JOURNAL OF REGIONAL SCIENCE, VOL. 44, NO. 3, 2004, pp. 543–568

REGIONAL LABOR MARKET DYNAMICS, HOUSING, AND MIGRATION*

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ABSTRACT. This study explores the impact of plant-level labor market dynamics and housing markets on gross migration flows. The internal and the external reorganizations of regional labor markets are shown to be related. An increase in internal turnover of jobs and workers in regional labor markets is found to increase net-migration. This effect arises mainly from a reduction in out-migration. Housing markets constitute constraints for migration. In particular, an increase in regional housing prices and a large share of owner-occupancy housing discourages net-migration to a region by reducing in-migration. In contrast, the out-migration rate remains largely unaffected by housing markets.

1. INTRODUCTION

Migration has been at the center of regional economics for decades and has gained more importance in recent years. Most of the developed countries are experiencing a declining labor force as the baby boom generation approaches retirement age. Provided that the working-age population is spatially mobile, migration contributes to a more efficient resource allocation of scarce labor resources across regions. This improves the matching process of regional labor markets, which in turn reduces frictional unemployment and improves the competitiveness of the economy as a whole, and especially for economies that are at the receiving end.

This study investigates migration in Finland, using both net flow and gross flow data on interregional migration among 85 regions. The time period under examination covers 1988 to 1997. Finnish regions have similar labor market institutions, similar legislation, and similar education systems. This homogenous institutional setting is connected to wide and persistent regional

*We would like to thank three anonymous referees for valuable comments. We also thank Seppo Laakso for providing us with data on housing prices. Paul A. Dillingham has kindly checked the language. All remaining errors are solely our responsibility.

Received: October 2002; Revised: June 2003; Accepted: September 2003.

Blackwell Publishing, Inc., 350 Main Street, Malden, MA 02148, USA and 9600 Garsington Road, Oxford, OX4 2DQ, UK.

disparities (see Pehkonen and Tervo, 1998). This typically occurs in most countries with comprehensive labor market regulations and binding collective agreements. Because of these institutions, wages fail to adjust to changes in regional labor demand. Thus, the adjustment must happen in terms of quantities. In this sense, binding collective agreements may enhance the importance of economic factors affecting interregional migration flows.

The investigation into gross flows offers the opportunity to get a clearer picture of the interactions between different markets and migration. It is a well-documented fact that in- and out-migration are strongly and positively correlated (for discussion of this compositional effect, see Westerlund, 1998 and Tervo, 2001). Given this stylized feature, one is tempted to think that the same factors hinge behind both migration flows. However, the estimation results of this study strongly reject this view. Results show that different variables can have a similar impact on net-migration, having totally different gross migration effects. Accordingly, the policy recommendations differ according to whether a region is losing or gaining population through the process of migration.

The current study is not the first to examine both the net-migration and gross-migration flows. Ever since Lowry's (1966) results implied that the behavior of in-migrants is different from that of out-migrants, gross flows have been examined separately in a number of empirical studies; for a recent survey, see Day and Winer (2001). However, this study differs from most of the previous studies by the following overlapping means. First, the comprehensive measures of the internal reorganization of regional labor markets are used, together with the conventional labor market variables, in exploring the possible connection between the internal and the external reallocation of labor resources. It is hypothesized that the intensive pace of the internal reorganization of a regional labor market reduces the out-migration of the working-age population. A panel of the Finnish regions is highly suitable for scrutinizing this issue. During the investigation period, the internal turbulence of regional labor markets was high, owing to the severe economic downturn at the beginning of the 1990s that resolved with the export-led recovery at the end of the decade.

Second, the role of housing markets in the adjustment of regional labor markets has been strongly stressed (for example in Oswald, 1996), but this issue has rarely been examined in terms of gross-migration flows. By focusing on gross migration, this study is able to provide a more detailed answer to the question of how binding the constraints produced by housing markets actually are. In addition, we are able to examine the impact of labor and housing markets on the migration flows of the working-age population. The advantages of focusing on the working-age population has been recognized before—see Pissarides and McMaster (1990)—but the available migration data has not usually been detailed enough for analyzing this segment of the population.

Third, there are still relatively uncovered methodological issues in the literature on migration. One potential difficulty in modeling migration flows is that many of the independent variables cannot be convincingly argued to be truly exogenous. This places some doubts on the results produced by the conventional panel data estimation methods. To examine the robustness of the results, we experiment with various GMM specifications that allow us to instrument potentially endogenous variables with their lagged levels in the dynamic setting (see Arellano and Bond, 1991). Although this modeling framework is subject to criticism and proper instruments for potentially endogenous variables are superior to lagged values, we believe that the framework offers the second-best solution for testing and dealing with endogeneity problems, especially since our data set does not contain economic instruments that could be argued to be truly independent of migration flows.

The paper is organized as follows. The next section provides theoretical underpinnings for empirical models. In the third section, we introduce the data and briefly discuss the evolution of migration flows in Finland. In section four we introduce the empirical framework. The fifth section presents the empirical estimates of the effects of dynamic regional labor markets and housing markets on gross migration flows. This section also reports other interesting findings. The final section presents our conclusions.

2. THEORETICAL CONSIDERATIONS

The motivation for the empirical part of the study can be derived from the optimizing behavior of individuals (see Sjaastad, 1962). The probability of moving to another location, $P(M)$, exceeds zero if and only if the difference between the individual's discounted utility streams in some other location i, $U_i(t)$, exceed the discounted utility streams in the current location o, $U_o(t)$, that is

$$0 < P(M) \leq 1 \text{ if and only}$$

$$U_i(t) = \int_{t=0}^{n} Q_i(t)e^{-rt}dt - C > \int_{t=0}^{n} Q_o(t)e^{-rt}dt = U_o(t)$$

where Q refers to the overall (existing or expected) quality of life, r is the discount factor, and C refers to the fixed costs of migration. The observed migration flows consist of individual decisions that are aggregated over all potential migrants. By this means, net and gross migration flows are functions of the same variables that affect the behavior of individuals. It should be noted that the equations above do not necessarily restrict the determinants of utility terms to be the same between gross migration flows, so different variables can have similar net-migration effects, having totally different gross-migration effects. This means that the focus on the net-migration rates may provide an incomplete picture of the adjustment of regional labor markets.

In this study, we express $P(M)_t$ as a function of lagged migration $c(M)$, labor market characteristics $f(x)$, housing market variables $h(z)$, local public sector variables g(y) and other factors s(w) that may affect the migration flows

$$P(M)_t = c(M)_{t-n} + f(INCOME,\ UNT,\ DGDP,\ EJR,\ CF)_{t-n}$$
$$+h(ACCOPRIC,\ OWNHOME)_{t-n}$$
$$+g(DEBTS,\ TAXINC,\ GRANTS)_{t-n}$$
$$+s(AGED,\ UNSK,\ CRIME,\ AGRI,\ ELEC,\ SERV,\ PUBL)_{t-n}$$

Migration has traditionally been viewed as a device in equilibrating the regional system of labor markets (see Mueller, 1982; Ghatak, Levine, and Price, 1996). This equilibrating effect largely depends on regional earnings (*INCOME*) and regional unemployment (*UNT*). Unemployment may also serve as an indicator for job opportunities influencing the expected income in a region—see Pissarides and McMaster (1990)—or, as in the context of the hiring function, unemployment may influence mobility through the activity of the unemployed in job searches outside the home region (Jackman and Savouri, 1992). In a similar fashion to *UNT*, the growth rate of regional *GDP* (*DGDP*) may serve as one determinant of overall job opportunities in a region.

Fields (1976) argued that the unemployment rate is an imperfect indicator of regional labor market opportunities. Individuals living in regions with high internal labor market dynamics may have better prospects of finding a job than those living in regions with relatively sluggish labor markets. Similarly, it is possible that individuals move to regions where internal labor markets are dynamic at the plant level, regardless of high unemployment. For this reason, we have included two measures of gross job and worker flows, namely, the excess job reallocation rate (*EJR*) and the churning rate (*CF*)—see Davis, Haltiwanger, and Schuh (1996)—among the conventional labor market characteristics. The *EJR* is an index of simultaneous gross job creation and destruction. If this measure is positive, the magnitude of gross job reallocation in a region exceeds the change in net employment. In other words, *EJR* is an indicator of the underlying heterogeneity of labor-demand adjustment at the plant level of the regions. On the other hand, *CF* is called the excess worker turnover rate since it compares worker flows with job flows; the larger the magnitude of *CF* is, the larger the worker flows (hirings and separations of workers) are compared to job flows (creation and destruction of jobs).

The earlier evidence based on plant-level data suggests that the unemployment rate is a poor measure of employment opportunities. This research has largely focused on the pace of job reallocation and worker flows in different phases of business cycles (Davis and Haltiwanger, 1999). With the exception of the study by Eberts and Montgomery (1995), there have been no empirical studies that investigate the regional aspect of the reallocation of labor markets. To our knowledge, the measures of job and worker flows have not been connected to regional migration flows previously. This apparent lack of focus on the regional aspect of micro-level reallocation is at least partly related to the limited availability of plant-level data sources. It is interesting to see whether the internal dynamics of labor markets provide an explanation for several puzzling findings according to which regional labor markets have only a limited influence on migration; for a discussion on this issue, see Westerlund (1998).

There are several ways that gross and job worker flows may influence migration flows. Contini and Revelli (1997) argue that the movements of jobs and workers are closely connected to each other via the vacancy chain. The hiring and separation of workers launch a sequence of adjustments at the plant level in a region. Accordingly, the mobility of employed workers across plants within regions creates opportunities for the unemployed. Lazear (1998), on the other hand, argues that young and fast-growing firms are characterized by a great deal of simultaneous hiring and separation of workers that is captured by the churning rate. These are often the very same firms that attract migrants from other regions. Finally, Acemoglu (2002) points out that churning is associated with the adaptation of new vintages of technology at the plant level. This implies that the regions that experience a great deal of churning are the same regions that stimulate large flows of in-migration, because technological progress at the plant level of the regions provides employment opportunities for recent migrants that have not yet established their labor market positions.

Housing markets have been allowed to affect migration flows through housing prices (*ACCOPRIC*) and share owner-occupied houses (*OWN-HOUSE*). Housing has a special role in the adjustment of regional labor markets. Individuals need to live relatively close to their working place and housing costs comprise almost entirely the regional differences in the cost of living in Finland. It should be noted that changes in housing prices may have different effects on in-migration and out-migration. At the receiving end, an increase in housing prices may slow down in-migration since higher accommodation prices may constrain some households who prefer to move (see Cameron and Muellerbauer, 1998). In original locations an increase in housing prices may have two opposite effects (Böheim and Taylor, 2000). On the one hand, individuals may cash in on their property and move elsewhere and, on the other hand, the appreciating value of the asset may reduce the propensity to migrate. During economic downturns the impact of decreasing housing prices may have a completely different effect on the mobility of individuals. This may generate capital losses to households and reduce the propensity to migrate (see Henley, 1998).

Owner occupation (*OWNHOME*) has recently been connected to higher unemployment both at the regional level (Oswald, 1996) and at the national level (Layard and Nickell, 1999). One explanation for these findings is that owner occupation forms an obstacle to mobility by locking people to regions. If this is the case, higher owner occupation is connected to smaller out-migration flows and to the sluggish adjustment of regional labor markets, which is reflected in high regional unemployment rates. It is interesting to see whether this hypothesis passes the empirical test put forward in later sections.

Public policy, and its impact on the allocative efficiency of the economy in terms of labor mobility, has been under examination in several studies—see Shaw (1986), Westerlund (1998), Day and Winer (2001), and Fishback, Horrace, and Kantor (2001). There are, however, certain controversies about the significance of public policy. For instance, in the Canadian context Shaw (1986) concludes that the fiscal structure that subsidizes residence in contracting regions has crowded out the influence of traditional market-based variables on migration. Day and Winer (2001) conclude in a recent study that the impact of public policies has a small impact on the volume of migration. Even though the exact magnitude of the impact of public policies is somewhat uncertain, they have been found to affect migration flows. Thus, their presence is also justified in this study owing to the presence of the large-scale local public sector in a Nordic welfare state.

In Finland, local government provides most of the social welfare, health care, and educational services. We approximate the capacity of municipalities to produce services for citizens through three types of fiscal factors that control for regional differences in the financial situation, namely, long-term debts (*DEBTS*), received taxes (*TAXINC*), and state grants (*GRANT*). Equality among individuals has been the main argument for state grants, so state grants have been the highest in the contracting regions. Until the mid-1990s, state grants were based on the matching grant system, under which regime state grants were an important factor in explaining regional differences in per capita expenditures (Moisio, 2002). This connection diminished at the end of the 1990s due to several reforms of the state grant system that almost halved the total sum of state grants paid to regions. This decline has been partially compensated through the tax system by giving regions a larger share of company taxes, which is captured by the *TAXINC* variable.

It is likely that fiscal variables have only a minor impact on migration flows between travel-to-work areas. The Tiebout hypothesis (1956) states that individuals will sort themselves across local communities according to their public good preferences. One of its central assumptions is perfect mobility without any costs. Since moving costs increase with distance, the local public sector can be more instrumental in determining the migration flows within the travel-to-work areas. In contrast, the migration flows between travel-to-work areas, as studied here, are likely to be driven by the opportunities that arise in labor and housing markets.

When it comes to other determinants of migration flows, differences in the demographic factors of regions influence the potential to generate mobility. Several individual-level studies have shown that the young and the highly educated have a higher propensity to move (see Ghatak, Levine, and Price, 1996). The proportion of individuals aged 55 and older from the population (*AGED*) and the proportion of unskilled individuals (basic schooling) from the working age population (*UNSK*) are included in the model to control for these effects.

Many of the factors above can be placed in the context of push and pull factors that have gained much attention in new economic geography models of economic agglomeration (see Krugman, 1998). Many of these effects have been previously discussed in regional science, for example, in the gravity models (Mueller, 1982). In this study the number of serious crimes per 1,000 inhabitants (*CRIME*) is included as an additional push factor to examine whether regional differences in crime have any effect on migration flows. Finally, industry shares of total production (*AGRI, ELEC, SERV, PUBL*) are among the factors explaining migration flows. These serve as additional control variables to take into account the economic boom in electronics and the economic downturn in agriculture, which are likely to affect the interregional mobility of workers across the Finnish regions during the 1990s. Table 1 shows the exact definitions of the variables.

3. THE DATA

This study exploits the fact that Finland is divided into 85 subregions (the so-called NUTS 4 level in the European Union). The yearly observations cover the period from 1988 to 1997. Since the designation of these regions by Statistics Finland is based on commuting regions, the regional division is highly suitable for the analysis of interregional migration, especially since commuting between NUTS 4 regions is almost nonexistent.[1]

The measures of the internal reorganization of regional labor markets are constructed from the longitudinal data on employers and employees. For the description of the data set, see Böckerman and Maliranta (2001). Job and worker flows that are calculated from this data set measure the number of jobs created/destroyed in the population of establishments and workers moving in and out of establishments (i.e., hiring and separation of workers). Annual job and worker flows are then aggregated at the regional level. Unlike most of the studies on job and worker flows, the measurement of job and worker flows includes all the major sectors of the economy, which is essential when examining the relation between the internal and external adjustment of labor markets. In addition, *EJR* and *CF* capture different aspects of the internal reorganization of labor markets, as implied by the relative small correlation of 0.35 that prevails between these two series.

Other variables that describe the evolution of migration flows and regional economy are collected from various data sources maintained by Statistics Finland. The summary statistics of the variables are provided in

[1]The selected statistics of NUTS 4 regions are presented in the Appendix (Table A1). The surface area of regions is typically smaller in Southern Finland owing to its higher population density.

TABLE 1: The Description of the Applied Variables[a]

Variable	Definition/Measurement
The Measures of Migration Flows	
NET (net-migration)	In-migration–out-migration in region *i*, %
IN (in-migration)	Gross inward migration of the prime-aged individuals (15–59) at time *t* divided by the prime-aged population at time $t-1$ in region *i*, %
OUT (out-migration)	Gross outward migration of the prime-aged individuals (15–59) at time *t* divided by the prime-aged population at time $t-1$ in region *i*, %
Labor Market Variables	
INCOME	Income subject to state taxation in region *i*/income receivers in region *i*
UNT	The unemployment rate in region *i*
DGDP	Change in regional GDP in region *i*, %
EJR	Excess job reallocation rate = (job creation rate + job destruction rate) − | job creation rate − job destruction rate | in region *i*
CF	Churning rate = (hiring rate + separation rate) − (job creation rate + job destruction rate) in region *i*
Housing Markets	
ACCOPRIC	Average price of houses in region *i*, 10,000 FIM
OWNHOME	The share of owner-occupied houses from total area in region *i*, %
Municipal Variables	
DEBTS	Long-term debts in region *i*/population in region *i*, 10,000 FIM
TAXINC	Tax revenues of municipalities in region *i*/population in region *i*, 100,000 FIM
GRANTS	State grants in region *i*/population in region *i*, 100,000 FIM
Other Control Variables	
AGED	The number of individuals aged 55 + in region *i*/population in region *i*
UNSK	The number of individuals with basic education in region *i*/population aged 15 + in region *i*
CRIME	The number of serious crime offences in region *i*/1,000 inhabitants in region *i*
AGRI	Value added by agriculture in region *i*/regional GDP in region *i*, %
ELEC	Value added by electronics in region *i*/regional GDP in region *i*, %
SERV	Value added by private services in region *i*/regional GDP in region *i*, %
PUBL	Value added by public sector in region *i*/regional GDP in region *i*, %

[a]For the descriptive statistics, please see Appendix (Table A1).

the Appendix (Table A1). To concentrate on labor-market-induced migration, the migration flows correspond to the working-age population aged 15–59. Even though the data set is rich in information and separates migration flows into different components, its drawback is that we do not know the destination of out-migrants or the origin of in-migrants. However, the current data set is the best available for exploring the dependence between the internal and external reorganization of regional labor markets.

Figure 1 reports the distribution of migration rates across regions. The first striking observation is that during the last decade migration has been concentrating; the net-migration rate is clearly positive only in 6 travel-to-work areas out of 85. This is in stark contrast with previous experience, when the expansion of public sector employment resulted in positive net-migration rates in dozens of travel-to-work areas. The situation is the most severe in eastern and northern Finland, where migration has resulted in a reduction of over 1 percent in the working age population each year.

The examination of the in- and out-migration rates reveals the strong positive correlation between the two flows with a correlation coefficient of 0.88. In-migration and out-migration rates tend to be especially high in southern Finland and in the university regions of eastern and northern Finland. Figure 1 also reveals that the poor net-migration record in eastern and northern Finland is not caused by especially large out-migration flows. The problem mainly arises from small in-migration rates. These observations point to the fact that there are considerable differences in migration patterns across regions. Examination of the factors hinging behind these patterns is the broad issue of interest in this study.

4. EMPIRICAL SPECIFICATIONS

The motivation for the dynamic specification of the explanatory variables is given in the Treyz et al. (1993) study, in which it is argued that migration may respond to lagged economic variables due to the time required to collect and act upon the available information. Lagged dependent variables, on the other hand, are used to capture the potential state dependence in migration flows. To examine this kind of dynamic process of migration flows we specify the following dynamic model

$$Y_{it} = \sum_{k=l}^{P} \alpha_p Y_{i,t-k} + \sum_{k=l}^{P} \beta_p \mathbf{X}_{i,t-k} + \eta_i + \delta_t + \varepsilon_{it} \qquad (1)$$

where Y stands for the selected measure of migration flow and $\mathbf{X}$ is a vector of explanatory variables. The impacts of these variables are allowed to influence migration flows from lags l to p. The unobserved regional effect η_i is taken to be constant over time and specific to each region i. The regional effects are allowed to correlate with the explanatory variables. Any invariant time-specific effects that are not included in the model are accounted for by the

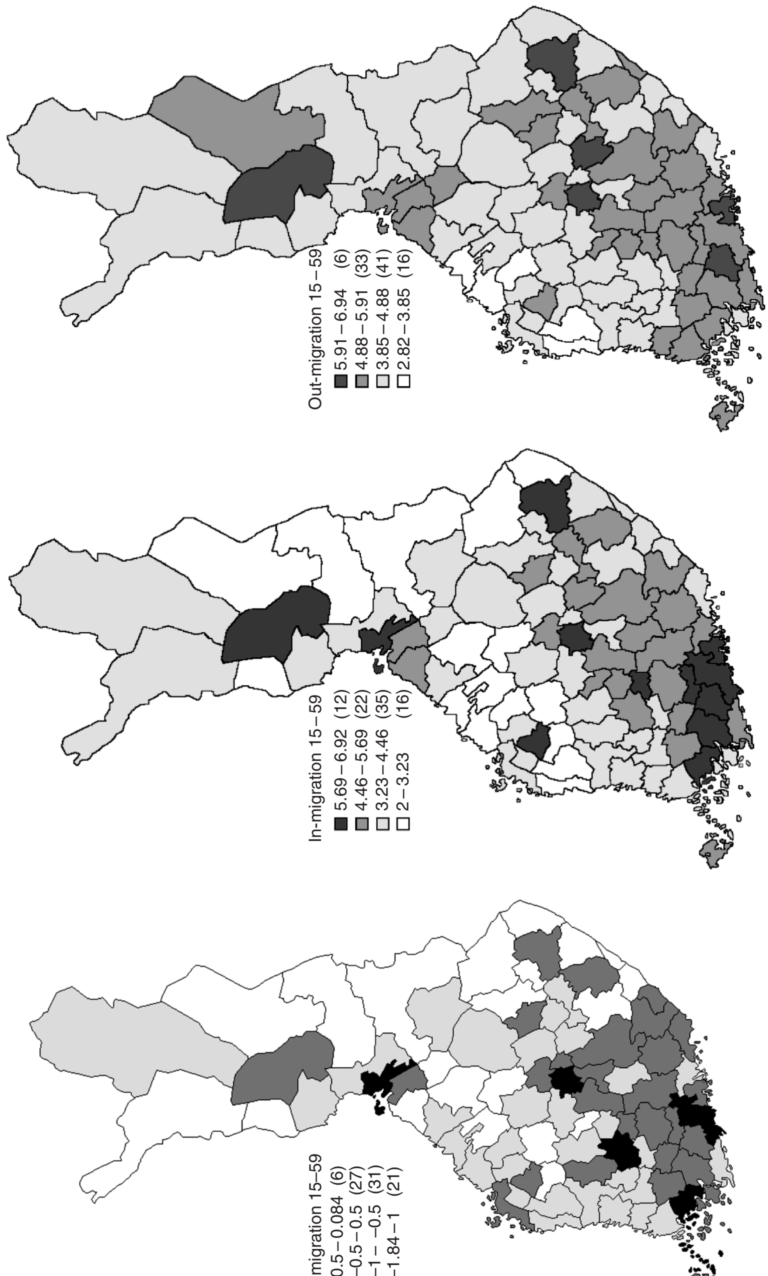

FIGURE 1: The Net-migration (left), In-migration (middle), and Out-migration (right) Rates of the Working-age Population in the Finnish Regions (the Average from 1988 to 1997).

regional-invariant time effects, δ_t. Finally, the remaining disturbances, ε_{it}, are assumed to be independently and identically distributed over i and t.

Nickell (1981) points out that the conventional within-groups (WG) estimator does not consistently estimate the model set up in Equation (1). Similarly, the OLS estimator produces inconsistent estimates in this context. It can be shown that these two estimators are biased in opposite directions (WG downward and OLS upward) in the AR model (see Blundell and Bond, 2000). Since this is also likely to carry over to more complex models, it is informative to report the results of these estimators along with more complex ones.

An alternative to the within-groups transformation used in removing the regional specific effect is to use first differences. This, however, induces a negative correlation between the lagged dependent variable, ΔY_{it-1}, and the disturbance term $\Delta\varepsilon_{it}$. Arellano and Bond (1991) developed the GMM method to overcome this problem. They instrumented the differenced lagged dependent variable with the lagged levels of Y_{it-s}, $s=2, 3, \ldots$ T. The available instruments differ from one time period to another resulting in different reduced forms of first-stage regressions in each period. More specifically, the instrument matrix for region i in the AR(1) model is of the form

$$\mathbf{Z_i} = \begin{bmatrix} y_{i1} & 0 & 0 & \cdots & 0 & \cdots & 0 \\ 0 & y_{i1} & y_{i2} & \cdots & 0 & \cdots & 0 \\ . & . & . & \cdots & . & & . \\ 0 & 0 & 0 & \cdots & y_{i1} & \cdots & y_{i,T-2} \end{bmatrix}$$

where rows correspond to the first-differenced equations for periods $t=3, 4, \ldots, T$. If the model includes strictly exogenous explanatory variables, the leads and lags of the variables can be employed as additional instruments. For practical reasons, strictly exogenous variables are, however, used only as their own instruments and an additional column is included at the end of the instrument matrix.

If the assumption that the explanatory variables are strictly exogenous with respect to $\varepsilon_{\mathrm{it}}$ does not hold, some of the explanatory variables are correlated with the disturbance term as $E(X_{it}\ \varepsilon_{is}) \neq 0$ if $s \leq t$. In this case, these endogenous variables are treated symmetrically with the dependent variable in constructing the instrument matrix, that is, X_{i1} is employed as an instrument for period $t=3$, X_{i1} and X_{i2} for period $t=4$, and so on. Accordingly, the set of valid instruments becomes larger as t increases. Monte Carlo experiments show that the use of the full set of moment conditions in the later cross-sections may result in over-fitting biases in the estimates—see Arellano and Honore (2000). For this reason, it is advisable to remove the least informative instruments from the instrument set.

The identification of the GMM model rests on the validity of the instruments. Blundell and Bond (1998) show that weak instruments connected with near-unit root series may result in seriously biased estimates. They propose the system estimator for the GMM model (GMM-SYS), in which the above moment conditions are combined with the suitably lagged first differences of ΔY_{it} and ΔX_{it} as instruments for the equations in levels. The GMM-SYS estimator is shown to perform well, for example, in production function estimations (Blundell and Bond, 2000). The drawback with this estimator in the current context is, however, that the first moments of the series are required to be time-invariant conditional on common year dummies. This assumption may be strong, given the severe economic downturn and the increase in regional disparities that occurred during the estimation period of this study.

Since the potential bias in the first differenced GMM estimations is connected with weak instruments, it is worth examining the validity of the instruments. These results are reported in Table 2. They correspond to our preferred specifications in which the number of instruments is set at two, that is, the pooled regression of ΔY_{it-1} (ΔX_{it-1}) on Y_{it-2} and Y_{it-3} (X_{it-2} and X_{it-3}) over the estimation period. Along with these, Table 2 reports the results of the regressions of Y_{it-1} (X_{it-1}) on ΔY_{it-1} (ΔX_{it-1}), that are employed in constructing the GMM-SYS estimator.

Encouragingly, the level instruments that form the first-stage regression for the first-difference estimator are jointly significant. There are, however, two variables for which the individual parameter estimates are insignificant, namely, in-migration (ΔIN) and tax revenues ($\Delta TAXINC$). The uncentered first-stage regressions reported at the lower panel of Table 2 show that the GMM-SYS estimator may alleviate the potential problem of weak instruments in the in-migration equation. These findings give some confidence in the choice of instruments employed in this study, especially since in the GMM estimations the lagged combinations of instruments may be more informative than the instrument set based on one series alone.

5. THE RESULTS

Dependent variables at time t are based on the migration flows between the final weeks of periods $t-1$ and t. These dynamic effects of the explanatory variables are allowed to rise from periods $t-1$ and $t-2$ (t and $t-1$ if a variable is modeled as endogenously determined). The choice of lag length is determined by two factors. First, the coefficients of further lagged dependent variables turned out to be insignificant. Second, we already lose three time periods owing to the lags and first-differences, and an increase in the number of lags would shorten the estimation period even further. Consequently, we implicitly assume that the period of two years is long enough for potential migrants both to collect information and to act, based on their information set.

Table 3 shows four sets of results for each migration flow. Since lagged explanatory variables are likely to be collinear, Table 3 reports the sum of coefficients. The corresponding significance levels are based on the Wald test that tests for the joint significance of different lags. The first column shows the results of linear regression that does not take account of regional specific effects. The next column contains the results of the within-groups estimator.

TABLE 2: The Validity of the Instruments[a]

	First Differences										
	ΔNET	*ΔIN*	*ΔOUT*	*ΔUNT*	*ΔEJR*	*ΔCF*	*ΔACCOPRIC*	*ΔINCOME*	*ΔGRANTS*	*ΔTAXINC*	*ΔDEBTS*
X_{t-2}	−0.170	−0.001	0.117	0.617	−0.441	−0.218	0.108	0.165	0.403	−0.016	−0.007
	(0.043)	(0.045)	(0.044)	(0.037)	(0.036)	(0.044)	(0.044)	(0.029)	(0.049)	(0.046)	(0.042)
X_{t-3}	0.167	0.018	−0.083	−0.624	0.351	0.113	−0.100	−0.149	−0.431	0.079	−0.038
	(0.047)	(0.045)	(0.044)	(0.042)	(0.035)	(0.040)	(0.044)	(0.030)	(0.050)	(0.048)	(0.042)
Joint Tests											
WALD	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
R^2	0.03	0.02	0.09	0.37	0.22	0.17	0.01	0.38	0.17	0.46	0.10
	Levels										
	NET	*IN*	*OUT*	*UNT*	*EJR*	*CF*	*ACCOPRIC*	*INCOME*	*GRANTS*	*TAXINC*	*DEBTS*
ΔX_{t-1}	0.855	2.161	3.380	3.046	−0.199	−0.772	1.602	19.131	−1.610	9.055	0.163
	(0.078)	(0.354)	(0.342)	(0.187)	(0.120)	(0.165)	(0.347)	(1.085)	(0.543)	(0.444)	(0.295)
Joint Tests											
WALD	0.00	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.57
R^2	0.19	0.06	0.16	0.34	0.00	0.04	0.04	0.37	0.01	0.44	0.00

[a]The specification labeled as First Differences corresponds to the reduced form regression of ΔX_{t-1} on X_{t-2}, X_{t-3} and Levels correspond to the reduced form regression of X_{t-1} on ΔX_{t-1}. The parentheses below the estimates parameters report the standard errors. WALD reports the p-value of the Wald test testing that H_0: slope coefficients are jointly zero. R^2 reports the adjusted (uncentered) R^2 statistics of the reduced form regressions.

TABLE 3: The Results of Different Specifications: The Sum of Estimated Coefficients[a]

	Net-migration				In-migration				Out-migration			
Dependent	OLS	Within	GMM1	GMM2	OLS	Within	GMM1	GMM2	OLS	Within	GMM1	GMM2
LAGS	0.588***	0.051***	−0.404**	−0.025	0.902***	0.206***	−0.250	−0.165	0.934***	0.248***	0.340	0.549**
Labor Markets Variables												
EJR	0.008**	0.000	0.004	0.026***	0.005	0.001	0.003	0.006	−0.003	0.001	−0.007	−0.005
CF	0.005	0.019*	0.017	0.054***	−0.003	0.009	0.010	0.024	−0.004	−0.007	−0.007*	−0.030**
UNT	−0.023***	−0.069**	−0.055	−0.130**	−0.001	0.015	−0.014	−0.086**	0.024***	0.082***	0.040	0.122***
INCOME	0.018***	0.060***	0.047**	0.073***	0.012***	0.041***	0.064***	0.047**	0.001**	−0.019	−0.019	−0.035
DGDP	0.008	0.009	0.018**	0.021	0.012	0.018*	0.019***	0.019**	0.002	0.009	0.000*	−0.003*
Housing Markets												
ACCOPRIC	−0.054	−0.077***	−0.121***	−0.102	0.034	−0.040	−0.153***	−0.188***	0.080**	0.049	0.049	0.023
OWNHOME	0.009	−0.068***	−0.080**	−0.052	0.006	−0.051**	−0.041*	−0.077**	−0.004	−0.008	−0.027	−0.035
Municipal Variables												
DEBTS	0.044***	0.061**	0.034	0.058	0.023	−0.016	−0.038	−0.019	−0.016	−0.083**	−0.097**	−0.095*
TAXINC	−0.575**	−0.288	0.097	−0.138	−0.390*	0.828	0.147	0.071	0.019	0.938	0.023	0.129
GRANTS	−0.247**	0.966	−0.006	−0.067*	−0.093*	0.766	−0.006	−0.020	0.024	−0.311	−0.025	0.064

Other Control Variables												
AGED	0.023**	0.166*	0.316**	0.271*	0.021**	0.120	0.090	0.193	0.007***	−0.008	−0.082	−0.078
UNSK	−0.027**	0.194*	0.222	0.260***	−0.034***	−0.028	0.294	0.248	−0.024***	−0.274***	−0.246***	−0.191***
CRIME	0.003	−0.069	−0.041*	−0.067	−0.002	−0.009	−0.001	−0.009	−0.006	0.046***	0.004	0.031
AGRI	0.004	−0.015	−0.020	−0.012	0.007	0.010	0.003	0.013	0.007	0.024***	0.023***	0.014
ELEC	0.015***	0.026**	0.051**	0.052	0.015***	0.045***	0.060**	0.059**	0.006	0.024*	0.005	0.005
SERV	0.002	−0.016	−0.018	−0.025	0.004	−0.028	−0.028	−0.023	0.004	−0.014	−0.010	0.005
PUBL	0.009*	0.040	0.064	0.041	0.005	0.059**	0.066*	0.056*	−0.002	0.016	−0.006	0.005
Test statistics												
WALD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SARGAN	n/a	n/a	0.00	0.56	n/a	n/a	0.02	0.51	n/a	n/a	0.50	0.82
AR(2)	n/a	n/a	0.07	0.22	n/a	n/a	0.89	0.50	n/a	n/a	0.75	0.44
R^2	0.76	0.53	n/a	n/a	0.92	0.76	n/a	n/a	0.91	0.87	n/a	n/a

[a] *** (**,*) = significant at the 1 (5, 10) percent level of significance. These correspond to the Wald test of joint significance of all lagged terms, the impact arising from different lags; n/a indicates that no figure is available. The Wald test is a test for the joint significance of the explanatory variables. SARGAN reports the test statistic for over-identifying restrictions and AR(2) for the second-order autocorrelation of the residuals. These test statistics are reported as p-values. All figures correspond to the one-step estimates.

The final two columns report the results of GMM estimators. In the GMM1 specification only the lagged dependent variables are instrumented. The GMM2 specification applies to the endogenous specification in which *EJR, CF, UNT*, and *ACCOPRIC* are treated as endogenously determined. These particular variables are chosen to be potentially endogenous owing to the focus on the impact of regional labor market dynamics and housing on migration flows. The number of instruments in these GMM specifications is set at two.

The results are largely robust on the number of instruments and on the number of endogenously determined explanatory variables. The results concerning these specifications are reported in the Appendix (Table A2) as GMM1-G and GMM2-G. If anything, these experiments enhance the significant levels of parameters connected to regional labor markets and housing markets. These results have to be considered with caution for two reasons. First, the general specifications tend to either reject the overidentifying restrictions or accept them at the suspiciously high significance levels (SARGAN). Second, the GMM2-G model produces extremely large, albeit insignificant, parameter estimates for the *TAXINC* variable that are five to ten times higher than in other specifications.

To recall, if only lagged dependent variables are included in estimations WITHIN is downward biased, and OLS upward biased. Provided that this also holds in the current context, we would expect the coefficient of the lagged dependent variable obtained from GMM estimations to lie somewhere between the WITHIN and OLS results. This is the case only in the out-migration equation. The finding is somewhat surprising, given that the instruments were found to be highly significant in reduced-form estimations.

Additional instruments seem to alleviate the problem to a certain extent as implied by higher values obtained by the lagged dependent variable in the GMM2 specification. This is consistent with the finding according to which level instruments were relatively uninformative in the net-migration equation, in which case the linear combination with other level instruments can be expected to improve the situation. However, the puzzle remains in the in-migration equation. We also experimented with the GMM-SYS estimator developed in the Blundell and Bond (1998) study, but unfortunately we could only instrument the lagged dependent variable with the first-difference instrument.[2] In addition, we needed to reduce the number of the level instrument to one for endogenously determined variables. The GMM-SYS estimator produced higher values for the coefficients of lagged dependent variables but some of the other results are neither in line with a priori expectations nor with previous empirical evidence. This casts some doubts on the GMM-SYS estimator in the current context. The results of these experiments are reported in Appendix (Table A2).

[2]All estimations and calculations of this study were carried out by GAUSS. The GMM estimators were produced by employing the DPD98 for the Gauss program developed by Arellano and Bond (1998).

Our reading of this evidence is that the GMM2 specification is to be preferred on several accounts. First, according to the Sargan test for the validity of the instruments, it improves the statistical properties of the estimated models. This gives us some confidence that the estimation framework helps to ease the potential endogeneity problems. Second, the potential problem of weak instruments is not universal across migration equations. In the GMM2 specification it mainly concerns the in-migration equation. Third, a number of results are robust across different specifications, regardless of different implicit assumptions concerning the data-generating process, so the choice of the preferred model is not crucial for the conclusions. The last finding implies that the potential bias resulting from specifying endogenous variables as strictly exogenous does not seem to be particularly severe when modeling migration flows, at least in our case.

When it comes to the estimation results, they reveal the strong relation between local labor markets and labor mobility. This means that the overall picture painted by the results is consistent with several migration theories ranging from neoclassical theories to the theory based on a hiring function. Thus, there is evidence that individuals are pushed from high-unemployment regions (*UNT*) to the regions with high income (*INCOME*).

As a striking finding based on the previously unexploited plant-level measures of job and worker turnover, the results confirm that the external and internal reorganizations of labor markets are closely related. In particular, the high rate of excess worker turnover at the establishment level (*CF*) is found to increase the net-migration rate by reducing out-migration from a region. The reason is that regions with a high level of gross flow dynamics at the plant level provide better job opportunities than stagnant regions with low levels of internal dynamics. The finding is consistent with the view put forward in Fields (1976), according to which the unemployment rate alone does not necessarily give a complete picture of the job prospects in regional labor markets. Hence, dynamic regional labor markets measured by the plant-level turnover of jobs and workers yield employment opportunities beyond those suggested by the unemployment rate.

When it comes to housing markets, they seem to form the main mechanism that slows down the regional mobility of workers. An increase in regional housing prices reduces net-migration by discouraging in-migration. Interestingly, there is not much evidence that housing prices influence out-migration. This pattern contrasts with the locking-in view that links the crash of the housing markets at the end of the 1990s with a slow regional adjustment process. One potential explanation for this finding is that the two opposite effects discussed in Böheim and Taylor (2000), that is, the cashing-in effect and the appreciating value effect, cancel each other.

The other determinant of the housing markets, namely, owner-occupancy, has a downward impact on net-migration. Interestingly, this effect is found to arise completely through lower in-migration rates. There is no statistically significant connection between out-migration and the rate of owner-occupancy.

This observation gives support to the results in Oswald (1996) that connected a large owner-occupancy sector to high regional unemployment through the weaker adjustment process of regional labor markets. However, this study offers a completely different explanation for the observed positive correlation between owner-occupancy housing and unemployment. Our results suggest that this follows mainly from the lack of rental housing in potential in-migration regions, not from the reluctance of unemployed homeowners to move.

Turning next to the local public sector, the parameter estimates of these variables turned out to be insignificant, with some exceptions. Interestingly, the larger debts of a municipality are correlated to lower out-migration. This finding implies that municipalities may, in the short run, alleviate the problem of excess out-migration by running a budget deficit. This is likely to be reflected both in better services that municipalities provide to citizens and in job opportunities in the local public sector.

In addition to these factors, the empirical models control for regional differences in various other factors such as demographics and the industry structure. These results are well in line with a priori expectations. The share of unskilled individuals to the working-age population (*UNSK*) has a statistically significant, downward impact on out-migration. The finding is not surprising, given that it is well reported that the highly educated are more mobile than individuals with low education.

Another factor shaping migration flows is the industry structure of a region. Finland recovered from an exceptionally deep recession in the early 1990s via an export-led recovery. This was significantly driven by the electronics sector, in which both production and employment improved quickly. This considerable boom in electronics is reflected in the results as an increase in both net- and in-migration to those regions with a high share of the electronics sector. In this sense, migration flows have definitely contributed to the efficient reallocation of the available labor force across regions and industries. Unlike the electronics sector, the agricultural sector steadily declined during the 1990s. This induced an increase in out-migration flows from regions where the share of agriculture is high, other things being equal.

Thus far, the discussion is based on the parameter estimates reported in Table 3 that do not take into account the long-term adjustment of migration flows on changes in explanatory variables. To get a sharper picture of the relative significance of different labor market and housing market variables, Table 4 reports the long-run effects of a one-standard deviation change in an independent variable on migration flows holding everything else constant.[3]

[3]The long-run effects of the model $Y_{it} = \alpha_1 Y_{it-1} + \alpha_2 Y_{it-2} + \beta_1 X_{it-1} + \beta_2 X_{it-2} + \ldots$ are calculated as $[(\beta_1 + \beta_2)/(1 - \alpha_1 - \alpha_2)] \times$ (a standard deviation in X). The exact definition of the standard deviation is given in the text. The significance level of a long-run coefficient is obtained from the diagonal of a matrix $\mathbf{J'VJ}$, where $\mathbf{J}$ denotes the Jacobian matrix of long-run multipliers and $\mathbf{V}$ is the estimated covariance matrix of the parameters. For a thorough discussion on how to calculate standard errors for nonlinear combination of parameters, see Bårdsen (1989).

TABLE 4: The Long-run Impact of a One-Standard Deviation Change in an Independent Variable[a]

	Net-migration				In-migration				Out-migration			
Dependent	OLS	Within	GMM1	GMM2	OLS	Within	GMM1	GMM2	OLS	Within	GMM1	GMM2
Labor Markets Variables												
EJR	0.12***	0.00	0.02	0.15*	0.30	0.01	0.02	0.03	−0.22	0.00	−0.07	−0.06
CF	0.05	0.08**	0.05*	0.20**	−0.13	0.05	0.03	0.08*	−0.24	−0.04	−0.04	−0.25
UNT	−0.27***	−0.37***	−0.20*	−0.64**	−0.03	0.09	−0.06	−0.37**	1.81**	0.55***	0.30	1.36
INCOME	0.44***	0.62***	0.34**	0.71**	1.26**	0.51***	0.51***	0.40***	0.16	−0.26	−0.29	−0.76
DGDP	0.12	0.06	0.07**	0.12*	0.73	0.14**	0.09**	0.10**	0.21	0.07	0.00	−0.04
Housing Markets												
ACCOPRIC	−0.08*	−0.05**	−0.05*	−0.06	0.21	−0.03	−0.07***	−0.10***	0.72*	0.04	0.04	0.03
OWNHOME	0.10*	−0.33**	−0.26*	−0.26	0.26	−0.29	−0.15	−0.30**	−0.28	−0.05	−0.19	−0.19
Municipal Variables												
DEBTS	0.19***	0.12**	0.04	0.10	0.43**	−0.04	−0.05	−0.03	−0.43	−0.20**	−0.26	−0.38
TAXINC	−0.18***	−0.04	0.09	−0.17	−0.51**	0.13	0.15**	0.08	0.04	0.16	0.04	0.36
GRANTS	−0.13**	0.21	−0.01	−0.14	−0.20	0.20	−0.01	−0.04	0.08	−0.09	−0.08	0.30
Other Control Variables												
AGED	0.21***	0.65**	0.83***	0.98**	0.81***	0.56	0.27	0.61	0.38	−0.04	−0.46	−0.64
UNSK	−0.32***	0.99*	0.77*	1.23	−1.71***	−0.17	1.14*	1.03	−1.80**	−1.77***	−1.81	−2.06
CRIME	0.01**	−0.12**	−0.05	−0.11	−0.04**	−0.02	0.00	−0.01	−0.14***	0.10**	0.01	0.12
AGRI	0.08	−0.13	−0.12	−0.10	0.59	0.11	0.02	0.09	0.91**	0.27*	0.30	0.25
ELEC	0.22***	0.16**	0.22***	0.30*	0.91***	0.33***	0.28***	0.30***	0.57	0.19**	0.04	0.07
SERV	0.04	−0.12	−0.09	−0.18	0.29*	−0.26**	−0.16**	−0.14*	0.47*	−0.14	−0.11	0.08
PUBL	0.13	0.24	0.26**	0.23	0.32	0.43***	0.31***	0.28**	−0.17	0.12	−0.06	0.06

[a] *** (**,*) implies that the long-run effect is significant at the 1 (5, 10) percent level of significance. For the calculation of the effects, see footnote 3. The asymptotic standard errors of long-run coefficients are calculated as **J'VJ**, where **J** denotes the Jacobian matrix of long-run multipliers and **V** is the estimated covariance matrix of the parameters.

By this means, it is possible to combine the information included in the parameter estimates with the actual distribution of variables across regions. The standard deviations correspond to the year 1997 so they are somewhat smaller than the ones reported in the Appendix (Table A1), in which the descriptive statistics are based on the whole estimation period.

The long-run estimates show that an increase in the plant-level dynamics of regional labor markets merely slows down a reduction in population that happens in high-unemployment regions. The long-run effects of a standard deviation change in the churning rate (*CF*) and in the excess job reallocation (*EJR*) vary between 0 and 0.2 in the net-migration equation, whereas the corresponding figure for unemployment varies between −0.2 and −0.6. Accordingly, a rise of eight percentage points in regional unemployment reduces net-migration by more than half a percentage point, other things being equal. All specifications imply that this follows from larger out-migration rather than smaller in-migration as implied by larger long-run impacts in absolute values in the out-migration equation. However, owing to large standard errors these long-run impacts are not always statistically significant. Provided that we are willing to conclude that labor markets play a larger role in the out-migration decisions, the finding is consistent with several previous findings that state that the unemployed are more mobile than the employed—see Herzog, Schlottmann, and Boehm (1993).

The long-run effects of other local labor markets variables, namely, *INCOME* and *DGDP*, are fairly robust to variations in the specification of a model, at least when the panel aspect of the data set is taken into account. These two factors form the pulling element of labor markets, individuals moving to rapid growth and high-income regions. Interestingly, the results imply that regional differences in income have a substantially larger impact on in-migration than regional growth differences, even after controlling for the observed differences in job opportunities and in the industry structure. The long-run impact of a one-standard deviation change in *INCOME* on the in-migration rate is found to be around 0.50, the corresponding figure for DGDP centering around 0.10. Since these two factors do not have any significant impact on out-migration or, if they have, they tend to reduce out-migration, these relative differences remain in the net-migration rate equation.

Housing markets were found to reduce in-migration to regions with high housing prices and a large share of owner-occupancy housing. The long-run effects of regional variation in these variables are estimated at being around −0.10 and −0.20, respectively. The finding that owner-occupancy has a larger impact on in-migration than housing prices may mean one of two things. The structural explanation focuses on the lack of the rental sector in rapidly growing regions that is able to force some of the potential migrants to abandon their migration plans. Provided that the tightness of housing markets affects the low-income households, the finding that owner-occupancy reduces in-migration offers an additional explanation for selective mobility reported in the Finnish context in Ritsilä (2002). The lack of rental housing results in selective in-migration, in which case highly educated, skilled individuals are observed to move to growth centers.

An alternative explanation for this negative dependence is connected to the regional division used in the study. It may be that individuals who move for work-related reasons are not able to choose between job opportunities in different travel-to-work areas. This, together with large regional differences in housing prices, means that the lack of rental housing creates a more severe constraint for mobility than housing prices. The latter is likely to play a much larger role in determining short-distance migration within travel-to-work areas.

When it is a matter of the long-run impacts of other variables, they show that the main determinants of migration flows are the proportion of elderly people to the population (*AGED*) and the proportion of unskilled individuals to the working-age population (*UNSK*). The estimated impacts of a one-standard-deviation change in these variables on net-migration is close to one percentage point when the panel nature of data is taken into account. This follows mainly from a reduction in the out-migration rate implying that the aged and unskilled are less mobile than others. More surprising is the exact magnitude of these effects, since the influences of *AGED* and *UNSK* on the mobility of the working-age population is, in some cases, even larger than that of regional unemployment, in absolute terms.

All in all, the results imply that migration equilibrates regional labor markets. People are pulled to regions with high income and rapid economic growth from regions where job opportunities are scarce. However, the dynamics of regional labor markets matters. In particular, an increase in the internal reorganization of regional labor markets is able to yield an increase in net-migration. The adjustment process is slowed down by a large share of prime-age individuals with only basic education who live in departing regions. Another constraint for regional adjustment is created by housing markets. High housing prices and a large share of owner-occupancy in regions that are potential destinations discourage mobility. The industry structure of a region either enhances or slows down mobility, public policies having a smaller role to play in this adjustment process.

6. CONCLUSIONS

The purpose of this study was to explore the impact of local labor markets and housing markets on the mobility of the working-age population. The analyses were carried out by examining both net-migration flows and gross migration flows between the Finnish travel-to-work areas during the time period of 1988–1997. As a new feature, the study incorporated the internal restructuring of regional labor markets into migration studies. In addition, the robustness of the results was scrutinized by various empirical specifications that rely on different assumptions on the adjustment process and the exogeneity of the explanatory variables.

The results connect regional unemployment and the internal restructuring of regional labor markets to the out-migration rate. High unemployment increases the mobility of the working-age population of a region. Out-migration is alleviated if internal labor markets are dynamic, that is, job and worker flows at the plant level are frequent. However, the internal restructuring of regional markets cannot totally offset the *pushing effect* of high unemployment. Despite this, the importance of internal labor market restructuring in explaining the observed migration flows calls for further studies—both theoretical and empirical.

The in-migration rates are influenced mainly by the income level of a region, its economic growth, and housing markets. The first two factors tend to increase in-migration, whereas housing prices and the lack of rental housing tend to reduce in-migration into a region. The results imply that the share of owner-occupancy housing affects only the in-migration rate and has no significant effect on out-migration. There are few signs that owner-occupied housing locks the unemployed to high-unemployment regions, at least in the Finnish context. This finding leads to a policy conclusion that an expansion in the rental-housing sector is likely to improve the matching process of regional labor markets. This, in turn, reduces large and persistent regional disparities in unemployment and, hence, structural unemployment.

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APPENDIX

TABLE A1: Descriptive Statistics From 1988 to 1997

	Mean	s.d.	Min	Max
The Measures of Migration				
NET (net-migration)	−0.56	0.76	−2.69	3.17
IN (in-migration)	4.33	1.28	1.61	8.54
OUT (out-migration)	4.89	1.02	2.04	8.47
Labor Market Variables				
INCOME	71.09	10.76	42.55	116.57
UNT	15.83	7.73	0.80	34.05
DGDP	1.08	6.48	−22.31	32.87
EJR	25.16	7.88	8.63	84.35
CF	20.61	5.84	7.27	51.58
Housing Markets				
ACCOPRIC	4.53	0.78	3.61	10.73
OWNHOME	67.51	4.39	53.00	77.00
Municipal Variables				
DEBTS	4.99	1.55	0.95	12.02
TAXINC	0.08	0.01	0.05	0.16
GRANTS	0.08	0.02	0.02	0.14
Other Control Variables				
AGED	26.66	3.77	17.45	39.34
UNSK	51.86	5.26	35.42	65.60
CRIME	4.39	1.97	1.04	12.26
AGRI	15.18	9.29	0.34	41.98
ELEC	3.11	3.65	0.00	47.85
SERV	32.31	7.32	17.66	63.51
PUBL	20.24	5.54	8.11	40.13
Selected Background Statistics for the Finnish NUTS 4 Regions				
Population	59,520.93	119,774	2,399	1,131 031
Surface area (km^2)	3,582.73	4,761.37	516.30	32,113.40
The population density (Population divided by the surface area)	26.24	43.22	0.61	370.71

TABLE A2: The Results of Different Specifications[a]

	Net-migration			In-migration			Out-migration		
Dependent	GMM1-G	GMM2-G	GMM-SYS	GMM1-G	GMM2-G	GMM-SYS	GMM1-G	GMM2-G	GMM-SYS
LAGS	−0.105***	−0.063	0.292***	−0.218	−0.150	0.506***	0.589***	0.149	0.881***
Labor Markets Variables									
EJR	0.007	0.006*	0.032***	0.003	0.001	0.030**	−0.010	0.006	0.006
CF	0.020*	0.043***	0.061**	0.008	0.023**	0.036	−0.012**	−0.021*	−0.004
UNT	−0.048	−0.160***	0.022	−0.030	−0.078**	0.031	0.057*	0.115***	−0.121
INCOME	0.056***	0.117***	0.057**	0.049**	0.052***	0.066	−0.008	−0.067**	−0.075
DGDP	0.019**	0.017	0.025	0.019***	0.019**	0.017	0.001*	0.003*	−0.018*
Housing Markets									
ACCOPRIC	−0.180***	−0.181*	−0.097	−0.164***	−0.196***	−0.036	0.055	0.022	0.201***
OWNHOME	−0.048**	−0.047	0.013	−0.061**	−0.089***	−0.015	−0.031	−0.033	−0.037*
Municipal Variables									
DEBTS	0.005	0.091	0.072***	−0.006	0.056	0.069	−0.012***	−0.074*	−0.046
TAXINC	0.088	−1.620	−0.129**	0.116	3.631**	−0.107*	0.051	4.289**	0.044
GRANTS	0.059	0.572	−0.057**	0.040**	−1.211	−0.037**	−0.012	−0.991	0.044

Dependent	Net-migration			In-migration			Out-migration		
	GMM1-G	GMM2-G	GMM-SYS	GMM1-G	GMM2-G	GMM-SYS	GMM1-G	GMM2-G	GMM-SYS
Other Control Variables									
AGED	0.174	0.326***	0.055***	0.124	0.166	0.060**	–0.075	–0.151	–0.016
UNSK	0.319***	0.388***	–0.037**	0.278	0.133	–0.091***	–0.195***	–0.291***	–0.043***
CRIME	–0.022*	–0.037*	–0.002	–0.006	0.030	–0.010	0.006	0.068*	0.001
AGRI	–0.038**	–0.007	0.018	0.000	0.016	0.040	0.023***	0.023*	–0.023*
ELEC	0.037*	0.032	0.021	0.058***	0.045**	0.035**	0.016	0.012	–0.004
SERV	–0.010	–0.025	0.004	–0.026	–0.029	0.006	0.000	0.004	–0.007
PUBL	0.059	0.034	–0.007	0.065	0.043	–0.023	–0.002	–0.001	0.008
Test Statistics									
WALD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SARGAN	0.00	0.99	0.26	0.04	0.99	0.77	0.06	0.99	0.46
AR(2)	0.42	0.13	0.74	0.72	0.13	0.78	0.73	0.04	0.35

[a]GMM1-G corresponds to the GMM1 model in which all available instruments are employed. GMM2-G is otherwise similar to the GMM2 model except that all municipal variables and the income variables are also modeled as endogenously determined. GMM-SYS reports the results of the system estimator in which the first differences are employed as instruments also.