NETWORKS AS DETERMINANTS OF RURAL MIGRATION

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Abstract

This paper focuses on networks as determinants of rural migration and the importance of networks in a rural development perspective. Furthermore the impact of public goods and amenities on migration decisions in rural regions is investigated. Special attention is paid on heterogeneity in peoples migration-decisive components. Data base is a non-farm household-survey of four rural communities in Poland. The estimations show that migration decisions are influenceable in different ways: Social networks as well as socio-economic components and the regional public-good endowment are important drivers of migration, but the direction and amount of influence depends on individual-preferences and on individual network-structures - among other things especially on the network-localization.

Keywords: Migration, Rural Development, Social Networks, Latent Class Model
JEL classification: R23, D83, H41

Introduction

It is a common observation in all EU-member states that population of rural areas is in a continuous and sharp decline, mainly caused by net-migration flows from rural to urban areas (European Commission, 2008). Results are regional disparities or rather their intensification; this applies mainly for factors like income opportunities, the availability of infrastructural and social services, the social environment, the availability of recreational and cultural activities, the environmental quality, in all, the regional quality of life. Since its beginning in the late 1960s the European regional and rural-development policy aims therefore among other things specially on reduction of regional disparities and the improvement of quality of life in rural regions. The rural development program of the present period 2007-2013, especially the Axis 3 has still as a central objective to develop a 'living countryside' and to help to maintain and improve the social and economic fabric, in particular in the more remote rural areas to face the depopulation (European Commission, 2006). So, the control of out-migration from rural to urban areas or the initiation of inmigration to rural regions is realized as an important tool for rural development but until today it has been fulfilled only with little success. Therefore, to be able to design rural development policies that effectively adjust regional migrations, a comprehensive understanding of household's migration choices is needed.

The general importance of regional quality of life to determine peoples' migration decisions is well and long-recognized at both academic and political levels. One of the most popular rationales for migration is Tiebout's observation that people vote with their feet, e.g. migrate to places where expected quality of life is highest (Tiebout, 1956). But the quality of life within a region not only leads to migration but also is affected from migration in- and outflows: E.g. in- or outmigration of well-educated and wealthy households corresponds to a resource gain or drain, respectively. Furthermore, famous contributions of the New Economic Geography show that micro-migration choices might have strong externalities at the macro level, i.e. from a welfare economic perspective rural out-migration might be both - too high and too low, respectively. During the last years the idea that social network relations have a significant impact on the behavior of individual agents and corresponding social outcomes has increasingly attract interest. Especially, also the European Commission has recognized the importance of social networks by promoting economic and political cooperation and thus economic development.

For example, the rural development axis Leader has been implemented partly to establish local network structures that facilitate collective action and thus promote rural development.

A considerable amount of research has been conducted on the topic of migration so far, mostly focusing national population moves. Contrary, the individual regional migration behavior has not been investigated in a comparable amount, yet. Particularly, the well recognized influences of quality of life and social networks on migration decisions have not been analyzed in conjunction on the regional level. This paper investigates therefore determinants of regional migration decisions, recognizing institutional and economic components, especially the public good and amenity endowment of a region as well as individual motivations while special attention is given to the possible influence of social networks. In this regard it is argued that beyond the network-structures of a potential migrant as e.g. size and density, in particular, the spatial location of his/ her network contacts determines the propensity to migrate. Multiple and intense contacts to local people can be understood as household's social capital, that would be destroyed if the household migrates. In contrast, intensive contacts to people outside the own community reduces information costs and thus reduces transaction costs of migration. Beyond the importance of networks a particular emphasis is put on the impact of the local public good endowment on migration decisions, since local public goods are under control of local governments and thus can be best used to influence migration. Further, it is widely accepted that the migration vote is determined by both man-made and natural amenities. Amenities are not measures of overall residential desirability of places, but rather place-specific attributes that people differentially value, e.g. caused by different stages of their life: A good endowment with care facilities might be much more valued by older in comparison to young people, while vice-versa provision of good public education is higher valued for by middle-aged family households than by older people. Thus, empirical estimations of micro-econometric models of individual migration choices have to take explicitly potential preference heterogeneity into account. In this regard we suggest the application of a latent class approach as a micro-econometric model that explicitly allows for preference heterogeneity. So it is possible to test if the asked individuals can be divided into different sub-groups caused by socioeconomic characteristics and if these subgroups differ in the way their migration-decision is determined.

The paper is structured as follows: First an overview of the existing migration-theory is given, possible migration determining factors are deduced and the influences social networks might have on migration behaviour are highlighted. Next the used methodology and data-base is described before the estimation-results are included and discussed. Conclusions with result-reflection and potential policy-relevance finish the paper.

Determinants of Migration Decisions

Migration-theory is an interdisciplinary field of research with sociological-, psychological, geographic-, political- and economic approaches. The dividing lines in migration research are along the focus of the study (international vs. internal, macro vs. micro, determinants vs. consequences, legal vs. illegal, etc.), the theoretical approach taken, and the methods applied. Moreover, the coexistence of macro- and micro-approaches leads to the conclusion that neither level provide a complete picture of the migration-process, so that an integration of both perspectives is desirable (Stillwell and Congdon, 1991). The tripartition to explain migration with distinguishing political, economic and cultural structures of the home and destination region (macro-structures), individual preferences and expectations (micro-level) and the social network (density, size) of potential migrants, links therefore the micro and macro-components.

Summarizing different migration approaches, the determinants of migration-decisions can be classified into three groups: Structural characteristics of the origin and destination region, intervening barriers and individual factors, respectively personal and household characteristics. Examples for structural characteristics are the wage-level, the rate of unemployment, the climate, the housing-situation, the health-care and school-system and the public-safety. In all, the regional living-conditions and so the quality of life caused by the regional endowment with amenities and social-, cultural- and technical-infrastructure or public goods. The second group are Intervening Barriers: This regards on the one hand to the distance-approach, meaning that some migrations do not happen caused by too high migration costs and on the other hand to objective barriers as e.g. immigration-acts. Age, sex, family-status,

education-level, job- and income-situation are examples of the personal and household characteristics. For these individual factors potential effects on migration-behaviour are e.g. consistent with the income-differentiation and job-vacancies hypothesis; that means, people migrate to places they earn the highest income or where the largest demand for labour exists. The given income-level in the home-region is also important because this allows for managing the migration-costs. The age of an individual can influence the migration-probability in different ways, as young people migrate easier in form of study- or labour-migration because of being unmarried, and pensioners sometimes like to migrate in form of Retirement-Migration, attracted from amenities and supported by being unlinked to the location of their work.

As mentioned above also immaterial factors of quality of life as family, friends, in all, the social network one is embedded is expected as important for someone's migration decision. Generally social capital emerges, accumulates and can be maintained by social relations (Coleman, 1990). So the amount of social capital an actor has depends on the network he/ she is embedded. Different studies have generally discussed the importance of networks in relation to migration, our idea was to have a closer look if networks can influence migration and in case, what sort of influence and which relative impact they have on the probability to migrate in comparison to 'classical' economic components like unemployment or income. Two general forms of network influence can be distinguished: Transaction-Costs and Belief-Formation. In case of transaction-costs it is e.g. imaginable that networks increase the transaction-costs to migrate because someone will lose the sort of network he or she was embedded before. Another possibility is that the transaction-costs rise caused by a change in social-exchange: Meeting people to celebrate parties e.g. are amenities someone loses in case he/ she moves out of his/ her community; so moving is linked to a loose of social-capital and in turn this is connected with higher transaction-costs of moving. On the other hand social-networks can reduce transaction-costs by providing migration-decisive information as a job-offer, so searching-costs decrease. Beyond the structure of ego[1]-centered networks as e.g. size and density, in particular, the spatial location of ego's network contacts might determine his propensity to migrate. Multiple and intense contacts to local people can be understood again as household's social capital, that would be destroyed if the household migrates. In contrast, intensive contacts to people outside the own community or 'open-networks' reduce information costs and thus reduce transaction costs of migration.

The second recognizable point for investigating the relation between networks and migration is Belief-Formation: People, thinking of migration, have to make their decision under uncertainty because not objective factors per se but their perception by the individual is decisive, meaning utility-attribution to the home and potential migration-region. In other words, people rank the regions in form of regional differences and migrate when their utility caused by migration is higher as the assumed migration costs. But also this utility-attribution on objective characteristics and lastly the attached quality of life to the home and migration region can be influenced by the members of the individuals' social-network.

Common for all possible influences of social networks as well as for other determinants of migration decisions is that their effect may vary for different types of migrants. A young person e.g. might be more motivated by a higher income in the potential moving region as an older person is because the period over which he/ she will benefit from the higher income in the new occupation is longer; respectively transaction-costs of moving might be not as decisive as they might be for older people. Also the network-impact might differ between young and older migrants as young people are not as well embedded in their social networks as older people are and might be so more likely to migrate. Beside the different preferences of young and older people, the education level, the family status, the employment-status but also the network-structure on its own might cause differences on the probability to migrate. For someone who is well embedded in his local social-network, a higher income or a better amenity endowment might have a lower marginal impact on the moving probability than this is the case for less embedded people. To take care for the preference heterogeneity of people we chose a latent class approach, which is introduced in the next section.

[1] Ego networks consist of a focal node ("ego") and the nodes to whom ego is directly connected to ("alters") plus the ties, if any, among the alters. In an ego-network each alter has his/her own ego network, and all ego networks interlock to form the human social network. Egos and alters are tied to each other by social relations.

Method and Data Base

The discussion of migration determinants above shows them as a mixture of structural characteristics and individual factors, among other things individual's social-networks. Moreover, the perception of different components by the individual and the caused utility attribution to the home and potential migration region are decisive, whereas the inevitable uncertainty in decision making can be reduced by the network someone has. To clarify the decision making process, it is formally given in the equations (1) to (4). Assuming a probabilistic utility function the expected utility includes a deterministic and stochastic component. Thus, formally it holds:

$$EU(X|D) = V(X|D) + \sigma \tag{1}$$

By this D =0,1 denotes the choice variable, $V(X|D)$ denotes the deterministic part of the expected utility and σ the random shock. Obviously, households migrate, i.e. $D = 1$, if equation (2) holds:

$$EU(X|D = 1) > EU(X|D = 0) \tag{2}$$

Accordingly, the probability of migration can be formulated as given in equation (3).

$$\Pr(D = 1|X) = \frac{\exp(V(X|D=1))}{\exp(V(X|D=0)) + \exp(V(X|D=1))} \tag{3}$$

Denoting z as the vector of relevant factors determining expected utility from living in the same regions or moving to another region and assuming again a simple linear function it follows equation (4).

$$V(X|D) = \alpha_0(D) + \sum_k \alpha_k Z_k(D) \tag{4}$$

Caused by the binary-choice design of the dependent variable we estimate a logit-model to determine the migration-probability of an individual; to take care for preference-heterogeneity of the respondents we use a latent class approach in addition. This allows for testing first, if the asked individuals can be divided into different sub-groups caused by socioeconomic characteristics, and next, if these subgroups differ in the way their migration-decision is influenced. In contrast to mixed logits which also allow for preference heterogeneity, latent class analysis is better suited to explain the sources of heterogeneity, based on socio-economic characteristics and individual attitudes/ tastes/ preferences (Boxall and Adamowicz, 2002). In a latent class formulation this parameter heterogeneity across individuals is modelled with a discrete distribution, or set of classes. The situation can be viewed as one in which the individual resides in a 'latent' class *q,* which is not relevant to the researcher. So a fixed number of classes is received and the estimates then consist of the class specific parameters and for each person a set of probabilities defined over the classes. For each individual the probability to be member of the different classes is thereby given. In equation (4) the formulation of the latent class logit model is shown (Greene, 2003); in other words the probability that an individual *i* chooses alternative *j* given that *i* is in class *q*. Received items of the chosen approach are: class-membership probabilities, class-member characteristics and class-specific migration decisive parameters.

$$Prob[choice\ j\ by\ individual\ i \mid q] = \frac{\exp(x_{i,j}^{l}\beta_q)}{\sum_{j=1}^{J_i}\exp(x_{i,j}^{l}\beta_q)}$$

$$= F(i,j|q) \tag{4}$$

$$P_{i|q}(j) = Prob(y_i = j|class = q)$$

Different applications of the latent class model shown above are given in the literature (Greene and Hensher, 2003; Ouma et al., 2007; Boxall and Adamowich, 2002). All papers focus the identification of subpopulations which are homogenous with regard to their interactions with the dependent variable inside their class but heterogeneous compared with other classes. The distinctiveness of this study is a comparison of two different ways to determine class-characteristics and migration explanatory variables. First we estimate a model using the network-components as explanatory-variables of the migration-decision as well as economic components like income and the labor-market-situation. To account for the importance of network-localization, we decide to include this aspect in the group decisive parameters. The second model is motivated by the idea of taking network-components as class-decisive parameters. So it is proved first if there exists a latent structure in the sample caused by the peoples networks and second, in case people can be divided into latent subgroups caused by their networks, to prove if these groups differ in the way economic-components and regional-differences are perceived and which migration-influencing character they have.

The data used for the empirical analysis is derived from a household-questionnaire of non-farm-households which includes around 400 heads of households in four different rural communities in Poland (LAU2-Level). From the conducted household-surveys socioeconomic characteristics are received, as well as migration-attitudes, their satisfaction with the local-environment, preferences and social-network characteristics. The migration-decision is received by using a choice-experiment: The individuals answered if they have ever thought about moving to a different region and if they would move to another region if they would receive there a 20% or rather a 50% higher income. In the following the migration explanatory variables are introduced in case they are not self-explanatory. To get a general overview all recognized variables are listed first.

Explanatory and class-membership determining variables:

- Regional Income-Differences: 20%, 50% higher Household-Income (Incdum)
- Personal Income in € (Inceur)
- Labour-Market: Unemployment-rate home region (Unemplr)
- Transaction-Costs (Tc)
- Regional-Differences
    - Public-Good-Endowment: City Life (Df-cl), Housing (Df-house), Recreation (Df-recr), Nature(Df-nat)
    - Family (Df-fam)
- Subjective-Characteristics
    - Age (Age), Sex (Male), Marital-Status (Spouse), Education (Educ), Employment (Havejob)
- Personal Preferences
    - Factor-Analysis: Family, School, Rural-Living-Conditions, Safety, Job, Availability (Fac1, Fac2)

- Network-Components
  - Network-Density (Net-dens), Network-Size (Net-size), Meeting-Frequency (Net-mfr), Contact-Frequency (Net-cont), Resources (Res), Position (Poshigh, Posdum), Net-Work-Localization (Local, Locdum)

One potential determinant of someone's migration-decision is the income-difference measure of the home and potential moving region. It is calculated by asking the people if they would move, in case of earning a 20% respectively a 50% higher household income. Transaction-Costs (Tc) are measured by asking the people how difficult they think it is actually for them to move. For eight different domains, whereas recreation, city life, housing and nature represent the public good endowment of a region, regional differences are requested as the rating of home- and potential moving-region. Subtracting the home- from the potential moving-region leads to the regional difference measure. Personal preferences are received by asking how important different reasons are to move to a region. They are factor-analyzed, so the variables family, school, rural living-conditions, safety, job and transaction-costs - meaning a good reachability - are combined to two factors: The first one (Fac1) stands for a positive attitude to rural living-conditions; the second factor (Fac2) is mainly characterized by a preference for a good spatial availability.

Six social-network components are considered in these estimations. Network-size (Net-size) is the number of different persons mentioned in all. Resources (Res) are identified by asking respondents whether they know someone who e.g. could fix their bike; a combination of twenty different specific resources/ capacities results in the resource-factor. The position-generator is a question that asks for whether a respondent knows someone with a specific job; so this is a measurement that indicates access to specific social positions and is divided into high and low positions (Poshigh, Poslow). The network-density (Net-dens) represents how closely the network-members are connected among each other or whether there exist different subgroups in different realms of the society. The network variables meeting- and contact-frequency (Net-mfr, Net-cont) stand for the strength of relationships, whereas meeting-frequency is the mean value on the frequency respondents meet, and contact-frequency stands for the frequency someone talks to the network-members. The network-localisation is measured by the number of network-members someone knows outside (Local), respectively in his/ her home-region.

Results

Two latent class models are estimated whereas the main interest applies on the first one 'Model A' which focuses on networks as determinants of migration decisions. In 'Model B' additionally the class-membership determining character of network variables is investigated. The results of both models are structured into three sections: First the class membership probabilities are given and in combination with the class membership determining factors, characteristics of the latent classes are highlighted. For both models two latent subgroups are retained whereas this small number may reflect a relatively small sample size. Then the estimation results of a simple logit and the latent class logit model are pointed out and a comparison of the estimated latent classes is given. Finally the marginal effects are presented and discussed as well.

In Table 1 the class membership characteristics of Model A are reported[2]. The class membership probabilities show 64% of the interviewees being a member of class 1 and 36% of class 2. The factors age, employment, marital-status and the network-localization included for determining the composition of the groups are statistically significant, respectively significant variability between the individuals exists. Thus the first group is likely to be overrepresented by older people, those who are employed, those without a spouse and those who have a local network, i.d. who have less contacts outside

[2] The ending "_1" of class-membership determining variables stands for class 1; the directions of the estimated coefficients are the other way round in case of class 2.

their home region compared to members of the second class. In relation to the factors which then affect migration decisions (Table 2), these are identified as being somewhat different for each group. The heterogeneous impact of migration influencing factors, depending on individual characteristics is therefore approved.

Table 1: Estimation Results Model A: Class Membership

	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]
Constant_1	-6.474***	2.049	-3.160	0.002
Age_1	0.128***	0.038	3.335	0.001
Male_1	-0.522	0.633	-0.826	0.409
Fac1_1	-0.352	0.273	-1.289	0.197
Havejob_1	6.554***	1.658	3.952	0.000
Spouse_1	-3.334***	1.082	-3.081	0.002
Local_1	-0.543***	0.176	-3.093	0.002
Inceur_1	-0.470	0.370	-1.271	0.204
Educ_1	0.213	0.305	0.699	0.484

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Prior class probabilities at data means for Latent-Class-Model variables:
Class 1: .6352 Class 2: .3647

Table 2: Estimation Results Model A: Simple Logit, Latent Class Model

	Simple Logit		Latent Class Model			
			Class 1		Class 2	
	Coeff. (b/St.Er.)	P[|Z|>z]	Coeff. (b/St.Er.)	P[|Z|>z]	Coeff. (b/St.Er.)	P[|Z|>z]
Constant	-1.863*** (-2.833)	0.0046	-9.926*** (-4.627)	0.000	1.100 (0.606)	0.545
Df-cl	-0.068 (-0.861)	0.389	-0.582*** (-3.972)	0.000	0.507** (2.006)	0.045
Df-fam	0.208** (2.369)	0.018	0.440*** (2.681)	0.007	0.190 (1.138)	0.255
Df-house	0.021 (0.259)	0.796	0.307** (2.257)	0.024	-0.305* (-1.944)	0.052
Res	0.170 (1.201)	0.230	0.366 (0.918)	0.359	0.892 (1.455)	0.146
Poshigh	0.469* (1.874)	0.061	0.229 (0.935)	0.350	0.367 (1.030)	0.303
Net-size	-0.044 (-0.264)	0.791	0.014 (0.145)	0.885	-0.127 (-1.328)	0.184
Net-dens	-0.056 (-1.188)	0.235	-0.146 (-0.512)	0.609	-0.538 (-1.242)	0.214
Net-cont	-0.014 (-0.119)	0.905	-0.294** (-2.087)	0.037	-0.423* (-1.955)	0.051
Net-mfr	-0.232*** (-2.650)	0.008	1.279*** (3.218)	0.001	-0.219 (-0.679)	0.497
Unemplr	9.248*** (5.089)	0.000	20.121*** (4.475)	0.000	7.855* (1.839)	0.066
Incdum	3.000*** (4.571)	0.000	1.844* (1.682)	0.093	6.729*** (4.147)	0.000
Tc	-0.401*** (-7.845)	0.000	-0.072 (-0.871)	0.384	-0.912*** (-5.358)	0.000

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

Simple Logit: Log likelihood function -343.63; Restricted log likelihood: -425.45
Latent Class Model: N=891; Log likelihood function: -293.84; Restricted log likelihood: -343.63

Table 2 shows the estimation results of Model A recognizing the coefficients (coeff.) of the simple logit model as well as the coefficients of the two estimated latent subgroups of the latent class approach. The latent class model provides a statistically significantly better explanation of the migration outcomes compared to simple logit model without classes. The heterogeneity of peoples' migration decisions can be deduced by different directions of coefficients for the classes as well as by their dif-

ferent marginal impacts which are listed in Table 3. Regarding the network-components, meeting-frequency is in case of class 1, the contact-frequency for both classes significant. Thus, the probability to migrate is reduced for both classes if the frequency they talk to their network members increases. A well network-embedding has therefore a migration reducing character.

In class 1 the regional-differences housing, family and city-life are seen to have statistically significant impacts in the expected direction on the outcome; but city-life has a negative impact. As expected endowment with housing and family amenities being better in the moving region has a positive impact. For the second group the impact of a better city-life endowment is positive significant; housing though has a negative impact. Explanation might be rural-/urban-preferences as class 1 members prefer rural and class 2 members urban structures. Common for both classes and conform to a simple logit model is the statistically significant impact of 'classical' economic components. So the migration-probability increases when unemployment gets higher in the home region and a higher income in the potential moving region functions as a pull-factor and increases therefore the probability to migrate. The transaction-costs of moving are only in case of class 2 significant but for both classes the negative direction stands for a lower probability to migrate in case the transaction-costs of moving increase.

Since the estimated parameters of a binary regression model do not provide directly useful information for understanding the relationship between the independent variable and the outcome, the marginal effects are reported in Table 3. To get an impression of their relative importance the marginal effects of the independent variables are divided by the marginal effect of the income-difference (Marg/MargInc); so it becomes obvious if and in which amount some factors can outrank the income-difference influence on the migration-probability.

Table 3: Estimation Results Model A: Marginal Effects

	Simple Logit			Latent Class 1			Latent Class 2		
	Coeff.	P[|Z|>z]	Marg/ MargInc	Coeff.	P[|Z|>z]	Marg/ MargInc	Coeff.	P[|Z|>z]	Marg/ MargInc
Constant									
Df-cl	-0.040	0.387	0.045	-0.018**	0.034	0.316	0.057	0.928	-0.075
Df-fam	0.243**	0.016	-0.272	0.013	0.948	-0.238	0.021	0.858	-0.028
Df-house	0.028	0.796	-0.032	0.009	0.942	-0.167	-0.034*	0.061	0.045
Res	0.428*	0.059	0.477	0.011	0.206	0.198	0.100	0.107	0.133
Poshigh	-0.040	0.230	-0.045	0.007	0.194	0.124	0.041	0.147	0.054
Net-size	-0.208	0.236	-0.233	0.000	0.443	0.008	-0.014	0.888	-0.019
Net-dens	-0.053	0.791	-0.059	-0.004	0.689	-0.079	-0.060	0.874	-0.080
Net-cont	-0.384***	0.008	-0.428	-0.009	0.947	-0.160	-0.047	0.936	-0.063
Net-mfr	-0.041	0.905	-0.045	0.039*	0.052	0.693	-0.025	0.737	-0.033
Unemplr	1.250***	0.000	1.396	0.616**	0.034	10.910	0.878*	0.058	1.167
Incdum	0.896***	0.000	1.000	0.056*	0.079	1.000	0.752***	0.007	1.000
Tc	-1.715***	0.000	-1.915	-0.002	0.796	-0.039	-0.102	0.992	-0.136

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$

The income-difference shows for both classes positive marginal-effects, whereas the increase of moving probability in case of class 2 is a multiple of the 1st class one. The well-known importance of a higher income functions as a pull factor of migration can be reinforced. Also high and significant effects for both groups can be found for the unemployment-rate: A high rate of unemployment is a push factor of the home-region. In comparison for both classes the labour-market situation is more decisive for the migration decision than the income-difference is. Further outstanding is the positive significance of the meeting-frequency in case of class 1. The negative coefficient for the second class is insignificant; however, the results support the idea of relation-ship between networks and peoples' migratory-behaviour as well as that people differ in the network-influences.

The second model shows most factors in the group selection model as being statistically significant (Table 4). Regarding the class-membership characteristics a ratio of 76% for class 1 and 24% for class 2 points out. Significant determinants are employment, network-size, position and Fac1, which represents the factor analyzed personal attitudes and stands for a positive attitude to rural living-conditions. With the network-size and position variable two network-components determine the class-membership significantly; because the attitudes can also be influenced by the network someone is embedded, in all

three significant network-influences are given for the class-division. The first class is characterized by older, employed ones with a high network-size but few relations to high-position people and a less positive attitude to rural living-conditions compared to class 2 members.

Table 4: Estimation Results Model B: Class Membership

	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]
Constant_1	-0.386	0.996	-0.388	0.698
Age_1	0.076***	0.019	3.954	0.000
Male_1	0.325	0.368	0.884	0.377
Fac1_1	-0.596**	0.266	-2.245	0.025
Havejob_1	0.943**	0.447	2.11	0.035
Net-dens_1	-0.206	0.316	-0.652	0.515
Net-size_1	0.193**	0.092	2.105	0.035
Posdum_1	-6.019***	1.361	-4.421	0.000
Spouse_1	0.187	0.403	0.464	0.642
Locdum_1	-0.360	0.389	-0.926	0.355

**** p < 0.01; ** p < 0.05; * p < 0.10*

Prior class probabilities at data means for Latent-Class-Model variables:
Class 1: .7609 Class 2: .2391

Table 5: Estimation Results Model B: Simple Logit, Latent Class Model

	Simple Logit		Latent Class Model			
			Class 1		Class 2	
	Coeff. (b/St.Er.)	P[|Z|>z]	Coeff. (b/St.Er.)	P[|Z|>z]	Coeff. (b/St.Er.)	P[|Z|>z]
Constant	-0.594 (0.431)	0.168	-3.983*** (-3.036)	0.002	6.195*** (2.643)	0.008
Df-cl	0.200 (0.091)	0.028	0.972*** (3.564)	0.000	-1.004 (-1.553)	0.120
Df-house	-0.052 (0.086)	0.546	-0.188 (-1.151)	0.250	0.026 (0.087)	0.931
Df-fam	-0.216 (0.089)	0.015	0.573*** (2.936)	0.003	-2.159*** (-2.622)	0.009
Df-job	-0.041 (0.053)	0.436	-0.193* (-1.783)	0.075	0.354 (1.415)	0.157
Df-nat	0.104 (0.093)	0.263	-1.053*** (-3.703)	0.000	1.587** (2.223)	0.026
Df-recr	-0.199 (0.075)	0.008	-0.551*** (-3.431)	0.001	1.010* (1.81)	0.070
Res	0.504 (0.202)	0.013	2.693*** (3.653)	0.000	-1.939** (-2.187)	0.029
Net-cont	-0.222 (0.087)	0.011	-0.232 (-0.963)	0.336	-0.979*** (-2.629)	0.009
Tc	-0.371 (0.049)	0.000	-0.447*** (-3.504)	0.001	-0.850*** (-3.452)	0.001
Incdum	2.994 (0.645)	0.000	3.894*** (2.648)	0.008	6.783** (2.514)	0.012
Inceur	-0.378 (0.131)	0.004	-1.273*** (-3.196)	0.001	-0.529 (-1.334)	0.182

**** p < 0.01; ** p < 0.05; * p < 0.10*
Simple Logit: Log likelihood function: -351.3755; Restricted log likelihood: -425.4512
Latent Class Model: N=891; Log likelihood function: -299.94; Restricted log likelihood: -351.38

Regarding the estimation results of the migration-components (Table 5) the significant estimation results of the economic variables show similar results as in Model A: A higher income-difference leads to a higher migration, transaction-costs have a migration-probability reducing character and the personal-income functions as a pull factor of the home-region in case it increases. One important finding is that resources as a network-variable is for both classes significant but for class 1 in a positive and for class 2 in a negative way. So both, a supporting and hindering impact on the likelihood of

moving can be found, depending on the class-membership. The estimated coefficients of all regional differences have contrary directions for the two classes. Remembering our consideration that people reach their migration-decisions by composing regional-differences, meaning evaluation of home and potential moving-region, whereas this evaluation as a form of belief-formation happens in uncertainty and can be influenced by information one receives from his/ her network-members, the class-determining character of the network-parameters might be an explanation of these clear class differences. Furthermore, the positive values of the city-life variable which represents pre-urban preferences and corresponding the negative signs of the pre-rural oriented variables Df-nat, Df-recr and Df-house in case of class 1 (class 2 is the inverse case) symbols that the migration-decisions are also driven by pre-rural/ pre-urban preferences and so by the amenity endowment of a region. Moreover, the idea of preference-heterogeneity can be approved. This also becomes apparent by the marginal effects (Table 6). Outstanding are the income-difference as a main driver of migration and in case of class 2 the significant regional-differences for nature and recreation; this is conform to class-characteristics which identified class 2 members preferring rural living-conditions more than class 1 members do.

Table 6: Estimation Results Model B: Marginal Effects

	Simple Logit			Latent Class 1			Latent Class 2		
	Coeff.	P[|Z|>z]	Marg/ MargInc	Coeff.	P[|Z|>z]	Marg/ MargInc	Coeff.	P[|Z|>z]	Marg/ MargInc
Constant									
Df-cl	0.673*	0.086	1.980	0.013	0.112	0.250	-0.183	0.938	-0.148
Df-house	1.545	0.348	4.545	-0.003	0.805	-0.048	0.005	0.465	0.004
Df-fam	1.329	1.000	3.908	0.008	0.123	0.147	-0.394	0.991	-0.318
Df-job	-0.057	0.492	-0.168	-0.003	0.854	-0.050	0.065*	0.084	0.052
Df-nat	1.150	0.139	3.383	-0.014	0.883	-0.270	0.290**	0.020	0.234
Df-recr	0.620	0.281	1.822	-0.007	0.897	-0.142	0.184**	0.043	0.149
Res	1.040**	0.027	3.057	0.036	0.117	0.691	-0.354	0.984	-0.286
Net-cont	1.884	0.135	5.539	-0.003	0.794	-0.060	-0.179	0.990	-0.144
Tc	4.865**	0.016	14.307	-0.006	0.889	-0.115	-0.155	0.996	-0.125
Incdum	0.340**	0.020	1.000	0.052	0.111	1.000	1.239***	0.010	1.000
Inceur	1.100***	0.000	3.235	-0.017	0.882	-0.327	-0.097	0.915	-0.078

**** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$*

Conclusions

Analyses of migration behaviour have been conducted in different fields of research so far. The understanding of peoples' migration-decisions is therefore doubtless an interesting issue. Innovative of the carried out analyses presented in this paper is to use a latent-class approach to analyze migration-behaviour; this approves as a good solution to recognize that not for all people migration is influenced in the same way and preference-heterogeneity exists. Furthermore, with including individual network-characteristics as well as personal and macro-economic components this paper stands out from the given literature. In summary the estimation results show that people can be divided into subgroups caused by subjective factors as age and employment as well as by network-components as network-localization, network-size, positions and attitudes, especially preferences/ aversions for a rural environment someone has. In particular, the classes show differing directions as well as differing marginal effects in the migration determining factors. So peoples' migration decisions are influenced differently and preference heterogeneity exists; especially, in both models evidence of rural vs. urban preference structures can be found.

The 'classical' migration explanatory variables income and employment can be reinforced by this study and are decisive push- and pull-factors of migration. In both models significant influences point out, whereas no variability in the direction of their impact arises for the estimated latent subgroups. Special are the differing marginal effects of these factors, depending on the class-memberships. So even if for all individuals income and (un-)employment are decisive drivers of migration, the relative importance varies clearly. Particularly, social-networks and amenities have a remarkable impact on

migration decisions, too. In respect to the research questions if and what sort of impact networks have on migration decisions, the first question can be approved clearly. The sort of impact networks have depends on the class membership determining factors: The classes differ in the marginal effects of the investigated network-components but not necessarily in the direction. In the second estimated model resources are an exception with increasing migration probability for class 1 and reducing it in case of class 2. In all, social-networks are important to determine migration-decisions, but the direction of their influence depends on individual-preferences and on individual network-structures - among other things especially on the network-localization.

The public-good and amenity endowment of a region is also significant. E.g. in case of Model B in comparison to the marginal impact of income-differences a perceived good environmental-quality of a region points out as being 25% as important as the income is to decide to migrate for the second class. Model A shows similar results with city-life amenities being 35% as decisive as income is for class 1. Moreover, rural as well as urban-preferences are outstanding determinants of migration-decisions because a pre-rural and pre-urban class becomes obvious in the estimated models. Generally, amenity-rich regions – rural as well as urban - can profit from their amenity-endowment as that in-migration can be induced and out-migration can be decreased. The well-known assumption of rural-urban migration-flows cannot be approved by this study. From a political-advise perspective the finding that a good endowment with amenities lead people to migrate to such a region is recognizable because by changing, improving and sustaining the public good endowment of a region it is possible to manage therefore migration. Furthermore, in respect to the importance of social networks it is thinkable that by enhancing social networks supporting institutions like sport or culture clubs migration decisions can be affected, too. In all, amenities as well as social-networks are important drivers of migration-decisions but the direction of their influence depends on individual-preference structures.

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