***
service	0.174***	-0.058*	-0.115***
Disability	-0.190***	0.121***	0.070*
FAMILY AND HOUSEHOLD CHARACTERISTICS			
<i>Spouse's main activity</i> (no spouse)			
non-employed (student, unemployed, etc.)	0.047*	0.036	-0.083***
employed	0.074***	0.027	-0.101***
Has children under 7	-0.093***	-0.095***	0.188***
Size of the family increased in 1993 – 94	-0.074**	-0.101***	0.175***
Household's monthly disposable income during the unemployment spell/1000	-0.039***	0.090***	-0.051***
(Household's monthly disposable income during the unemployment spell/1000) ²	0.002***	-0.004***	0.002***
House owner	0.049**	-0.058***	0.009

Table 2. (continued)

Characteristic (Reference group is given in parentheses)	Unemployment spell ending to...		
	Employment	ALMP	Out of labour force
LABOUR MARKET CHARACTERISTICS			
Duration of job search/100	-0.136***	0.115***	0.021***
(Duration of job search/100) ²	0.005***	-0.004***	-0.001**
ln(unemployment rate in person's industry)	-0.080**	-0.241***	0.321***
Before unemployment person has just came to labour force	-0.147***	0.110***	0.037***
<i>Reason for ending the previous employment spell (other reasons)</i>			
own request	-0.102**	0.069*	0.033
working period ended	-0.068***	0.109***	-0.041**
fired (or laid off) because of productive or economic reasons	0.097***	-0.066**	-0.031
<i>During the job search person has had... (didn't have)</i>			
short term working period(s)	0.128***	-0.103***	-0.024
job placement(s)	0.209***	-0.186***	-0.023
training program period(s)	0.200***	-0.099***	-0.101***
No work experience	-0.082***	0.049**	0.033*
REGIONAL AND MIGRATION CHARACTERISTICS			
<i>Person living in (other parts of Southern Finland)</i>			
Uusimaa	0.050**	-0.089***	0.038*
Central Finland	-0.046**	0.013	0.033*
Northern Finland	-0.059**	0.056**	0.003
Person living in country side	0.053***	0.020	-0.072***
Regional unemployment rate	-0.005**	-0.001	0.006**
<i>Migration status (didn't migrate)</i>			
migrated temporarily in 1990 – 94	-0.062	-0.020	0.082*
migrated permanently into non-growth centres in 1990 – 94	-0.076**	0.010	0.065**
migrated permanently into one of the growth centres in 1990 – 94	0.067*	-0.104***	0.037

* (**, ***) Indicates significance at the 10 per cent (5 per cent, 1 per cent) level.

All variables are measured in 1994 if not otherwise mentioned. They are defined in the text.

Growth-centre regions are Helsinki, Salo, Porvoo, Tampere, Kaakkois-Pirkanmaa, Turku, Vaasa, Jyväskylä, Oulu, Kuopio, and Lohja.

A. *Personal Characteristics*. Males have on average about 5 percentage points higher employment probability than females, while females have higher probability to transfer to ALMPs and outside the labour force. Personal variables included continuous variables age and age squared. The latter variable was used for picking up the non-linearity effects. Our results indicate that employment probability is highest at the age of 35 and relationship has an inverse U-shape (see Figure A1 in Appendix).³⁰

In general, education augments person's employment likelihood: high education increases employment probability and lowers probability to transfer to ALMPs or outside the labour force.³¹ For example, worker with higher academic degree has about 24 percentage points higher employment probability than worker from secondary school. However, the workers from primary schools are more likely to end their unemployment spell to ALMPs. One reason for higher employment probability is that people with higher education are better equipped for job search. Furthermore, they have higher productivity rates. Naturally, we found that disability worsens person's employment chances (by 19 percentage points) and increases probability to transfer to ALMPs or outside the labour force.

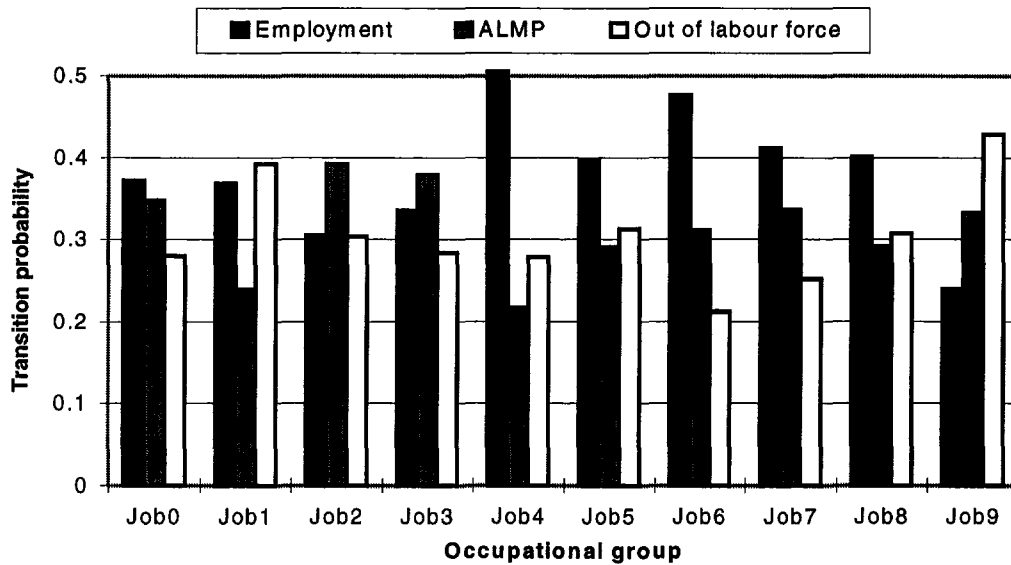
Differences in labour market transition probabilities between different occupational groups can be seen in Figure 2. The Job9 includes students and persons with no occupation, so they naturally have high probability to transfer outside the labour force. The low employment likelihood of administrative workers can be explained by the government/municipal policy to reduce the number of its workers by taking only a few new employees. Administrative workers seem to have high ALMP transition probability as well. Another group with high probability to transfer to ALMP is mercantile sector. Reverse is true in farming/forestry/fishing and health care sector. Our results also indicate that employment probability was particularly high in farming/forestry/fishing sector and construction sector. However, this does not tell us the actual duration of the job, since employment might be only very temporary.³²

³⁰ Note that probabilities in all the following figures have been calculated by using the estimated coefficients from multinomial logit model and explanatory variables' mean values: the probability values are calculated so that the value of one or two explanatory variables changes while keeping the other variable values at their mean values. Excel-software was used for producing these calculations and figures.

³¹ However, we did not find differences in employment probabilities between workers with primary and secondary school background.

³² Holm and Tuomala (1998) have studied transitions from unemployment to temporary employment. According to their results, the short term jobs have positive effect on permanent employment. The labour market policies have positive effects on the job finding probability, especially with young persons. They also found that an increase in disposable income during the unemployment spell reduces the likelihood of employment and increases transitions to ALMPs. Further aspects of temporary employment are examined in OECD (1994, 18 - 29).

Figure 2. *Labour Market Transition Probabilities by Occupational Group*



Job0 = technical, Job1 = health care, Job2 = administrative, Job3 = mercantile,
 Job4 = farming/forestry/fishing, Job5 = transport, Job6 = construction,
 Job7 = manufacturing, Job8 = service and Job9 = other occupations (incl. e.g. students).

B. Family and Household Characteristics. Our results indicate that married persons have higher employment probability than single persons. This is in line with previous results (see e.g. Tuomala 1998). Worker's employment status also follows the spouse's main activity: if spouse is working it is more likely that unemployed worker also will receive new job than if spouse is not working. These results accord with Brown and Sessions' (1997) findings. They argue that individuals living in households with other unemployed members are more likely to be discouraged and therefore undertake less intensive search than those living in fully employed households. Conversely, households linked to the labour market may generate a flow of labour market information into the household, which may increase the expected benefits to search and therefore stimulate search intensity. However, if person has under 7-year-old children or her (his) family size has increased, she (he) is very likely to transfer outside the labour force.³³

Household's disposable income during the unemployment spell was used to evaluate the economic position of the household and person's incentive to employ oneself.³⁴ The variable was found to be statistically very significant (see Table 2). Results indicate that household's disposable income has negative effect

³³ Models were also estimated using interactive dummies: female x (has children under 7) and female x (size of the family increased in 1993 – 94). The results indicated, as expected, that females are the ones who transfer outside the labour force in these situations (see also Tuomala 1998).

³⁴ For calculation of the variable see e.g. Tuomala (1998) or Holm and Tuomala (1998).

on employment likelihood and transition outside the labour force and positive effect on transition to ALMPs.³⁵ For example, if household's monthly disposable income is 3 000 FIM instead of 11 000 FIM, person has over 50 per cent lower (about 25 % higher) chance to end his/her unemployment spell to ALMPs (employment), *ceteris paribus*.

Home ownership increases person's employment likelihood. This is probably because house owners are typically working in higher positions than non-house-owners. Another explanation might be that house owners have normally a large burden of debt, and therefore have high incentive to employ themselves. Family members have higher probability to obtain a job than single persons. This result has been interpreted so that employers value family membership as indication of reliability and stability (see Van Dijk and Folmer 1985, 246).

C. Labour Market Characteristics. We have used a number of labour market characteristics, for example duration of job search, reason for ending the previous unemployment spell, ALMP-participation and short-time working period record, and request for working time during the job search. Our results indicate that as duration of job search continues person's employment likelihood reduces and likelihood to transfer to ALMPs increases.³⁶ Results also show that ALMPs – job placements and training program periods – and short term working periods increase worker's employment chances. In addition, workers who had training program periods had especially low likelihood to transfer outside the labour force. However, results should be evaluated with caution since people are selected to ALMPs. For example, one might argue that they are more active than other unemployed workers are and therefore have better employment probability.³⁷

Students were taken into account by using a dichotomous variable, which is one if person has just come to labour force before unemployment spell. They had significantly reduced employment likelihood. Same result applies to persons who did not have work experience. Our results also indicate that as unemployment rate increases in person's industry it reduces person's employment likelihood and increases person's probability to transfer outside the labour force. However, former is only true when unemployment rate is over 12 percent, i.e. when

³⁵ These results are in line with Tuomala's (1998, 45) and Holm and Tuomala's (1998, 25) results. Notice, however, that we did not examine selectivity by gender in our analysis, which has been found to be significant factor in a previous study (see Holm and Tuomala 1998).

³⁶ The probabilities for different job search durations can be seen in Tuomala (1998).

³⁷ To minimise this problem we have included a good number of control variables that correlate these non-observable individual characteristics. See Hämäläinen (1998) for selectivity analysis on repeated unemployment incidence and ALMPs.

unemployment rate is low in person's industry, increase in it has no effect on employment likelihood.³⁸

D. *Regional and Migration Characteristics.* Regional characteristics were measured by using distinction between different parts of Finland, namely Uusimaa, other parts of Southern Finland, Central Finland, and Northern Finland. As expected, employment likelihood is highest in Uusimaa, then come other parts of Southern Finland, Central Finland, and finally Northern Finland. Transition probability to ALMPs is highest in Northern Finland.

As we expected, the higher unemployment is in hometown the more unlikely is that person gets employed and the more likely is that he/she transfers outside the labour force. To illustrate this linear relationship, let us compare employment chances of two persons: one living in a town, where unemployment rate is 10 per cent and the other living in a town where unemployment rate is 30 per cent. Now our results indicate that the latter person has about 5 percentage points lower employment likelihood than the former person, *ceteris paribus*. According to job search theory, this is simply because the number of competitors is greater for each job opening in high unemployment regions than in low unemployment regions.

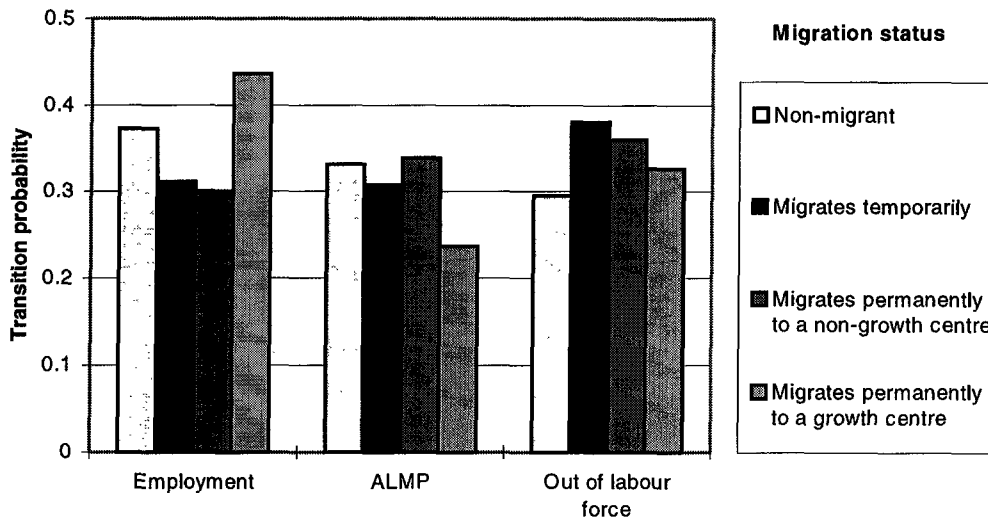
Previous studies evaluating the effects of migration on the labour market transitions are scarce. In Finland, one rare exception is Tervo's (1998) study.³⁹ However, his results were not conclusive and therefore more research is needed. He examined the effects of long-distance (provincial) migration on employment likelihood in different individual groups. Tervo (1998, 9) concludes that moving does not advance employment in the group of old workers. Instead, moving reduces it significantly. In the group of entrants and unemployed workers he found that migration has positive but not significant effect on employment likelihood.

We examine the effects of migration on labour market transitions with a distinction of different migration types (see previous section). Figure 3 shows that migration has diverse effects on labour market transitions (see also Table 2 and Figure A1 in Appendix).

³⁸ There was substantial increase in p-value when we were not using natural logarithmic functional form for industry's unemployment rate variable. Therefore we found that relationship is not linear.

³⁹ Laakso (1998) has studied employment prospects of migrants, but he doesn't compare them with non-migrants. Van Dijk *et al.* (1989) found that migration more than doubles the employment likelihood in Netherlands. On the contrary, they did not find significant or large effect in the United States.

Figure 3. *Labour Market Transition Probabilities by Migration Status*



The results indicate that a person who migrates permanently to a growth-centre region has about 7 percentage points higher employment probability than a non-migrant. However, person who migrates permanently to a non-growth-centre region has about 7 percentage points lower employment probability than a non-migrant. Permanent growth-centre migration also reduces person's probability to end his/her unemployment spell to active labour market programmes by about 10 percentage points. Migrants are also more likely to transfer outside the labour force than non-migrants, especially those who migrate temporarily. However, results are not always statistically very significant and therefore should be evaluated with some caution. But it is still evident that migration to growth-centre and non-growth-centre regions has diverse effects on labour market transitions.⁴⁰ Therefore we need to consider next who migrates to these regions, i.e. what are the determinants of migration.

3.4 Determinants of Migration

3.4.1 Model Estimation

In this section we use the multinomial logit model for modelling person's migration behaviour. We assume that individual has three alternatives in 1990 - 95, i.e. we constructed our dependent variable, m_i , as

$m_i = 0$ if individual decided not to migrate,

⁴⁰ These qualitative results did not change for example if permanent vs. temporary migration concept was removed.

$m_i = 1$ if individual migrated to a non-growth-centre region, and
 $m_i = 2$ if individual migrated to a growth-centre region.

To be more specific, person doesn't migrate if his/her home region doesn't change in 1990 – 1995, where the home region ("seutukunta") is measured every year. Person migrates to a growth-centre-region if person's home region changes at least once in 1990 – 95 and his/her final destination region is Helsinki, Salo, Porvoo, Tampere, Kaakkois-Pirkanmaa, Turku, Vaasa, Jyväskylä, Oulu, Kuopio, or Lohja. Person migrates to a non-growth-centre region if his/her final destination is one of the other (78) regions. Thus, in our migration model distinction between permanent and temporary migration is removed and migration period is one year longer in order to get more observations into different categories.⁴¹ Growth-centre regions are the same as in labour market transition model.

By using the multinomial logit model we can provide a set of probabilities for these three mutually exclusive choices for individuals with different characteristics (see Section 3.2). Non-migrants are used as the reference category. Again, we used choice based sampling to correct the overrepresentation of persons whose unemployment spell lasted over a year. It is worth reminding that we are modelling, in particular, the migration activity of persons who had to have a terminated spell of unemployment in 1994, not the whole working population.

Note also that unlike in labour market transition model, our dependent variable is unbalanced, i.e. we do not have relatively equal amount of observations in different migration categories (0, 1, 2). Only twenty per cent of our sample persons migrate during the period 1990 – 95. Thus, migration is a quite rare phenomenon. What makes the interpretations of the estimation results easier is the fact that the number of observations in the non-growth-centre migration category is only a bit higher than in the growth-centre migration category (10 % in each category). Because our sample is unbalanced, our model probably doesn't predict very well. It is most likely that our model will predict right most of the non-migrants but only a few migrants. For example, since the average predicted growth-centre migration probability is 0.10 it may require an extreme configuration of regressors even to produce a distribution function value of 0.20, to say nothing of 0.50 (see Greene 1997, 893).⁴²

⁴¹ We did not make distinction between permanent and temporary migration, because we had only a few migrants who migrated temporarily and therefore estimation results would have been poor and the model very unbalanced.

⁴² Note however that policy implications remain unaffected even under unbalanced sample, i.e. marginal effects are not affected by this property.

We are using multinomial logit model for migration analysis, because it allows us to consider not only the question "does a person migrate or not?" but also the question "where does a person migrate?" Latter question is also important, since migrants do not just vanish into thin air (Hughes and McCormick 1994, 513): they migrate to other regions, and information about those destinations is potentially important in their decision making. While this is well known in aggregate migration analysis, it has usually been neglected in microeconomic work with Hughes and McCormick's studies (1989a; 1989b; 1994) being exceptions. To our knowledge, Finnish studies have not been conducted in this fashion. So our study is unique in its attempt.

However, our study is considerably different from Hughes and McCormick studies. Firstly, they are using a minor variant of McFadden's nested logit model (see e.g. Maddala 1983, Chapter 3), while we are using a simple multinomial logit model. So, they analyse migration by using a decision tree, while we are not. We are using multinomial logit model in order to keep the framework simple and that way the results are easy to interpret. Secondly, Hughes and McCormick consider migration to ten destinations, while we are modelling migration to only two destinations, namely to growth-centre and non-growth-centre regions. Reason for considering only two destination regions is our small sample size of migrants as well as our specific interest in growth-centre regions.

Independent variables are largely the same as in the labour market transition model. They can be interpreted by human capital model using cost and benefit concepts or by job search model. Namely, model includes variables that represent personal, family and household, labour market, and regional conditions. Most of the variables are measured in the beginning of migration period (1990 – 95), so that we can evaluate how the initial conditions before migration affect migration likelihood. However, education and occupation are measured in 1994, so that the highest educational level could be taken into account.⁴³ Again, explanatory variables are dichotomous or continuous. Mean values and brief descriptions of explanatory variables are given in Appendix (see Table A2).

3.4.2 Results

Estimated parameters and their significance levels are given in Appendix (see Table A2). Calculated marginal effects and their significance levels are given in Table 3:

⁴³ Naturally, results would be slightly different if the educational level was examined in the beginning of migration period (say in 1990), since more people would be categorised into low educational levels.

Table 2. *Determination of Migration Status in 1990 – 95, Marginal Effects of Multinomial Logit Model^(a)*

Characteristic (Reference group is given in parentheses)	Migration status in 1990 – 95		
	Non-migrant	Non-growth-centre-migrant	Growth-centre-migrant
PERSONAL CHARACTERISTICS			
Male (female)	0.029***	-0.021***	-0.008
Age ^(b)	-0.019***	0.010***	0.008***
(Age/10) ²	0.032***	-0.017***	-0.015***
<i>Education</i> (secondary school)			
primary school	0.013	0.000	-0.013*
lower academic degree	-0.018	0.006	0.012
higher academic degree	-0.027	0.002	0.025*
<i>Occupation</i> (other occupations)			
technical	-0.062***	0.039**	0.023*
health care	-0.013	0.012	0.001
administrative	-0.001	0.004	-0.003
mercantile	-0.017	0.019	-0.002
farming/forestry/fishing	0.030	0.037*	-0.067**
transport	0.005	-0.018	0.013
construction	0.032	-0.010	-0.022
manufacturing	0.024**	0.014	-0.037***
service	-0.002	0.020	-0.018*
FAMILY AND HOUSEHOLD CHARACTERISTICS			
<i>Spouse's education</i> (no spouse)			
primary school	-0.026	0.006	0.020
secondary school	-0.017	0.012	0.005
high-school	-0.105***	0.065***	0.040***
<i>Children^(b)</i> (doesn't have children under 18)			
only children under 7	0.033**	-0.011	-0.022*
children between 7 and 18	0.071***	-0.033***	-0.038***
<i>Size of the family in 1990 - 94</i> (has not changed)			
decreased	-0.067***	0.028***	0.040***
increased	-0.040***	0.022**	0.018*
Spouse's main activity is employment ^(b)	0.046***	-0.028***	-0.017*
ln(household's monthly disposable income during the unemployment spell/1000)	0.000	0.006	-0.006
House owner ^(b)	0.046***	-0.028***	-0.018**

Table 3. (continued)

Characteristic (Reference group is given in parentheses)	Migration status in 1990 – 95		
	Non-migrant	Non-growth- centre-migrant	Growth-centre- migrant
LABOUR MARKET CHARACTERISTICS			
Duration of job search/100	-0.015***	0.011***	0.004
(Duration of job search/100) ²	0.001***	-0.001***	-0.000
Main activity is studying in 1991	-0.025**	0.013	0.011
Main activity is studying in 1994	-0.039***	0.022**	0.017**
<i>Reason for ending the previous employment spell (other reasons)</i>			
own request	-0.042**	0.022	0.021*
working period ended	0.023**	-0.015*	-0.008
fired (or laid off) because of productive or economic reasons	0.052***	-0.034**	-0.018
<i>During the job search person has had... (didn't have)</i>			
short term working period(s)	0.037*	-0.030*	-0.006
job placement(s)	0.029*	-0.000	-0.029**
training program period(s)	-0.012	0.001	0.011
<i>Hoped for working time during the job search (other periods are also suitable)</i>			
only whole-day	-0.039***	0.031***	0.009
Ending his/her last unemployment spell into ALMPs in 1994	0.020**	-0.002	-0.018***
REGIONAL CHARACTERISTICS			
<i>Person living in^(b) (Southern Finland)</i>			
Central Finland	-0.020*	0.022***	-0.002
Northern Finland	-0.028**	0.018*	0.010
<i>Person living in^(b) (city)</i>			
town	-0.034***	0.022**	0.012
country side	-0.021*	0.015*	0.006
Person lived in one of the growth-centre regions ^{(b),(c)}	0.021**	-0.012	-0.009

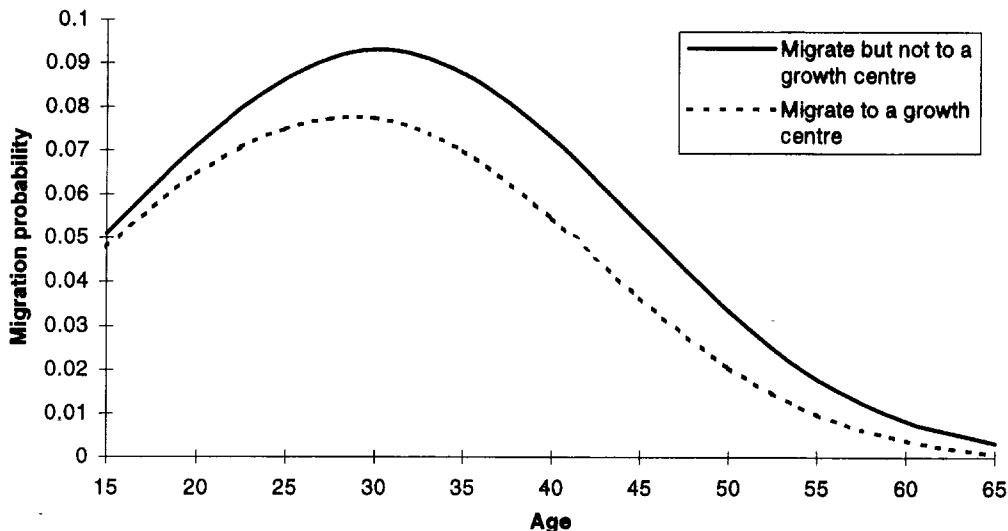
(a) * (**, ***) Indicates significance at the 10 per cent (5 per cent, 1 per cent) level.

(b) Measured in the beginning of migration period 1990 – 95; Other variables are measured in 1994. Variables are defined in the text.

(c) Growth-centre regions are Helsinki, Salo, Porvoo, Tampere, Kaakkois-Pirkanmaa, Turku, Vaasa, Jyväskylä, Oulu, Kuopio, and Lohja.

A. Personal Characteristics. Migration is affected by gender: females are more likely to migrate, especially to the non-growth-centre regions (see Table 3 and Table A1 in Appendix).⁴⁴ One reason for this is that girls move away from home earlier than boys and not the fact that the proportion of females is higher in older age groups (Laakso 1998).⁴⁵ Results indicate that migration probability is highest when person is about 30 years old (see Figure 4). Reason for this might be that person older than 30 years may find moves more costly due to family ties. On the other hand, young people may be connected to educational location or parents. Alternatively, we might argue that as age increases person has less time to earn back the migration cost and therefore migration probability reduces with high ages (see the human capital and job search model in Section 2). These results are in accordance with many previous results (see e.g. Laakso 1998; Tervo 1997).

Figure 4. Migration Probabilities by Age



Results also indicate that persons who are older than 30 years have especially higher tendency to migrate to a non-growth-centre region than to a growth-centre region (see Figure 4). At the ages of 57 and over migration to a non-growth-centre region is over twice as likely as migration to a growth-centre region, while between ages of 15 to 25 there is no large difference between these probabilities (see also Laakso 1998).

⁴⁴ Reported results on the effect of gender on migration probability have not been similar. While Laakso (1998) has found similar results, Tervo (1997) did not find significant effect. On the other hand, Van Dijk *et al.* (1989) found that females are less likely to migrate than men both in Netherlands and United States. Opposite is true, for example in Krieg's (1993) study. Note that we did not find that gender has statistically significant effect on growth-centre migration.

⁴⁵ This is because at high ages migration is very unlikely to occur (see the estimation results and Figure 4).

Normally, higher education is associated with higher migration likelihood. Our results, however, indicate that relationship is not as simple as that. Figure 5 shows that person's migration likelihood to a growth-centre region increases with education. For example, results indicate that a person with a higher academic degree has twice as high growth-centre migration probability as a person coming from a primary school. In fact, growth-centre migration probability increases with educational level quite evenly, i.e. those who had high educational level in 1994 have very likely been migrants in 1990 – 95. On the other hand, we did not find that education has a substantial effect on non-growth-centre-migration probability.

Figure 5. *Migration Probabilities by Education*

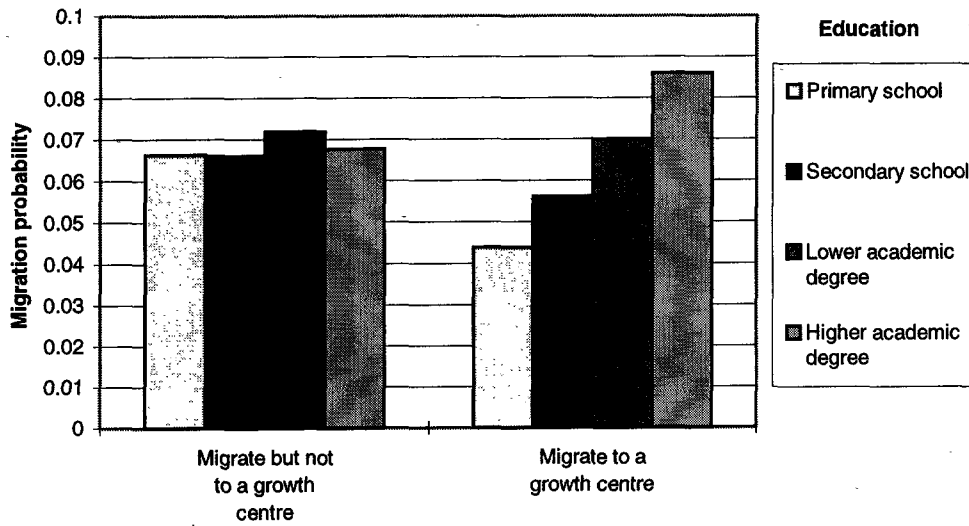
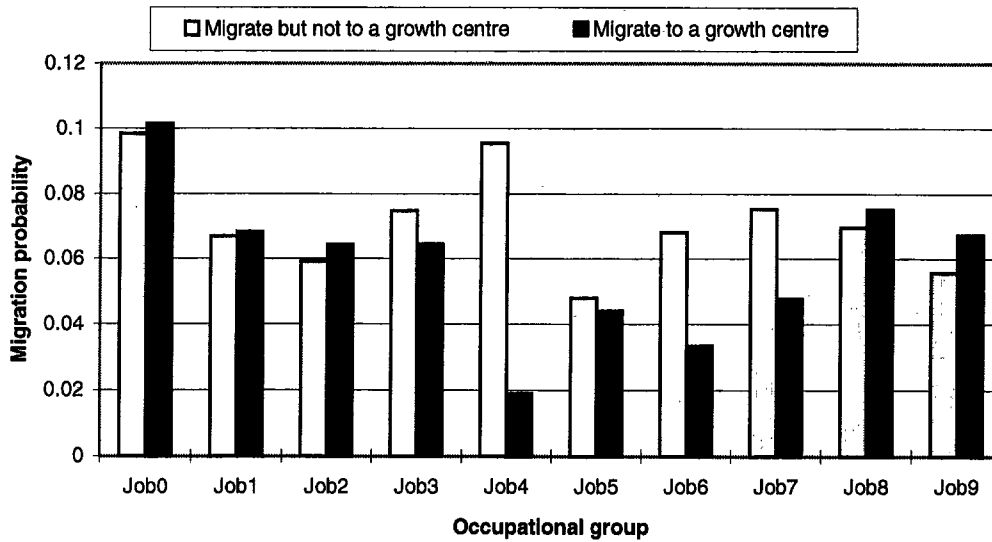


Figure 6 describes the differences in migration likelihoods between occupational groups. Results indicate that growth-centre-region migration probability is lowest in farming/forestry/fishing and construction occupations. The former workers are on the other hand very likely to migrate into non-growth-centre regions. Technical workers have high migration probability in general, which is in line with previous results (see e.g. Herzog and Schlottmann 1984). Notice also the differences in migration probability to different regions inside the following occupational groups: farming/forestry/fishing, construction, and manufacturing. That is, they migrate relatively more to non-growth-centre than to growth-centre regions compared to other occupational groups.

Figure 6. *Migration Probabilities by Occupational Group*

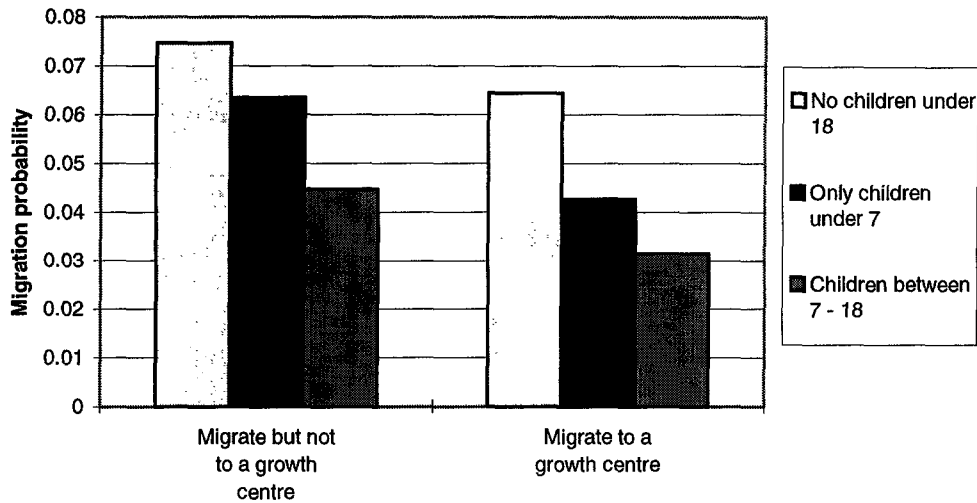


Job0 = technical, Job1 = health care, Job2 = administrative, Job3 = mercantile,
 Job4 = farming/forestry/fishing, Job5 = transport, Job6 = construction,
 Job7 = manufacturing, Job8 = service and Job9 = other occupations (inc. e.g. students).

B. Family and Household Characteristics. The costs of migration associated with family status are usually measured with information about spouse's labour force participation and presence of children. In addition, we used information about spouse's education and changes in family size during the migration period.

When the effects of children were evaluated, we divided persons into three categories: persons (i) who did not have children, (ii) who had only under 7-year-old children, and (iii) who had 7 to 18-year-old children in the beginning of the migration period. The last group is interesting - but rarely used - since it evaluates the effects of school-age children on migration likelihood. Results in Figure 7 indicate that a person who has only under 7-year-old children has lower migration probability than a person with no children. Migration likelihood is even smaller if person has children at school age (7 - 18-year-old). However, migration patterns differ slightly between migration types. A person with only under 7-year-old children does not have much smaller non-growth-centre migration probability than a person without children. On the other hand, migration probability to a growth-centre region is generally low when person has children; they need not to be at school age.

Figure 7. *Impact of Children on Migration Probabilities*



Marital status may encourage or discourage migration, since there are two potential earners to either find jobs in new region or be uprooted from a job (see Krieg 1997, 5). Normally, this question is examined by using simple distinction between married and single persons. The results have indicated that married persons migrate less than single (see e.g. Van Dijk *et al.* 1989, 72). However, we have also used information about spouse's education and labour market status (see Table 3). As we expected, our results indicate that if spouse is working it has negative effect on person's migration likelihood. On the other hand, if spouse has high educational level it is more likely that person migrates than in cases where person does not have a spouse. Thus, we cannot necessarily say that married person is less able to migrate than single. More importantly, we need to consider if spouse is working and/or if he/she has high educational level.⁴⁶ An important factor is also whether person's family size has changed during the migration period; migrants have typically experienced a change in family size compared to non-migrants, more typically a decrease in family size.

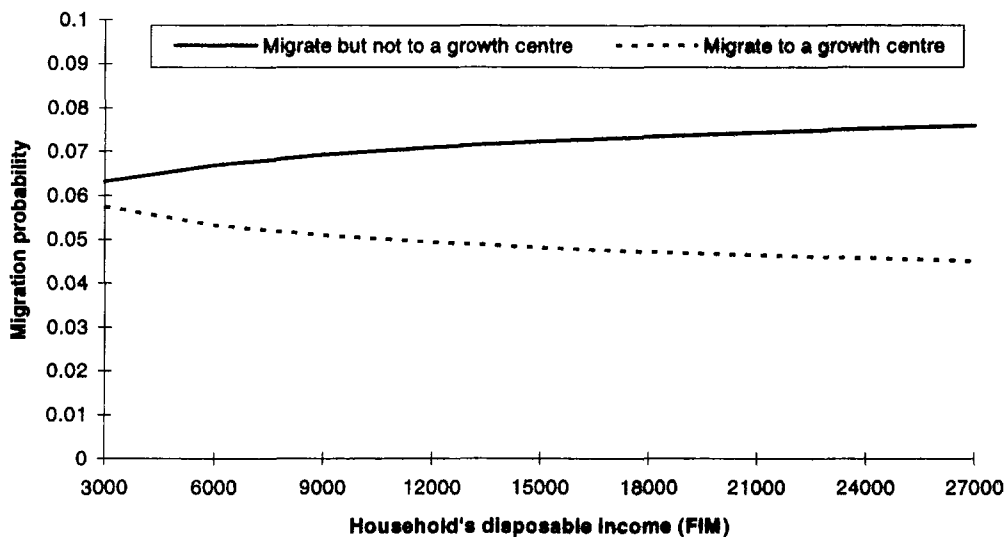
Household's disposable income during the unemployment spell was used in order to evaluate the economic position of the individual. One might argue that a rise in income provides more finance for a move. Thus, it increases person's ability to migrate. However, previous studies are inconclusive and usually do not support this view. Hughes and McCormick (1994) argue that high-levels of real wages in the origin region discourage out-migration for those in the youngest and oldest age groups but not for those in the middle group aged between 35 and 54. Bartel (1979) argues as well that the wage should have a negative effect on the decision to migrate (and job change). Tervo's (1997) and Schlottmann and Herzog's

⁴⁶ It would also be useful to examine how these variables interact with gender status.

(1981) results support the view, while Tervo and Ritsilä (1998) did not find that income has significant effect on migration.

Our estimation results are not statistically significant and they indicate diverse income effects (see Table 3 and Figure 8).⁴⁷ As household's disposable income during the unemployment spell increases, non-growth-centre-migration likelihood increases but growth-centre migration likelihood reduces. One might argue that the gains from growth-centre migration could be highest for those who have lowest income levels. Although the impact of income change is very marginal at high level of income, we can see in Figure 8 that people at those income levels are almost twice as likely to migrate to non-growth-centre regions as to growth-centre regions.

Figure 8. *Migration Probability by Household's Disposable Income*



House owners were found to have much lower migration probability than non-house-owners. This is in line with many previous results (e.g. Hughes and McCormick 1981; 1987; Tervo 1997). According to our estimation results, the odds for a house-owner to belong to growth-centre (non-growth-centre) migration category instead of non-migrant category are 0.626 (0.674) times the odds for a non-house-owner observation. One reason for home ownership's higher and more significant effect on non-growth-centre migration might be following. Since growth-centre migrants are typically searching for accommodation in block of flats (see Laakso 1998, 47), they must be more willing to live in rented flat. Therefore, growth-centre migrants do not have as large liquidity problems and

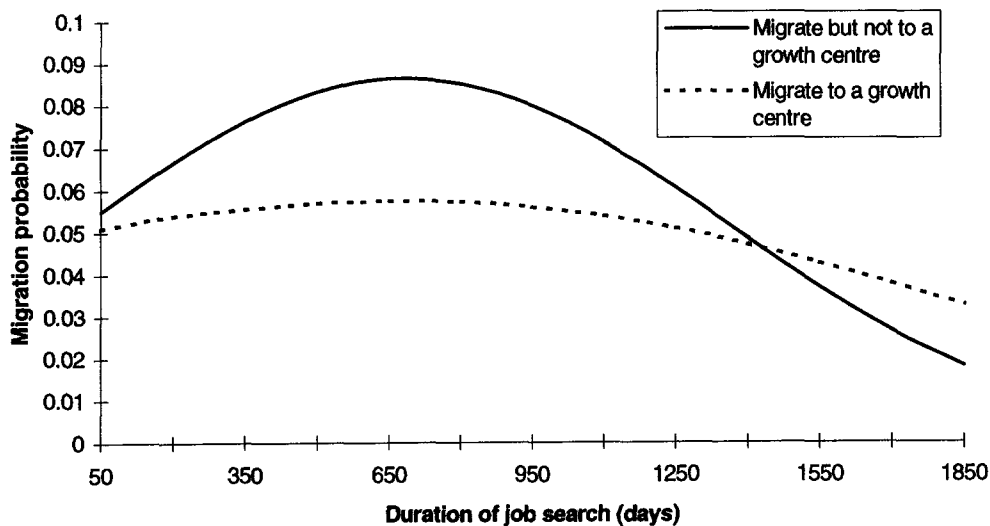
⁴⁷ One reason for this might be that we do not know whether the income level is achieved in origin or destination region: it describes the economic position of the person during the unemployment spell that terminated in 1994.

transaction costs as those who migrate into non-growth-centre regions and therefore more typically into private houses.

C. Labour Market Characteristics. We have used a number of labour market characteristics: duration of job search, reason for ending the previous unemployment spell, ALMP-participation and short-time working period record, request for working time during the job search. Students were taken into account by using two dichotomous variables: a person is categorised as student in 1991 (1994) if his/her main activity is studying in 1991 (1994). As expected, students had much higher migration probability than other people.⁴⁸ For example, student in 1994 has about 1.44 times higher migration probability than other people have. However, we did not find considerable differences between migration types, i.e. odds for belonging to one of the migrant categories vs. non-migrant category was about the same.

Previously, Tervo (1997) could not give strong evidence in favour of the hypothesis that personal unemployment augments the likelihood of migration, all else being equal. We examined this question by using job-search variable, in which we have calculated the search length from 1994 backwards. Figure 9 reports the effects of job-search length – and thus the effects of person's unemployment duration – on migration likelihood.

Figure 9. *Migration Probabilities by Duration of Job Search*



⁴⁸ It is important to take students into account. Not only because they have, on average, high migration probabilities but also because the law on home residence changed in 1994. Nowadays, student has the right to change his/her residence to municipality where he/she is studying. Naturally, this explains part of the students' large migration probabilities in 1994.

Our results support Tervo's (1997) results partially. At the mean value (354 days) the duration of job search does not have a significant effect on growth-centre migration probability. On the other hand, it increases non-growth-centre migration probability markedly until the job search has lasted about two years (see also Table 3). After two years' job search migration probability reduces considerably. Thus, persons who have experienced a long period of job search (say four years) are very unlikely to migrate. One might argue that persons with long unemployment/job-search record have reduced job-search activity, which shows as a reduced migration activity. From efficiency point of view, it is not a good result that the duration of job search does not increase growth-centre migration likelihood. This is because we previously found that persons who migrate to growth-centre regions are more likely to get employed compared to other people. On the other hand, when job search has lasted over two years, continued job search period does not reduce growth-centre-migration probability as much as non-growth-centre-migration probability. A good result is also that at very long search duration migration is more likely to be directed to growth-centre regions rather than non-growth-centre regions. In general, we can say that persons who have experienced very long (short) search period have reduced (increased) migration likelihood, but especially to non-growth-centre regions. In conclusion, more attention should be directed to ways how we can increase (growth-centre migration) activity of the long-term unemployed workers.

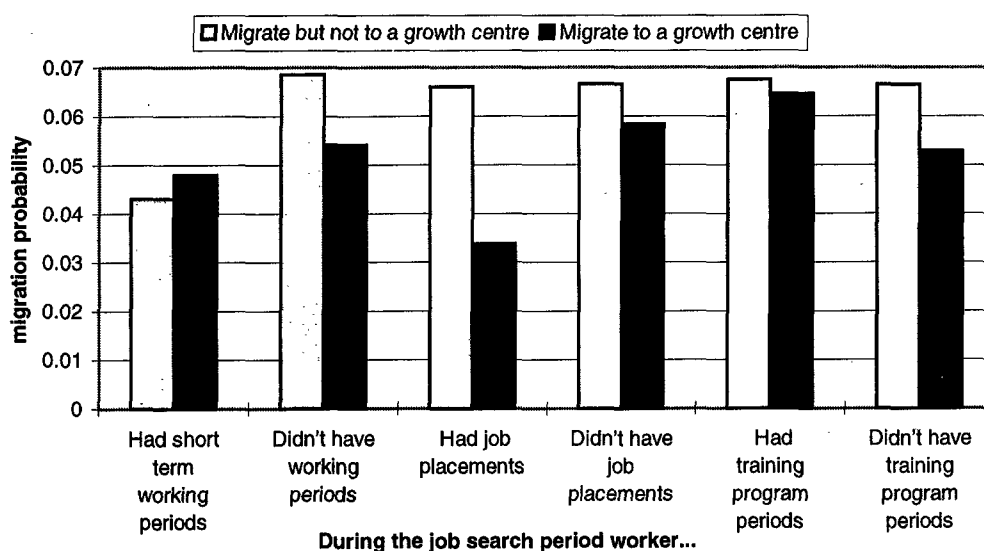
An interesting result is also that persons who were fired or laid off had much lower migration probability than other people (see Table 3). This is at least partly because of their dependence on the job places from which they are laid off and therefore they have limited ability to migrate. We can see from Table 3 that those who are only willing to work full time have also incentive to migrate and find work in other places, especially in non-growth-centre regions. And those who are willing to work flexibly have a tendency of not migrating. They need not necessarily have to migrate.

How does quality of job search and that way ALMPs influence migration probability? As pointed out for example by Fredriksson (1997) and Westerlund (1992), there is a regional dimension to active labour market policy in the sense that labour market programmes have been targeted at high unemployment regions. If labour market programmes reduce the utility loss of unemployment, accommodating shocks by increasing program activity may lower the incentive to relocate from depressed regions. Thus the programmes potentially have important implications for regional adjustment and migration. For example, Westerlund (1992, 21) argues that increases in participation in labour market programs lower outmigration, which may indicate a lower search intensity among program participants than among the unemployed. He also argues that this supports the assumption that participation in a labour market program is a substitute for outmigration for the unemployed, at least in the short run. On the contrary,

Fredriksson (1997, 61) could not give a definite answer as to whether the provision of labour market programs limits regional adjustment.⁴⁹

Limitation of Westerlund's and Fredriksson's studies is that their specifications did not allow for different impacts from job placements and training program periods on outmigration. This is an evident problem since our estimation results in Figure 10 show that different ALMPs have different effects on migration likelihood (see also Table 3 and Table A2).

Figure 10. *Migration Probabilities by Different Types of Job Search Status*



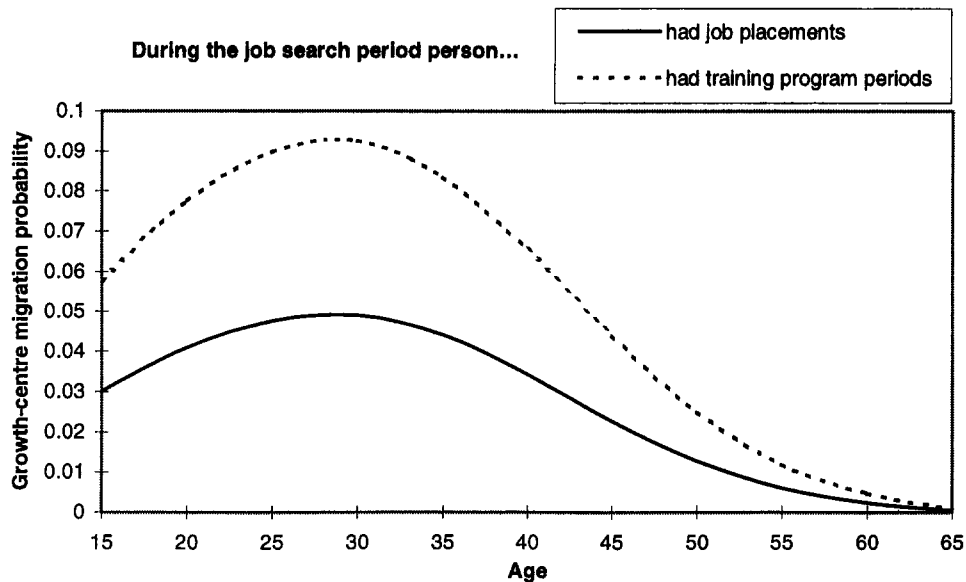
Our estimation results indicate, firstly that short term working periods during the job search period lower person's migration likelihood, especially to non-growth-centre regions. Thus, one might argue that short term jobs are substitutes for migration. Secondly, when the effects of ALMPs on migration were examined, we found that job placements reduce and training program periods increase growth-centre migration probability. However, ALMPs did not have an effect on non-growth-centre migration probability.

To be more specific, training program periods increase growth-centre migration probability by 1.1 percentage points and job placement reduces it by 2.9 percentage points, all other things being equal. Figures seem small but if one looks at the relative effects, it can be stated: person who did not have job placements is almost twice as likely to migrate as one who had. On the other hand, training periods increase worker's growth-centre migration probability about 1.3 times. This results into conclusion that a person who had training

⁴⁹ Both Fredriksson and Westerlund have used time series analysis on Swedish data.

periods during the job search period is about twice as likely to migrate to growth-centre regions as a person who had job placements (see Figure 11). Therefore the programmes have important implications for migration.

Figure 11. *Impact of Age & Job Placements and Training Program Periods on Growth-centre Migration Probability*



D. *Regional Characteristics.* Distinction between different parts of Finland, namely Southern, Central, and Northern Finland, was used in order to control for different distances and variations in the geographical locations of growth-centre regions. Individuals were also categorised into those living in city, town and countryside. It was found that people who do not live in city areas are more likely to migrate to growth-centre regions than those who are. One reason for this might be that those who live in cities are already in a growth-centre region and they need not to migrate. Therefore we made a dummy variable, which describes whether person lived in one of the growth-centre regions in the beginning of migration period. Our results indicate that those who live in growth-centre regions are less likely to migrate than those who do not live there. This might be due to better possibilities of career management and job possibilities in these central areas (see also Tervo 1997). Effects of regional characteristics are examined more detailed in Tervo (1997), and Tervo and Ritsilä (1998). For example, Tervo (1997) found that area unemployment augments the likelihood of migration. Tervo and Ritsilä (1998) argue that the likelihood of migration increases with the size of the origin municipality.

4. Conclusions

The principle goal of this study was to examine how internal migration affects labour market transitions of unemployed workers in 1994 and what are the determinants of migration in 1990 - 95. In both cases multinomial logit model was constructed by using a micro-level panel data containing a sample of 4990 persons. Sample persons were drawn from the population so that they had to have a terminated spell of unemployment in 1994. Explanatory variables described personal, family, household, labour market, regional, and migration characteristics. Theoretical migration models – namely the classical, human capital, and job search models of migration – were also reviewed.

The results of the labour market transition model indicated that a person who migrates permanently to a growth-centre region has about 7 percentage points higher employment probability than a non-migrant. However, a person who migrates permanently to a non-growth-centre region has about 7 percentage points lower employment probability than a non-migrant. Permanent growth-centre migration also reduces person's probability to end his/her unemployment spell to active labour market programmes (ALMPs) by about 10 percentage points. Migrants are also more likely to transfer outside the labour force than non-migrants, especially those who migrated temporarily.

When the other variables affecting labour market transitions were considered, we found, firstly, that household's disposable income during unemployment spell has negative effect on employment likelihood and transition outside the labour force and positive effect on transition to ALMPs. Secondly, as duration of job search continues person's employment likelihood reduces and likelihood to transfer to ALMPs increases. Thirdly, our results showed that ALMPs – job placements and training program periods – and short term working periods during the search period increase worker's employment chances. In addition, workers who had training program periods are especially unlikely to transfer outside the labour force. However, results should be evaluated with caution since people are selected to ALMPs.

Results of our migration model indicated that migration is selective for example by age, education, and home ownership status. Relationship between age and migration has inverse U-shape and migration probability is highest when person is about 30 years old. Results indicated that people who are older than 30 years have especially high tendency to migrate to non-growth-centre regions rather than to growth-centre regions. Education increases person's migration probability to into growth-centre regions but does not have a substantial effect on non-growth-centre-migration probability. Presence of children reduces person's migration likelihood. Migration to growth-centre regions was remarkably low with persons

who had children at school age. House owners have generally low migration likelihood, since they face large liquidity problems and transaction costs during migration.

As household's disposable income increases, non-growth-centre-migration probability increases but growth-centre migration reduces. One might argue that the gains from growth-centre migration could be highest for those who have lowest income levels. Although the impact of income change is very marginal at high level of income, people at those income levels are almost twice as likely to migrate to non-growth-centre regions as to growth-centre regions.

How does the quality of job search and ALMPs influence migration probability? Our estimation results showed that the duration of job search does not have a significant effect on growth-centre migration probability but increases migration to other regions markedly until the job search had lasted about two years. With longer job-search duration the relationship is reversed: we can say that person who has experienced very long job-search period has reduced migration likelihood, but especially to non-growth-centre regions.

Job placements reduce and training program periods increase growth-centre migration probability: a person who did not have job placements is almost twice as likely to migrate as one who had. On the other hand, training periods increase worker's growth-centre migration probability about 1.3 times. This leads into conclusion that person who had training periods during the job search period is about twice as likely to migrate to growth-centre regions as a person who had job placements. However, ALMP did not have an effect on non-growth-centre migration probability. Thus, our results did not totally support the view that labour market programmes reduce the utility loss of unemployment and lower the incentive to relocate from depressed regions. Labour market programmes have potentially important implications for migration.

In the future it would be useful to compare these results with other results obtained using more advanced estimation methods. One possibility would be to follow Hughes and McCormick (1989a; 1989b; 1994) more closely and to formulate nested logit model. Then migrant's choice of destination would follow the decision whether or not to migrate at all.

References

- Armstrong, H. and Taylor J. (1993) *Regional economics and policy* (2nd edition), Harvester Wheatsheaf, London.
- Bartel, A. P. (1979) The migration decision: what role does job mobility play? *American Economic Review*, 69(5), 775 - 786.
- Becker, G. S. (1962) Investment in human capital: a theoretical analysis, *Journal of Political Economy*, 70(Supplement), 9 - 49
- Berglund, S. (1996) Approaches to mobility studies, in: Johansson, M. and Persson, M. O. (eds.) (1996) *Extending the reach: essays on differing mobility pattern in Sweden*, Graphic Systems, Göteborg, 53 - 68.
- Bhattacharya, G. (1990) Migration under uncertainty about quality of locations, *Journal of Economics Dynamics and Control*, 14, 721 - 739.
- Brown, S. and Sessions, J. G. (1997) A profile of UK unemployment: regional versus demographic influences, *Regional Studies*, 31(4), 351 - 366.
- Charney, A. H. (1993) Migration and the public sector: a survey, *Regional Studies*, 27(4), 313 - 326.
- Chun, J. (1996) *Interregional migration and regional development*, Avebury, Aldershot.
- Cushing, B. J. (1987) A note on specification of climate variables in models of population migration, *Journal of Regional Science*, 27(4), 641 - 649.
- Eriksson, T. (1989) International migration and regional differentials in unemployment and wages: some empirical evidence from Finland, in: Gordon, I. and Thirlwall, A. P. (eds.) *European factor mobility: trends and consequences*, MacMillan, London and Basingstoke, 59 - 73.
- European Commission (1997) *Employment in Europe*, Luxembourg.
- Falaris, E. M. (1982) Migration and regional wages, *Southern Economic Journal*, 48(2), 670 - 686.
- Farber, S. C. (1983) Post-migration earnings profiles: an application of human capital and job search models, *Southern Economic Journal*, 49(3), 693 - 703.
- Fredriksson, P. (1997) Education, migration and active labor market policy, Uppsala University, Department of Economics, Economic Studies 28.
- Ghatak, S., Levine, P. and Wheatley Price, S. (1996) Migration theories and evidence: an assessment, *Journal of Economic Surveys*, 10(2), 159 - 198.

- Gordon, I. (1991) Multi-stream migration modelling, in Stillwell, J. and Congdon, P. (eds.) *Migration models: macro and micro approaches*, Belhaven Press, London, 73 - 91.
- Gordon, I. (1992) Modelling approaches to migration and the labour market, in: Champion, T. and Fielding, T. (eds.) *Migration processes and patterns (volume 1): research progress and prospects*, Belhaven Press, London, 118 - 134.
- Greene, W. H. (1995) *LIMDEP, version 7.0: user's manual*, Econometric Software, New York.
- Greene, W. H. (1997) *Econometric analysis* (3rd edition), Prentice Hall, New Jersey.
- Greenwood, M. J. (1975) Research on internal migration in the United States: a survey, *Journal of Economic Literature*, 13, 397 - 433.
- Greenwood, M. J. (1985) Human migration: theory, models, and empirical studies, *Journal of Regional Studies*, 25(4), 521 - 544.
- Greenwood, M. J., (1993) Migration: a review, *Regional Studies*, 27(4), 295 - 296.
- Greenwood, M. J., Mueser, P. R., Plane, D. A. and Schlottmann, A. M. (1991) New directions in migration research: perspectives from some North American regional science disciplines, *Annals of Regional Science* 25, 237 - 270.
- Harris, J. R. and Todaro, M. P. (1970) Migration, unemployment and development: a two sector analysis. *American Economic Review*, 60, 126 - 142.
- Haskel, J., Kersley, B. and Martin, C. (1997) Labour market flexibility and employment adjustment: micro evidence from UK establishments, *Oxford Economic Papers*, 49(3), 363 - 379.
- Hausman, J. and McFadden, D. (1984) A specification test for the multinomial logit model, *Econometrica*, 52, 1219 - 1240.
- Haut, J. C. and Kau, J. B. (1985) Migration and wage growth: a human capital approach, *Southern Economic Journal*, 51(3), 697 - 710.
- Herzog, H. W. Jr, Hofler, R. A. and Schlottmann, A. M. (1985) Life on the frontier: migrant information, earnings and past mobility, *Review of Economics and Statistics*, 67(3), 373 - 382.
- Herzog, H. W. Jr and Schlottmann, A. M. (1984) Labor force migration in the United States: migration, unemployment and remigration, *International Regional Science Review*, 9(1), 43 - 58.

- Herzog, H. W. Jr, Schlottmann, A. M. and Boehm, T. P. (1993) Migration as spatial job-search: a survey of empirical findings, *Regional Studies*, 27(4), 327 - 340.
- Holm, P. and Kyyrä, T. (1997) Tulojen vaikutus työmarkkinasiirtymiin (Effects of income on changes in labour market status), VATT, Government Institute for Economic Research, Research reports No. 40, Helsinki.
- Holm, P. and Tuomala J. (1998) Työllistyneiden työsuhteiden kesto ja työvoimapolitiikka, VATT, Government Institute for Economic Research, Discussion papers No. 163, Helsinki.
- Hughes, G. and McCormick, B. (1981) Do council housing policies reduce migration between regions? *Economic Journal*, 91, 919 - 937.
- Hughes, G. and McCormick, B. (1987) Housing markets, unemployment and labour market flexibility in the UK, *European Economic Review*, 31, 615 - 645.
- Hughes, G. and McCormick, B. (1989a) Migration and regional unemployment rates in the UK, 1981-1986, Fackföreningsrörelsens Institut för Ekonomisk Forskning, Trade Union Institute for Economic Research, Working paper No. 69, Stockholm.
- Hughes, G. and McCormick, B. (1989b) Does migration reduce differentials in regional unemployment rates? in: Van Dijk, J., Folmer, H., Herzog, H. W. Jr and Schlottmann, A. M. (eds.) *Migration and labor market adjustment*, Kluwer, Dordrecht, 85 - 108.
- Hughes, G. and McCormick, B. (1994) Did migration in the 1980s narrow the north-south divide? *Economica*, 61, 509 - 527.
- Hunt, G. L. (1993) Equilibrium and disequilibrium in migration modelling, *Regional Studies*, 27(4), 341 - 349.
- Hämäläinen, K. (1998) The impact of active labour market programmes on repeat unemployment incidence, University of Jyväskylä, School of Business and Economics, Working paper No. 189.
- Jackman, R. and Savouri, S. (1992) Regional migration in Britain: an analysis of gross flows using NHS central register data, *Economic Journal*, 102, 1433 - 1450.
- Kettunen, J. (1990) Työllistyminen, työvoiman liikkuvuus ja työttömän taloudellinen asema (Re-employment, labour mobility and welfare of unemployed persons), ETLA, The Research Institute of the Finnish Economy, B-67, Helsinki.

- Kettunen, J. (1993) Re-employment of Finnish unemployed workers, ETLA, The Research Institute of the Finnish Economy, A-17, Helsinki.
- Kettunen, J. (1997) Essays on wages, job tenure and unemployment duration in the Finnish labour market, ETLA, The Research Institute of the Finnish Economy, A-25, Helsinki.
- Krieg, R. G. (1993) Black-white regional migration and the impact of education: a multinomial logit analysis, *Annals of Regional Science*, 27, 211 - 222.
- Krieg, R. G. (1997) Occupational change, employer change, internal migration, and earnings, *Regional Science and Urban Economics*, 27 - 15.
- Laakso, S. (1998) Alueiden välinen muutto Suomessa: muuttajien sopeutuminen työ- ja asuntomarkkinoille vuosina 1993 - 1996, Helsingin kaupungin tietokeskuksen tutkimuksia 4/1998.
- Lippman, S. A. and McCall, J. J. (1976) The economics of job search: a survey, *Economic Enquiry*, 14, 155 - 189 and 347 - 368.
- Maddala, G. S. (1983) *Limited-dependent and qualitative variables in econometrics*, Cambridge University Press, Cambridge.
- Maier, G. (1985) Cumulative causation and selectivity in labour market oriented migration caused by imperfect information, *Regional Studies*, 19(3), 231 - 241.
- Maier, G. (1987) Job search and migration in regional labour markets, in: Fischer, M. M. and Nijkamp, P. (eds.) *Regional labour markets*, Elsevier Science Publishers B.V., North-Holland, 189 - 204.
- Maier, G. and Weiss, P. (1991) The discrete choice approach to migration modelling, in: Stillwell, J. and Congdon, P. (eds.) *Migration models: macro and micro approaches*, Belhaven Press, London, 17 - 33.
- McCall, B. P. and McCall, J. J. (1987) A sequential study of migration and job search, *Journal of Labor Economics*, 5(4), 452 - 476.
- Milne, W. J. (1991) The human capital model and its econometric estimation, in: Stillwell, J. and Congdon, P. (eds.) *Migration models: macro and micro approaches*, Belhaven Press, London, 137 - 151.
- Milne, W. J. (1993) Macroeconomic influences on migration, *Regional Studies*, 27(4), 365 - 373.
- Mincer, J. (1958) Investment in human capital and personal income distribution, *Journal of Political Economy*, 70.
- Mortensen, D. T. (1986) Job search and labour market analysis, in: Ashenfelter, O. and Layard, R. (eds.) *Handbook of labour economics* (vol. 2), Elsevier Science Publishers BV, 849 - 919.

- Nickell, S. and Layard, R. (1997) Labour market institutions and economic performance, Institute of Economics and Statistics, University of Oxford.
- OECD (1990) *Employment outlook*, Paris.
- OECD (1994) *Jobs study - evidence and explanations (Part I)*, Paris.
- Pickles, A. and Rogerson, P. (1984) Wage distributions and spatial preferences in competitive job search and migration, *Regional Studies*, 18(2), 131 - 142.
- Pissarides, C. A. and McMaster, I. (1990) Regional migration, wages and unemployment: empirical evidence and implications for policy, *Oxford Economic Papers*, 42(4), 812 - 829.
- Rantala, J. (1998) Työvoimapolitiikan rooli ja työttömien työllistyminen, VATT, Government Institute for Economic Research, Research reports No. 44, Helsinki.
- Rogerson, P. (1982) Spatial models of search, *Geographical Analysis*, 14, 217 - 228.
- Schlottmann, A. M. and Herzog, H. W. Jr. (1981) Employment status and the decision to migrate, *Review of Economics and Statistics*, 63(4), 590 - 598.
- Schultz, T. W. (1961) Investment in human capital, *American Economic Review*, 51, 1 - 17.
- Shields, G. M. and Shields, M. P. (1989) The emergence of migration theory and a suggested new direction, *Journal of Economic Surveys*, 3(4), 277 - 304.
- Shields, M. P. and Shields, G. M. (1993) A theoretical and empirical analysis of family migration and household production: U.S. 1980 - 1985, *Southern Economic Journal*, 59(4), 768 - 782.
- Silvers, A. (1977) Probabilistic income maximizing behaviour in regional migration, *International Regional Science Review*, 2, 29 - 40.
- Sjaastad, L. A. (1962) The costs and returns of human migration, *Journal of Political Economy*, Supplement, 70, 80 - 93.
- Stillwell, J. and Congdon, P. (1991) Migration modelling: concepts and contents, in: Stillwell, J. and Congdon, P. (eds.) *Migration models: macro and micro approaches*, Belhaven Press, London, 1 - 16.
- Tervo, H. (1997) Long-distance migration and labour market adjustment: empirical evidence from Finland 1970 - 90, University of Jyväskylä, School of Business and Economics, Working paper No. 168.

- Tervo, H. (1998) Post-migratory employment prospects: evidence from Finland, University of Jyväskylä, School of Business and Economics, Working paper No. 187.
- Tervo, H. and Ritsilä, J. (1998) Regional differences in migratory behaviour in Finland, University of Jyväskylä, School of Business and Economics, Working paper No. 188.
- Todaro, M. P. (1969) A model of labour migration and urban unemployment in less developed countries, *American Economic Review*, 59(1), 138 - 148.
- Todaro, M. P. (1976) *Internal migration in developing countries: a review of theory, evidence, methodology, and research priorities*, International Labour Organization, Geneva.
- Tuomala, J. (1998) Pitkäaikaistyöttömyys ja työttömien riski syrjäytyä avoimilta työmarkkinoilta, VATT, Government Institute for Economic Research, Research reports No. 46, Helsinki.
- Van den Berg, G. J. (1990) Nonstationarity in job search theory, *Review of Economic Studies*, 57(2), 255 - 277.
- Van Dijk, J. and Folmer, H. (1985) Entry of the unemployed into employment: theory, methodology and Dutch experience, *Regional Studies*, 19(3), 243 - 256.
- 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-national comparison, in: Van Dijk, J., Folmer, H., Herzog, H. W. Jr and Schlottmann, A. M. (eds.) *Migration and labor market adjustment*, Kluwer, Dordrecht, 61 - 84.
- Vartiainen, P. (1997) Muuttoliikkeen uusi kuva. Muuttoliikkeen sosio-ekonomiset piirteet seutukunnittain 1993 - 1995 ja kehityksen suunta 1996, Sisäasiainministeriö, Aluekehitysosaston julkaisu 4/1997.
- Westerlund, O. (1992) Internal gross migration in Sweden: the effects of variation in mobility stimuli and regional labor market conditions, Umeå Economic Studies No. 292.
- Öberg, S. (1997) Theories on inter-regional migration: an overview, in: Blotevogel, H. H. and Fielding, A. J. (eds.) *People, jobs and mobility in the new Europe*, John Wiley & Sons, Chichester, 23 - 48.

Appendix

Table A1. *Labour Market Transition Model: Estimated Coefficients of Multinomial Logit Model and Mean Values of Variables^(a)*

Explanatory Variable	Estimated Coefficient for Status 1 ^(b)	Estimated Coefficient for Status 2 ^(b)	Mean
Intercept	-0.862 (-1.127)	-0.122 (-0.173)	1
PERSONAL CHARACTERISTICS			
Gender (= 1 if male)	-0.251 (-2.541)	-0.177 (-1.790)	0.548
Age	-0.038 (-1.291)	-0.275 (-9.474)	33.572
(Age/10) ²	0.040 (1.061)	0.409 (10.815)	12.606
<i>Education</i>			
primary school	0.084 (0.843)	-0.191 (-1.890)	0.294
lower academic degree	-0.413 (-2.428)	-0.451 (-2.600)	0.077
higher academic degree	-1.144 (-4.225)	-0.920 (-3.259)	0.028
<i>Occupation</i>			
technical	-0.397 (-1.840)	-0.869 (-4.212)	0.104
health care	-0.764 (-3.648)	-0.522 (-2.723)	0.090
administrative	-0.076 (-0.394)	-0.588 (-3.140)	0.110
mercantile	-0.205 (-0.948)	-0.749 (-3.539)	0.063
farming/forestry/fishing	-1.175 (-4.603)	-1.176 (-4.618)	0.038
transport	-0.638 (-2.436)	-0.819 (-3.098)	0.035
construction	-0.753 (-3.735)	-1.391 (-7.125)	0.105
manufacturing	-0.531 (-3.177)	-1.074 (-6.814)	0.217
service	-0.647 (-3.379)	-0.848 (-4.622)	0.100
Disability	0.883 (3.548)	0.745 (2.892)	0.040
FAMILY AND HOUSEHOLD CHARACTERISTICS			
Spouse's main activity is non-employed	-0.016 (-0.130)	-0.400 (-3.172)	0.176
Spouse's main activity is employed	-0.116 (-1.073)	-0.531 (-4.741)	0.360
Has children under 7	-0.042 (-0.323)	0.872 (6.687)	0.172
Size of the family increased in 1993 - 94	-0.112 (-0.683)	0.777 (5.516)	0.089
(Household's monthly disposable income during the unemployment spell/1000)	0.382 (6.188)	-0.063 (-1.902)	6.095
(Household's monthly disposable income during the unemployment spell/1000) ²	-0.018 (-4.850)	0.000 (-0.008)	49.452
House owner	-0.311 (-3.099)	-0.104 (-0.985)	0.430

Table A1. (continued)

Explanatory Variable	Estimated Coefficient for Status 1 ^(b)	Estimated Coefficient for Status 2 ^(b)	Mean
LABOUR MARKET CHARACTERISTICS			
Duration of job search/100 (Duration of job search/100) ²	0.719 (20.892) -0.026 (-11.067)	0.438 (12.881) -0.016 (-6.804)	3.538 25.821
ln(unemployment rate in person's industry)	-0.526 (-3.061)	1.276 (7.958)	2.813
Before unemployment spell person has just came to labour force	0.732 (5.564)	0.517 (4.129)	0.157
<i>Reason for ending the previous employment spell</i>			
own request	0.486 (2.194)	0.384 (1.839)	0.044
working period ended	0.520 (5.220)	0.049 (0.509)	0.563
fired (or laid off) because of productive or economic reasons	-0.464 (-3.123)	-0.363 (-2.624)	0.133
<i>During the job search period person had...</i>			
short term working period(s)	-0.660 (-4.191)	-0.425 (-2.572)	0.064
job placement(s)	-1.133 (-6.889)	-0.641 (-3.815)	0.154
training program period(s)	-0.843 (-5.160)	-0.874 (-4.768)	0.079
No work experience	0.370 (3.293)	0.328 (2.913)	0.293
REGIONAL AND MIGRATION CHARACTERISTICS			
<i>Person living in</i>			
Uusimaa	-0.409 (-3.171)	-0.009 (-0.076)	0.198
Central Finland	0.163 (1.588)	0.234 (2.217)	0.278
Northern Finland	0.330 (2.510)	0.169 (1.206)	0.159
Person living in country side	-0.081 (-0.842)	-0.381 (-3.746)	0.266
Unemployment rate in home town	0.013 (0.958)	0.034 (2.420)	21.054
<i>Migration status</i>			
migrated temporarily in 1990 - 94	0.103 (0.325)	0.437 (1.601)	0.021
migrated permanently into non-growth centres in 1990 - 94	0.237 (1.357)	0.418 (2.273)	0.059
migrated permanently into one of the growth centres in 1990 - 94	-0.498 (-2.704)	-0.056 (-0.3439)	0.058
Number of observations: 4990	Log likelihood (lnL): -4262.956		
Correctly classified: 2988 (=59.9 %)	Restricted log likelihood ^(c) : -5442.609		
	Likelihood ratio index ^(d) : 0.217		

(a) Labour market transition status 1 means that person ends his/her unemployment spell to active labour market policies. Status 2 means that person ends his unemployment spell to outside the labour force. Status 0 is the reference group (employment).

(b) Asymptotic t-values are given in parenthesis.

(c) Restricted log likelihood ($\ln L_0$) is the maximum of log likelihood function subjected to the constraint that all the regression coefficients except the constant term are zeros.

(d) The likelihood ratio index is calculated as $1 - \ln L / \ln L_0$. The likelihood ratio index is also called as "McFadden's R^2 ". (See e.g. Maddala 1983, 40; Greene 1997, 891.)

Figure A1. *Labour Market Transition Probabilities by Age and Migration Status*

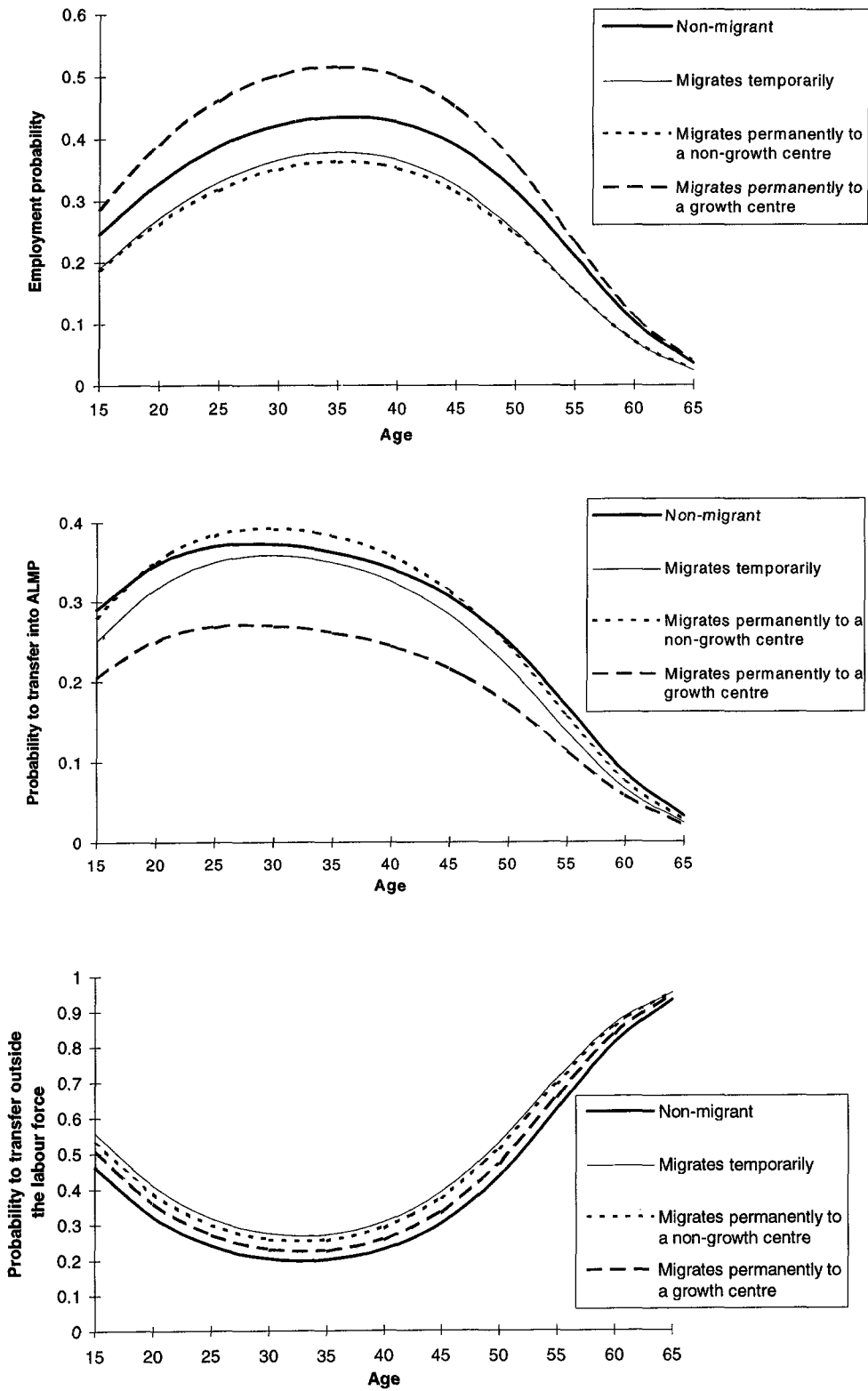


Table A2. Migration Model: Estimated Coefficients of Multinomial Logit Model and Mean Values of Variables^(a)

Explanatory Variable	Estimated Coefficient for Status 1 ^(b)	Estimated Coefficient for Status 2 ^(b)	Mean
Intercept	-5.311 (-7.381)	-4.344 (-5.975)	1.000
PERSONAL CHARACTERISTICS			
Gender (=1 if male)	-0.349 (-2.598)	-0.185 (-1.347)	0.548
Age ^(c)	0.178 (3.754)	0.179 (3.429)	29.572
(Age/10) ²	-0.293 (-3.950)	-0.315 (-3.800)	10.080
<i>Education</i>			
primary school	-0.009 (-0.063)	-0.260 (-1.621)	0.294
lower academic degree	0.109 (0.500)	0.245 (1.211)	0.077
higher academic degree	0.064 (0.192)	0.490 (1.650)	0.028
<i>Occupation</i>			
technical	0.657 (2.458)	0.501 (1.968)	0.104
health care	0.196 (0.805)	0.027 (0.116)	0.090
administrative	0.062 (0.251)	-0.046 (-0.205)	0.110
mercantile	0.312 (1.126)	-0.025 (-0.093)	0.063
farming/forestry/fishing	0.525 (1.650)	-1.277 (-2.398)	0.038
transport	-0.272 (-0.646)	0.240 (0.768)	0.035
construction	-0.182 (-0.614)	-0.456 (-1.665)	0.105
manufacturing	0.176 (0.840)	-0.722 (-3.348)	0.217
service	0.302 (1.296)	-0.342 (-1.366)	0.100
FAMILY AND HOUSEHOLD CHARACTERISTICS			
<i>Spouse's education</i>			
primary school	0.125 (0.504)	0.395 (1.505)	0.123
secondary school	0.196 (1.297)	0.116 (0.732)	0.297
high-school	1.101 (5.015)	0.861 (3.856)	0.062
<i>Children^(c)</i>			
only children under 7	-0.199 (-1.035)	-0.448 (-1.880)	0.099
children between 7 and 18	-0.585 (-2.947)	-0.787 (-3.170)	0.200
<i>Size of the family in 1990 - 94</i>			
decreased	0.497 (4.041)	0.814 (6.500)	0.337
increased	0.370 (2.148)	0.380 (2.026)	0.143
Spouse's main activity is employment ^(c)	-0.477 (-2.841)	-0.377 (-2.026)	0.359
ln(household's monthly disposable income/1000)	0.084 (0.507)	-0.110 (-0.629)	1.712
House owner ^(c)	-0.468 (-2.772)	-0.394 (-2.242)	0.393

Table A2. (continued)

Explanatory Variable	Estimated Coefficient for Status 1 ^(b)	Estimated Coefficient for Status 2 ^(b)	Mean
LABOUR MARKET CHARACTERISTICS			
Duration of job search/100	0.178 (3.722)	0.095 (1.379)	3.538
(Duration of job search/100) ²	-0.013 (-3.437)	-0.006 (-0.920)	25.821
Main activity is studying in 1991	0.222 (1.483)	0.245 (1.638)	0.235
Main activity is studying in 1994	0.371 (2.581)	0.364 (2.541)	0.141
<i>Reason for ending the previous employment spell</i>			
own request	0.377 (1.606)	0.432 (1.775)	0.044
working period ended	-0.244 (-1.955)	-0.175 (-1.384)	0.563
fired (or laid off) because of productive or economic reasons	-0.563 (-2.504)	-0.394 (-1.659)	0.133
<i>During the job search person has had...</i>			
short term working period(s)	-0.497 (-1.956)	-0.157 (-0.613)	0.064
job placement(s)	-0.036 (-0.189)	-0.576 (-2.476)	0.154
training program period(s)	0.030 (0.140)	0.215 (0.963)	0.079
<i>Hoped for working time during the job search (other periods are also suitable)</i>			
only whole day	0.507 (3.651)	0.208 (1.336)	0.124
Ending his/her last unemployment spell into ALMPs in 1994	-0.052 (-0.427)	-0.351 (-2.642)	0.343
REGIONAL CHARACTERISTICS			
<i>Person living in^(c)</i>			
Central Finland	0.355 (2.740)	-0.013 (-0.094)	0.280
Northern Finland	0.297 (1.859)	0.221 (1.359)	0.161
<i>Person living in^(c)</i>			
town	0.375 (2.549)	0.253 (1.648)	0.175
country side	0.248 (1.760)	0.134 (0.890)	0.283
Person lived in one of the growth-centre regions	-0.204 (-1.544)	-0.183 (-1.386)	0.387
Number of observations: 4990	Log likelihood (lnL): -2495.451		
Correctly classified ^(f) : 4157 (=83.3 %)	Restricted log likelihood ^(d) : -2832.932		
	Likelihood ratio index ^(e) : 0.119		

(a) Status 1 means that person migrates but not to a growth-centre region. Status 2 means that person migrates to a growth-centre region. Status 0 is the reference group (non-migrant).

(b) Asymptotic t-values are given in parenthesis.

(c) Measured in the beginning of migration period 1990 - 95. Other variables are measured in 1994.

(d) Restricted log likelihood (lnL₀) is the maximum of log likelihood function subjected to the constraint that all the regression coefficients except the constant term are zeros.

(e) The likelihood ratio index is calculated as $1 - \ln L / \ln L_0$.

(f) The percent of correctly classified observations (83.3 %) is not very meaningful, since in our model explanatory variable is not equally proportioned: about 80 % of our sample persons do not migrate, about 10 % migrate to a growth-centre region, and about 10% migrate to a non-growth-centre region.

