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WHAT DRAWS PEOPLE TO URBAN GROWTH CENTERS: JOBS VS. PAY?*

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Abstract: The present study analyses migration patterns in Finland to test if microeconomic evidence for the Harris-Todaro model can be found. The Harris-Todaro hypothesis states that rural-urban migration stems from regional differences in the wage level and the chances of finding work. To test the hypothesis one needs to predict urban and rural wage and employment probability for each individual. This method is applied to a study of the recent migratory trend in Finland in which most migrants are heading towards a few urban growth centers while the rest of Finland is losing its population. The present study finds evidence for the Harris-Todaro model and concludes that rural urban migration is a result of higher wages and, even more so, better employment prospects in urban areas. Demographic factors may serve to reduce the migration flows in future, but this reduction is likely to remain modest. The results suggest that the best way to prevent excessive rural population loss is to pay attention to job-creation schemes, concentrating especially on workers with secondary and tertiary education.

Key words: Migration, growth center, Harris-Todaro model, human capital, wages, employment

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Tiivistelmä: Tutkimuksessa testataan Harris-Todaro- mallia suomalaisella muuttoliikeaineistolla. Hypoteesin mukaan maalta kaupunkeihin muutto johtuu alueellisista palkka- ja työllisyyseroista. Suomessa suurin osa muuttajista suuntautuu muutamiin kaupunkikeskuksiin kun taas suurin osa alueista menettää väestöä muuttoliikkeen kautta. Muuttaminen on seurausta keskuksien korkeammasta palkkatasosta ja niiden paremmasta työllisyystilanteesta. Demografiset tekijät saattavat hidastaa muuttoliikettä jonkin verran tulevaisuudessa. Tulosten perusteella paras keino vähentää syrjäseutujen liiallista lähtömuuttoa on luoda uusia työpaikkoja, etenkin korkeasti koulutetuille työntekijöille.

Asiasanat: Muuttoliike, kasvukeskus, Harris-Todaro –malli, inhimillinen pääoma, palkat, työllisyys

Yhteenveto

Tausta

Suomessa suurin muuttoliike maalta kaupunkeihin tapahtui 1970-luvulla. Uutena piirteenä muuttoliikkeessä on nyt myös keskisuurten kaupunkien kokema muuttotappio. Ainoastaan muutama alue sai muuttovoittoa 1990-luvulla. Alueellinen keskittyminen on kiihtynyt 1990-luvun loppua kohti ja muuttoliike on suuntautunut suurimpiin kaupunkeihin. Aluerakenteen epätasapaino onkin herättänyt huomiota sekä tutkijoiden että poliitikkojen keskuudessa.

Uudessa agglomeraatiokirjallisuudessa alueellista keskittymistä selitetään ydin-periferia malleilla. Jo huomattavasti vanhemmat muuttoliikemallit kuitenkin selittävät väestön ja työpaikkojen kasautumista keskuksiin. Harris-Todaro mallissa muuttoliike maalta kaupunkeihin aiheutuu alueiden välisistä palkka- ja työllisyyseroista.

Tässä tutkimuksessa testataan Harris-Todaro –hypoteesia suomalaisella muuttoliikeaineistolla. Pitkän aikavälin trendejä tarkastellaan seutukuntatasolla 1975-1996. Yksilötason aineisto keskittyy vuosiin 1985-1996. Aineistona käytetään yhden prosentin otosta väestölaskennan- ja työssäkäynnin pitkittäistiedostosta. Maa on jaettu viiteen kasvukeskukseen (Helsinki, Tampere, Turku, Oulu and Jyväskylä) ja muihin alueisiin (78 seutukuntaa).

Tulokset

Tutkimus analysoi seutukuntatason muuttoliiketrendejä. Havaitaan, että väestö ja inhimillinen pääoma on kasautunut enenevässä määrin viiteen kaupunkikeskukseen. Yksilöaineisto tukee Harris-Todaro hypoteesia: paremmat ansiot ja työllisyysmahdollisuudet houkuttelevat työvoimaa kasvukeskuksiin. Toisaalta keskittymistä hillitsevänä voimana on muuttoliike maaseudun sisällä ja lähtömuutto kaupungeista. Näillä muuttajilla on kuitenkin alempi koulutustaso kuin kaupunkeihin muuttavilla. Näin ollen inhimillisen pääoman keskittyminen ei hidastu samassa määrin kuin väestön keskittyminen. Viimeaikaiset tilastot osoittavat, että alueellinen keskittyminen kiihtyi 2000-luvun alkuun asti, jonka jälkeen hidastui hieman talouden taantuman myötä.

Johtopäätökset

Mikäli alueellista keskittymistä pidetään ongelmallisena, voidaan sitä hidastaa esimerkiksi tukemalla uusien kasvukeskusten muodostumista sekä kannustamalla inhimillisen pääoman sijoittumista pienempiin kaupunkeihin. Mikäli taas ajatellaan, että vahva keskusalue tukee Suomen kansainvälistä kilpailukykyä, kannattaisi keskittyä työllisyyden alentamiseen keskusalueilla.

Vaikuttaa, että kaupungeista maalle muuttoa ei tule tapahtumaan suuressa määrin tulevaisuudessa. Toisaalta kaupunkeihin kohdistuva muuttoliike saattaa hidastua, koska väestö ikääntyy eikä koulutustaso kasva enää yhtä nopeasti kuin aiemmin. Yhtäaikainen työllisyyden parantaminen ja muuttoliikkeen hidastaminen on vaikeaa. Mikäli halutaan hidastaa maaseudun autioitumista, kannattaa maaseudun työllisyyttä parantaa suhteessa kaupunkeihin luomalla uusia työpaikkoja. Maaseudulle kohdistuvat verohelpotukset eivät todennäköisesti ole yhtä tehokkaita sillä ansioerot eivät ole kovinkaan suuria, varsinkaan jos otetaan huomioon kaupunkien korkeammat asuntohinnat. Parhaiden toimenpiteiden löytämiseksi täytyisi tutkia työpaikkojen luomisen ja verohelpotusten tehokkuutta ja kustannuksia.

Contents

1. Introduction

Most developed countries have experienced increasing regional concentration of population and economic activity throughout the latter half of the 20th century. This, among other issues, has sparked an interest in the regional aspects of the economy. Moreover, the recent theoretical discussion on the agglomeration forces leading to the concentration of economic activities has given a new meaning to many observed patterns such as the European growth triangle, Silicon Valley etc. Also in Finland population has been moving towards a few urban growth centers ever since the industrial revolution began after World War II. Interestingly, the speed of this movement has increased markedly in the last ten years, and highest ever migration figures were reached in 2001.

The major phase of urbanization began in Finland in the 1970s. The new feature, however, is that people are now leaving even the middle-sized towns and head only to the very largest ones. Indeed, only a handful of regions have received a positive net flow of migrants since the mid 1990s. Consequently, fears have been expressed about widening regional disparities.[i] Strategies for reducing the possible negative effects in regions that experience excessive out-migration have been pondered in tandem by economists and politicians. The fear is that if this development continues, which seems likely, the concentration of the population in only a few regions will lead to a very uneven regional structure.

In the popular agglomeration literature concentration patterns are explained by the core-periphery model (see e.g. Krugman, 1991b). However, already much earlier models predicted that migration tends to concentrate people to a small number of urban growth centers (Lewis, 1954; Todaro, 1959; Harris and Todaro, 1970). The present study analyzes microeconomic data in the light of the Harris-Todaro model. The model lends itself well to empirical testing and has therefore stimulated vast amounts of empirical work, mainly using macro-level data. One recent empirical contribution using macro data is the study on inter-regional migration in Italy by Daveri and Faini (2000).[ii] However, it has been noted that the problem with macro analysis is that relating average wages to migration propensities is an insufficient test for the underlying individual migration decisions, and this may explain the often mixed results found in the literature. The initial empirical work with micro data found support for the H-T model (Da Vanzo,1976; Lucas, 1985). More recent micro-level studies include, for example, Lee and Phillips (1997), McGormick and Wahba (2000) and Agesa (2000). In addition, theoretical contributions to the Harris-Todaro model have introduced features

[i] In many cases analysts have described rural-urban migration to be excessive (Todaro, 1976a, b; World Bank, 1983; Simmons, 1981). In Finland the problem is considered serious due to the extremely low population densities and low birth rates in many parts of the country.

[ii] The migration literature based on the Harris-Todaro model is so vast that it is impossible to refer to all relevant studies. Emphasis is put here on studies analyzing developed countries.

such as land rents and urban cost of living (Brueckner and Zenou, 1999; Brueckner and Kim, 2001), wage flexibility and urban agglomeration (Krichel and Levine, 1999), provision of public goods (Arnott and Gersowittz, 1986), endogeneity of wages and employment (Carter, 1998), and migrants' attitudes towards risk (Daveri and Faini, 2000). A more extensive picture of the recent state of the Harris-Todaro literature is provided in the survey by Bhattacharya (1993).

The aim of the present study is to analyze both the long-term aggregate trends (1975-96) and more recent individual level information (1985-96) provided by the Finnish longitudinal population census. The country is divided into a group of five *growth centers* (Helsinki, Tampere, Turku, Oulu and Jyväskylä) and the *rest of the country* (78 subregions). The study concentrates on key assumptions of the H-T model that produce the process of rural-urban migration, i.e. rural-urban differences in wages and employment. Some additional hypotheses, such as distance-decay, are also tested in the Finnish context. It should be noted that the Harris-Todaro model requires that wage levels in urban areas are not affected by the level of employment, but, admittedly, earlier studies disagree about the extent of wage flexibility in Finland.[iii] Moreover, an earlier Finnish study has analyzed the effect of expected income on migration across regions (Haapanen, 2000). However, the wage level alone is not a sufficient indicator of the labor market conditions in a given region, especially as the level of unemployment in Finland has been very high in the 1990s. The probability of finding paid work needs to be taken into account also, and will be accounted for in the present empirical work.

The results indicate, firstly, that since the mid 1970s migrants have continued to move towards the growth center regions, and that those regions have experienced rapid human capital accumulation. In other words, the level of education has grown much more rapidly and the share of highly educated inhabitants has continuously been much higher in the growth centers than in "rural" Finland. Net in-migration flows are higher in regions with lower unemployment rates and greater average wages. The micro-level results reveal that it is in particular the "human capital component" (i.e. highly educated, young individuals) of the labor force that is moving to and, even more clearly, residing in the growth centers. Moreover, the results support the Harris-Todaro hypotheses in the sense that migration to urban areas is caused by better employment prospects those regions offer. Real wage differences, however, do not appear to play such a large role in this process, possibly due to the relatively small extent of such differences once regional cost-of-living is accounted for. Moreover, differences between rural and urban wages have declined over 1985-96, both in nominal and real terms. In contrast,

[iii] In principle, the central wage-bargaining system could cause a considerable degree of regional wage rigidity (Blanchflower and Oswald, 1994) and some studies support this hypothesis (Albaek et al., 1999). Other studies using national- or individual data find evidence for wage flexibility (e.g. Parjanne, 1997; Pekkarinen, 2001).

differences in employment prospects increased dramatically in 1990-95 and declined somewhat thereafter.

The rest of the paper is organized as follows. Next section presents the standard H-T model, concentrating on the determinants of migration. The subsequent section (section 3) describes the data and empirical methods. Section 4 presents the results concerning individual migratory behavior, and analyzes regional development on the basis of both micro- and macro level observations. The last section concludes.

2. The model of rural-urban migration

I will first discuss the choice of the migration model. Long-run regional evolution in Finland is very much characterized by migration away from agricultural regions, due to the on-going structural change. Hence a model of rural-urban migration appears to be the natural choice. Krugman's core-periphery model could be another alternative, yet there are certain reasons why it may not be applicable. Firstly, the growth centers in Finland are very small compared to the "core-regions" given as typical examples of agglomeration (less than 300,000 on average, compared to 50-100 million inhabitants in the European growth triangle and the U.S. manufacturing belt). It would thus leave the number of cores in Finland non-existent or, alternatively, towns with a population less than 100,000 would need to be "core-regions". Secondly, constructing a strong link between theory and empirical work at individual level using the core-periphery is complicated, and telling apart whether the findings lend support to "rural-urban" or "periphery-core" migration pattern is virtually impossible. Finally, Harris-Todaro (H-T) framework allows unemployment in the destination (growth center) region, without making the migration choice appear irrational. Hence, the H-T model, directly applicable to our empirical case, was chosen.

2.1 The basic Harris-Todaro model

The model is based on individual decision making responding to differential economic opportunities between regions. The simplest model contains only two (sets of) regions, R (rural) and U (urban), and two perfectly competitive production sectors: agriculture and manufacturing. There are two types of mobile labor: agricultural and manufacturing workers. Other factors of production (capital, land and technology) are fixed. Agriculture takes place only in the rural areas, experiencing constant returns. Manufacturing is the urban sector. The economy is closed, but internal trade exists. (Todaro, 1969; Harris and Todaro, 1970)

The industrial production functions are given by (Harris and Todaro, 1970):

(1) $$X_A = q(N_A, L, K_A)$$

(2) $$X_M = f(N_M, K_M),$$

where X_A and X_M are the outputs of agricultural and manufacturing good, N_A and N_M (K_A and K_M) are their respective uses of labor (capital) and L is rural land used by agriculture. Prices of goods are determined by the relative outputs of the goods, and the price of agricultural good, P, can be expressed in terms of the manufactured good:

(3) $$P = p(X_M/X_A)$$

Wages in the sectors are two of the key variables in the model. They are determined by the marginal productivity of labor. Agricultural real wage is:

(4) $W_A = P \times q'$,

where marginal product of agricultural labor (q') is expressed in terms of manufactures. Real wage in manufacturing is:

(5) $W_M = f' \geq \overline{W}_M$.

Again, marginal product of labor determines the real wage, but it has to equal or exceed the set level of minimum wage, $\overline{W}_M$. The third key variable is the probability of having a job in the urban sector at time t, p(t) (Todaro, 1969). At any time there will be a pool of labor of which a random choice of entry to wage work is made. The probability of being chosen at any time t, $\pi(t)$, depends on the size of the unemployment pool. Hence, Todaro (1969) shows that the probability of having a job at time t can be written as:

(6) $p(t) = p(t-1) + [1-p(t-1)]\pi(t)$.

Note the difference between the two concepts: getting a new job $\pi(t)$ and having a job p(t). If the probability of having an urban job is very small, then even a large difference in the wage rates will not be enough to cause migration away from rural areas.

2.2 Migration in the Harris-Todaro model

In the standard model, migration between R and U is governed by real wage differences. Workers choose an optimal migration time path in their attempt to maximize their lifetime utility. Workers therefore form expectations about the expected real wages and the likelihood of receiving an urban job. Expected urban real wage in (Harris and Todaro, 1970):

(7) $EW_U = \overline{W}_M N_M / N_U$,

where N_U is the total urban labor force and N_M is the urban labor actually employed. The total size of labor force in the whole economy is hence

(8) $N_A + N_U = \overline{N}_R + \overline{N}_U = \overline{N}$,

where $\overline{N}_R$ is the initial rural and $\overline{N}_U$ the initial urban labor force.

Labor force migrates as a result of a positive difference between the expected (lifetime stream of) urban and rural wages. The utility function of workers thus

contains both the rural and urban real wages (w) and the respective probabilities of having a job (p) (Lucas, 1985):

(9) $$U_i = u(w_i, p_i, z_i, e_i),$$

where z_i is a vector of characteristics of individual i and e_i is a disturbance term. Individual i picks the optimal location by comparing wages and employment probabilities at alternative regions R and U. The choice of location is determined according to:

(10) $$m_{ir} = m(W_i, P_i, z_i, e_i),$$

where W_i and P_i are now vectors of w_i and p_i at alternative locations and r denotes the region.

2.3 Extensions and further hypotheses

The basic Harris-Todaro model has been extended in several ways, for example by including land rents and urban cost of living (Brueckner and Zenou, 1999; Brueckner and Kim, 2001). Here we use the version with rural-urban differences both in real wages and employment probabilities. As explained above, the basic H-T hypothesis states that migration to urban centers is speeded up by the earnings differential and the differential employment situation. In many studies these are tested by including regional wage and unemployment levels in the migration equation. However, Lucas (1985) points out that this will lead to biased estimates as the deviation between average regional wage and true individual wage is correlated with individual characteristics also included in the migration equation. Hence we follow Lucas' strategy of predicting values for each individual. We use the basic semilogarithmic wage equation

(11) $$\log(w) = \alpha_1 + \beta_1 \times S + \beta_2 \times E + \beta_3 \times E^2 + \varepsilon,$$

where S is the years of schooling and E is experience. In the empirical specification we add some other variables, such as regional dummies, in the model. The model deals with real wages, i.e. it takes into account regional cost of living. It is also typical to add some sort of selectivity correction in the wage-model to account for differences between those who earn a positive wage and those who are not working. The employment equation is

(12) $$\Pr(Emp) = \alpha_2 + \beta_4 \times F + \beta_5 \times S + \beta_6 \times A + \beta_6 \times A^2 + \beta_6 \times FS + \beta_7 \times UDUR + u,$$

where F denotes a female, A is the age, FS is the individuals' family status and UDUR is the duration of previous unemployment. It is expected that the duration of unemployment lowers the chances of having a job in latter periods. Using these models we predict wage and employment probability for each individual.

In the final stage we include the predictions as separate variables in the migration equation to allow different weights to be given.

Using the above variables we can test the H-T hypothesis. However, a number of other hypotheses of interest are also tested. Firstly, theory states that just like the benefits of moving also the costs of moving will enter the migration equation (Sjaastad, 1962; Mincer, 1978). Moreover, family migration decisions tend to be made according to the family, rather than individual, utility maximization. Hence, we should control for various factors affecting the costs associated with migration, such as the family status and size, distance and the type of dwelling (owned vs. rented). We expect the probability of migration to be greater for those who have no family and/or no children, and who live in rented accommodation. Distance is of interest also by its own right as the "distance decay hypothesis" states that the likelihood of migration between a pair of regions m and n is smaller the greater the distance between m and n (Clark, 1970; Fotheringham, 1981; Schwartz, 1981). Hence, we expect the likelihood of migration to centers to be greater, ceteris paribus, for those living closer. On the other hand, for those living very close commuting may be the preferred option of mobility and this also needs to be controlled for.

It has been argued that one problem with the H-T model is that it fails to take into account the dual nature of migration (Cole and Sanders, 1985). In other words, the model assumes that all migrants head to the high-paying urban manufacturing sector, whereas in reality many, particularly those with less education, start working in the so-called "urban subsistence sector" (services etc.). In fact, jobs offering a higher wage have a strict entry requirement of human capital and not all migrants can enter. In our view, as the control of labor market is very strict and average education level high, the existence of a "grey economy" and/or minimally educated migrants pose less of a problem for the empirical relevancy of the H-T model in the Finnish case than in the case of developing countries. Another, and maybe a more serious, problem with the model is that it does not address migration flows between urban regions. We attempt to take this into account in our empirical testing.

3. Statistical methods and description of the data

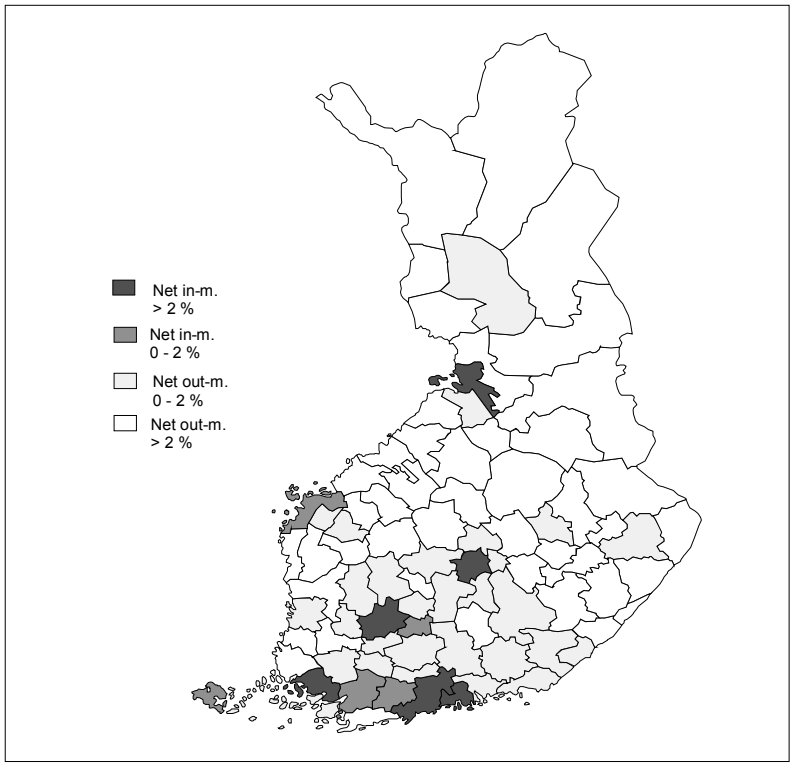
Migration decisions are made according to expected lifetime utility. In reality, the perceived net benefit (real wage or utility) of the migrant is never directly observed, but is present as a *latent variable* in the migration decision equation. This suggests that we use the *latent regression approach* (also called the index function approach), which is the basis for most binary or multiple choice models in econometrics (Greene, 1993), to analyze the concentric trends in labor mobility.[iv] Assuming the independence of irrelevant alternatives (IIA), the best alternative is to use a multinomial logit model (MLOGIT) (Greene, 1993), where the dependent variable can take one of three values, i.e. M=0,1 or 2. In other words, the individual can either stay in his original region (M=0), move to a growth center (M=1) or to countryside (M=2). Estimation is conducted in one stage, i.e. assuming that migration and destination choices are made simultaneously. However, if the IIA assumption is violated, we must opt for a nested logit model (NLOGIT). More discussion will follow in the next section.

The data set used in the present study consists of a one-percent random sample of the Finnish longitudinal census file and comprises the years 1985-96. Finland is divided into 85 subregions (NUTS4) that represent the actual commuting and labor market areas rather well. In the present study, the two subregions of Åland have been excluded, as they cannot be robustly analyzed within the same framework as "mainland" Finland. The special character of Åland (self-regulation, isolated geographical position, language etc.) could affect the analysis as it is likely that the personal migration determinants in Åland differ from those in the rest of the country. In addition to the longitudinal data, macro level data for the 83 continental subregions have been used to determine the aggregate net migration patterns over a longer time period, i.e. 1970-95. Subregional indicators for housing prices are used to deflate the nominal wages to account for difference in urban and rural cost of living.

Since the 1970s there have been only five central regions that have consistently had a positive net migration rate, i.e. the growth center regions. Those regions were in fact the only ones that experienced any positive net in-migration in the last 6 years. Figure 1 shows the net-migration pattern in 1995-98. It should be noted that as a large job market area Helsinki receives a very large flow of commuters from its neighboring regions and it is necessary to control for the typical commuting behavior in those regions.

[iv] A latent regression is specified as $y^* = \beta' x + \varepsilon$. However, we only observe $y = 1$, iff $y^*>0$. See Greene (1993) for further discussion on latent regression models.

Figure 1. Net in-migration in the Finnish subregions, 1995-1998



The longitudinal population census was combined with employment data and together these provide a vast amount of information about the characteristics of around 36,000 individuals aged 18 to 60. Altogether there are 400,000 individual-per-year-observations during 1985-96. 41 % of these individuals were living in one of the five growth centers (Helsinki, Oulu, Tampere, Turku or Jyväskylä) in 1996, compared to 37 % in 1985. 18 % of all individuals had moved at some point during 1985-96 and 49 % had migrated at least once during their lifetime.

4. Migration to growth centers in Finland

This section describes how the regional pattern has evolved since the mid 1970s, and how growth centers differ from rural regions in terms of their income levels, education levels and migration flows. After that the Harris-Todaro- and other hypotheses are tested.

4.1 Aggregate picture

The Finnish economy, as most countries, has displayed a clear trend towards greater concentration of population and economic activity in fewer regions since the World War II. The share of urban population[v] has grown from 32.3 % to 65.1 % between 1950 and 1996, and since the 1960s migration has been directed towards regional growth centers located mainly in southern Finland. The threat of desolation is, in fact, quite substantial in more than 50 out of 85 subregions.[vi] In 1998 only the five "urban growth center regions" received a net inflow of migrants of over 2 percent of their populations, while 74 regions experienced a net loss of migrants. Note, however, that while in the 1960s and 1970s the growth of urban population was mainly the result of diminishing agricultural sector, the picture was quite different in the 1990s. The agricultural sector was not shrinking nearly as fast as earlier, and even the middle-sized, service and industry oriented towns started losing their population. Only the most technology oriented regions managed to attract migrants, even to the extent that Helsinki was the fastest growing metro region in Europe (EU Report, 1998).

The growth of human capital has also concentrated in the urban centers, even though the level of education has risen in the whole country (table 1). The level of education has traditionally been higher and grown faster in the growth centers than in other areas. The same applies to the share of highly educated inhabitants: twice as many growth center inhabitants have obtained higher education than in other regions. The average share of higher education in Finland has grown during 1975-97, but has consistently been much above the average in the growth centers. Moreover, the growth of higher education has been somewhat divergent since the mid 1980s, compared to the previous decade (figure 2). These indicators of regional education support the assumption that both population in general, and educated individuals in particular, tend to accumulate in growth centers. The five growth center regions have also been richer than the average in terms of their

[v] Here urban population refers to population in all urban areas in Finland, not merely the five growth center regions.

[vi] Source: Statistics Finland Population Statistics 1995. Threat of desolation is substantial if the share of square kilometers where youngest inhabitant is over 50 exceeds 16% of all inhabited km²'s. The threat of desolation covers all of northern- and most of eastern Finland. On the west-coast and in the south, where birth rate and in-migration of youth is higher, no threat of depopulation exists (the share of "over 50" km²'s ranges 4-15,9%).

per capita taxable incomes. The income gap has diminished, however, indicating that convergence in per capita incomes can take place simultaneously with a growth in regional disparities as measured by population and economic activity.

Table 1. Comparison of centers and the rest of the country

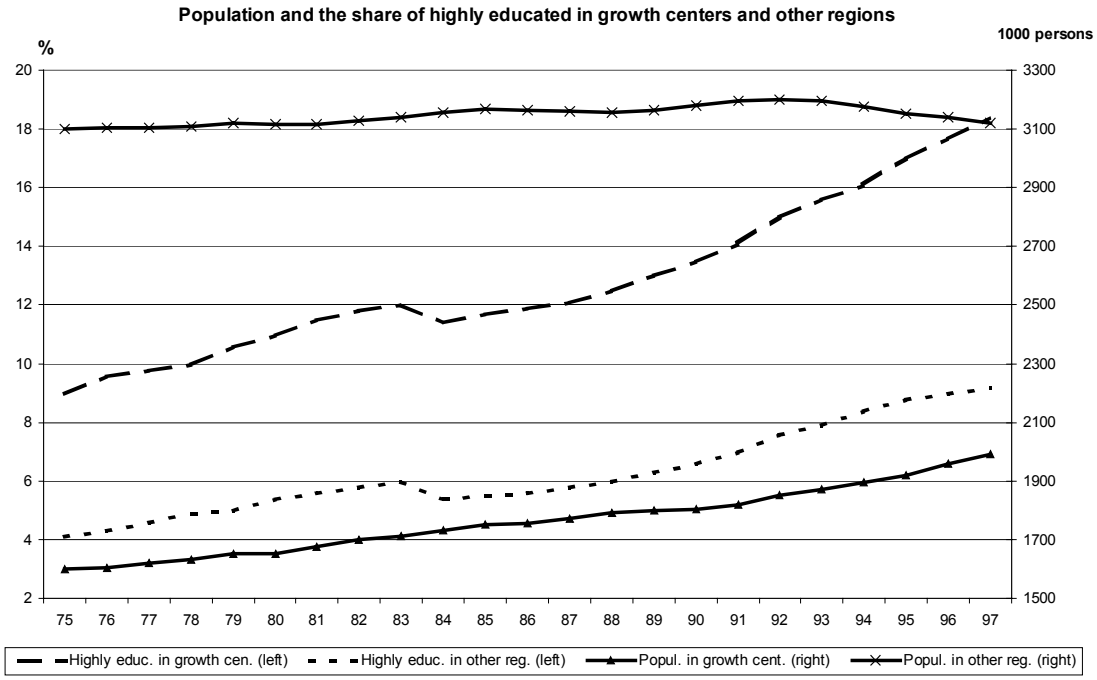
Variable	Growth centers		Other regions	
	1975	1997	1975	1997
Unemployment rate (%)	4.4	17.0	7.9	21.1
Level of income (FIM)	41 469	73 067	27 644	61 689
Net in-migration (%)	0.005	0.008	-0.006	-0.006
Average age of in-migrants	25.1	27.2	24.5	27.8
Level of education, inhabitants	3.98	4.25	3.65	3.80
Share of secondary education, inhabitants (in-migrants)	36.8% (55.3%)	47.2% (58.2%)	36.9% (51.2%)	47.3% (54.6%)
Share of higher education, inhabitants (in-migrants)	12.1% (23.1%)	19.6% (24.4%)	5.2% (15.1%)	10.2% (17.4%)
Agricultural employment (%)	3.8	1.8	29.2	15.4

*Notes: The regional level of education is calculated for each region as

$$X = \sum_{i=1,5}^{8} fixi \Big/ \sum_{i=0}^{8} fi,$$

where fi is the number of individuals and the level of education (xi) ranges from secondary education (i=1,5) to doctoral degree (i=8). The weighed sum of educated persons is then divided by the whole population of the region.

Figure 2. Population growth and the share of highly educated inhabitants in growth centers and other regions, 1975-1997



4.2 Migration and rural-urban differences

Migration activity varies from year to year moving in tandem with the economic cycle (figure 3). The slowest migration rates are observed during the 1990s recession after which they start to increase exceeding the level of 3% (subregional level) by 2001. Migration distances, however, show no systematic variation over time. The average distance moved is about 220 kilometers. The Harris-Todaro model predicts that migrants should be heading towards regions with greatest (real) wages and lowest unemployment rates. This indeed seems to be the case in the Finnish data in 1985-1996 (figures 4 and 5). The correlation between regional mean wage and net in-migration rate is .205, and that between regional unemployment rate and net in-migration rate is -.363. This would suggest that employment prospects are a more important determinant of migration than real wages. It would also be understandable because rural-urban wage differences are fairly small in Finland, whereas unemployment disparities are much larger. Moreover, wage differences have declined marginally during the period examined here, but unemployment differences grew dramatically during the recession 1990-95, falling only slightly thereafter (figure 6).

Figure 3. *Inter-regional migration across municipalities and subregions, and GDP growth, 1975-2001*

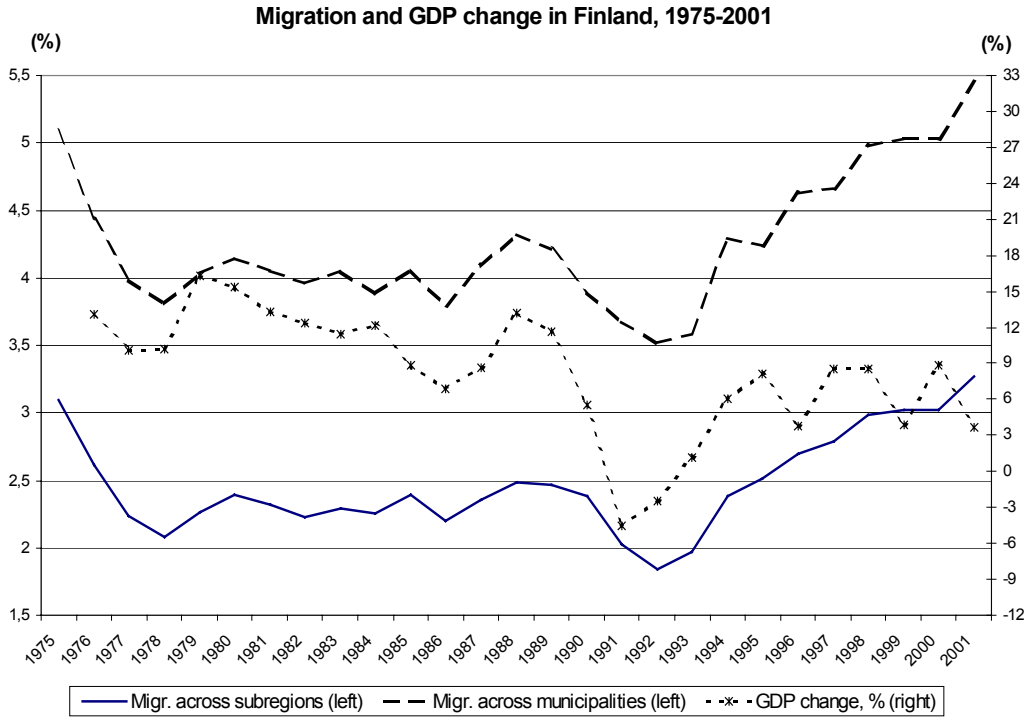


Figure 4. *Net in-migration and regional mean wage (subregions), 1985-1997*

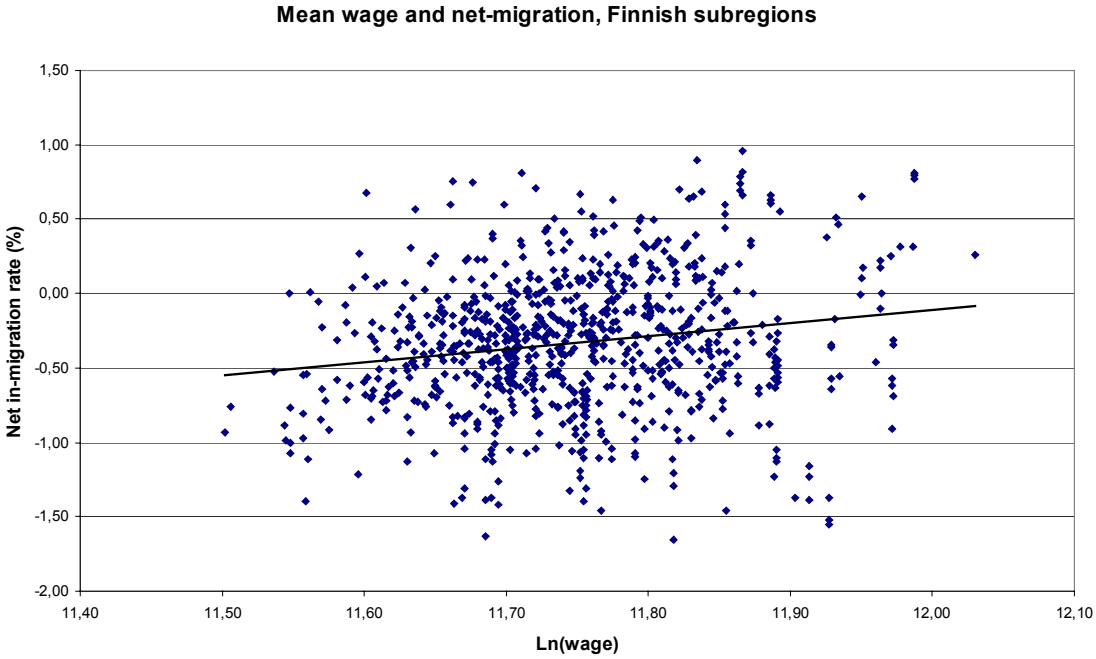


Figure 5. Net in-migration and unemployment rate (subregions), 1985-1997

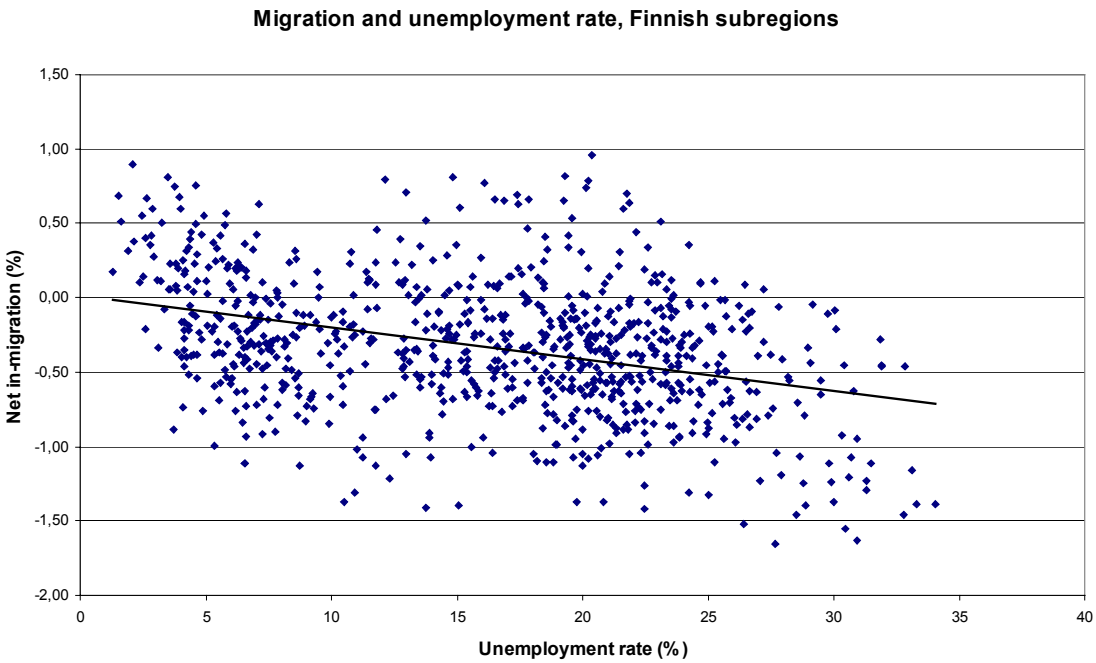
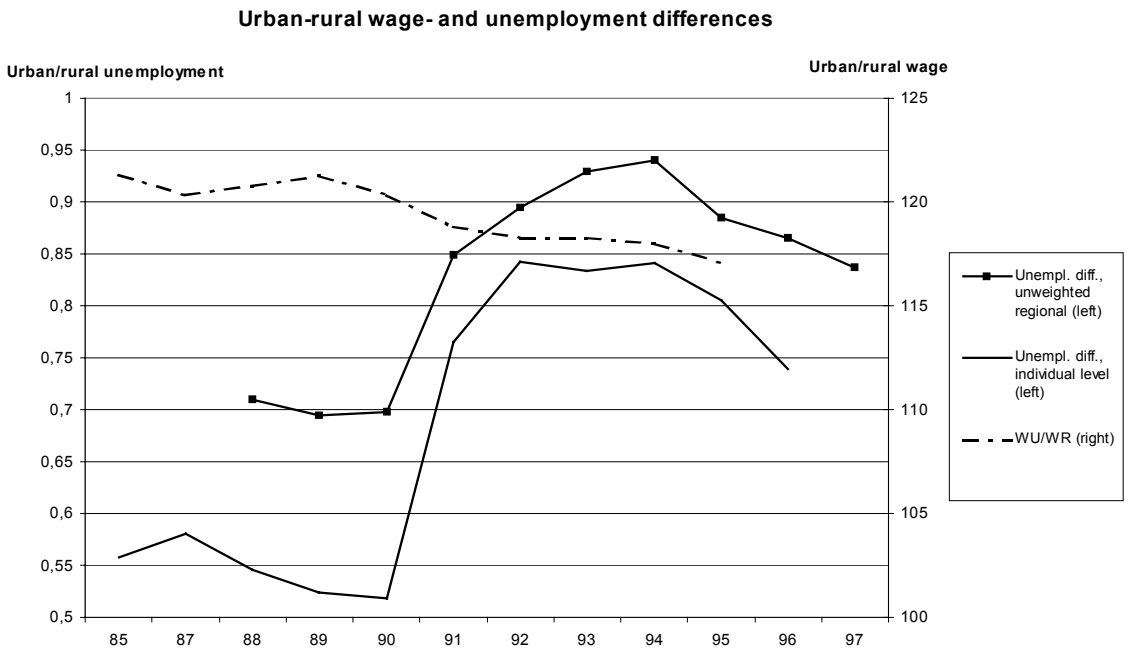


Figure 6. Rural-urban differences in wages and unemployment, 1985-1996



It should be noted that the H-T model assumes that urban wages do not respond to migration (i.e. growing labor force). Finnish studies on regional wage flexibility have not reached a clear consensus of the extent to which regional wages are

affected by the level of unemployment. Some argue that wages are rather rigid due to the central bargaining system (Albaek et al., 1999), others find evidence for a downward sloping wage curve (Parjanne, 1997). Yet others argue that the findings depend on the inclusion of region-specific fixed effects, and the inclusion of those abolishes any evidence of a regional wage curve (Pekkarinen, 2001). In the light of those findings it is difficult to reject the hypothesis of zero wage flexibility, so we stick with this prior.

4.3 Tests of the Harris-Todaro and other hypotheses

Let us next look at the census data to see what more it can tell about the flows of human capital in Finland. Interestingly, the individual data reveal whether human capital is actually moving from rural areas to growth centers or whether it is acquired in the urban centers, where universities tend to be established. The data show significant differences across different groups in the level of education (table 2). On average, rural-rural moves comprise 40.4% of all moves, while rural-urban migration forms 30.4%, urban-rural 20.9% and urban-urban 8.1% of all moves. However, the propensity of out-migration to another region type differs widely between education classes in growth centers and other regions. In 1985-96 the average propensity to move out was 1.2% in the rural areas and 1.3% in the growth centers. However, the respective figures for individuals with higher education were 3.2% and 1.5%. The same is true for in-migration propensity from another region type. In fact, those with basic or no education are the only group where the migration balance is positive for rural and negative for urban regions. Migration is clearly widening the education gap between rural and urban Finland.

Table 2. Migrant flows by region of origin and education level (in the current sample)

	By region of origin		By level of education and region of origin					
	Urban regions	Rural regions	Basic or no education		Secondary education		Higher education	
			Urban	Rural	Urban	Rural	Urban	Rural
Out-moves 1985-96	2 795	6 801	749	1 709	1 459	3 893	587	1 199
In-moves 1985-96	3 705	5 891	701	1 757	2 167	3 185	837	949
Moves to urban regions	785	2 920	135	1 143	410	1 757	240	597
Moves to rural regions	2 010	3 881	614	566	1 049	2 136	347	602
Number of inhabitants	150 054	249 389	62 626	124 032	63 738	106 635	23 690	18 722
Out-migr propensity (to other region type)	1.3 %	1.2 %	1,0 %	0.9 %	1.7 %	1.7 %	1,5 %	3.2 %
In-migr propensity (from other region type)	2.0 %	0.8 %	0.9 %	1.0 %	2.8 %	1.0 %	2,5 %	1.9 %

The analysis of migration determinants will be conducted in three stages. In the first stage rural and urban wages and employment probabilities are predicted for each individual. The predictions are then used in the migration model. Finally, based on the estimations it is possible to calculate necessary changes needed to influence the existing migration pattern. Variable descriptions are presented in the appendix. Apart from expected real wages and employment probabilities the explanatory variables reflect various personal and family characteristics. Distance is indicated as the kilometer distance to the closest urban region, and in the case of urban residence distance to the next urban region.

Estimating the employment status equation is fairly straight-forward. Based on several earlier studies, employment status (employed vs. not employed) is explained by gender, schooling, age and various family status indicators. Moreover, the probability of being employed if usually found to be greatly affected by earlier unemployment experience and hence the duration of unemployment in earlier periods is also included in the model. Finally, the H-T model assumes that urban employment probability grows with time spent in the urban region so this is also taken into account. It is found that urban and rural coefficients are rather similar in applicable parts: education, age (up until 39 years when employment probability peaks), being married and being household head are associated with higher employment probabilities, whereas a greater household size and longer previous unemployment duration reduce the probability (table 3). The coefficient of the latter variable for women differs between rural and urban areas. Time spent in urban regions is associated with a higher probability, as expected, but the estimate is not statistically significant. The signs and magnitudes of the estimated coefficients seem reasonable, and are in line with previous studies (e.g. Lucas, 1985).

Table 3. Employment probabilities and estimates

Observed	Urban	Rural
Males / females	0.74 / 0.73	0.69 / 0.66
Estimated coefficients		
Intercept	-3.764 (.091)	-4.407 (.082)
Female	0.029 (.019)	-0.075 (.017)
Years of education	0.060 (.004)	0.086 (.004)
Age	0.232 (.005)	0.238 (.004)
Age^2	-0.003 (.001)	-0.003 (.001)
Household head	0.232 (.024)	0.234 (.020)
Married	0.250 (.022)	0.355 (.018)
Household size	-0.087 (.005)	-0.062 (.005)
Time in urban region	-0.038 (.009)	-
$(\text{Time in urban region})^2$	0.003 (.001)	-
Unemployment duration before period t	-0.635 (.011)	-0.570 (.008)
Helsinki	0.151 (.017)	-
Pseudo R2	0.180	0.188
N	99 520	131 375

*Notes: Sample is individuals age 18-60. Models include time-dummies. Robust standard errors are reported in parentheses.

The wage equation requires somewhat more consideration. Firstly, the H-T model refers to regional real wages and hence we need to deflate the nominal wage by the cost of living in the region. However, a regional cost-of-living –index is not available. On the other hand, the main difference in regional cost of living is the housing price, and we do have those data at subregional level for 1985-96. As housing constitutes about a quarter of all consumption expenditure (growing from 18% in 1985 to 28% by 1996) we develop an index for the "cost of living" based on housing prices and its share in the household budget. As expected, rural-urban real wage differences are smaller than differences in nominal wages (table 4, upper panel). All wages referred to are real wages from now on. Secondly, as our interest is in predicting expected urban and rural wages for each individual, the OLS-estimates for those with a positive observed wage is likely to be give a biased idea of what those not working would earn if they were employed. There are several ways to deal with this selectivity issue, for example the Heckman procedure (Heckman, 1979), the truncated regression etc. Heckman correction was tried first, yet the results indicated that the distributional assumptions are not met. The value of rho (correlation of the errors in the wage equation and the selection equation) was very close to one, indicating serious problems with the estimates. Moreover, the predicted wages were unrealistically high. Hence we opt for using a truncated regression, taking into account that wages are observed only for those working.

Table 4. Determinants of log real wages

	Urban		Rural	
Observed averages	Males	Females	Males	Females
Nominal wage	11.46	11.17	11.08	10.88
Real wage	11.43	11.14	11.13	10.92
Estimated coefficients				
Intercept	7.998 (.042)	8.029 (.041)	7.515 (.047)	7.192 (.043)
Years of education	0.106 (.002)	0.110 (.002)	0.133 (.003)	0.151 (.003)
Experience	0.126 (.002)	0.092 (.002)	0.124 (.002)	0.109 (.002)
Experience2	-0.002 (.000)	-0.002 (.000)	-0.002 (.000)	-0.002 (.000)
Time in urban region	0.010 (.008)	-0.014 (.007)	-	-
(Time in urban region)2	-0.002 (.001)	0.001 (.000)	-	-
Duration of unempl. before t	-0.574 (.013)	-0.465 (.013)	-0.444 (.010)	-0.390 (.011)
Helsinki	0.066 (.010)	0.098 (.010)	-	-
Log likelihood	-46886.7	-47694.6	-68460.0	-60055.3
Sigma (constant)	0.942 (.004)	0.900 (.003)	1.159 (.004)	1.004 (.003)
N	34 506	36 319	43 702	42 217

*Notes: Truncated regression. Sample includes individuals aged 18-60. Models include time-dummies. Robust standard errors are reported in parentheses.

The wage equation is estimated separately for rural and urban regions, and for men and women. On average, rural-urban wage differences are greater for men than for women, and the male-female wage difference is larger in urban than in rural regions. The logarithmic wage model includes the typical variables: years of schooling, years of labor market experience and time spent in the urban regions. Duration of previous unemployment is also included as longer job search is found to lead to lower reservation wages (e.g. Mortensen, 1986; Addison and Portugal, 1989; Folmer and Van Dijk, 1999). It is found that women enjoy somewhat greater returns to schooling than men, and the returns are greater in rural areas (table 4). The latter is quite plausible because skilled labor is relatively more scarce in rural regions. On the other hand, returns to labor market experience are greater for men than for women and regional differences in those returns are smaller. A similar conclusion was made by Folmer and Van Dijk (1999), for example. In our data the wage profile appears to be clear: experience has a positive coefficient while experience squared has a negative one. Wage level peaks at 26 years of experience for men (25 in rural regions) and at 30 years for women (29 in rural regions). Unemployment duration has a negative effect on wages, and the effect is somewhat greater in urban regions. Finally, time spent in urban region has a positive effect on real wages for men, as expected, but the coefficient is not significant. Somewhat surprisingly, the effect is negative for women.

To further test the hypotheses concerning migration flows, a multinomial logit model is estimated for individual migration choices during 1985-96. As explained above, the choice between multinomial versus nested logit is a decision that needs to be made on the basis of statistical testing (Hausman and McFadden, 1984; Small and Hsiao, 1985). The Hausman test for the IIA assumption lends support for the multinomial vs. nested logit model. Note that Hausman test is only reliable if the estimated model meets the asymptotic assumptions of the test, i.e. Chi(2) is greater than zero. However, Hausman and McFadden (1984) note that a negative value of the test statistic is also evidence that the IIA has not been violated. The alternative test for the IIA assumption is the Small-Hsiao test, which in our case gives the same result: adding or deleting outcomes does not affect the odds among the remaining outcomes. Both test statistics are reported for each model presented in table 5. The consistency of the two tests leads us to conclude that independence of irrelevant alternatives is a plausible assumption and multinomial logit is the correct model choice. Finally, the Wald test for combining alternative outcomes shows that no categories can be collapsed together.

First a single multinomial migration model including all origin regions is estimated. Table 5 reports the coefficients for categories “move to an urban region” and “move to a rural region”. Base category “stay” is normalized to zero. The results concerning demographic variables and other personal characteristics are very similar to those obtained in earlier migration studies. As usual, family size and home ownership tend to keep people from moving, whereas young age and education motivate to move. Household heads also appear to be more committed to staying in their current region. Interestingly, looking at the comparison between rural and urban migrants, education promotes migration to urban areas much more than it does to rural regions. Age reduces migration probability to urban and rural region in a very similar manner, whereas being female only reduces migration propensity to urban regions. Similarly, the negative coefficients of home-ownership and household head are much larger in case of urban than rural migration. Marital status is a less significant determinant of migration, but being married does seem to have a slight positive impact on urban migration and a just significant negative impact on rural migration.

Table 5. Coefficients for multinomial logit model. All origins. 3 choices, base category (coefficients set to 0): staying

Variable	Migrating to urban region		Migrating to rural region	
	Coeff.	(p-value)	Coeff.	(p-value)
Constant	6.630	(.000)	5.048	(.000)
Female	-0.574	(.000)	-0.001	(.999)
Years of education	0.418	(.000)	0.111	(.000)
Age	-0.035	(.000)	-0.040	(.000)
Household head	-0.314	(.000)	-0.021	(.695)
Married	0.158	(.028)	-0.102	(.092)
Owns a dwelling	-1.804	(.000)	-0.619	(.000)
Commuter	0.561	(.000)	1.146	(.000)
Household size	-0.154	(.000)	-0.224	(.000)
Urban origin region	-1.102	(.000)	-0.608	(.000)
Distance to nearest urban	-0.002	(.000)	0.001	(.000)
Urban wage	2.552	(.000)	-0.661	(.001)
Rural wage	-4.015	(.000)	-0.208	(.376)
Urban employment	11.197	(.000)	-3.026	(.000)
Rural employment	-7.768	(.000)	5.460	(.000)
N	287 350			
Pseudo R2	0.139			
Hausman Chi2 (omitted outcome)	0.330 (for H0)		-2.696 (for H0)	
Small-Hsiao Chi2	19.476 (for H0)		14.573 (for H0)	
Wald (each pair) Chi2 (p>Chi2)	U-R: 1169.19 (.000) U-S: 5119.81 (.000) R-S: 4715.91 (.000)			

*Notes: Sample: individuals aged 18-60. Model includes year dummies. P>|z| based on robust standard errors. Predicted probabilities were: Pr(Stay)=0.97, Pr(Urban)=0.013 and Pr(Rural)=0.017.

Interpretations of the results of the multinomial logit should be based on marginal effects, not coefficients. Indeed, the relative magnitudes of marginal effects may be quite different from the multinomial logit coefficients. We have calculated the marginal effects for continuous and dummy variables, and report those for wages and employment in table 6. For example, as far location effects are concerned individuals currently living in urban regions are more likely to stay. Urban origin reduces migration to both other urban areas (by 0.5%) and rural regions (by 0.6%). The other location effect, the distance-decay, is also clear but small in magnitude. Distance to the next urban region reduces migration to urban areas but increases migration to rural areas. The size of this effect is minor, however: an increase of 100 kilometers in the distance to an urban region reduces the predicted probability of urban migration by 0.1%, as much as an increase of 6 years in the average age. Compared to the effects of most other variables (such as schooling), these changes are very small. An interesting finding is the positive

effect of previous inter-regional commuting experience on urban (0.3%) and especially rural (1.5%) migration. This supports the view that people may first look for jobs in other regions and move only later.

Most interestingly, however, also the H-T variables show a clear pattern. In the "all-origins model" urban wages and employment significantly increase mobility to urban regions whereas the rural counterparts reduce it. In case of rural migration greater rural employment probability increases and greater urban probability reduces migration. The wage effects for rural migration are not so clear, however. A higher expected urban wage reduces rural migration, as expected, but expected rural wage has no effect. The coefficients of expected urban and rural employment probability are all significant and large compared to estimated effects of other variables (11.20 and -7.77 for urban migration, and –3.03 and 5.46 for rural migration, respectively). The effects of urban and rural expected wages are more modest in magnitude. The conclusion here is very similar to that of Lucas (1985). In other words, the higher the persons expected earnings or employment probability if in urban area the more likely he or she is to move to an urban region. And conversely, the higher the expected wage or employment chances in rural regions the more likely the person is to move there. In the Finnish case, however, employment situation seems to be the most important determinant of migration. More discussion on the magnitudes of these effects follows in the next section.

Secondly, two separate models for urban and rural origin regions were estimated. Predicted probabilities for urban residents were: Pr(Stay)=0.84, Pr(Urban)=0.16 and Pr(Rural)=0.01. For rural residents the probabilities were: Pr(Stay)=0.95, Pr(Urban)=0.03 and Pr(Rural)=0.02. The results of the multinomial logit models by region of origin give slightly different results, yet all the main conclusions remain valid (results not reported here, marginal effects for the H-T variables in table 6). We should note, however, that in the origin-specific models the H-T variables only have a true interpretation for the cases urban to rural and rural to urban migration. In the other cases the staying effect is dominant, as high urban wages and employment are likely to encourage staying in the current urban area rather than move to another urban area. Finally, to see if the model can better explain flows between rural and urban areas (not rural-rural or urban-urban) an additional model was estimated. The model assumes (unrealistically) that all urban regions are perfect substitutes, and so are all rural regions. If no switch from urban to rural (or vice versa) was made the migration variable is set to equal zero. Again all the basic conclusions remained the same, but the magnitudes of the coefficients did vary. For example, an additional year of education increases rural to urban migration twenty times more than it increases urban to rural migration. However, the marginal effects of the variables are so small in this model that no dramatic conclusions can be made.

4.4 Predictions of the H-T model

Let us now concentrate on the analysis of the effects of expected wages and employment. Table 6 reports the marginal effects for all four models mentioned above, together with the IIA tests. It is clear from all models that employment plays a much greater role than wages as a determinant of migration flows. Assuming that urban wages increase by 1% compared to rural wages migration propensity to urban areas will increase by 1.3% both in general and from rural regions. A similar sized increase in urban employment would lead to a 5.5% increase in migration propensity to urban regions in general and a 12.6% increase from rural areas! Note that the average migration propensity to urban regions is 0.5% in any given year (0.35% from rural areas), and these numbers must be related to that. The converse is also true. If rural wages were to increase relative to urban, the average staying propensity would increase by 2.2% and by 2.7% in rural areas. However, increasing rural wages would have no impact on migration to rural areas on average, because moves to rural regions from urban and other rural areas display the opposite signs. Interestingly, a 1% increase in rural employment opportunities would increase migration propensity to rural areas by 5.7% on average, propensity of staying in rural areas by 6.6%, even though it would not encourage migration from urban to rural areas. Note that there may still be large differences between individual "rural areas" (as defined here) because the group of rural regions is very heterogeneous. In the light of these results, it seems that encouraging migration to rural areas by means of economic policy would be a difficult task. For each urban job created 1.5 to 2 rural jobs are needed to keep the staying propensities unchanged.

Table 6. Marginal effects for expected wages and employment probabilities

	Model: all origin regions		
	Move to U	Move to R	Stay in original region
Urban wage	.013***	-.007***	-.006***
Rural wage	-.020***	-.002	.022***
Urban employment	.055***	-.032***	-.023***
Rural employment	-.038***	.057***	-.018***
	Hausman: Chi21=0.33 (for H0), Chi22=-2.70 (for H0)		
	Small-Hsiao: Chi21=19.48 (for H0), Chi22=14.57 (for H0)		
	Model: rural origin region		
	Move to U	Move to other R	Stay in rural region
Urban wage	.013***	-.002	-.011***
Rural wage	-.020***	-.007**	.027***
Urban employment	.126***	-.018	.107***
Rural employment	-.107***	.042***	.064***
	Hausman: Chi21=0.53 (for H0), Chi22=--2.68 (for H0)		
	Small-Hsiao: Chi21=22.23 (for H0), Chi22=24.13 (for H0)		
	Model: urban origin region		
	Move to other U	Move to R	Stay in urban region
Urban wage	-.003	-.016***	.019***
Rural wage	-.003	.008**	-.004*
Urban employment	-.021***	.016*	.006*
Rural employment	.039***	.010	-.050***
	Hausman: Chi21=0.10 (for H0), Chi22=-0.78 (for H0)		
	Small-Hsiao: Chi21=28.15 (for H0), Chi22=19.39 (for H0)		
	Model: switches between R and U		
	From R to U	From U to R	Stay in same region type
Urban wage	.0001***	-.0001***	-.0001***
Rural wage	-.0001***	.0001**	.0001***
Urban employment	.0002***	.0001*	-.0002***
Rural employment	-.0001***	.0001	.0001***
	Hausman: Chi21=4.29 (for H0), Chi22=0.00 (for H0)		
	Small-Hsiao: Chi21=27.38 (for H0), Chi22=30.60 (for H0)		

Note that some of the demographic factors may serve to "automatically" reduce the extent of migration in general, and rural to urban migration in particular. For example, an increase in the average age by 7 years (same as occurred between 1970 and 2000) will increase the propensity of staying by 0.7% and reduce the propensity of migration to urban regions by 0.1%. Moreover, as the growth in educational attainment will necessarily be reduced from its very high recent pace, the speed of rural urban migration may also be reduced as a result. However, education affects migration to urban regions in two ways: firstly, by increasing mobility in general, and secondly, by improving the expected relative earnings

and employment probability in urban areas. All these effects are very small, however, and other demographic characteristics (such as decreasing family size) serve to increase the speed of rural urban migration. To conclude, the results presented above indicate a considerable level of labor mobility. It is also suggested that it is particularly the "human capital component" of the labor force that migrates to and stays in urban growth centers. Both the aggregate and individual data suggest that there is a trend in Finland of a high-degree regional concentration of population into a few growth centers, one that particularly seems to be emerging in the aftermath of the recession of the 1990s. Like the H-T hypothesis suggests, the causes of that concentration seem to be the better earnings and in particular the employment chances that the highly educated individuals have in urban regions. However, it should be noted that some workers are moving towards rural regions (as defined in the present study), and therefore the speed at which the urban pattern is developing is somewhat retarded.

5. Discussion and conclusions

The present study seeks to test the Harris-Todaro hypotheses directly using micro level data. Other hypotheses, such as distance-decay, were also tested. Finnish population census data were used to analyze the migration decisions of some 36,000 individuals during 1985-96. The regional pattern in Finland has experienced some degree of concentration ever since the 1950s, and this development has speeded up considerably in the 1990s. Moreover, the movement of population towards growth center regions switched from pure rural-urban migration (before mid 1980s) into movement from even middle-sized towns to few metro regions (1990s). The present study analyzed those trends at the subregional level, and found clear evidence for the accumulation of population and human capital in the five central regions. The micro level results yielded some further evidence for the Harris-Todaro model: earnings and employment possibilities lure people to centers. This indicates greater perceived utility in the regional growth centers, as assumed in the model. Hence, these "early migration models" are quite consistent with mobility of the degree observed in Finland (Lewis, 1954; Harris and Todaro, 1970).

Even though the pace of rural-urban movement has speeded up recently, there are some decentric forces in operation, too. In other words, some persons are also moving from growth centers to rural Finland, and, to a greater extent, from one rural region to another. These migrants tend, on average, to have lower human capital than those migrating to growth centers. Hence, even though the speed of urbanization is reduced by rural migration, the concentration of human capital does not diminish to the same extent. The most recent figures in Finland show that the speed of concentration may actually have been accelerating as the decade ended. These findings are in accordance with international studies (Krugman 1991b, Krugman and Venables, 1995). If this development is considered to be a threat to regional stability an option would be to try and increase the number of growth regions by supporting small-scale regional centers and encouraging the mobility of human capital into smaller towns. Actual migration controls have generally been considered problematic (Harris and Todaro, 1970) and are therefore not usually recommended. On the other hand, regional concentration may actually be *efficient* (i.e. at least theoretically it is not a horror scenario), and to be competitive in the global economy, Finland needs at least one thriving growth pole. If one accepts this view, the main concern will be to create more urban jobs to reduce the unemployment in growth centers.

To sum up, depending on the policy goals the present study can offer the following policy conclusions. Firstly, it is not likely that a sizeable urban-rural movement can be achieved. The speed of rural-urban migration may be retarded in future as the average age of population increases and the growth of the level of education slows down. However, as indicated above the aims of reducing rural

depopulation and simultaneously improving overall employment may be somewhat contradictory. If the aim is to reduce the extent of rural depopulation, the best policy is to concentrate on rural job creation schemes in order to improve the rural employment relative to urban employment. Tax cuts to rural residents are likely to be less successful, and may be politically suspect since urban real wages are not that much higher anyway as lower housing prices compensate for the somewhat lower rural nominal wages. However, in order to decide whether a euro is best spent in creating jobs in rural or urban areas one would need information about the relative costs of job creation schemes in different regions. Further research is necessary to establish the relative costs and benefits of such schemes.

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Appendix

Appendix 1. Variable descriptions

Variable name	Description	Mean	St. Dev.
Migration	Does not move = 0, moves to urban region = 1, moves to rural region=2	0.04	0.25
Female	Yes=1, no=0	0.50	0.50
Years of education	Basic education = 9, lower level of secondary = 10, upper level of secondary (e.g. high-school) = 12, lowest level of higher = 13, undergraduate level (e.g. BA) =15, graduate (e.g. MA) =16, postgraduate (e.g. Ph.D.) = 22	11.01	2.05
Age	Years of age	38.02	11.66
Household head	Yes=1, no=0		
Married	Yes=1, no=0	0.54	0.50
Owns a dweling	Yes=1, no=0	0.40	0.48
Commuter	Yes=1, no=0	0.33	0.47
Household size	Number of persons	3.03	1.57
Urban origin region	Yes=1, no=0	0.39	0.49
Distance to nearest urban	Kilometers to nearest (other) urban region	95.07	104.92
Urban wage	Ln(real wage), estimated	11.16	0.56
Rural wage	Ln(real wage), estimated	10.99	0.57
Urban employment	Prob(employed), estimated	0.73	0.21
Rural employment	Prob(employed), estimated	0.69	0.22
Experience	Years of experience = Age - 7 – yeears of education	20.00	12.11
Time in urban region	Years lived in an urban region before t	2.55	3.82
Duration of unemployment	Years of unemployment before t	0.13	0.51
Helsinki	Lives in Helsinki: yes=1, no=0	0.22	0.42

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